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THE IMPACT OF CHRONIC COMORBID CONDITIONS ON QUALITY OF LIFE OF A PATIENTS WITH MEDICATION ADHERENCE IN GENERAL MEDICINE DEPARTMENT

Dr. Neela Navya[1], Dr. Ramya Priya Talluri[2], Dr. Sai Prasanna[3], Dr. MD Muzaffar Pasha[4], Dr. M. Prathibha*[5] and Dr. M. V. Rambabu[6]

[1]Pharm. D (PB), 3rd Year Malla Reddy College of Pharmacy.

[2,3,4]Pharm. D, 6th Year Malla Reddy College of Pharmacy.

[5]Asst. Professor, Doctor of Pharmacy Malla Reddy College of Pharmacy.

[6]Assistant Professor, DNB General Medicine Malla Reddy Institute of Medical Sciences.

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***Corresponding Author**
M. Prathibha
Bhel Vista Apartments
Block -b, FL.no 305,
Jeedimetla, Hyderabad,
India- 500014.
Phone no: 9676243939

ABSTRACT

Background: Comorbidity is the presence of one or more additional diseases or disorders co-occurring with a primary disease or disorder. Quality of life (QoL) incorporates the patient's perspective of his/her physical, mental and social well-being. Comorbidities can have profound effects on patient's ability to manage their self-care and pose significant barriers to lifestyle changes and regimen adherence and associated with worse health outcomes, more complex clinical management, and increased health care costs. Hospitalization and subsequent discharge home often involve discontinuity of care, multiple changes in medication regimens, and inadequate patient education regarding the instruction of drug use, respiratory devices, and disease information and also lack of information about the drug's side effects that can lead to medication nonadherence and low level of treatment satisfaction[1], which in turn shows effects on QoL of patient. **Aim and Objectives:** To assess QoL and Medication Adherence in patients with chronic comorbid conditions using SF-12 questionnaire and Morisky scale respectively. To counsel patients based on their conditions and assess the improvement in their QoL for three months. To use different measures (PIL's, Flash cards) to improve Medication Adherence. To analyze prescriptions for medication errors and suggest suitable recommendations. **Methodology:** A Prospective Observational study conducted in multispeciality tertiary care hospital with a sample size of 100 patients for a period of 6

months. Patients were recruited based on inclusion and exclusion criteria. Data was collected from the patient by data collection forms and by providing questionnaire. **Results and Discussion:** The present study, was aimed at assessing quality of life and medication adherence in chronic comorbid conditions (primary conditions: HTN, CVA, CLD, CKD, CAD). In our study QOL was assessed by providing SF-12 questionaires to the patient and the outcomes were observed. QOL was increased by 23.4% in hypertensive patients, 24.24% in CVA patients; 23.51% in CLD patients; 24.36% in CKD patients and 22.66% in CAD patients. Medication adherence was assessed by morisky scale. Means of motivational score was increased by 1.01 & knowledge score was increased by 1.43. **Conclusion:** Based on our study, we have observed that, Quality of life was poor in CKD patients, when compared to other primary conditions, which was 60.53%, through SF-12 questionaires. After the follow ups, it was increased by 24.36% in CKD patients. Also, an increase in QOL was found in all the conditions. Improvement was also found in medication adherence.

KEYWORDS: Quality of life; Medication adherence; Chronic comorbidities; Hypertension; Cardiovascular accident; Chronic liver disease; Chronic kidney disease; Coronary artery disease; SF-12 quesstioneries; Morisky scale.

1. INTRODUCTION

Comorbidity means more than one disease or condition present in the same person at a time. Conditions described as comorbidities are often chronic or long-term. Other names to describe comorbid conditions are co-occurring conditions and sometimes also "multimorbidity" or "multiple chronic conditions".[1]

Comorbidity can be thought of in a number of ways. Some comorbidities are contingent on pre-existing conditions, such as heart failure in patients with hypertension. Other comorbidities are distinct, almost certainly unrelated to the index condition, such as osteoarthritis in a patient with hyperthyroidism.[2]

Comorbidities can have profound effects on patient's ability to manage their self-care and pose significant barriers to lifestyle changes and regimen adherence. Quality of life incorporates the patient's perspective of his/her physical, mental and social well-being. Complications and comorbid conditions primarily determine the quality of life.[3]

Poor quality of life is associated with adverse outcomes in people with comorbidities, including poor response to therapy, disease progression, and mortality.[4]

Quality of life was measured using Short Form-12 (SF-12). The SF-12 is a generic, reliable and validated instrument, containing 12 items derived from the Short Form-36 questionnaire. Physical and mental quality of life was measured using the physical component summary (PCS) and mental component summary (MCS) scores of the SF-12, respectively. The PCS items include an assessment of the participant's self-report on the level of limitations experienced in performing moderate activities, climbing stairs, accomplishing less because of physical health, the experience of bodily pain, and a rating of general health. The MCS items include questions on feeling calm and peaceful, downhearted and blue, accomplishing less, and doing activities less carefully than usual because of one's mental health.[5]

Medication adherence is defined by the World Health Organization as "the degree to which the person's behaviour corresponds with the agreed recommendations from a health care provider. Though the terms adherence and compliance are synonymously used adherence differs from compliance. Compliance is the extent to which a patient's behaviour match whereas adherence signifies that thepatient and physician collaborate to improve the patient's health by integrating the physician's medical opinion and the patient's lifestyle, values and preferences for care.[6]

Adherence to medication is the extent to which a person takes medicines as prescribed by the health care provider. It is a key factor for effectiveness of pharmacological therapy. Nonadherence to medication leads to increased morbidity and mortality.[7]

Medication adherence can have significant impact on the health-related quality of life (HRQoL) in patients with chronic clinical conditions including CAD. Although they are different constructs, adherence and HRQoL are related to patients and should be considered when evaluating the impact of interventions that affect their health. Furthermore, these constructs are considered distinct outcomes in the care process - while adherence constitutes an intermediate result, HRQoL can be understood as a final outcome of the treatment. Thus, it is possible to assume that interventions outlined for optimizing adherence influence medication adherence a priori and subsequently the HRQoL.[8]

In outpatient clinical settings, there is a need for a valid, reliable, cost-effective tool that is accepted by both health care providers and patients for measuring medication adherence. Widespread use of such a tool, which could provide insight into modifiable factors regarding adherence in different patient populations, would lead to better understanding of non-adherence and lay the groundwork for interventions aimed at increasing adherence to therapies.[9]

1.1 BACKGROUND INFORMATION

Interventions to improve care for persons with chronic medical conditions often use quality of life (QOL) outcomes. These outcomes may be affected by coexisting (comorbid) chronic conditions as well as the index condition of interest.[10]

The primary co morbidities included in this study are Hypertention, cerebrovascular accident [CVA], chronic liver disease [CLD], coronary artery disease [CAD], Nephropathy.

HYPERTENSION: *Hypertension* is a common disease that is defined simply as persistently elevated arterial blood pressure (BP).[11] Hypertention has often been described as silent killer. Although symptoms are usually absent, persistently elevated blood pressure cause long term damage to numerous organs and can result in over cardiovascular diseases, kidney damage and stroke, and is a frequent cause of pre-marture death.

The risk of cardiovascular morbidity and mortality is directly correlated with blood pressure (BP).[11] Starting at a BP of 115/75 mmHg, risk of cardiovascular disease doubles with every 20/10-mm Hg increase.

Essential hypertension is usually an asymptomatic condition. A diagnosis cannot be made based on one elevated BP measurement. An elevated value from the average of two or more measurements on two or more clinical encounters is needed to diagnose hypertension.[11]

Lifestyle modifications should be prescribed in all patients with hypertension and prehypertension. However, they should never be used as a replacement for antihypertensive drug therapy in patients with hypertension.

Compelling indications are comorbid conditions where specific drug therapies have been shown in outcome trials to provide unique long-term benefits.[11] Drug therapy

recommendations for compelling indications are either in combination with or in place of a thiazide diuretic.

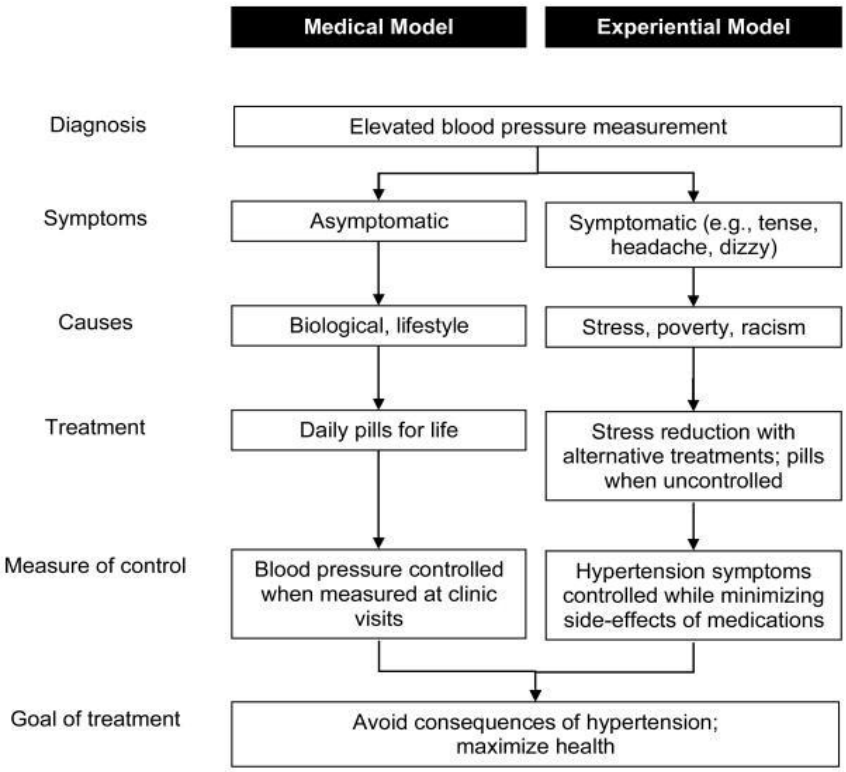


Figure 1.1.1: Hypertension algorithm[12]

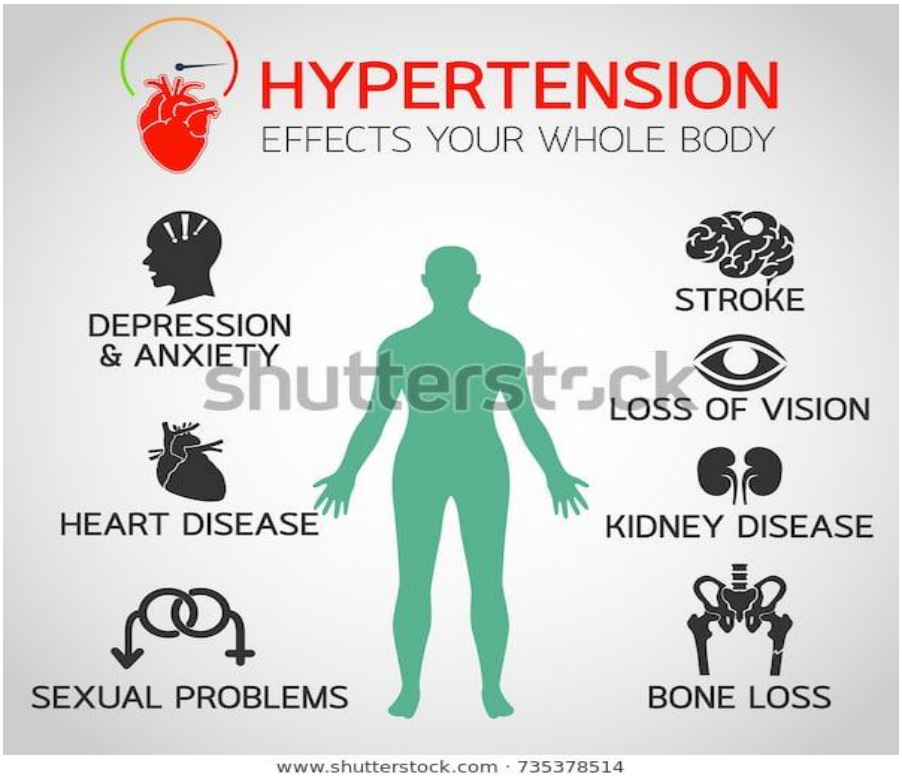


Figure 1.1.2: Hypertension[34]

CEREBROVASCULAR ACCIDENT [CVA]: A cerebrovascular accident, more commonly known as a "stroke," is broadly classified as either ischemic or hemorrhagic. In either category, the end result is a loss of blood flow and nutrients and oxygen to a region of the brain, resulting in neuronal damage and subsequent neurological deficits. There are numerous causes of stroke, such as prolonged hypertension, arteriosclerosis, and emboli that have formed as a result of atrial fibrillation or rheumatic fever. In younger patients, the possible list of causes may be broadened to include clotting disorders and various forms of vasculitis. In the event of a possible stroke presentation, a precise history and physical must be performed alongside emergent neurological imaging before administering any form of treatment. With early, focused treatment based on the stroke etiology, rehabilitation programs, and long-term lifestyle changes, one can maximize his/her chances for a meaningful recovery.

Before any treatment can be administered, the patient must be assessed for stable airway, breathing, and circulation. The patient must also be assessed to determine whether he/she is a candidate for alteplase (rt-PA). The fibrinolytic must be administered within 3 to 4.5 hours after symptom onset to be effective, depending on exclusion criteria.

Within 24 to 48 hours of symptoms onset, patients should be placed on anti-platelet therapy, typically 325 mg of aspirin orally.

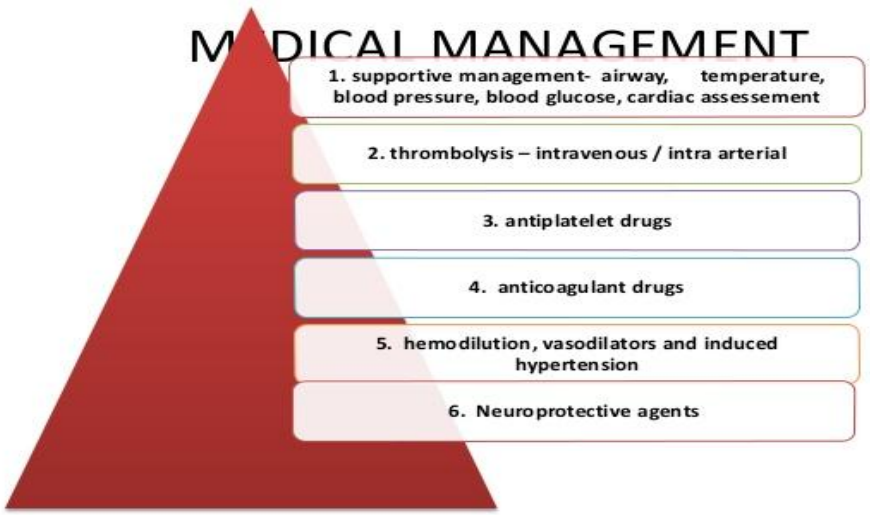


Figure 1.1.3: Management of stroke

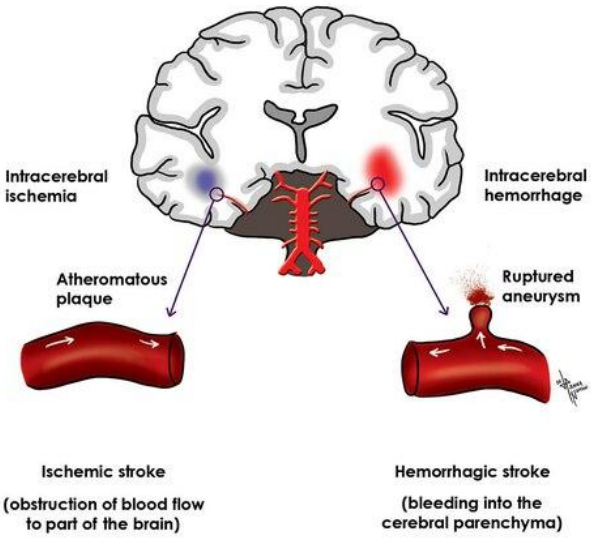


Figure 1.1.4: Cerebrovascular accident[37]

CHRONIC LIVER DISEASE: Chronic liver disease is characterised by scarring and destruction of the liver tissue. Early changes, such as 'fatty liver' (a build up of fat in the liver cells) can progress via inflammation (hepatitis) and scarring (fibrosis) to irreversible damage (cirrhosis). At this point, the liver will not be able to regenerate itself though further damage can be averted. Most chronic liver disease is symptomless ('silent') and when symptoms do develop, they are often vague such as tiredness, weakness, loss of appetite and nausea. Once the liver begins to fail (or decompensate) symptoms and signs include bruising easily; yellow skin (jaundice); itching and accumulation of fluid in legs (oedema) or the abdomen (ascites). Causes of death from cirrhosis include development of liver failure, brain damage (encephalopathy), catastrophic internal bleeding (oesophageal varices) and also primary liver cancer. Most of cases of hepatocellular carcinoma, the commonest primary liver cancer, occur in patients with cirrhosis.

Many patients with chronic liver disease are predisposed to malnutrition as a result of many factors, including inade-quate intake and malabsorption. Decreased appetitite, nausea, vomiting, and restrictive diets can result in inade- quate nutrient intake. Ascites itself can also affect intake, because the ascites may result in increased intra-abdominal pressure, which leads to early satiety. Cholestasis, cirrhosis, portal hypertension, and pancreatic insufficiency can all con-tribute to malabsorpton. Elevated energy expenditure and altered protein metabolism may also contribute to the development of malnutrition.

Causes of chronic liver disease

Viral	Metabolic	Vascular	Autoimmune
Alcohol	Hemochromatosis	Portal Vein thrombosis	Autoimmune hepatitis
Inherited	Wilson's disease	Hepatic Vein thrombosis	Primary biliary cirrhosis
Toxins CCl 4 Aflatoxin	α1antitrypsin deficiency	Non Alcoholic Fatty Liver Disease	Primary sclerosing cholangitis

Figure 1.1.5: Causes of Chronic liver disease.

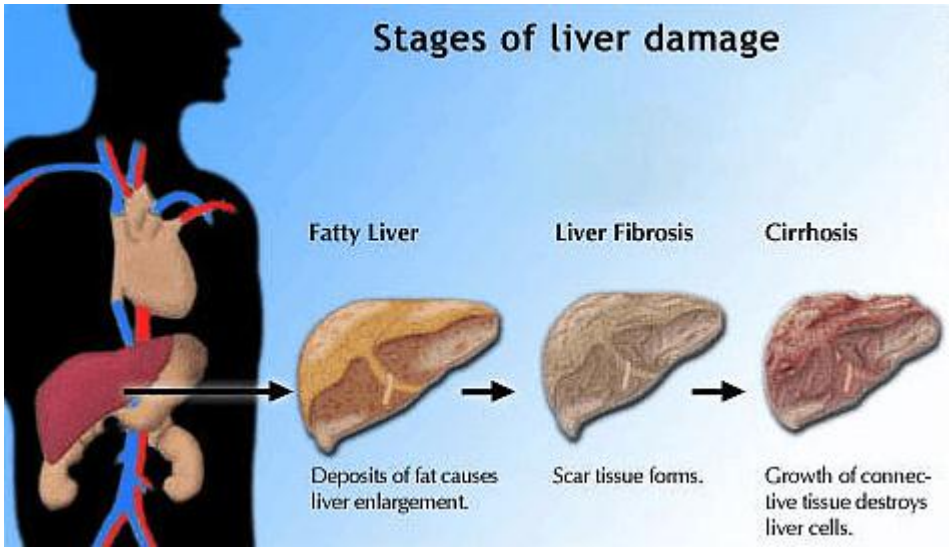


Figure 1.1.6: Stages of liver damage[38]

Octreotide is the preferred vasoactive agent employed in the medical management of variceal bleeding. Vasopressin can no longer be recommended as a first-line agent because of its significant adverse effect profile. Endoscopy employing endoscopic band ligation or endoscopic injection sclerotherapy is the primary therapeutic tool in the management of acute variceal bleeding.

The combination of spironolactone and furosemide is now the recommended initial diuretic therapy for patients with ascites.

All patients who have survived an episode of spontaneous bacterial peritonitis should receive long-term antibiotic prophylaxis.

The mainstay of therapy of hepatic encephalopathy involves therapy to lower blood ammonia concentrations, and includes diet therapy, lactulose, and antibiotics alone or in combination with lactulose.

CHRONIC KIDNEY DISEASE: Chronic kidney disease (CKD) is recognized as a major health problem affecting approximately 13% of the United States population. Numbers of prevalent CKD patients will continue to rise, reflecting the growing elderly population and increasing numbers of patients with diabetes and hypertension. As numbers of CKD patients increase, primary care practitioners will be confronted with management of the complex medical problems unique to patients with chronic renal impairment. As well documented in the literature, the nephrologist rarely manages the medical needs of CKD patients until renal replacement therapy is required. In this chapter we will define CKD staging and discuss five complications associated with CKD: anemia, hyperlipidemia, nutrition, osteodystrophy, and cardiovascular risk.[13]

CKD is defined as the presence of kidney damage, manifested by abnormal albumin excretion or decreased kidney function, quantified by measured or estimated glomerular filtration rate (GFR), that persists for more than three month. Although creatinine clearances can be calculated from urine creatinine concentration measured in a 24 hour urine collection and a concomitant serum creatinine concentration, a more practical approach in the office is to estimate GFR (estimated GFR or eGFR) from the serum creatinine concentration, using either the Cockcroft-Gault or the Modification of Diet in Renal Disease (MDRD) Study estimating equations.

- To facilitate assessment of CKD severity and, the National Kidney Foundation developed criteria.
- Stage 1: normal eGFR $\geq$ 90 mL/min per 1.73 m^2 and persistent albuminuria
- Stage 2: eGFR between 60 to 89 mL/min per 1.73 m^2
- Stage 3: eGFR between 30 to 59 mL/min per 1.73 m^2
- Stage 4: eGFR between 15 to 29 mL/min per 1.73 m^2

- Stage 5: eGFR of < 15 mL/min per 1.73 m^2 or end-stage renal disease

Table 1.1: Mainstay of Treatment in Chronic Kidney Disease Complications.

Complication	Treatment		
Osteodystrophy	Vitamin D Supplements		
Anemia	Recombinant Erythropoietin	Calcium Supplements	Intestinal Phosphate Binder
Cardiovascular	Statins		Transfusion in Urgent Cases
Dyslipidemia	Statins	Blood Pressure Control via ACE Inhibitor and/or Angiotensin Receptor Blockers	Specific CAD Interventions

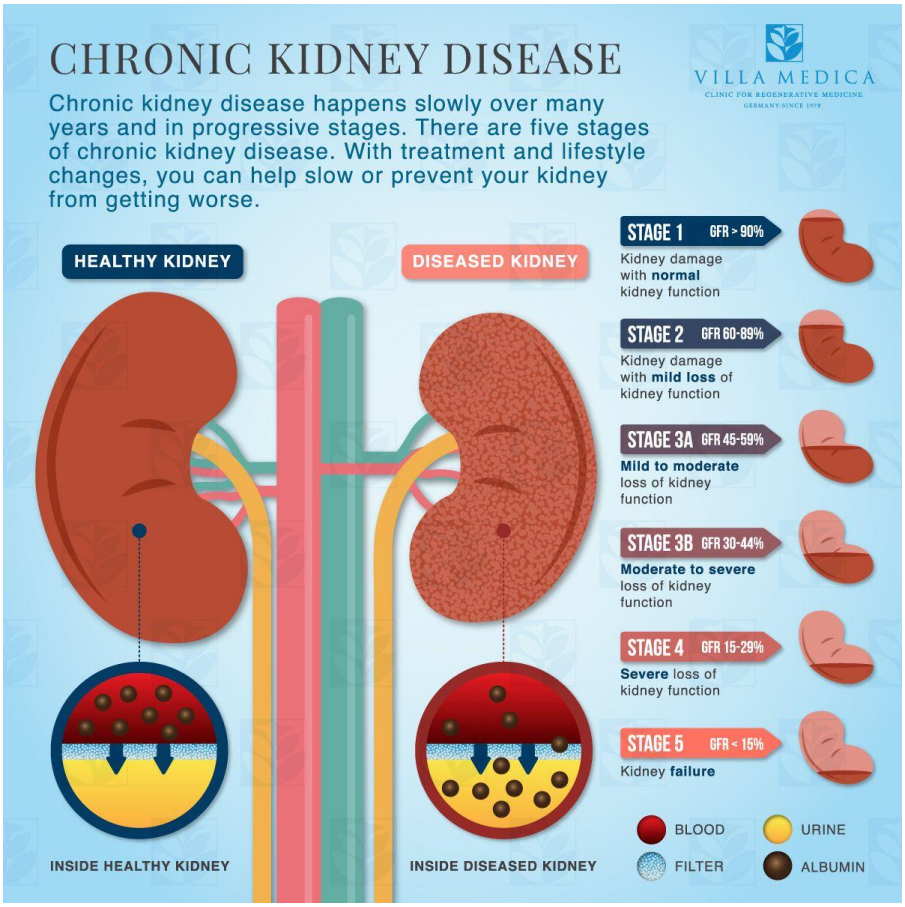
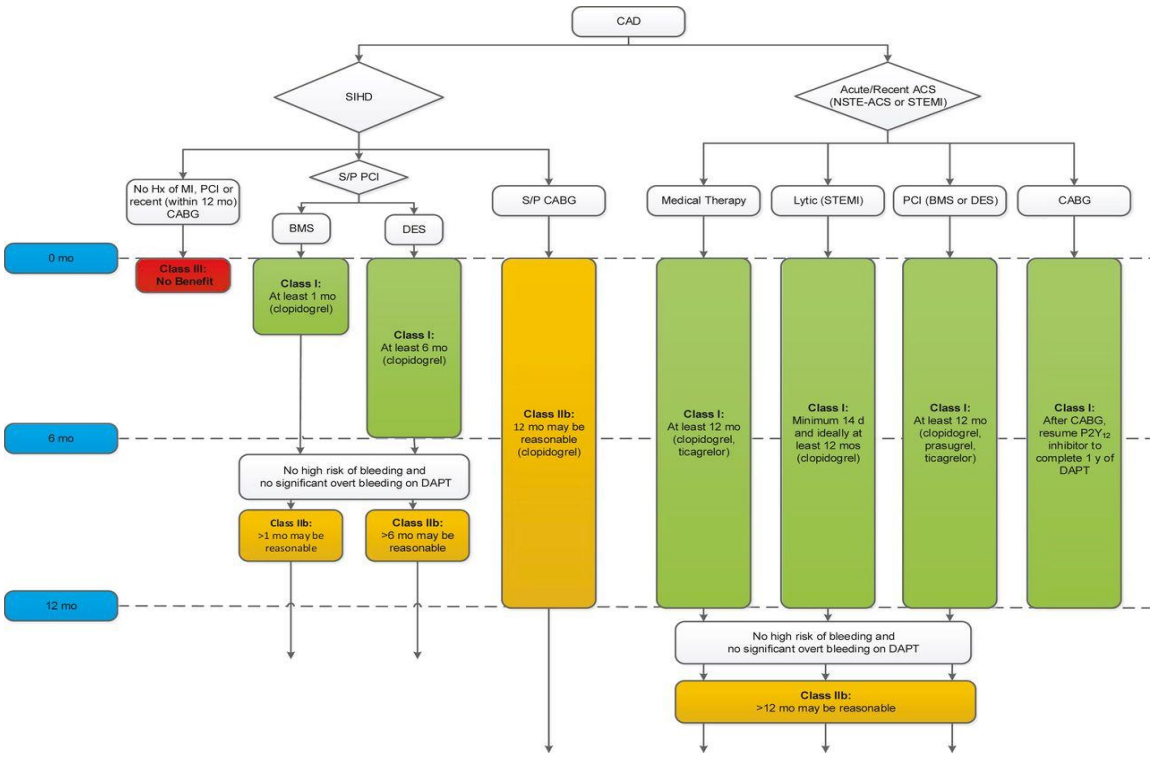


Figure 1.1.7: Chronic kidney disease[36]

CORONARY ARTERY DISEASE: Coronary artery disease (CAD) is characterized by disease within the arteries that supply the heart muscle. The disease typically develops due to atherosclerosis (hardening) and plaques (sections of calcified material) within the blood vessels. As a result, the coronary arteries often cannot carry blood as efficiently as they should and may even become completely obstructed (blocked off). Because the heart muscle

requires a continuous supply of oxygen and nutrients to survive, obstruction of a coronary artery rapidly leads to significant problems, such as heart attacks and strokes.

CAD is caused by lifestyle factors such as smoking and lack of exercise, as well as medical conditions such as high blood pressure and diabetes. Treatment includes managing risk factors with lifestyle adjustments and prescription medications, and sometimes directly repairing or replacing the arteries with surgical or specialized procedures.[14]



Figurse 1.1.8: Algorithm of CAD.

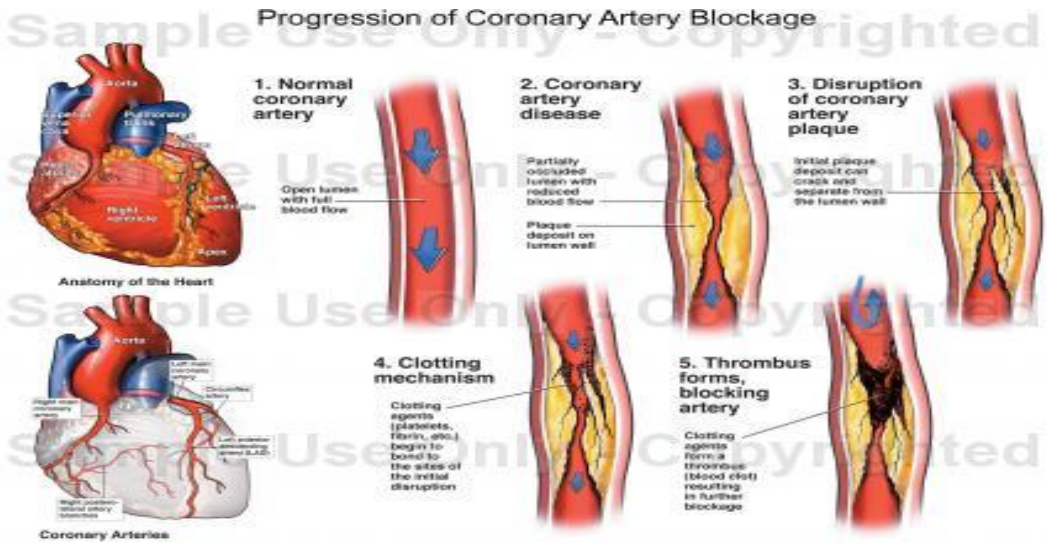


Figure 1.1.9: Progression of coronary artery blockage[35]

1.2 NEED OF THE STUDY

- To study the impact of chronic comorbid conditions on QoL and Medication Adherence.
- To improve QoL and Medication Adherence by using different measures.
- To avoid medication errors due to polypharmacy.

1.3 AIM and OBJECTIVES

AIM

- To study the impact of chronic comorbid conditions on QoL and Medication Adherence.
- To study the significance of patient counselling.
- To study the significance of Medication Adherence techniques on QoL. Primary objective.

OBJECTIVES

Primary objectives

- To assess QoL and medication adherence in patients with chronic comorbid conditions.
- To counsel patients based on their conditions and assess the improvement in their QoL for three months.
- To use different measures (PIL's, Flash cards) to improve medication adherence.

Secondary objectives

- To analyze prescriptions for medication errors and suggest suitable recommendations.

2. LITERATURE REVIEW

1. Prasanna Tadi; Benjamin Senst.

Acute Stroke (Cerebrovascular Accident).

A cerebrovascular accident, more commonly known as a "stroke," is broadly classified as either ischemic or hemorrhagic. In either category, the end result is a loss of blood flow and nutrients and oxygen to a region of the brain, resulting in neuronal damage and subsequent neurological deficits.[15]

2. Zanchetti, Albertoa; Fujita, Toshirob; Mancia, Giuseppe

Introduction

A brief introduction was given about hypertension, which included a note on hypertension, about RAAS system and complications of hypertension.

Jose M. Valderas, Barbara Starfield, Bonnie Sibbald, Chris Salisbury, Martin Roland. Defining Comorbidity: Implications for Understanding Health and Health Services In this article, they reviewed definitions of comorbidity and their relationship to related constructs. They conclude that the more precise use of constructs, as proposed in this article, would lead to improved research into the phenomenon of ill health in clinical care, epidemiology, and health services.[16]

3. Luis García-Olmos; Carlos H. Salvador; Angel Alberquilla; David Lora; Montserrat Carmona; Pilar García-Sagredo; Mario Pascual; Adolfo Muñoz; José Luis Monteagudo; and Fernando García-López

Comorbidity Patterns in Patients with Chronic Diseases in General Practice

This study sought to identify comorbidity patterns in patients with chronic diseases, by reference to number of comorbidities, age and sex, in a population receiving medical care from 129 general practitioners in Spain, in 2007. Four comorbidity patterns were identified which grouped diseases as follows: one showing diseases with a high comorbidity burden; one showing diseases with a low comorbidity burden; and two showing diseases with an intermediate comorbidity burden.[17]

4. Xuan J; Kirchdoerfer LJ; Boyer JG; Norwood GJ.

Effects of comorbidity on health-related quality-of-life scores: an analysis of clinical trial data

In this study, the effects of comorbidity on the results of QOL measures were done through an analysis of longitudinal data from 3 double-masked, randomized, placebo-controlled clinical trials dealing with heartburn, asthma, and ulcer. The study results suggest that comorbid conditions significantly and extensively affect patients' scores on generic QOL measures and estimation of treatment effect, whereas their influence on disease-specific QOL scores and estimation of treatment effect is considerably smaller.[18]

5. Adriaanse MC, Drewes HW, van der Heide I, Struijs JN, Baan CA.

The impact of comorbid chronic conditions on Quality of Life in type 2 diabetes patients

A study was conducted to study the prevalence, impact and dose-response relationship of comorbid chronic conditions on Quality of Life of type 2 diabetes patients and they concluded that comorbidities are highly prevalent among type 2 diabetes patients and have a negative impact on the patient's QoL. A strong dose-response relationship between

comorbidities and physical QoL was found. Reduced physical QoL is mainly determined by musculoskeletal and cardiovascular disorders.[4]

6. **Anastasia F. Hutchinson; Marnie Graco; Tshepo Mokuedi Rasekaba; Sumit Parikh; David John Berlowitz and Wen Kwang Lim.**

Relationship between health-related quality of life, comorbidities and acute health care utilisation, in adults with chronic conditions

The aim of this study was to explore the relationship between HRQoL, comorbid conditions and acute health care utilisation. It found that both HRQoL and comorbidities were predictive of subsequent acute care attendance over 3-years of follow-up. At 1-year, comorbidities was a better predictor of acute care representation than HRQoL. To maximise benefits, programs should initially focus on medical disease management, but subsequently switch to strategies that enhance health independence and raise HRQoL.[19]

7. **Roger Jones**

Chronic Disease and Comorbidity

In this article, a few description was given about Chronic Disease and Comorbidity.[3]

8. **Ian M Kronish; Howard Leventhal; and Carol R Horowitz.**

Understanding minority patients' beliefs about hypertension to reduce gaps in communication between patients and clinicians

Their objective was to gain a better understanding of minority patients' beliefs about hypertension and to use this understanding to develop a model to explain gaps in communication between patients and clinicians. By, listening to patients' beliefs about hypertension it may increase trust, improve communication, and encourage better self-management of hypertension.[12]

9. **Robert Thomas; Abbas Kanso; and John R. Sedor**

Chronic Kidney Disease and Its Complications

A study was assessed in patients with CKD for the presence of complications and receiving of optimal treatment to reduce their morbidity and mortality. In conclusion, they stated that uremic malnutrition is very prevalent in CKD patients, and several studies have established a correlation between malnutrition and poor clinical outcome. Management of nutrition in CKD and dialysis patients can be difficult and involvement of dieticians with experience in the treatment of kidney disease patients is recommended.[13]

3. MATERIALS AND METHODS

Informed Consent Form

I _____ exercising my free power of choice here by give my consent to be included as a subject in the clinical study "The Impact of Chronic Comorbid Conditions on Quality of Life of Patient with Medication Adherence in General Medicine Department."

I understand that I may be asked for some particulars about my condition and will be given counseling. I have been informed to my satisfaction by the attending doctor the purpose of the clinical study and the follow up to know the impact.
I am also aware of my right to opt out of the study at any time during the course of the study without having to give the reasons for doing so.

_____

Signature of the Attending Doctor **Signature of the patient**
(Date)

The Impact of Chronic Comorbid Conditions on Quality of Life of a Patients with Medication Adherence in General Medicine Department

Centre Name: _____ Date: _____ Investigator Name:

_____

Patient Name: _____ Patient no: _____Age (yrs):

____

Height (cms): _____ Weight (kgs) : _____ Sex: ___ Address:

_____

_____Pincode: _____ Mobile no:

_____

Diagnosis: _____ Duration of Symptoms:

_____

Co-morbidities:

_____

Any other conditions -give details:

_____

3.1 PROFORMA: PROFILE FORM

Patient name:	**IP No:**		**Date of admission:**
Age: BMI:	**weight:**	**sex:**	**Date of discharge :**
Department:		**Consultant:**	
Contact no:		**Email id:**	
Provisional Diagnosis:			
COMPLAINTS ON ADMISSION:			
PAST MEDICAL HISTORY:		**PAST MEDICATION HISTORY :**	
SOCIAL HISTORY: **Smoking :** **Alcohol :** **Chewing Tobacco :**	**ALLERGIES:** **1.FOOD :** **2.DRUG :** **3.OTHER :**		
FAMILY HISTORY:		**SURGICAL HISTORY:**	
PHYSICAL EXAMINATION:			

DATE										
TEMPERATURE (°F):										
BLOOD PRESSURE(mm/Hg):										
PULSE RATE (bpm):										

CO-MORBIDITIES

PRIMARY CONDITIONS:	**SECONDRY CONDITIONS:**
Cardiac disease (CAD):	
Hypertension:	
CVA:	
Renal disease	
Chronic liver disease	

Complete Blood Picture	**Liver function Test**
Hb(g/dl)(M-11-16,F-11-14) **RBC (10^6 cells/cumm)(4-6.5):** **WBC (cells/cumm)(4000-11000):** **Differential leucocyte count:** **Neutrophils (40-70%):** **Lymphocytes (20-45%):** **Eosinophils (01-06%):** **Monocytes (02-10%):** **Platelet count (1.5-4.5 lakhs/cumm):**	**Serum bilirubin total(0-1mg):** **Direct :(up to 0.25mg/dl):** **Indirect:** **SGOT (Upto 65 IU/L):** **SGPT (Upto 37 IU/L) :** **ALP (15-116 IU/L):** **Total proteins(6-8gm/dl):** **Albumin(3.2-5.8gm/dl):** **Globulin(2.2-4.8gm/dl)):**
	Lipid profile (mg/dl):
Peripheral smear:	**Total cholesterol(140-250):** **HDL cholesterol(30-65):** **LDL cholesterol(80-180):** **VLDL Cholesterol)(5-45):** **Triglycerides(25-160):** **TC/HDL Ratio(upto 4.5):**
RBCs: **WBCs:**	
ESR(M-0-10mm/hr; F-0-20):	
Urine analysis:	
Color : **Appearance :** **Pus cells:**	**Biochemical Investigation(mg/dl):**
	Serum creatinine(0.6-1.4): **Blood Urea(14-45):**

Albumin: **Glucose:** **RBCs:**	**Serum electrolytes(mmols/L):**
Thyroid Function Test:	**Serum sodium(135-156):** **Serum potassium(3.6-5.5):** **Serum chlorides(98-108):** **Serum phosphates(2.5-5):** **Serum calcium(8-108):**
T_3(60-181ng/dl): **T_4(7.3-15µg/dl):** **TSH(0.55-4.78IU/L):**	**Blood sugar(mg/dl):**
Other investigations:	**Fasting blood sugar(70-110):** **Post lunch blood sugar(70-150):** **Random blood sugar(80-1120:**
Radiological Reports:	
Final diagnosis:	

DRUG TREATMENT CHART

Trade name	Generic name	Route	Dose	Frequency								

SF-12 QUESTIONARIES FOR QUALITY OF LIFE[20]

Answer each question by choosing just one answer. If you are unsure how to answer a question, please give the best answer you can.

1. In general, would you say your health is:

1 **Excellent** ☐ **2 Very good** ☐ **3 Good** ☐ **Fair** ☐ **Poor** ☐

The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

2. Moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.

1 YES, limited a lot ☐ **2 YES, limited a little** ☐ **NO, not limited at all** ☐

3. Climbing several flights of stairs

1 YES, limited a lot ☐ **2 YES, limited a little** ☐ **NO, not limited at all** ☐

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

4. Accomplished less than you would like.

1 YES ☐ **2 NO** ☐

5. Were limited in the kind of work or other activities.

1 YES ☐ **2 NO** ☐

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

6. Accomplish less than you would like.

1 YES ☐ 2 NO ☐

7. Did work or activities less carefully than usual.

1 YES ☐ 2 NO ☐

8. During the past 4 weeks, how much did pain interfere with your normal work (including work outside the home and housework)?

1 Not at all ☐ 2 A little bit ☐ 3 Moderately ☐ 4 Quite a bit ☐ 5 Extremely ☐

These questions are about how you have been feeling during the past 4 weeks.

For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the past 4 weeks

9. Have you felt calm and peaceful

1All of the time ☐ 2 Most of the time ☐ 3 A good bit of the time ☐ 4 Some of the time ☐

5 A little of the time ☐ 6 None ☐

10. Did you have a lot of energy

1 All of the time ☐ 2 Most of the time ☐ 3 A good bit of the time ☐

4 Some of the time ☐ 5 A little of the time ☐ 6 None ☐

11. Have you felt down-hearted and blue?

1 All of the time ☐ 2 Most of the time ☐ 3 A good bit of the time ☐

4 Some of the time ☐ 5 A little of the time ☐ 6 None ☐

12. During the past 4 weeks, how much of the times has your physical health or emotional problem interfered with your social activities (like visiting friends, relatives, etc.)?

1All of the time ☐ 2 Most of the time ☐ 3 Some of the time ☐

4 A little of the time ☐ 5 None ☐

MODIFIED MORISKY SCALE (MMS)[21]

Instructions

Ask the patient each question and circle the corresponding "yes" or "no" response. Circle the answer to each question and sum the score for the motivation column and sum the score for knowledge column. Report the results on the CMAG-1 Patient Summary Assessment Form.

Question	motivation	Knowledge
Do you ever forget to take your medicine?	**Yes (0) No(1)**	
Are you careless at times about taking your medicine?	**Yes (0) No(1)**	
When you feel better do you sometimes stop taking your medicine		**Yes (0) No(1)**
Sometimes if you feel worse when you take your medicine, do you stop taking it?		**Yes (0) No(1)**
Do you know the long-term benefits of taking your medicines as told to you by your doctor or pharmacist?		**Yes (0) No(1)**
Sometimes do you forget to refill your prescription medicine on time?	**Yes (0) No(1)**	
Total score	**0-1 = Low motivation** **2-3 = High motivation**	**0-1 = Low knowledge** **2-3 = High knowledge**

3.2 METHODOLOGY

STUDY SITE

The study is conducted in the Department of General Medicine at Malla Reddy Multispecialty Tertiary care Hospital which is Located at Suraram, Medchal District.

STUDY DESIGN

Prospective observational study

SAMPLE SIZE: 100 Patients

STUDY PERIOD: 6 months

STUDY CRITERIA

Inclusion criteria

- Patients with chronic comorbid medical conditions.
- Patients who agree to participate.

Exclusion criteria

- Patients undergoing surgeries.
- Cognitive impairment patients
- Pregnant women

SOURCE OF DATA

- The department selected for the study was department of general medicine

STUDY PROCEDURE

- **ETHICAL COMMITTEE APPROVAL**

Permission to carry this study was obtained from the authorities of ethical committee after submission of the study Protocol.

- **CONSENT FROM THE HOSPITAL AUTHORITY:**

The Protocol of the study which includes the aim, objectives, methodology and Plan of work was submitted to the medical superintendent of the study hospital.

All the health care professionals were well informed through medical superintendent official circular.

TOOLS

- **Proforma (Data entry form)**

A Separate data entry form was designed for incorporating the Patient details.

- **SF-12 Quesstionares**
- **Morisky scale**

STATISTICAL ANALYSIS:

- **SPSS version- 23 software**

3.3 PLAN OF WORK

Selection of patients based on inclusion and exclusion criteria

The particulars of study will be explained, and consent will be obtained from the patients.

Incorporating the collected data in predesigned patient pro-forma

Assess the QoL and Medication Adherence by different scales

Perform patient Counselling and improve Medication Adherence by using different Medication Adherence techniques.

Evaluate the QoL and Medication Adherence in patients for three consecutive months.

Statistical analysis of the data collect

Discussion

Conclusion

4. RESULTS

Table 4.1.1: DISTRIBUTION OF PATIENTS ACCORDING TO GENDER

GENDER	NUMBER OF PATIENTS
FEMALE	40
MALE	60

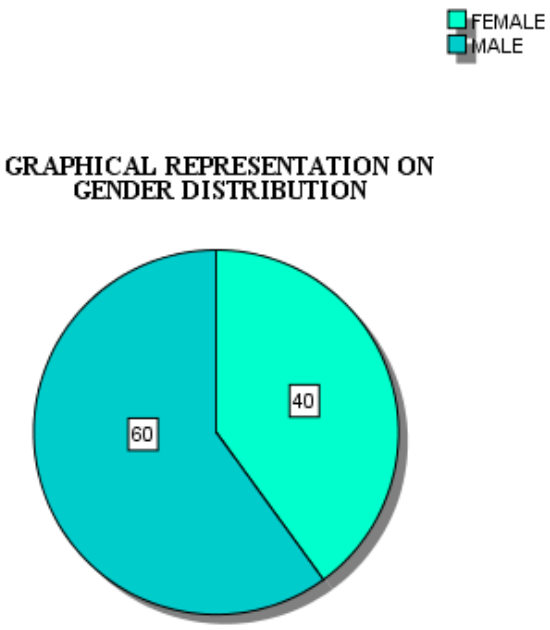


Figure 4.1.1: Illustration of number of patients based on gender.

INFERENCE: From this figure, we can observe that number of female patients were 40 in number and male patients were 60 in number.

Table 4.1.2: DISTRIBUTION OF PATIENTS BASED ON DIAGNOSIS

DIAGNOSIS	NUMBER OF PATIENTS
CVA	33
T2DM with Htn	14
CVA, Htn, Hypothyroid	3
ALD, Portal htn, ascitis, CLD	9
Pneumonia, Htn, CCF	4
COPD with Htn	6
CKD with Htn	7
T2DM	5
Hypertension	19

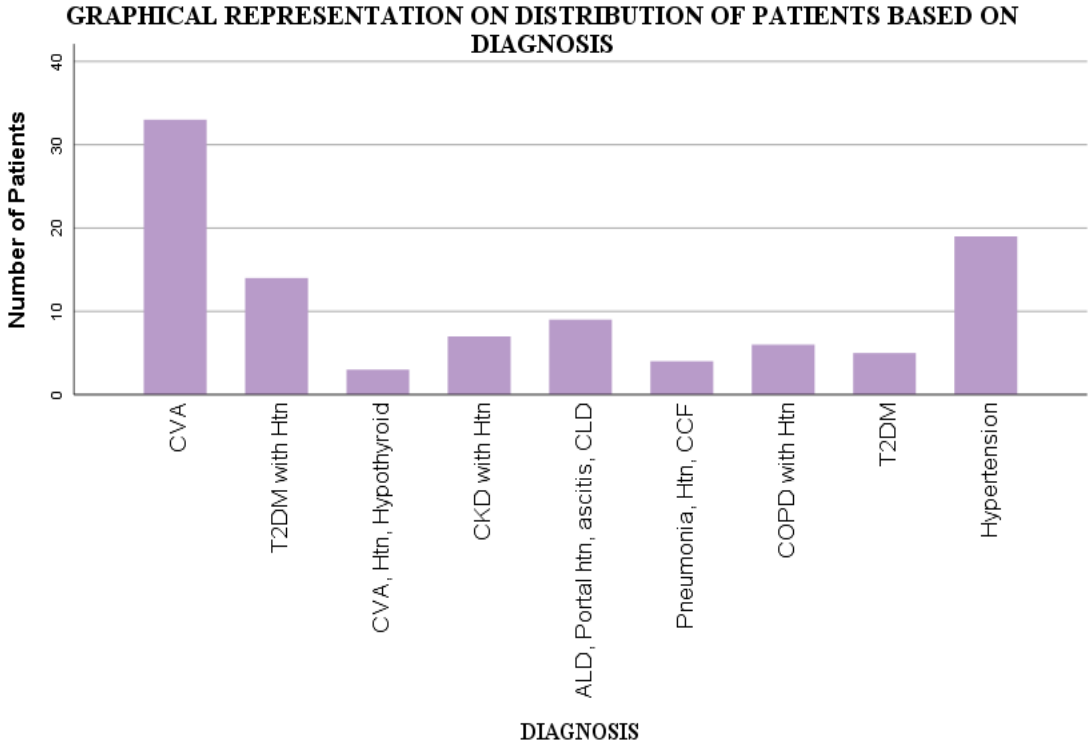


Figure 4.1.2: Illustration of number of patients based on diagnosis.

INFERENCE: This figure, represents about the initial diagnosis of the patients. Out of 100 patients, 33% of patients were diagnosed with CVA; 14% were diagnosed with T2DM with Hypertension; 3% of patients were diagnosed with CVA, Hypertension and Hypothyroid; 9% were diagnosed with CKD with Hypertension; 4%were diagnosed with ALD, Portal hypertension, ascitis, CLD; 6%ypertension**.**

Table 4.1.3: Distribution of Patients Based on Past Medical History.

PAST MEDICAL HISTORY	NUMBER OF PATIENTS
CVA	1
Htn	34
T2Dm	3
Thyroid	7
Htn and DM	19
Htn and hypothyroid	5
COPD	1
ALD	2
CAD	3
No Past History	25

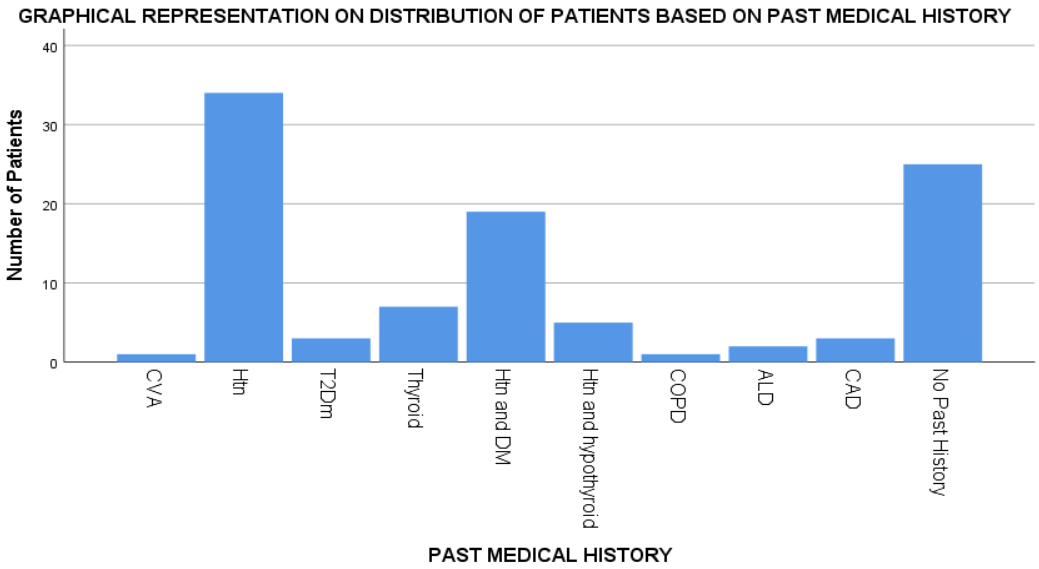


Figure 4.1.3: Illustration of number of patients based on past medical history.

INFERENCE: This figure, represents past medical history of the patients. Out of 100 patients, we observed that, 1% had a past history of CVA; 34% had Hypertension; 3% had Type2 Diabetes Mellitus; 7% had thyroid; 19% had Hypertension and Diabetes; 5% had Hypertension and Hypothyroid; 1% had COPD; 2% had ALD; 3% had CAD; were as, 25% of patients were found to be without any past history.

Table 4.1.4: Distribution of Patients Based on Smoking

SMOKING STATUS	NUMBER OF PATIENTS
SMOKERS	18
NON-SMOKERS	82

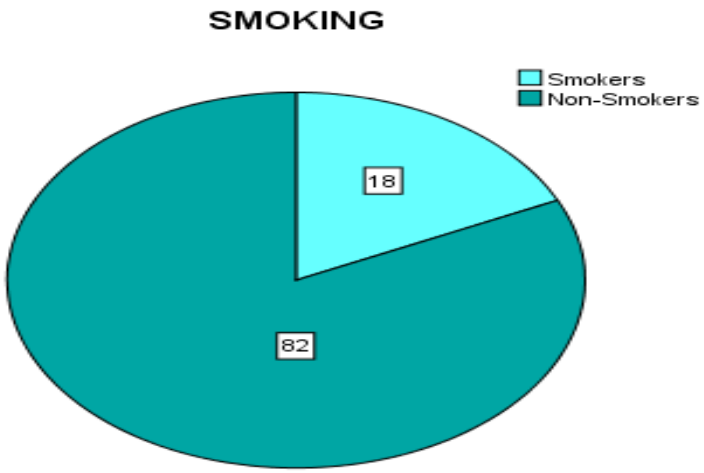


Figure 4.1.4: Illustration of number of patients based on smoking conditions.

INFERENCE: From this figure, it is observed that, 18% of patients were smokers and 82% of patients were non-smokers.

Table 4.1.5: DISTRIBUTION OF PATIENTS BASED ON TOBACCO CHEWING

CHEWING TOBACCO	NUMBER OF PATIENTS
YES	4
NO	96

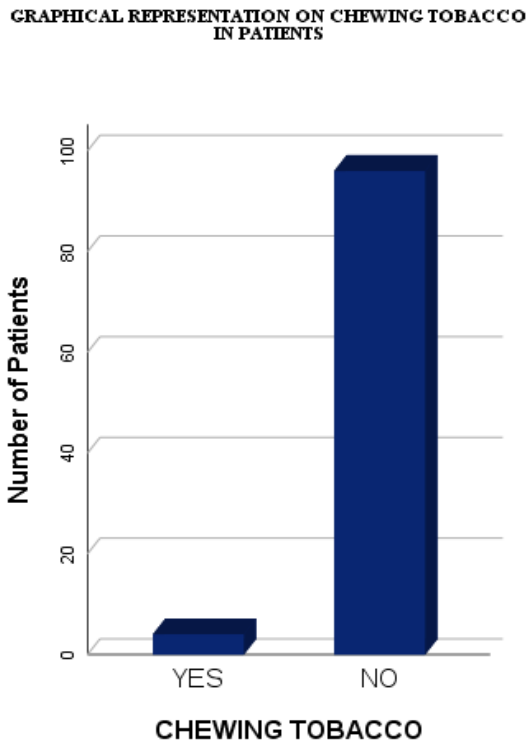


Figure 4.1.5: Illustration of number of patients based on chewing tobacco.

INFERENCE: From this figure, it is observed that, 4% of patients chewed tobacco and 96% of patients didn't chew tobacco.

Table 4.1.6: Distribution of Patients Based On Alcoholic Conditions

ALCOHOL CONSUMPTION	NUMBER OF PATIENTS
Non Alcoholic	**68**
Alcoholic	**26**
Stopped	**6**

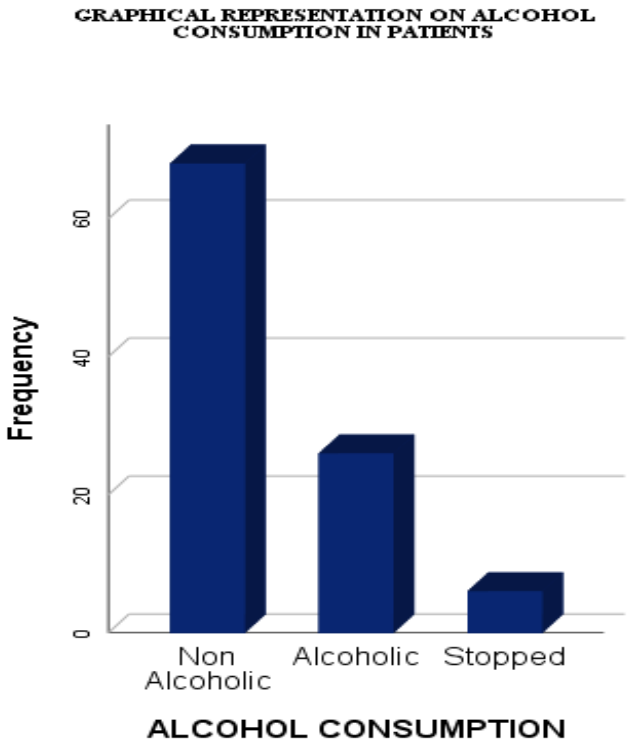


Figure 4.1.6: Illustration of number of patients based on alcohol consumption.

INFERENCE: From this figure, it is observed that, 68% of patients were non-alcoholic, 26% of patients were alcoholic and 6% of patients stopped taking alcohol.

Table 4.1.7: Distribution of Patients Based on Primary Conditions.

PRIMARY CONDITIONS	NUMBER OF PATIENTS
HTN	27
CVA	41
CLD	14
CKD	12
CAD	6

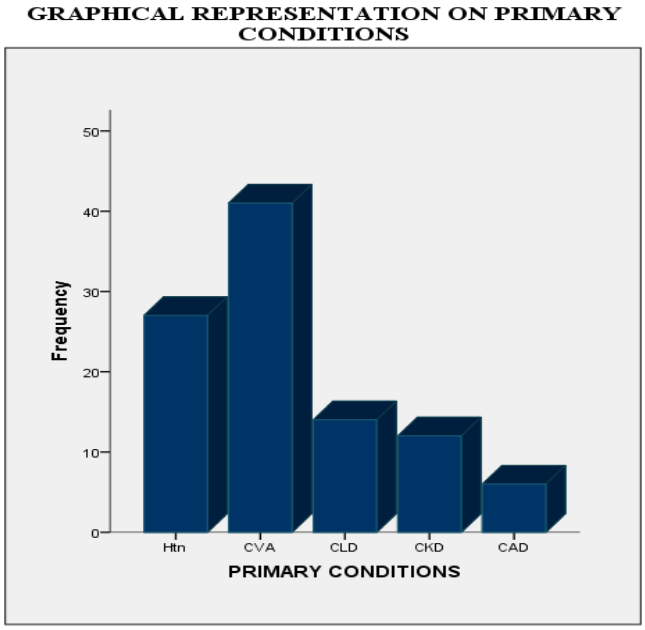


Figure 4.1.7: Illustration of number of patients based on primary conditions.

INFERENCE: This figure represents the Primary conditions, of the patients, which are considered for the study. It is observed that, 27% of patients had Hypertension; 41% of patients had CVA; 14% of patients had CLD; 12% of patients had CKD; 6% of patients had CAD.

4.2. QUALITY OF LIFE OUTCOME BASED ON PRIMARY CONDITIONS

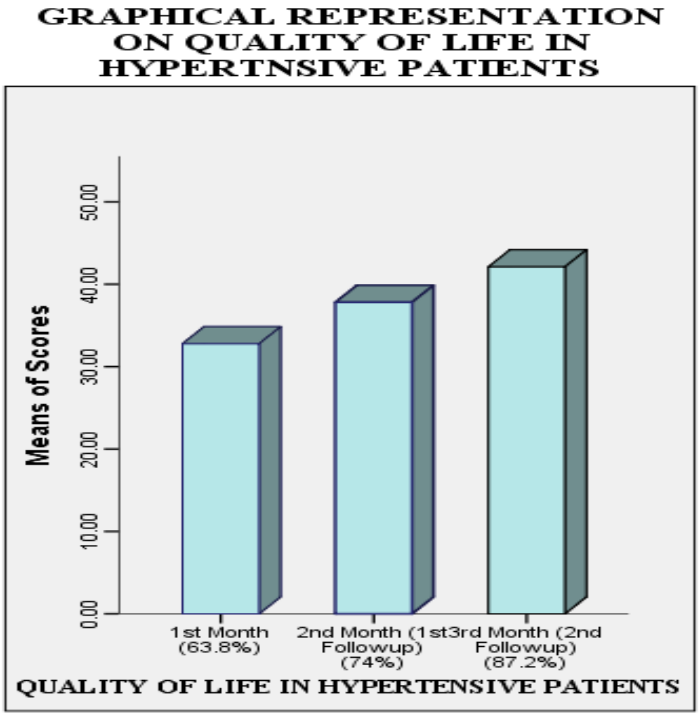


Figure 4.2.1: Graphical representation of quality of life in HTN patients.

INFERENCE: QOL by using SF-12 questionaires in hypertensive patients was 63.8% in 1st month. It was improved by 10.2% in 1st followup & 13.2% in 2nd followup.

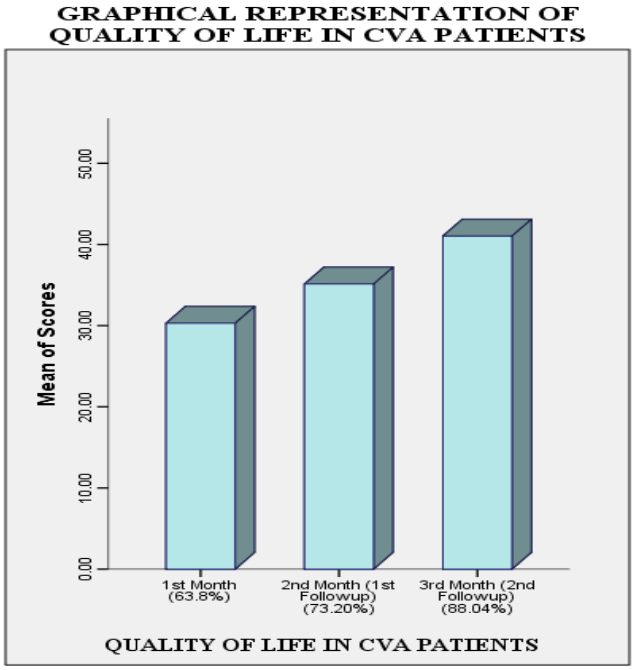


Figure 4.2.2: Graphical representation of quality of life in CVA patients.

INFERENCE: QOL by using SF-12 questionaires in CVA patients was 63.8% in 1st month. It was improved by 9.4% in 1st followup & 14.8% in 2nd followup.

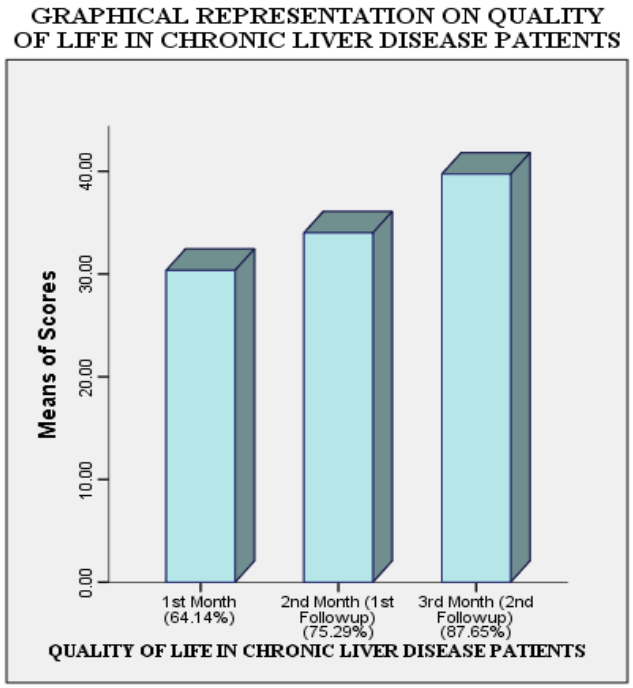


Figure 4.2.3: Graphical representation of quality of life in CLD patients.

INFERENCE: QOL by using SF-12 questionaires in CLD patients was 64.14% in 1st month. It was improved by 11.25% in 1st followup & 12.36% in 2nd followup.

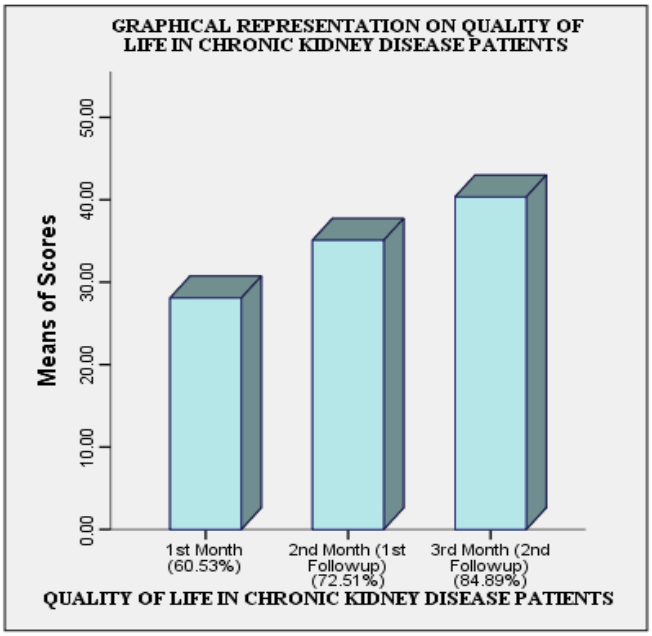


Figure 4.2.4: Graphical representation of quality of life in CKD patients.

INFERENCE: QOL by using SF-12 questionaires in CKD patients was 60.53% in 1st month. It was improved by 11.98% in 1st followup & 12.38% in 2nd followup.

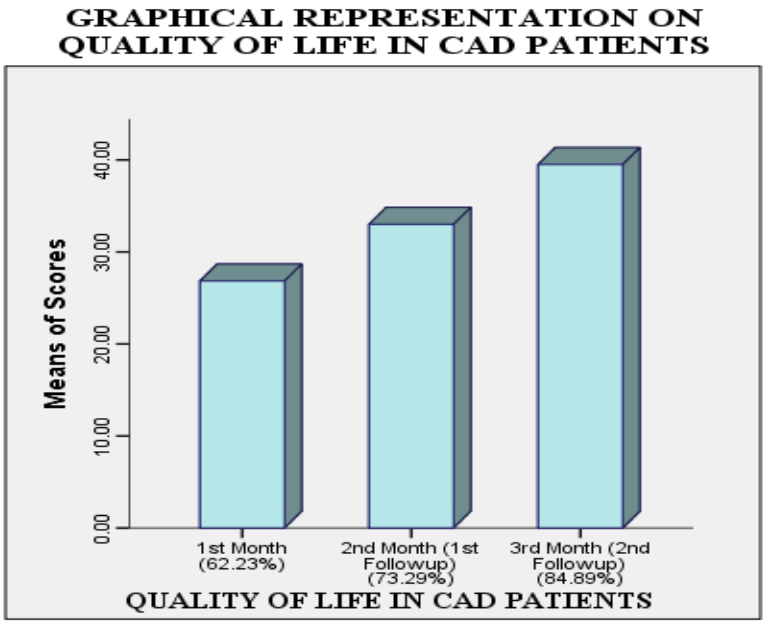


Figure 4.2.5: Graphical representation of quality of life in CAD patients.

INFERENCE: QOL by using SF-12 questionaires in CAD patients was 62.23% in 1st month. It was improved by 11.06% in 1st followup & 11.60% in 2nd followup.

4.3: OUTCOMES BASED ON QUALITY OF LIFE COMPONENTS

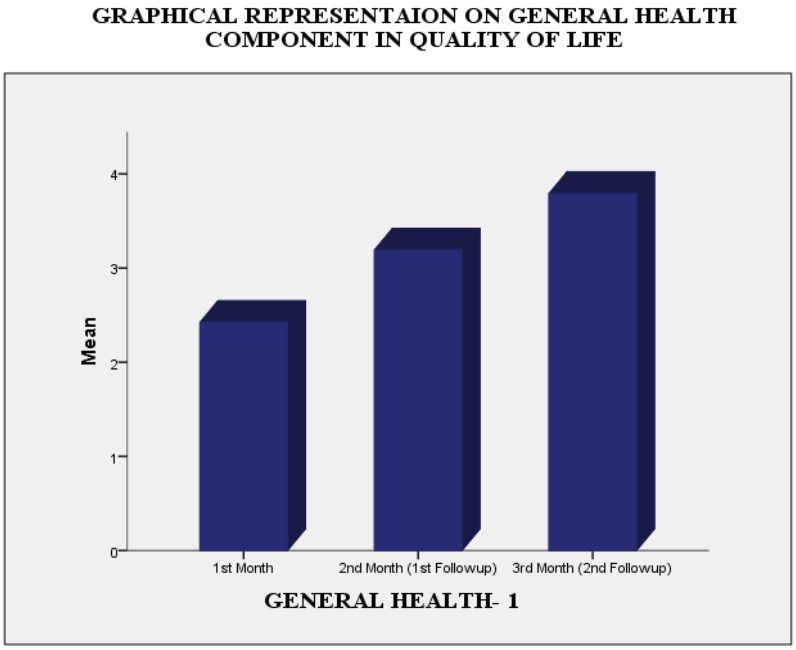


Figure 4.3.1: Illustration on General Health component of Quality of life.

INFERENCE: This figure, represents about the general health component of Quality of life scale. The mean score of general health in 1st month was found to be 2.5, implying to be in between Fair and good; and 3, in the 1st followup, implying to be Good; and 4 in the 2nd followup, implying to be Very good.

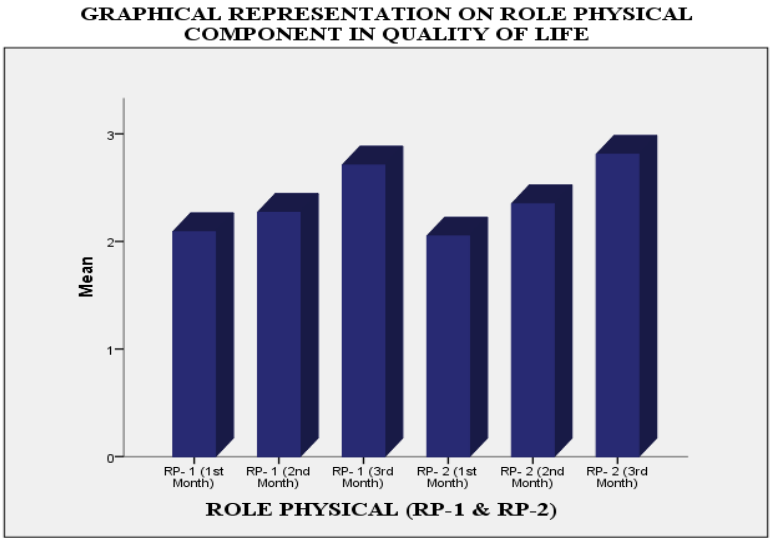


Figure 4.3.2: Illustration on Role physical component of Quality of life.

INFERENCE: This figure, represents about the role physical component of Quality of life scale. It consists of, two questions about physical roles. The mean scores of role physical in 1st month was found to be 2, implying to be limited a little; and 2.5, in the 1st followup, implying to be in between limitd a little and not limited at all and; 3 in 2nd followup implying to be not limited at all.

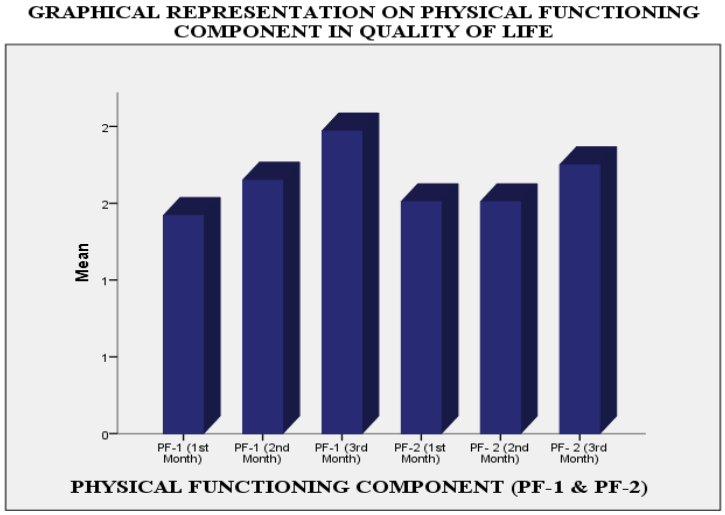


Figure 4.3.3: Illustration on Physical function component of Quality of life.

INFERENCE: This figure, represents about the physical function component of Quality of life scale. It consists of, two questions about physical functions. The mean scores of role physical in 1st month was found to be 2, implying to be limited a little; and 2.5, in the 1st followup, implying to be in between limitd a little and not limited at all and; 3 in 2nd followup implying to be not limited at all.

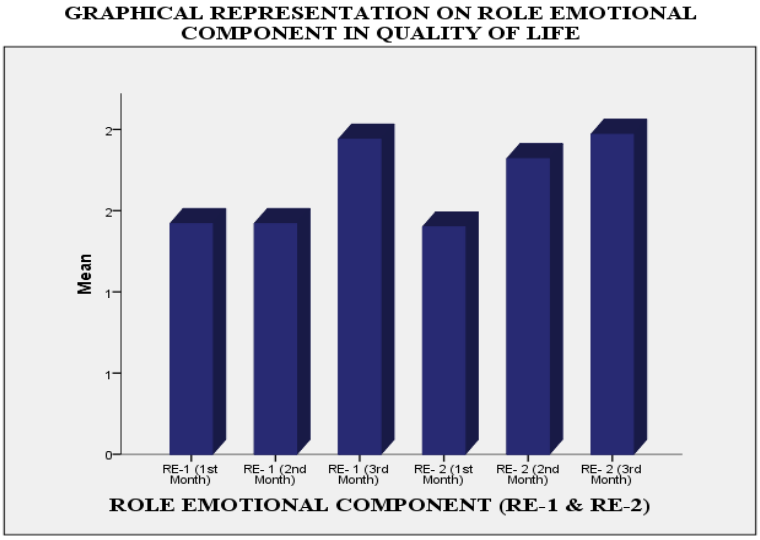


Figure 4.3.4: Illustration on Role emotional component of Quality of life.

INFERENCE: This figure, represents about the role emotional component of Quality of life scale. It consists of, two questions about emotional roles. The mean scores of role emotional in 1st month was found to be 2, implying to be no ; and also 2 in the 1st and 2nd followup, implying to be no.

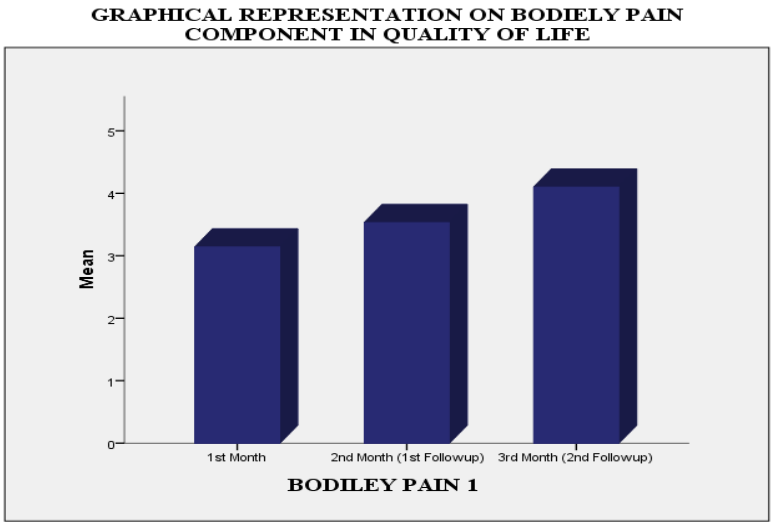


Figure 4.3.5: Illustration on bodiley pain component of Quality of life.

INFERENCE: This figure, represents about the bodiley pain component of Quality of life scale. The mean scores of bodiley pain in 1st month was found to be 3, implying to be moderate; and 4, in the 1st followup, implying to be a little; and 4.5 in 2nd followup implying to be in between a little bit and not at all.

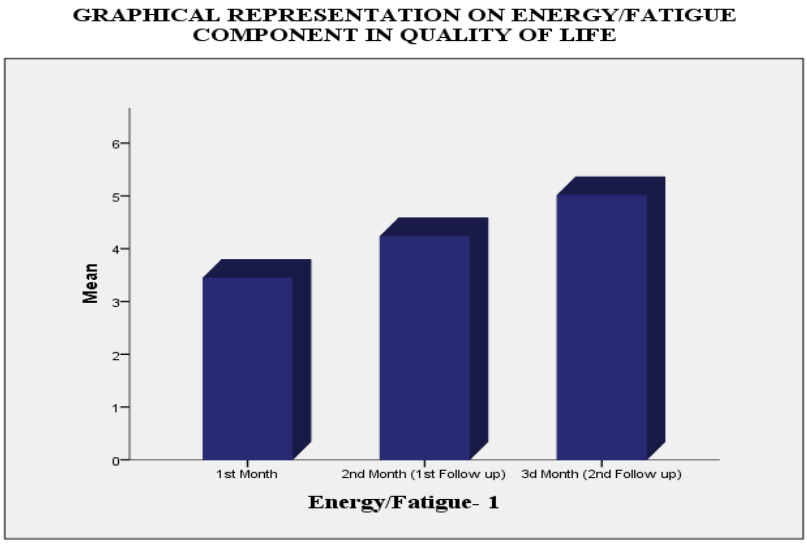


Figure 4.3.6: Illustration on energy/fatigue component of Quality of life.

INFERENCE: This figure, represents about the vitality component of Quality of life scale. The mean scores of vitality role in 1st month was found to be 3.5, implying to bein between some of the time and a good bit of the time; and 4.5, in the 1st followup, implying to be in between a good bit of time and most of the time and; 5 in 2nd followup implying to be most of the time.

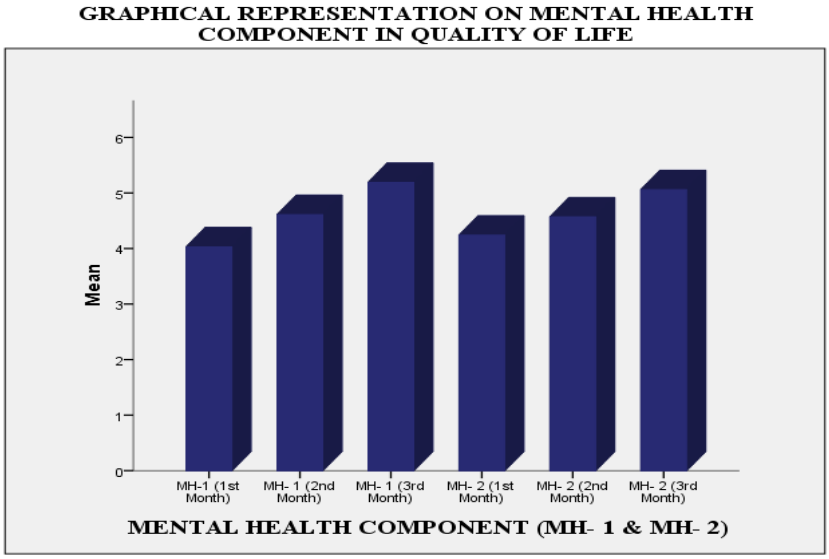


Figure 4.3.7: Illustration on mental health component of Quality of life.

INFERENCE: This figure, represents about the mental health component of Quality of life scale. It consists of, two questions about physical roles. The mean scores of mental health in 1st month was found to be 4, implying to be a good bit of time; and 4.5, in the 1st followup, implying to be in between a good bit of the time and most of the time; and 5.5 in 2nd followup implying to be in between most of the time and all of the time.

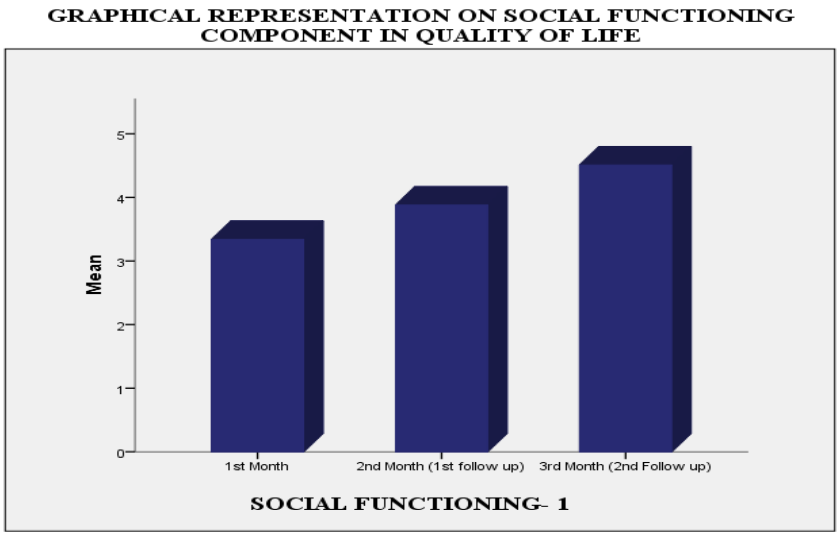


Figure 4.3.8: Illustration on social functioning component of Quality of life.

INFERENCE: This figure, represents about the social functioning component of Quality of life scale. The mean scores of social functioning in 1st month was found to be 3.5, implying to be in between some of the time and a little of the time; and 4 in the 1st followup, implying to be a little of time; and 4.5 in 2nd followup implying to be in between a little of the time and none.

BAR DIAGRAM SHOWING PHYSICAL COMPONENT SUMMARY

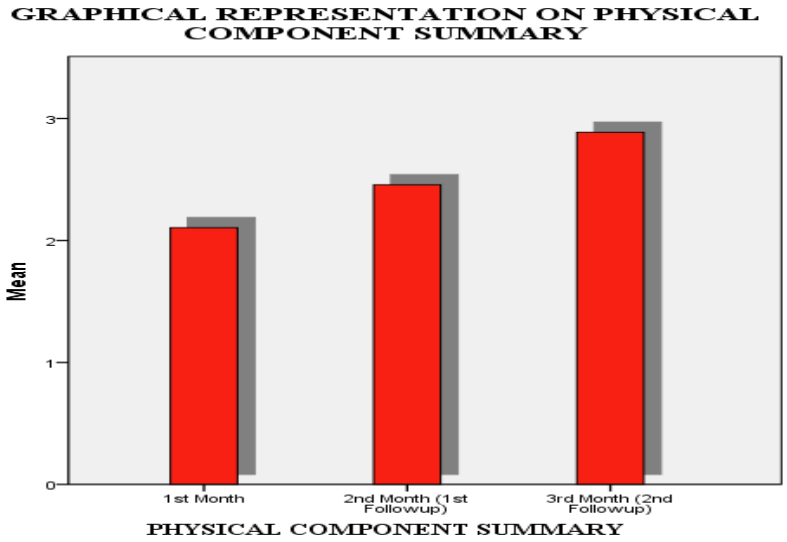


Figure 4.4.1: Bar diagram showing physical component summary scores.

INFERENCE: Improvement in the physical component summary scores, were observed.

BAR DIAGRAM SHOWING MENTAL COMPONENT SUMMARY

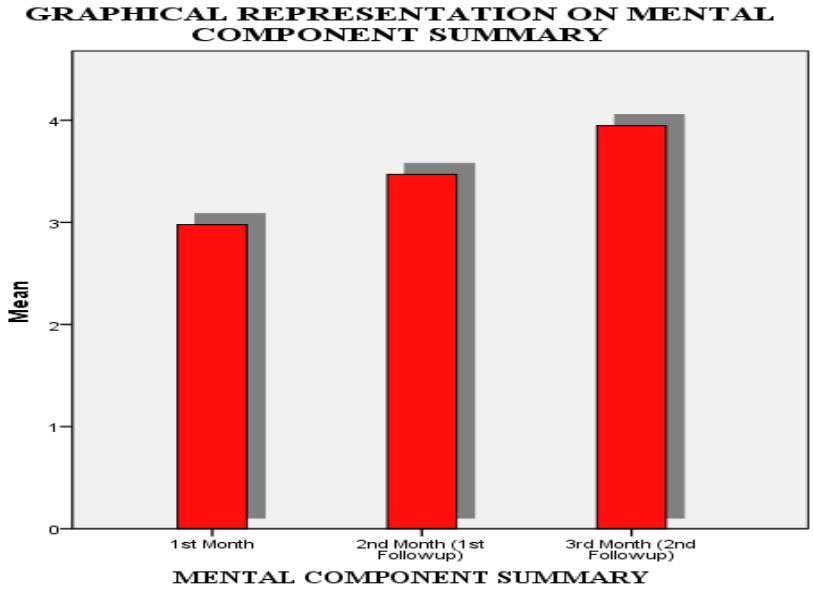


Figure 4.4.2: Bar diagram showing mental component summary scores.

INFERENCE: Improvement in the physical component summary scores, were observed.

Table 4.2: Paired Sample Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	MOT SCORE	1.54	100	.540	.054
	MOT SCORE	2.55	100	.539	.054
Pair 2	KNOW SCORE	1.57	100	.537	.054
	KNOW SCORE	2.48	100	.541	.054

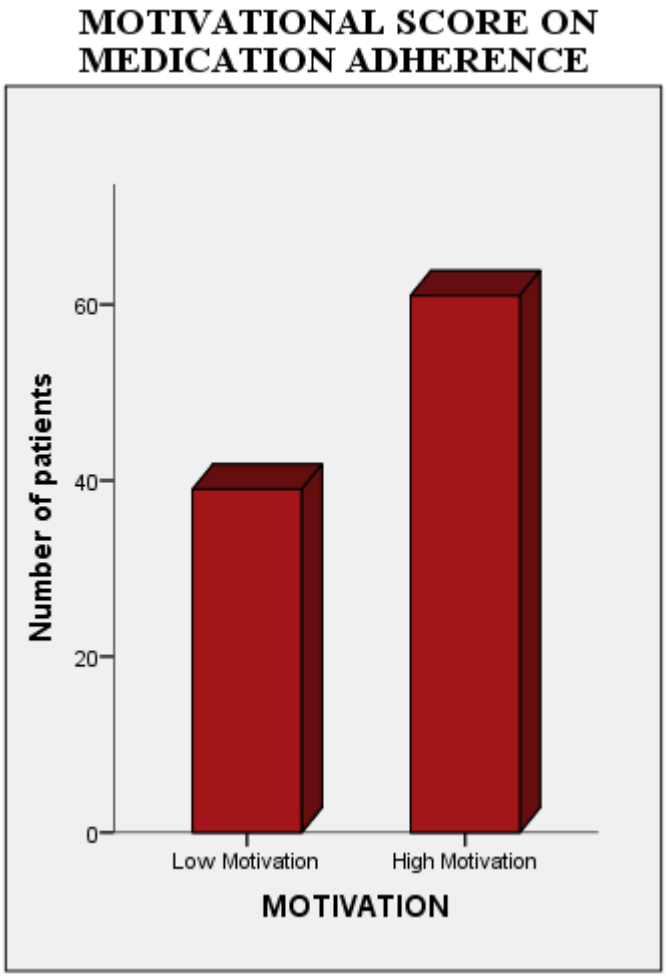


Figure 4.5.1: Bar diagram showing outcomes of motivational score on medicational adherence.

Inference: Out of 100 samples, low motivation was found in 40% and high motivation was found in 60% of patients.

Figure 4.5.2: Bar diagram showing outcomes of motivational score on medicational adherence.

Inference: Out of 100 samples, low motivation was found in 35% and high motivation was found in 65% of patients in 2nd month.

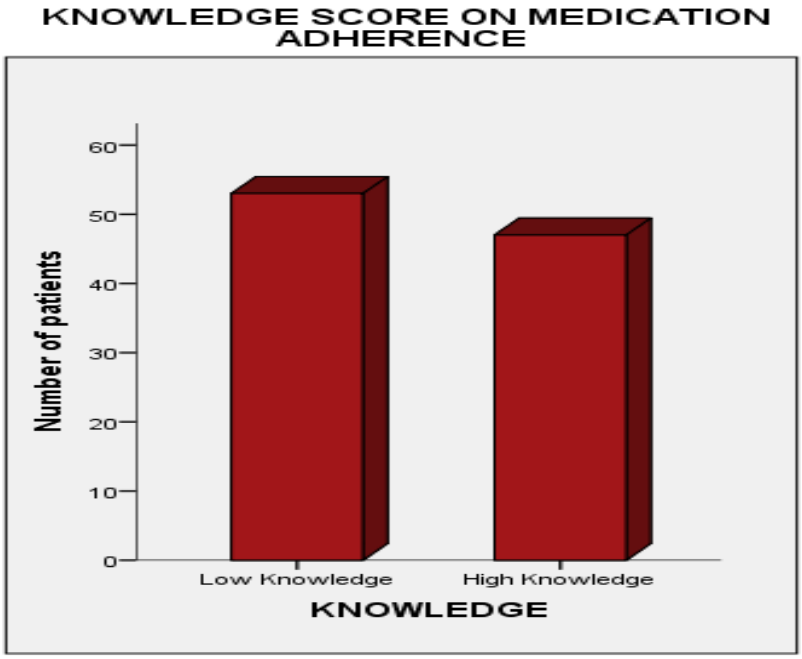


Figure 4.5.3: Bar diagram showing outcomes of knowledge score on medicational adherence

Inference: Out of 100 samples, low knowledge was found in 53% and high knowledge was found in 47% of patients.

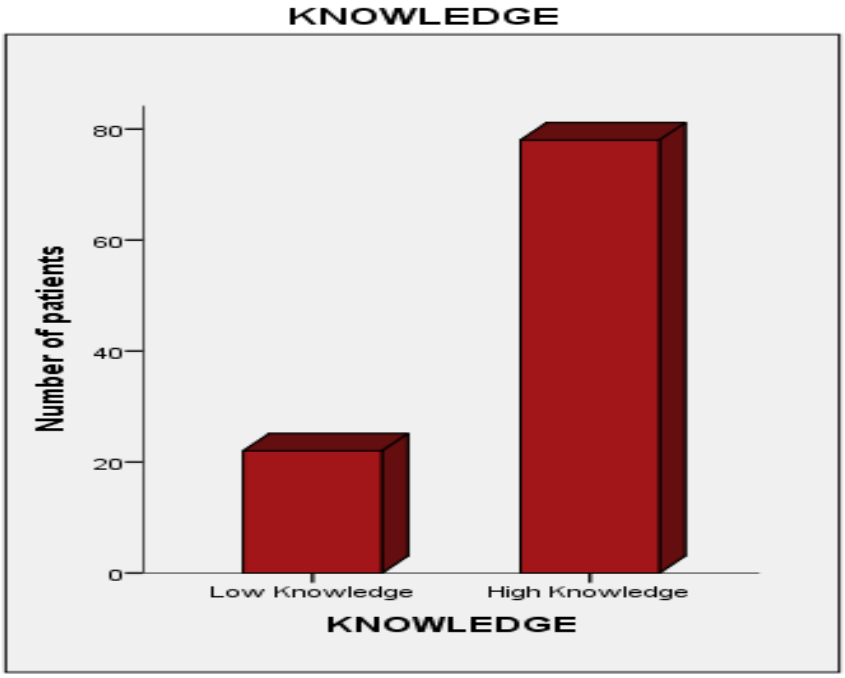


Figure 4.5.4: Bar diagram showing outcomes of knowledge score on medicational adherence.

Inference: Out of 100 samples, low knowledge was found in 20% and high knowledge was found in 80% of patients in 2nd month.

4.2 DISCUSSION

- Generally, Patients with low comorbidity medication adherence experienced an increase in unhealthy days compared to patients with moderate or high comorbidity medication adherence.
- The present study, was aimed at assessing quality of life and medication adherence in chronic comorbid conditions (primary conditions: HTN, CVA, CLD, CKD, CAD)
- A sample size of 100 patients, were selected based on inclusion & exclusion criteria.
- In this study, we observed that there is low adherence to comorbidity medications which was negatively associated with HRQoL.
- In our study, out of 100 samples, male patients were more compared to female patients
- Out of 100 samples, provisional diagnosis as CVA condition is more in when compared to other conditions.
- We found that HTN as a past medical history is high in number.

- The highest sample size of primary condition in our study, was found to be CVA. Quality of life and medication adherence were assessed for three consecutive months.
- In our study QOL was assessed by providing SF-12 questionaires to the patient and the following outcomes were observed.
- In hypertensive patients 63.8% QOL was observed in 1st month and it was improved by 10.2% in 1st followup & 13.2% in 2nd followup.
- In CVA patients 63.8% QOL was observed in 1st month and it was improved by 9.4% in 1st followup & 14.8% in 2nd followup.
- In CLD patients 64.14% QOL was observed in 1st month and it was improved by 11.25% in 1st followup & 12.36% in 2nd followup.
- In CKD patients 60.53% QOL was observed in 1st month and it was improved by 11.98% in 1st followup & 12.38% in 2nd followup.
- In CAD patients 62.23% QOL was observed in 1st month and it was improved by 11.06% in 1st followup & 11.60% in 2nd followup.
- There are 8 componets in SF 12 questionaires in which 6 questions comes under physical component summary and 6 questions comes under mental component summary.
- The mean QOL for both PCS and MCS scores has been improved after the followps.
- In our study the out comes from general health component of Quality of life scale was observed .The mean score of general health in 1st month was found to be 2.5, implying to be in between Fair and good; and 3, in the 1st followup, implying to be Good; and 4 in the 2nd followup, implying to be Very good
- In role physical component of Quality of life scale, two questions about physical roles are present. The mean scores of role physical in 1st month was found to be 2, implying to be limited a little; and 2.5, in the 1st followup, implying to be in between limitd a little and not limited at all and; 3 in 2nd followup implying to be not limited at all.
- In physical function component of Quality of life scale, two questions about physical functions are present. The mean scores of physical function in 1st month was found to be 2, implying to be limited a little; and 2.5, in the 1st followup, implying to be in between limitd a little and not limited at all and; 3 in 2nd followup implying to be not limited at all.
- In the role emotional component of Quality of life scale, two questions about emotional roles were present. The mean scores of role emotional in 1st month was found to be 2, implying to be no; and also 2 in the 1st and 2nd followup, implying to be no.

- In bodiley pain component of Quality of life scale, the mean scores in 1st month was found to be 3, implying to be moderate; and 4, in the 1st followup, implying to be a little; and 4.5 in 2nd followup implying to be in between a little bit and not at all.
- In the vitality component of Quality of life scale, the mean scores of vitality role in 1st month was found to be 3.5, implying to bein between some of the time and a good bit of the time; and 4.5, in the 1st followup, implying to be in between a good bit of time and most of the time and; 5 in 2nd followup implying to be most of the time
- In the mental health component of Quality of life scale, two questions about mental roles were present. The mean scores of mental health in 1st month was found to be 4, implying to be a good bit of time; and 4.5, in the 1st followup, implying to be in between a good bit of the time and most of the time; and 5.5 in 2nd followup implying to be in between most of the time and all of the time.
- In the social functioning component of Quality of life scale, the mean scores in 1st month was found to be 3.5, implying to be in between some of the time and a little of the time; and 4 in the 1st followup, implying to be a little of time; and 4.5 in 2nd followup implying to be in between a little of the time and none.
- Medication adherence was seen through morisky scale, motivational and knowledge scores were taken.
- Improvement in both the scores were seen after giving them proper patient counselling and aided them with pils and flashcards.

5. CONCLUSION

- In this study, the type of comorbidity appeared to have a greater impact than the number of comorbidities.
- Our findings demonstrate the diverse negative effects of multimorbidity on HRQoL and reveal that apart from count of chronic conditions, severity and pattern also influence HRQoL negatively. Health care providers should consider severity as an outcome measure to improve QoL especially in individuals with physical multimorbidity.
- Based on our study, we have observed that, Quality of life was poor in CKD patients, when compared to other primary conditions, which was 60.53%, through SF-12 questionaires.
- After the follow ups, it was increased by 24.36% in CKD patients.
- Quality of life was increased by 23.4% in hypertensive patients, 24.24% in CVA patients; 23.51% in CLD patients; 24.36% in CKD patients and 22.66% in CAD patients.

- Means of motivational score was increased by 1.01 & knowledge score was increased by 1.43.

ABBREVATIONS

HRQOL: Health Related Quality of Life

QOL: Quality of Life

MA: Medication Adherence

HTN: Hypertention

CVA: Cerebrovascular Accident

CAD: Coronary Artery Disease

CLD: Chronic Liver Disease

CKD: Chronic Kidney Disease

PCS: Physical Component Summary

MCS: Mental Component Summary

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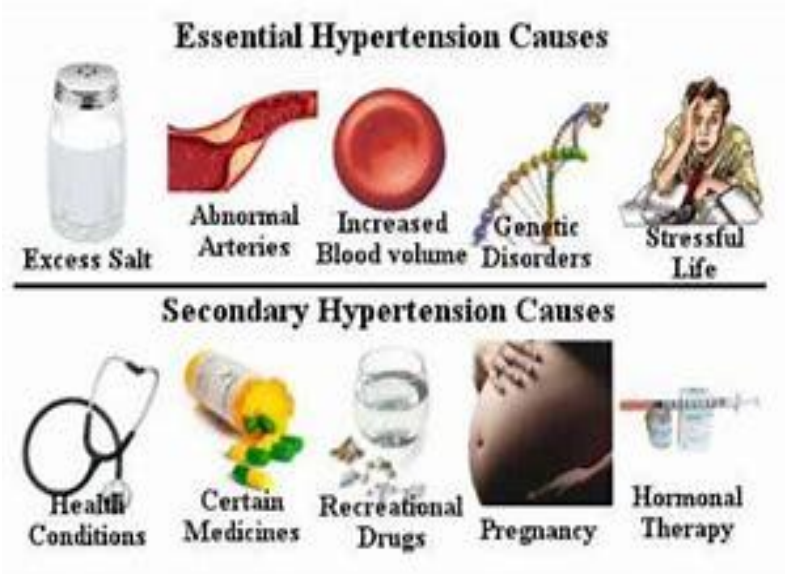
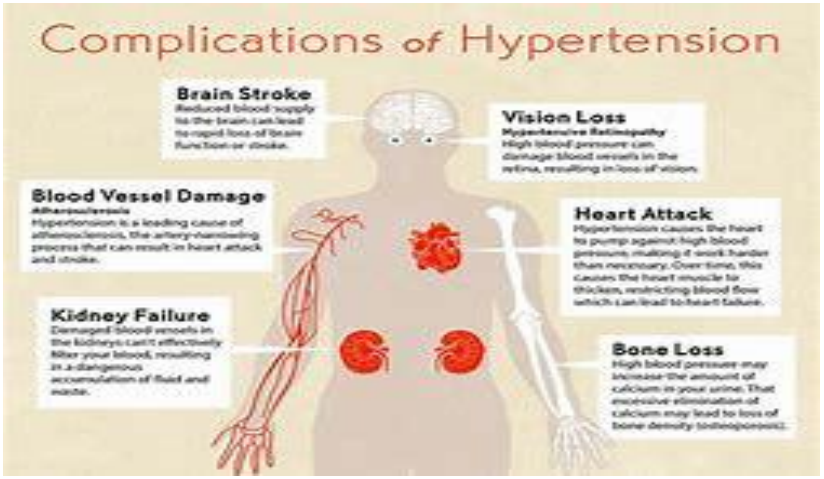
Hypertension

Hypertension (**HTN** or **HT**), also known as **high blood pressure** (**HBP**), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated.[10] High blood pressure typically does not cause symptoms.[1] Long-term high blood pressure, however, is a major risk factor for coronary artery disease, stroke, heart failure, atrial fibrillation, peripheral arterial disease, vision loss, chronic kidney disease, and dementi.



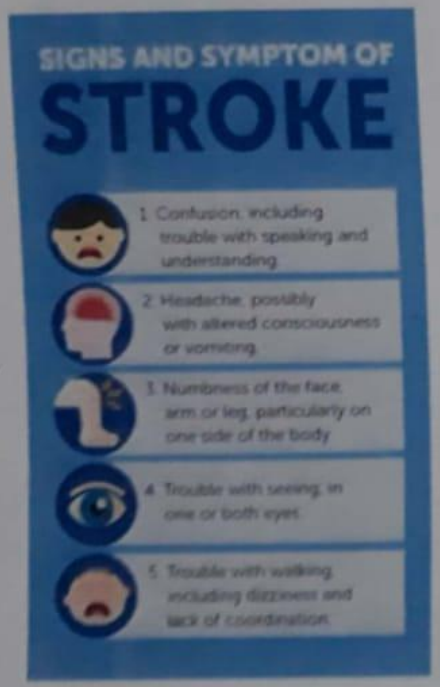



MANAGEMENT FOR HYPERTENSION
D-iet Modification
E-xercise
A-nti Hypertensive Meds
L-ifestyle Modification
S-moking Cessation
thenursingcorner.blogspot.com


Lifestyle Modifications
Food
Exercise
Manage Stress
Cut Salt
Limit Alcohol
Stop Smoking
Manage Weight

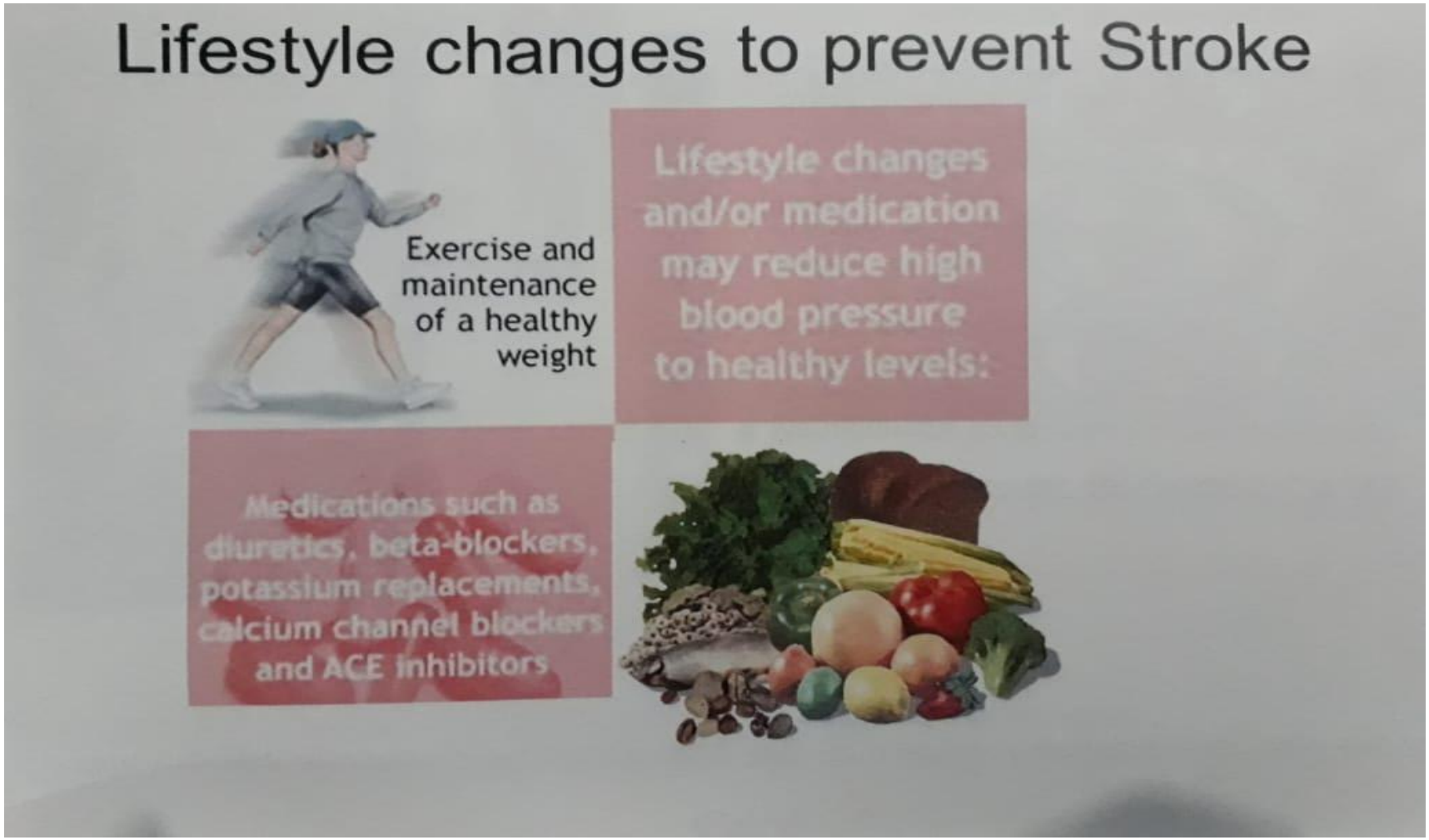
CVA

Cerebro Vascular Accident (**CVA**) is the medical term for a **stroke**. A **stroke** is when blood flow to a part of your brain is stopped either by a blockage or the rupture of a blood vessel.



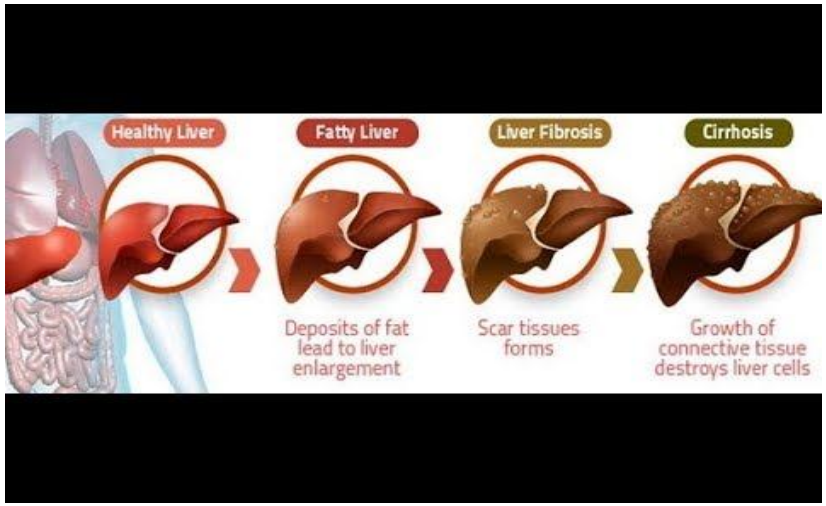
Cerebrovascular accident(CVA)

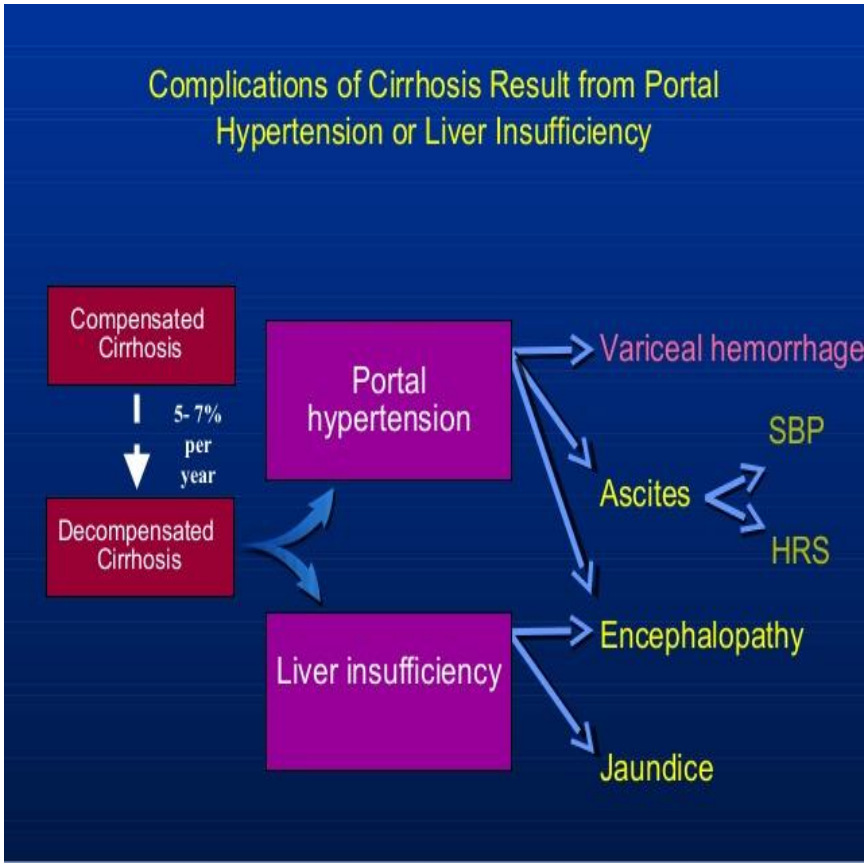
- Management for in case of a recurrent CVA:
  - terminate dental Tx
  - upright position
  - loosen restrictive garments
  - administer oxygen
  - monitor vital signs
  - summon medical assistance
  - CPR
    - if unconscious, supine position
    - head slight elevated if CPR is not required
  - avoid CNS depression drugs

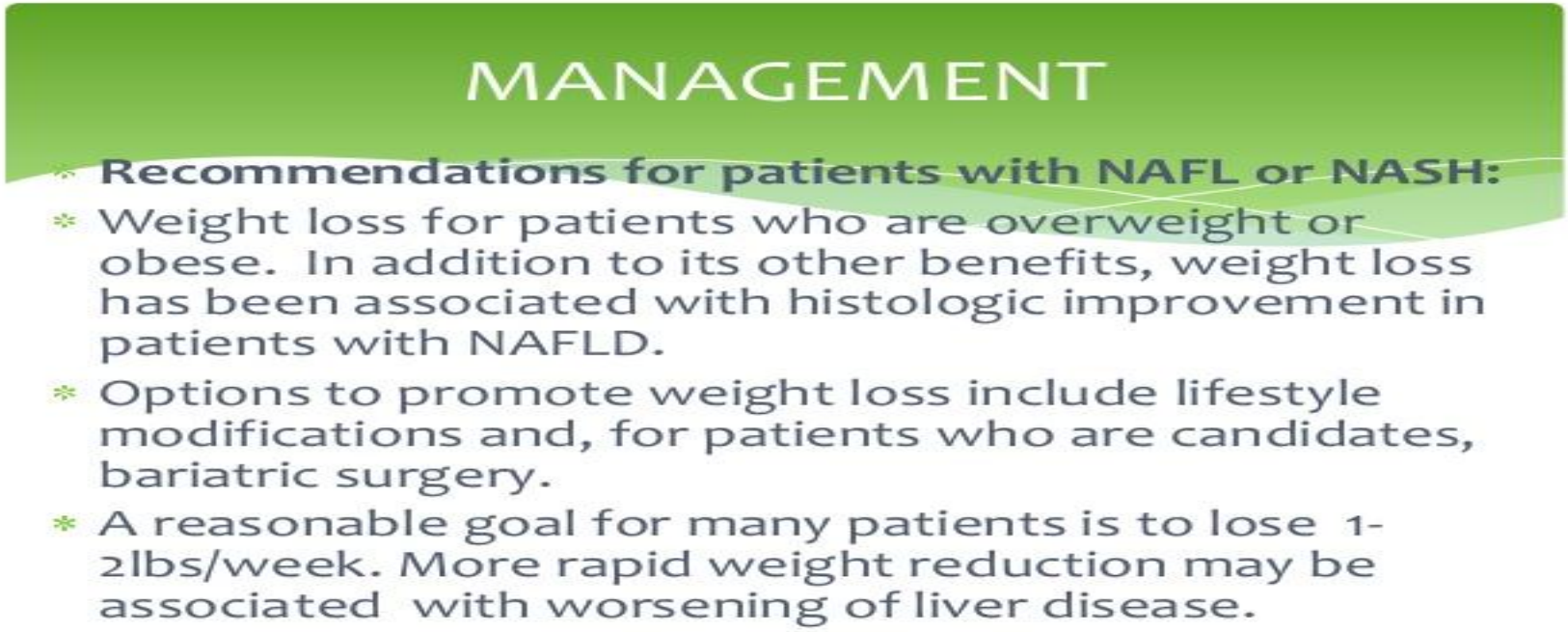

Lifestyle changes to prevent Stroke
Exercise and maintenance of a healthy weight
Lifestyle changes and/or medication may reduce high blood pressure to healthy levels:
Medications such as diuretics, beta-blockers, potassium replacements, calcium channel blockers and ACE inhibitors

Cirrhosis

Cirrhosis, also known as **liver cirrhosis** or **hepatic cirrhosis**, is a condition in which the liver does not function properly due to long-term damage.[1] This damage is characterized by the replacement of normal liver tissue by scar tissue.[1] Typically, the disease develops slowly over months or years.






MANAGEMENT
Recommendations for patients with NAFL or NASH:
Weight loss for patients who are overweight or obese. In addition to its other benefits, weight loss has been associated with histologic improvement in patients with NAFLD.
Options to promote weight loss include lifestyle modifications and, for patients who are candidates, bariatric surgery.
A reasonable goal for many patients is to lose 1-2lbs/week. More rapid weight reduction may be associated with worsening of liver disease.

PATIENT INFORMATION LEAFLET ON HEPATITS

DEFINATION: Hepatitis refers to an inflammatory condition of the liver. It's commonly caused by a viral infection, but there are other possible causes of hepatitis. These include autoimmune hepatitis and hepatitis that occurs as a secondary result of medications, drugs, toxins, and alcohol. Auto immune hepatitis is a disease that occurs when your body makes antibodies against your liver tissue.

TYPES OF HEPATITIS :

There are 5 types of viral hepatitis.Viral infections of the liver that are classified as hepatitis include hepatitis A, B, C, D, and E. A different virus is responsible for each type of virally transmitted hepatitis.

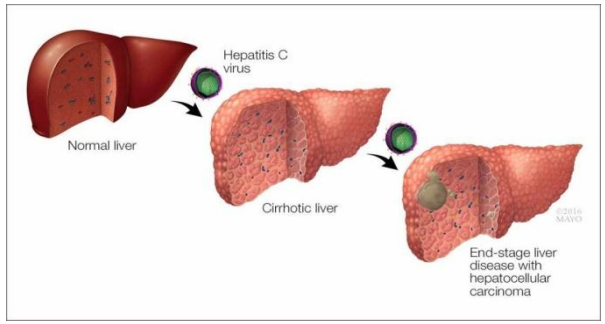
Hepatitis A is always an acute, short-term disease, while hepatitis B, C, and D are most likely to become ongoing and chronic. Hepatitis E is usually acute but can be particularly dangerous in pregnant women.

SIGNS AND SYMPTOMS:

Acute hepatitis appear quickly. They include: Fatigue,
Dark urine
Abdominal pain
Pale stools
Unexplained weight loss
Yellowish skin &eyes.
Chronic hepatitis develops slowly, so these signs and symptoms may be too subtle to notice.

RISK FACTORS:

chronic liver disease
cirrhosis
liver cancer



bleeding disorders,
ascites
portal hypertension

DIAGNOSIS:

History and Physical examination
Liver function test
Liver biopsy
Ultrasound

NON PHARMACOLOGICAL THERAPY:

Hygiene

Practicing good hygiene is one key way to avoid contracting hepatitis A and E. If you're traveling to a developing country, you should avoid:

- local water
- ice
- raw or undercooked shellfish and oysters
- raw fruit and vegetables

Hepatitis B, C, and D contracted through contaminated blood can be prevented by:

- not sharing drug needles
- not sharing razors
- not using someone else's toothbrush
- not touching spilled blood

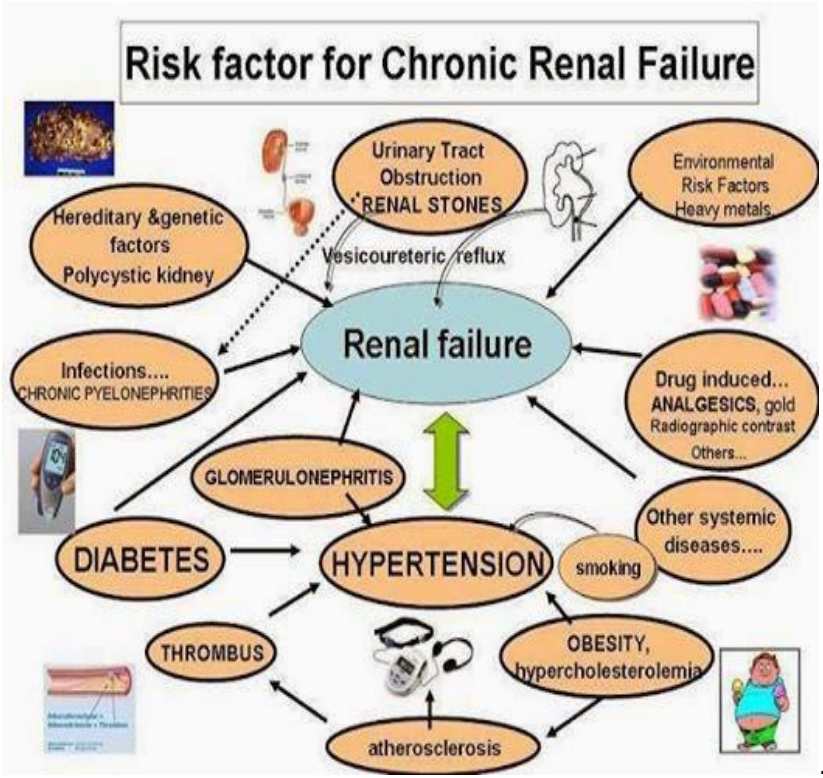
Vaccines

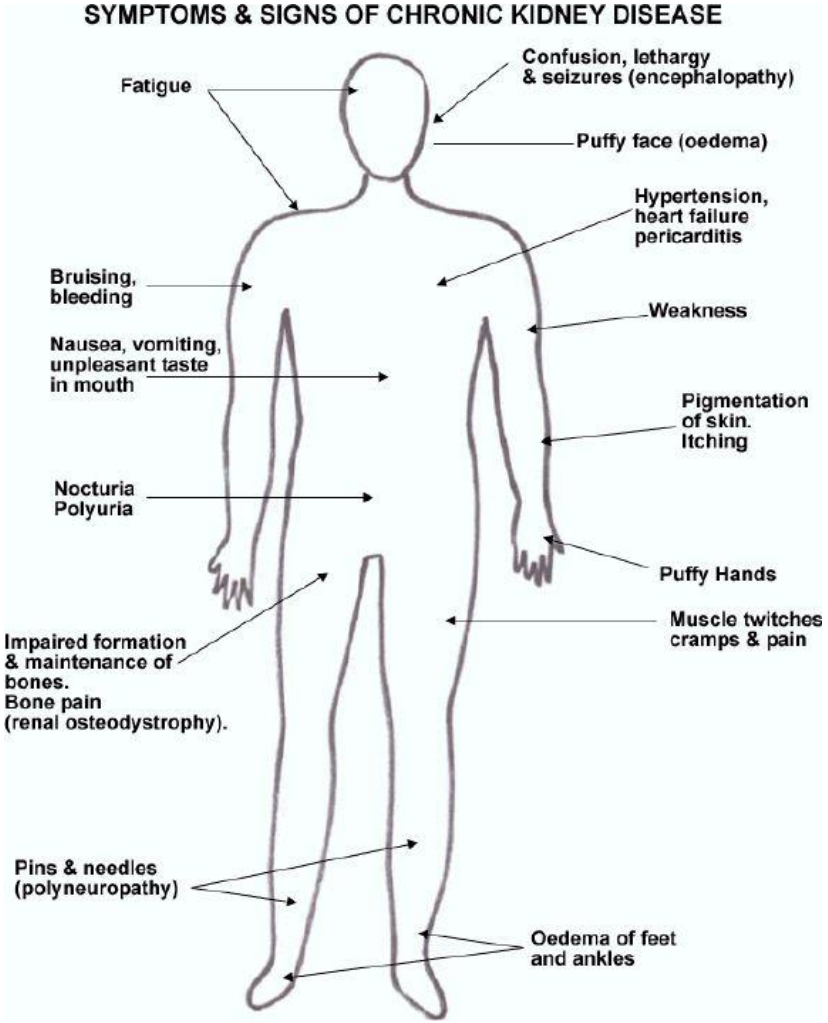
- The use of vaccines is an important key to preventing hepatitis.
- Vaccinations are available to prevent the development of hepatitis A and B. Experts are currently developing vaccines against hepatitis C. A vaccination for hepatitis E exists in China, but it isn't available in the United States.

Causes of high serum-ascites albumin gradient (SAAG or transudate) are:[5]

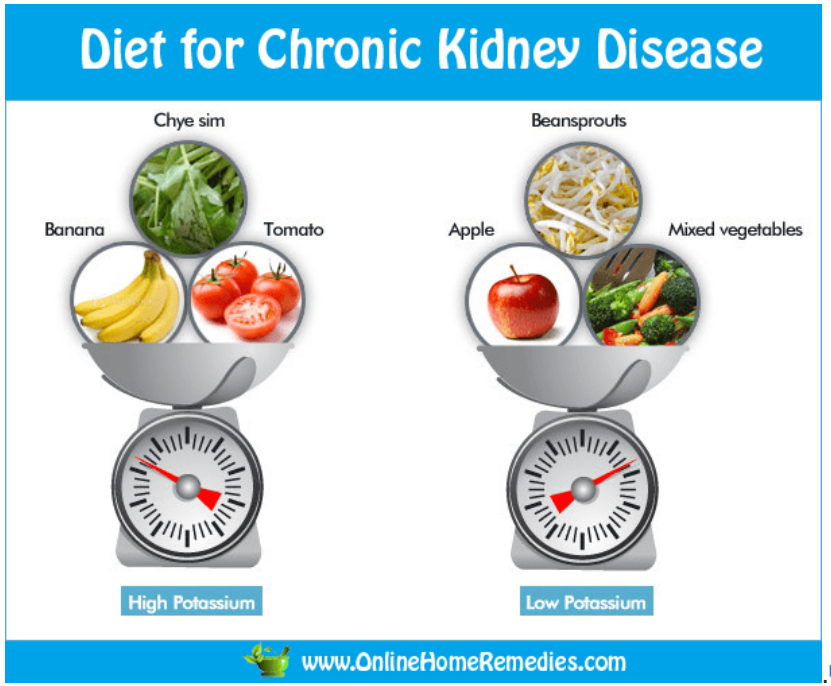
Chronic kidney disease

Chronic kidney disease (**CKD**) is a type of kidney disease in which there is gradual loss of kidney function over a period of months or year.





Stages of Chronic Kidney Disease of all Types		
Stage	**Qualitative Description**	**Renal Function (mL/min/1.73 m²)**
1	Kidney damage-normal GFR	≥90
2	Kidney damage-mild ↓ GFR	60-89
3	Moderate ↓ GFR	30-59
4	Severe ↓ GFR	15-29
5	End-stage renal disease	<15 (or dialysis)



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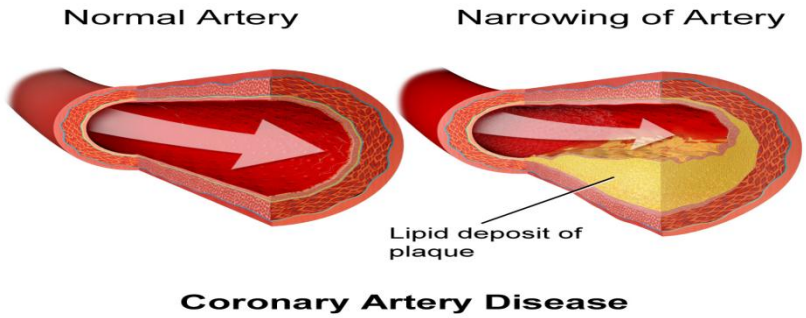
Coronary artery disease

DEFINATION:

Coronary artery disease develops when the major blood vessels that supply your heart with blood, oxygen and nutrients (coronary



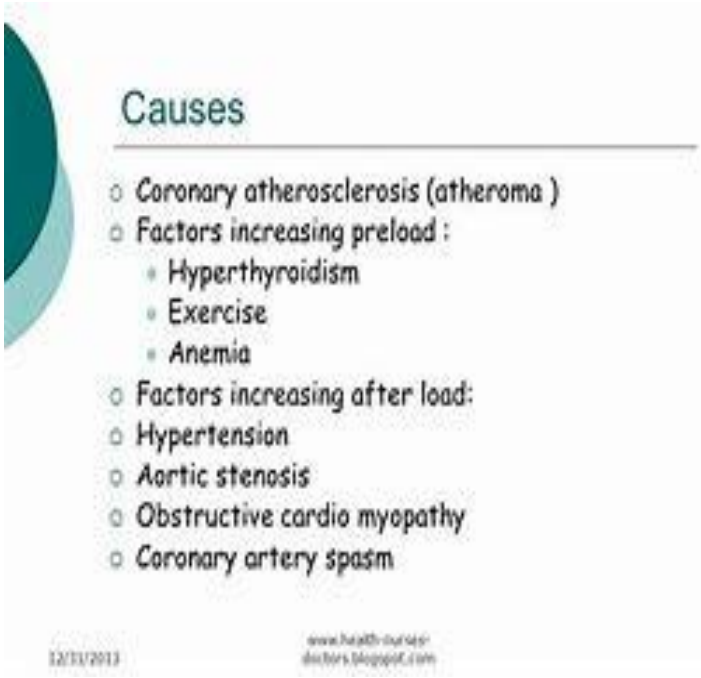
arteries) become damaged or diseased. Cholesterol-containing deposits (plaque) in your arteries and inflammation are usually to blame for coronary artery disease.When plaque builds up, it narrows your coronary arteries, decreasing blood flow to your heart.

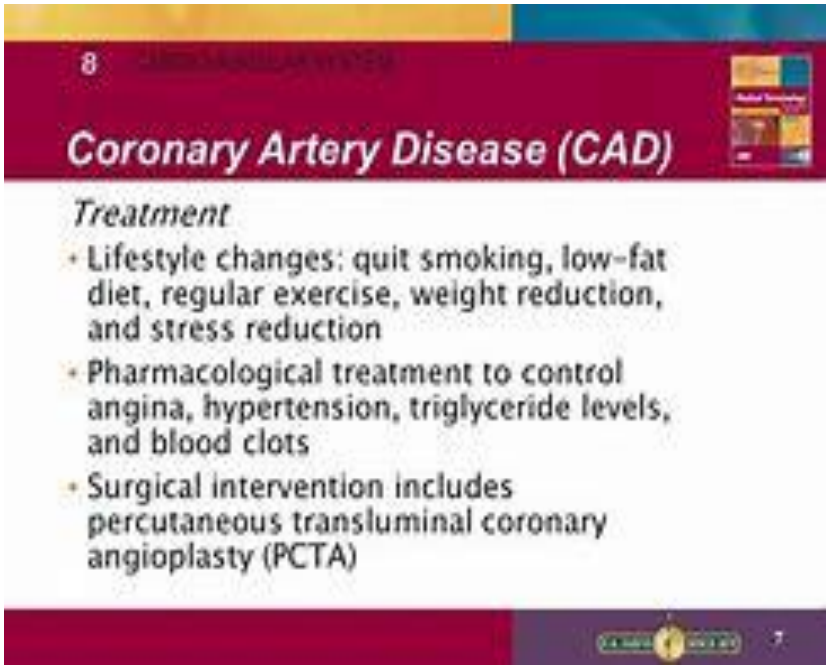
What Are the Symptoms of Coronary Artery Disease?

The most common symptom is angina, or chest pain.

Angina can be described as a:

- Heaviness
- Pressure
- Aching
- Burning
- Numbness
- Fullness
- Squeezing
- Painful felling

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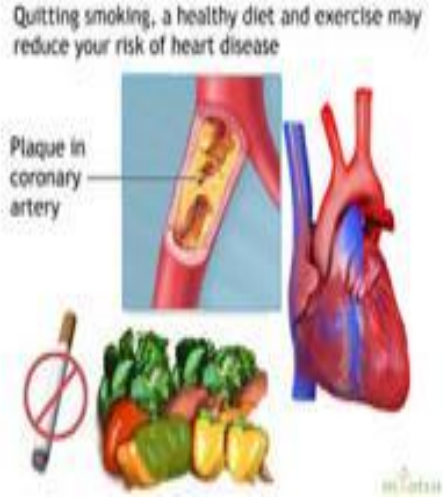
Coronary Artery Disease (CAD)
Treatment
• Lifestyle changes: quit smoking, low-fat diet, regular exercise, weight reduction, and stress reduction
• Pharmacological treatment to control angina, hypertension, triglyceride levels, and blood clots
• Surgical intervention includes percutaneous transluminal coronary angioplasty (PCTA)


Avoid Tobacco
Be More Active
Choose Good Nutrition


Quitting smoking, a healthy diet and exercise may reduce your risk of heart disease
Plaque in coronary artery