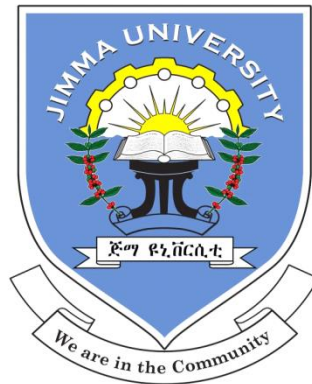


JIMMA UNIVERSITY

SPORT ACADEMY



**EXERCISE IS MEDICINE: DOES HEALTH AND SPORT
SCIENCE PROFESSIONALS PRESCRIBING IT TO PATIENTS
WITH NON COMMUNICABLE DISEASES (NCDs) IN JIMMA
TOWN**

BY: - ZEBEGNASH GELETE

**THE RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY SPORT
ACADEMY TO THE DEPARTMENT OF SPORT SCIENCE IN PARTIAL
FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF
EDUCATION IN TEACHING PHYSICAL EDUCATION**

**November, 2022
JIMMA ETHIOPIA**

JIMMA UNIVERSITY

SPORT ACADEMY

**EXERCISE IS MEDICINE: DOES HEALTH AND SPORT SCIENCE
PROFESSIONALS PRESCRIBING IT TO PATIENTS WITH NON
COMMUNICABLE DISEASES (NCDs) IN JIMMA TOWN**

BY: - ZEBEGNASH GELETE

ADVISER: MELKAMU DUGASSA (Phd)

COADVISOR: TILAHUN BIKILA (Msc)

**THE RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY SPORT
ACADEMY TO THE DEPARTMENT OF SPORT SCIENCE IN PARTIAL
FULFILMENT OF THE REQUIREMENT**

**FOR THE DEGREE OF MASTER OF EDUCATION IN TEACHING PHYSICAL
EDUCATION**

NOVEMBER, 202

JIMMA ETHIOPIA

JIMMA UNIVERSITY

SPORT ACADEMY

**EXERCISE IS MEDICINE: DOES HEALTH AND SPORT SCIENCE
PROFESSIONALS PRESCRIBING IT TO PATIENTS WITH NON
COMMUNICABLE DISEASE IN JIMMA TOWN**

BY: ZEBEGNASH GELETE BEYENE

Approved Board of Examiners

ADVISOR

Signature

Chairman Signature

Internal Examiner Signature

External Examiner

Signature

Certification

This is to certify that the thesis prepared by ZebegnashGeleteentitled: Exercise is medicine: does professionals prescribing it to patients with non communicable disease(NCDs).submittedin partial fulfillment for the degree of science in physical education complies with the regulation of the university and meet the expected standard with respect to the originality and quality.

Signature by the examining committee

Advisor

Signature

Internal Examiner

Signature

External Examiner

Signature

Declaration

ZebegnashGeletehereby declare that the thesis entitled “Exercise is medicine: Does professionals prescribing it to patients with non-communicabledisease’ ’submitted by me for the award in master of education in Jimma University which is my original work and it has not been presented for the award of any degree ,diploma fellowship or other similar titles of any other university or institution and that all sours of materials I have used or quoted for this thesis have been dully indicated and acknowledged by a complete reference.

This thesis would be submitted for examination with my approval as a university adviser.

Adviser Name MelkamuDugassa (Phd)

Signature -----

Date-----

ZebegnashGelete

Signature -----

Date -----

Dedication

This thesis would be dedicated to my adviser MelkamuDugassa (Phd)supporting and advising to do my thesis ,all my brothers my sisters for lifelongcare, thank you very much, I wish to all of you, and your family happy, joyful ,succeeded,healthy and long life thank you.

ZebegnashGelete

Signature-----

Date -----

ACKNOWLEDGEMENTS

First and foremost, I would like to give my glory and praise to the almighty GOD for his invaluable cares and support throughout the course of my life and helped me since the inception of my education to its completion and enabled me to achieve my career.

Next, I'm grateful to appreciate my Adviser Melkamu Degussa (PHD) who has taken all the trouble with me while I was preparing the thesis. Especially, his valuable and prompt advice. Positive facial expression, constructive correction, and insightful comments, suggestions and encouragements are highly appreciated and also

Next, I'm heartfelt thanks to my co advisor Tilahun Bikila (Msc) and Jimma University sport academy for those who are all working in sport academy and to all teachers of the academy.

Fourthly I would like to thank for all health professionals and sport science professionals for those who participated as respondents in my study to answer or to fill the questionnaire.

Lastly lifelong thanks all my brothers and sisters for their moral, financial support and suggestions and thank my entire classmate by supporting by editing.

ACRONUM /ABBREVIATIONS

NCD=non communicable diseases

WHO=world health organization

ACSM==American college of sport medicine

ERS=exercise referral scheme

HCP=health care provider

NYHA=New York heart association

OA =osteoarthritis

NSAID=no steroidalanti-inflammatory drugs

RA=rheumatoid arthritis

TNF=tumor necrosis factor

SCP=sport science professionals

HP=health professionals

LIST OF FIGURES

Figure

3.1. Geographical location of jimma town

Abstract

Background: Regular physical activities play an important role in the primary and secondary prevention of several chronic diseases. The main aim of the study was to investigate whether health care professionals are prescribing physical exercise as medicine to patients for non-communicable diseases (NCDs) and the factors limiting them not to prescribe physical exercise in selected hospitals and sport science professionals in Jimma town.

Methods: The total target population was 1000 professionals from (nurse=86, internist=34, physician=107, sport science professionals=73) the sample size of the study was 227 health professionals by proportionality and 73 sport science professionals by availability sampling. Descriptive survey cross section method would be used to conduct this study from health and sport science professionals to collect data. Self-administered questionnaires were used from two government and two private hospitals by random sampling method. The source of data was primary data. The data analysed quantitatively and interpreted through percentage, frequency or numbers, table.

Result: The health professionals and sport science professionals reported 71.3% of professionals had poor written exercise prescription, 70% of professionals had inadequate knowledge about exercise prescription 66% of professionals responded that there are no written guidelines. The analysis of regression shows that gender (male: OR 0.51, 95% CI 0.27 to 0.94), institution (primary hospital: OR 3.38, 95% CI 0.86 to 13.2), service years (6 to 10 years: OR 1.43, 95% CI 0.39 to 5.15), specialty (nurse: OR 0.66, 95% CI 0.3 to 1.4), marital status (married: OR 0.94, 95% CI 0.45 to 1.96) were associated with physical exercise prescription for their patients.

Conclusion: The exercise prescription of knowledge, practice, confidence, trends and desire of majority of health professionals regarding to prescribe exercise for non-communicable diseases to patients were poor. In many hospitals some health professionals do not appreciate patients to do exercise. Inadequate awareness of professional's concerning to benefits of exercises to patients.

Key terms: non-communicable diseases. Exercise prescription, Patients, Professionals.

BIOGRAPHICAL SKETCH

My name is ZebegnashGeleteI was born at a place called Gondar, on 1995 GC. I attended my Elementary School from grades 1-8 in Sholect elementary school. I learned my secondary school from 9-12 at Mekaneeyesus Secondary school. After completing secondary school education, I joined the higher education at MizanTeppi University of sports science for in BSC program in the year 2005E.C and graduated in 2007E. C 3.53 result. Having graduated, I had employed by the government and worked seven year in TeppiBechi Secondary School, and then I joined Jimma University for my M.Ed. program in the year 2010E C. Today I have been working at Bechi secondary school. Finally, I am a summer student to pursue MED program in teaching Physical Education.

Contents

SPORT ACADEMY	i
Certification	iv
Declaration.....	v
Dedication.....	vi
ACKNOWLEDGEMENTS.....	vii
ACRONUM /ABBREVIATIONS	viii
LIST OF FIGURES	ix
ABSTRACT.....	IX
BIOGRAPHICAL SKETCH	XIV
LIST OF TABLES:.....	xvi
CHAPTER ONE	1
1. INTRODUCTION	1
1.1. Back ground of the study	1
1.2. Statement of the Problem.....	4
1.3. Research questions.....	5
1.4. Objective of the study	5
1.4.1. General Objective	5
1.4.2. Specific Objectives	5
1.5. Significance of the study.....	6
1.6. Delimitation of the study (scope of the study).....	6
1.7. Limitation of the study.....	6
1.8. Operational definition of key terms	7
CHAPTER TWO	8
2. REVIEW LITRATURE.....	8
2.1. Disease of Deficiency physical Exercisee	8

2.1.1. Hypo-kinetic Diseases.....	8
2.2. Type 2 Diabetes	9
2.3. Cardiovascular Health.....	11
2.3.1. Ischemic heart disease.....	11
2.3.2. Heart failure	12
2.3.3. Hypertension	12
2.3.4. Pharmacology and Physical exercise	13
2.4. Mental Health.....	13
2.4. 1. Depression.....	13
2.4.2. Anxiety.....	14
2.4.3. Schizophrenia.....	14
2.4.4. Sleep and psychological well-being.....	15
2.4.5. Dementia	15
2.5. Musculoskeletal Health.....	16
2.5.1. Fibro-myalgia.....	16
2.5.2. Osteoarthritis	16
2.5.3. Osteoporosis.....	17
2.5.4. Rheumatoid Arthritis.....	18
2.5.5. Fall and fracture	19
2.6. Obesity	20
2.7. Cancer	23
2.7.1. Colon cancer.	23
2.7.2. Breast cancer.	23
2.7.3. Endometrial cancer.	23
2.7.4. Prostate cancer	24
2.7.5. Lung cancer.....	24

2.7.6. Oesophageal cancer.....	24
2.7.7. Gastric cancer.....	24
CHAPTER THREE	26
3. METHODOLOGY OF THE STUDY	26
3.1. Research Design.....	26
3.2. Description of the study	26
3.3.Total population of the study	27
3.4. Sample size and techniques.....	28
3.5. Source of data	29
3.6. Method of Data Collection.....	29
3.7. Questionnaire	29
3.8. Method of Data Analysis and Interpretation.....	30
3.9. Validity of instruments	30
3.10. Reliability of the instruments	30
3.11. Ethical consideration.....	30
CHAPTER FOUR.....	32
4. RESULTS AND DISCUSSIONS.....	32
4.1. RESULTS	32
4.1.1. Demographic information of health and sport science professionals	32
4.2. Discussion on the finding of the study.....	46
CHAPTER FIVE	49
5. Summery, Conclusion and recommendation	49
5.1 summery.....	49
5.1.1. The time professionals spend with their patients regarding the different types of physical activity guidelines during their work time at their institution:.....	50
5.1.2. During any of their visits, were professionals advised their patients to do:.....	51

5.1.3. Rate the restraints to prescribe physical activities for their patients to prevent non-communicable disease.....	51
5.2. Conclusion	51
5.3. Recommendations.....	52
5.3.1. Recommendations for health and sport science professionals:	52
References.....	Error! Bookmark not defined.
APPENDIX ONE	62

LIST OF TABLES:

Table 3.1.Number of respondent in each hospitals and fitness centers

Table 4.1.Sex, institution, specialization, service year,marital status, distribution of respondents

Table 4.2.life style distribution of respondent

Table 4.3.Age distribution of respondents

Table 4.4.The presence of .physical activity in their clinical practice

Table 4.5. Distribution of variable in equation

Table 4.6 Time spend with your patients regarding the difference types of physical activity guide lines during your work time at your institution

Table 4.7 During of their visit were you advised your patients to do

Table 4.8 Rate the restraints to prescribe physical activity for your patients

CHAPTER ONE

1. INTRODUCTION

1.1. Back ground of the study

This chapter is present over view justification about exercise is medicine: does professionals' prescribing it to patients. It is start from back ground of the study, statement of the problem, research question, objective of the study (general and specific) objectives, significance of the study, Limitation of the study, scope of the study, and operational definition.

Despite the growth evidence placing (PedersenBK,Saltin B, 2015)physical activity is the major determinant physical and mental health .international recommendations identify health professionals as pivotal agents to tackle physical inactivity .this study sought to characterized health professionals and sport science professionals concerning are their prescribe physical activity or not. According to the global action plan for physical activity 2018-2030 more active people for a healthier world by (Geneva :WHO;2018).a join t and inter sectorial approach is needed to tackle physical in activity. Within a health care sector, the WHO recommends the establishment of system for patient assessment and counseling on increasing physical activity and reducing sedentary behavior, implemented by appropriately trained health professionals as a priority action in this regard (WHO, 2016)

regular physical activity (pa) play an important role in the primary and secondary prevention of several chronic diseases, example., diabetes, cancer, hypertension, heart diseases obesity, depression, and osteoporosis(who 2010,acsm 2009)here the health care setting has been recognized as an appropriate and promising venue for counseling and prescribing physical activity(Jacobson et al;2005).

Exercise has been widely used as preventative medicine to reduce the risk and incidence of cardiovascular and metabolic diseases related to sedentary an unhealthy living. Regular exercise has been shown to improve health and reduce the severity of diseases accompanying a healthy lifestyle (Persson, G., Brosson, A, 2013, BMC).

The standard vision of exercise is medicine a global healthy initiative managed by the American College of sports medicine(ACSM) is to make physical activity assessment and promotion a in

clinical care connecting health care with evidence based physical activity resources for people everywhere and of all abilities. Exercise is medicine encourages physician and health care providers to includes physical activity when designing treatment plans to refer patients to evidence based exercise programs and qualified exercise professionals(Getu Teferi,2017).

Exercise is medicine committed to the belief that physical activity promotes optimal health and integral in the prevention and treatment of many medical conditions. Engaging in regular physical exercise has a protective effect against the department of Physiotherapy School of Medicine College of medicine. Strong evidence shows that physical inactivity increases the risk of many adverse health conditions including major non communicable diseases such as coronary heart diseases, type 2 diabetes, cancer, depression, anxiety, obesity and hypertension.InEthiopia some club players, sport professionals, and health professionals working in referral hospitals across the country often use the use of exercise as a medicine. That is to say, they recommend that their patients to an exercise (GetuTefer&DesalewEndalew., 2021, Silva et al., 2022).

However the researcher believe that those who grew up and lived in Aruban areas have a better understanding about exercise, in particular, treat themselves with a variety of exercises to correct injuries to prescribe physical exercise. This support is provided by sport science professionals. Therefore, researcher believe that sport science professionals needed to do more in the future because we need to educate inform the local community about exercise a medicine as not only athletes but also all people needed exercises (Silva et al.,2022).

In general the researcher believe that the cooperation of our health professional and sport science professionals in Ethiopia can save the country from various economic and health problems, If they prescribe physical exercise for their clients(grade 11th text book). Exercise prescription commonly refers to the specific plans of fitness related activities that are designed for a specified purpose which is often developed by a fitness or rehabilitation specialist for a client or patient .due to the specific and unique needs and interests of the patients, the goal of exercise prescription should be successful integration of exercise principles and behavioral techniques that motivates the participant to be compliant those achieving their goals.

A green prescription is a referral given by a doctor or nurse to a patient. Written on them the term used by health professional in Newzeland draws parallel to the usual prescription given to patients for medications and emphasizes the importance of exercise in improving their condition and not relaying on drugs. The green prescription is written after discussing the issues and goals in the consultation studies have shown that an increase in exercise better sense of well-being and decrease in blood pressures (Singh P, Teferi G, 2018).

Exercise referral scheme |ERS| are away to manage, prevent and treat many non-communicable disease with physical activities via referral from a health care professional |HCP| to an exercise referral instructor to prescribe a safe and structured exercise prescription, despite the benefit of exercise for the prevention of NCDs health care workers in low resourced countries such as Ethiopia are not prescribe physical exercise for their patients. More over the factors that hinder exercise prescription remain misty in Ethiopian health care setting (Singh P, Teferi G, 2018).

The prescription of “exercise as a medicine” often presented as being this linear and predictable process towards health benefits. However, the evidence that exercise referral scheme positively influence in people who have an existing non communicable disease in limited and short term (Sumchal AP, 201).

1.2. Statement of the Problem

The majority of our country's peoples are suffering and dying from various non-communicable diseases in various institutions is it true that the health professionals working in the hospital have instructed their patients to do exercise? (Prescribe physical exercise for those patients?) or just make them take only drugs based on this idea the researcher wants to identify the gap between the health professionals and sport science professionals with their patients in terms of prescribing and doing physical activities what the understanding knowledge, confidence, trends, desire, of health professionals working in a health institutions about physical activity.

The importance of to get prescription is that providing individualized exercise programs and can greatly improve patients cardiovascular fitness and protect them from the development from non-communicable diseases. The goal of exercise prescription is to change patients' behavior from sedentary to active (Silva et al., 2022).

Exercise prescription should take in to account the patient's medical history and pre examination of patient's physical fitness to make sure a person has the capacity to perform the exercise. The patient referral in the united Kingdom there is scheme called "exercise prescription" or "exercise referral in which doctors are able to prescribe exercise to those with benefit from it such as asthma, hypertension, depression, obesity, type 2 diabetes, cancer, pregnancy, anxiety and so on the initiative particularly aimed to lower the rate of heart diseases (GetuTefer&DesalewEndalew., 2021, Silva et al., 2022).

Exercise prescription aims to prevent deterioration of conditions, and view exercise or losing weight 'such preventives measures hop to lead to savings for the national health services. Researchers in Newzeland have also discusses the benefits of exercise referral by medical practitioner there is in this country it is known as a green prescription while in the united states a similar initiatives is known as exercise is medicine. (GetuTeferi, 2021).

The prescription of "exercise as a medicine" often presented as being this linear and predictable process towards health benefits. However, delivery of exercise as a medicine through exercise referral scheme is reliant on participants. Therefore this study was investigated where health care

professionals are prescribing physical exercise as medicine to patients in selected hospitals and fitness center in Jimma town.

The main aim of the study was to investigate the knowledge confidence, desire, and practice of health professionals and sport science professionals to wards non communicable diseases pertaining to exercise prescription in Jimma town in selected hospitals and fitness centers and The researcher wants to study this study in order to understand what is said and to inform those health sport science professionals to understand and recognized the gap they have with prescribing physicals activates based on this questionnaires.

1.3. Research questions

This study will try to answer for the following basic research questions:

1. How can the reveal of the predictors of physical exercise prescription in clinical practice in your fitness centre and hospitals health care system in Jimma town?
2. What is the reveal of the position of physical exercises in clinical practice to prevent NCDs in selected hospitals and sport science professionals' in Jimma town?
3. Who assess the restraints to exercise prescription to prevent NCDs in selected hospitals and sport science professionals in Jimma town?

1.4. Objective of the study

1.4.1. General Objective

The general objective of the study would be investigate whether health care professionals are prescribing physical exercise as medicine to patients with non-communicable diseases (NCDs) and the factors limiting them not to prescribe physical exercise in selected hospitals and sport science professionals in Jimma town.

1.4.2. Specific Objectives

In line with the above broad aim, the following specific objective would be draw for this study

1. To reveal the predictors of physical exercise prescription in clinical practice in Jimma town.
2. To reveal the position of physical exercise in clinical practice to prevent NCDs in Jimma town.

3. To assess the restraints to exercise prescription to prevent NCDs in clinical practice in hospitals and fitness center in Jimma town.

1.5. Significance of the study

The main advantage of this study is to increase the capacity of professionals to educate and to command the exercise for patients and patients to be aware of this by exercise in order to protect themselves from various ailments and to prevent early illness caused by physical inactivity.

In general, these studies have the following benefits:

- ❖ Creating and strengthening general awareness and solving problems by taking to different professionals.
- ❖ It enables patients to practice their culture and is advised by professionals and has a good understanding of it.
- ❖ In addition, all professionals would be played an important role in informing patients that exercise is better for patients than ever before.

1.6. Delimitation of the study (scope of the study)

The study was conducted on four selected hospitals and sport science professionals in Jimma town. The selected area which are in two government hospitals Jimma specialized hospital and Shenen gibe hospital and in two private hospitals in Odahulle hospital and Fromsis hospital in Jimma town because of time and money constraints. The total population of the study was 300 health professionals and sport science professionals. The external problem such as language, economic and climatic conditions and on the other hand internal problem such as hospital inputs like health professionals interest, the like would be faced during the study. The research was conducted to exercise is medicine: does professionals' prescribing it to patients with non-communicable diseases (NCDs) in selected hospitals and fitness centres in Jimma town?

1.7. Limitation of the study

The researcher doesn't believe that the study is totally free from any types of limitations. As a result listed below the following factors would be the limitation of the study.

- Lack of recent literature
- Lack of health professionals interest when data collecting time (questionnaire)

- Shortage of reference
- Lack of materials
- Family problems of the researcher(social life)
- The study is conducting in hospitals distance from the researcher
- The researcher living place far away from the adviser.

1.8. Operational definition of key terms

- **Exercise** is any bodily activity that enhance or maintains physical fitness and overall health and wellness.
- **Medicine** is a science or practice prevention of the diagnosis, treatment of diseases.
- **Prescription** is an instruction written by a medical practitioner that authorities a patient to be issued with a medicine or treatment
- **Health professional** is any one suited by education, training and the necessary licensing to perform a medical service or take care of patients with the application of evidence based practice.
- **Sport science professional** is any one suited by education, training and the necessary licensing to perform a medical services or take care of patients with the application of evidence based on practice.

CHAPTER TWO

2. REVIEW LITRATURE

2.1. Disease ofDeficiency physical Exercisee

2.1.1. Hypo-kinetic Diseases

Physical exercise is recognized as one component of non-communicable disease prevention. But little attention has been devoted to integrating exercise in to the Ethiopia health care system with the barrier to its exclusion being clear. Non communicable diseases particularly type 2 diabetes mental health cancer obesity and are the main cause of morbidity and mortality globally (mensah, 2016; fatt, 2010) compelling evidence has shown an increase in the burden of non-communicable disease creating the need for a worldwide response to decrease the associated morbidity and mortality (Pearce et al2013; Varghese, 2013)

Non communicable diseases are one of the main health and developmental challenges of the 21st century in relation to the social and economic consequence .they cause countries and are particularly over whelming in poor and vulnerable population. according to the world health organization (who) global statics' report non communicable for 38 million (68%) of the global 56 million deaths in 2012; more than 16 million (40%) were amongst early; affecting people under the age of 70(who, 2014).nearly three quarters of all non-communicable diseases mortalities, and the majority of premature deaths, namely28 million (82%) occurs in low and middle income countries.

Premature deaths from non-communicable diseases range from 22% among men and 35%amongst women in low countries to 8% amongst men and 10%amongst women in high income countries(who,2014;who,2015). As with other low income countries, the burden of non-communicable diseases is currently growing in Ethiopia, according to world health organization non communicable diseases progress monitor 30% of total annual diseases In Ethiopia can be attributed to non-communicable diseases, particularly due to cardio vascular diseases, diabetes, and hypertension with 15%of those occurring prematurely (who2015).

It is documented that the major non communicable disease share common risk factors such as tobacco use, alcohol drinking, unhealthy diet, and lack of physical exercise and that their risk

factors are associated with life style changes, urbanization, globalization and industrialization (Engelen, lina, Adrian et al, 2017).

In Ethiopia the rate of urbanization is increasing at 4.89% per annum resulting in life style changes for many people (Kay and Nagesha, 2016).studies shows that non communicable diseases risk factors are more prevalent in urban setting due to the availability of alcohol, tobacco, junk energy food and a more sedentary lifestyle (Bishwajit, Ide, Hossian and Safe, 2014; Eckert, sophie, 2014).

The strategy to address non communicable diseases in Ethiopia is mainly focused on prescribing drugs to treat the resulting conditions rather than have effective prevention strategies. Compiling pieces of evidence indicate that treating major non communicable diseases such as coronary heart diseases, type 2 diabetes ,and hypertension causes an increases in medical expenses for the consumer and health care providers specifically the public health sector (Krueger,Turner,KruegerAnd Ready,2014;Shuual,Leonard,Drope et al,2017)

2.2. Type 2 Diabetes

It is well known that physical inactivity is a major risk factor for developing type 2 diabetes. Primary prevention: many studies have shown that type 2 diabetes can be prevented in high risk (obese) patients by taking regular exercise and following dietary guidelines(Tuomilehet,Jerikson,J.G.,20001). In all, there have been four major trials of diabetes prevention with intensive lifestyle counseling in China, Finland, India and the US. In the largest trial, the US Diabetes Prevention Program, high risk individuals were assigned to a placebo control, a lifestyle intervention (which included aerobic activity of at least 150min/week) or a third group who were given metformin 850mg twice daily. Lifestyle advice was nearly twice as effective in preventing diabetes compared to metformin drug therapy in high risk individuals (58% v 31% reductions in incidence) over 3 years of study(Williamson,D.F.,Bowman.,2004).

In three of these trials there was a 40-60% relative risk reduction in the incidence of diabetes in the lifestyles intervention group. This translates into one case of diabetes being averted by treating around seven people with glucose impairment for three years. In the Indian study the relative risk reduction of diabetes was a little lower at 28.5% but the Indian population was

generally younger, with a relatively lower BMI and higher insulin resistance. The long term follow up studies show that lifestyle interventions delayed on average the onset of diabetes by two to four years rather than preventing it totally (Sigal, R.J., Kenny, G.P., 2007).

In the treatment of type 2 diabetes, regular physical activity remains a major part of treatment, alongside dietary and pharmacological interventions. Aerobic training remains the mainstay of treatment, but benefits also occur with strength training and are greatest when combined. A meta-analysis comparing physical activity advice against structured exercise training consisting of aerobic exercise, resistance exercising or a combination showed all were associated with a reduction of HbA1c. Longer programs than the recommended 150 minutes per week were associated with a greater reduction of HbA1c (Umpierre D2011).

This study also confirmed physical activity is associated with lower HbA1c but only when combined with dietary advice. Physical activity improves insulin sensitivity. It is increased sensitivity to insulin, once achieved, that is important in obtaining good metabolic control, but physical activity also impacts on lowering the risk of cardiovascular complications by improving the blood lipid profile, HbA1c, body weight and lowering blood pressure (Pederson B, K., 2006)

Precautions: Hypoglycemia rarely occurs in diet controlled, metformin or gliptin-treated diabetes unless any exercise is prolonged or strenuous, such as in marathon running. In patients on glugs or insulin, moderate to vigorous exercise may cause a drop in blood glucose (sugar) with the effect lasting up to 12 hours post exercise. Those wanting to take prolonged exercise may need to halve or further reduce oral medication, depending on their blood glucose levels and will need to monitor themselves more frequently. They should also be able to recognize the symptoms of hypoglycemia. Suitable alteration of carbohydrate intake before, during and after exercise may then be required. (Bowman, Am2008., BACR.2006., Pierce, NS, 1999)

Foot care and exercise: peripheral neuropathy is a common complication of type 2 diabetes and patients with this may have a decreased ability to exercise but a greater need for exercise instruction and monitoring. Care should be taken to promote safe good foot care by encouraging patients to check their feet before and after exercise.

2.3. Cardiovascular Health

2.3.1. Ischemic heart disease

Primary prevention: There is a clear inverse relationship between physical activity and cardiovascular disease which is dose responsive. The reduction in cardiovascular mortality is of the order of 20-35%, depending on the level of physical fitness (Department of Health, 2011)

Mechanisms which contribute to this effect are multiple (Taylor RS, Sagar VA, 2014):

- Direct actions on the heart (increasing myocardial oxygen supply, myocardial contraction and electrical stability)
- Increased high density lipids
- decreasing harmful low density cholesterol
- Lower blood pressure
- Decreased blood coagulability
- Improved insulin sensitivity

Secondary prevention: in established heart disease, regular adapted exercise is required to reduce mortality, and habitual physical activity has been shown to reduce all-cause mortality by 25-30%.⁴ The evidence of cardiac rehabilitation if it is used, is associated with a reduction in morbidity, cardiac mortality (26-36%), total mortality (13-26%) and reduces hospital readmissions (28-56%).⁵ Despite this, 55% of adults in the UK having had a cardiac event do not attend cardiac rehabilitation exercise programs (Whelton SP, Chin A 2013).

NICE guideline on secondary prevention for patients following a myocardial infarct recommends:

- ❖ Offer cardiac rehabilitation programs designed to motivate people to attend and complete the programs.
- ❖ Patients should be advised to undertake regular physical activity sufficient to increase exercise capacity
- ❖ They should be advised to be physically active for 20-30 min a day to the point of breathlessness

- ❖ Patients not achieving this should be advised to increase their activity in a gradual step-by-step way, aiming to increase their exercise capacity
- ❖ They should start at a level that is comfortable, and increase the duration and intensity as they gain fitness
- ❖ The benefit of exercise may be enhanced by tailored advice from a suitable qualified professional.

2.3.2. Heart failure

Trials support the evidence of the beneficial effect of physical activity training in patients with stable heart failure in NYHA class I, II and III. Although there is no evidence of increased or decreased all because mortality in the short term (up to 12 months), the benefits of exercise have been shown by meta-analysis to:

- Physiologically increase VO2 max
- Functionally increase walking speed and tolerance
- Significantly reduce hospital admissions
- Improve quality of life.
- And have an emerging trend towards reducing mortality in trials longer than 1 year.

2.3.3. Hypertension

The evidence supports an inverse relationship between physical activity and the incidence of hypertension. Apart from prevention, it is also effective in treatment with clinically relevant reductions in blood pressure (Fagard, R.H., 2007):

- ❖ The acute effect of physical activity causes a decrease in blood pressure lasting 4-10 hours, but may last up to 22 hours; thus daily activity may achieve clinically significant improvement
- ❖ For a long term effect, regular exercise is required
- ❖ The effect seems to be greatest in those with established hypertension
- ❖ Inactive individuals have a 30-50% increased risk of hypertension
- ❖ Review data support the observation that physical activity training in hypertensive patients can show a reduction of 7 / 5 mmHg in systolic and diastolic blood pressure respectively

- ❖ The main recommendation is for aerobic fitness training but dynamic resistance and isometric resistance at moderate intensity training is also beneficial
- ❖ Reductions of this magnitude have important clinical implications:

1. They are a similar magnitude to conventional medication
2. A 2mmHg reduction in systolic blood pressure is associated with reductions of 10% and 7% in the risks of stroke and coronary heart disease respectively

2.3.4. Pharmacology and Physical exercise

There is plenty of strong randomized controlled trial data showing reductions in stroke risk in those taking antihypertensive medication. There is less evidence that they significantly reduce the risk of all-cause mortality and myocardial infarction, with the exception of thiazide diuretics and angiotensin-converting enzyme inhibitors. However, there is strong prospective cohort evidence that regular physical activity can reduce the risks of all-cause mortality and cardiovascular mortality.

The comparison of the mortality and morbidity risk reduction between long-term antihypertensive medication and physical activity is made below and reinforces of the need for physical activity as a treatment in hypertensive patients.

2.4. Mental Health

2.4. 1. Depression

There is good supporting evidence for the use of regular moderate intensity physical activity in the acute treatment of mild to moderate depression (O'Donovan G, Blazeovich AJ, Boreham C, CooperAR, Crank H, Ekelund U, et al (2010).The ABC of physical activity for Health's consensus statement from the British Association of Sport and Exercise Science and in helping reduce the risk of relapse. However, there has been little evidence on the most effective form of exercise with low intensity exercise appearing to have no effect and in children and young adults different exercise intensities failing to show any significant effect. Physical activity matched to an individual's preferred intensity has been shown to improve mental health outcomes and exercise adherence rates. When preferred intensity exercise was combined with motivational support it improved depression symptoms severity, quality of life and exercise adherence rates.

Advice on exercise should be given in parallel to antidepressant medication and or psychotherapy treatments.

2.4.2. Anxiety

A lot of studies have evaluated the effect of physical activity on anxiety and many link physical activities to a consistent reduction of anxiety symptoms. This is best seen in state anxiety with less evidence in trait states. But the research remains certainly limited for children and young adults so physical activities may be more effective as an adjunctive treatment for anxiety disorders and appears less effective when directly compared with antidepressant treatment

2.4.3. Schizophrenia

Physical activity can play an important role in the treatment of schizophrenia. Physical activity has been shown to significantly reduce negative symptoms of mental state and improve the control of positive symptom. The physical health of people with severe mental illness such as schizophrenia, depression and bipolar disorder is often poor with a high risk of premature death and a shorter life expectancy of at least 10 years. This excess cardiovascular mortality in schizophrenia and bipolar disorder is attributed in part to the increased modifiable coronary risk factors of: unhealthy diets, obesity, Smoking, diabetes, hypertension and hyperlipidaemia. In most of these conditions lifestyle factors of physical activity plays an important role.

A small number of studies on people with schizophrenia taking part in exercise programs have so far shown a positive effect on both physical health, quality of life and positive and negative symptoms, and therefore increasing physical activity should be advocated.

NICE guideline on Psychosis and Schizophrenia in adults: treatment and management recommend:

- Before starting anti-psychotic medication: an assessment of nutritional status, diet and level of physical activity.
- People with psychosis or schizophrenia, especially those taking anti-psychotics, should be offered a combined healthy eating and physical activity programs by their mental healthcare provider.

2.4.4. Sleep and psychological well-being

Physical activity has been shown to improve the quality of sleep, whilst many studies have shown improved wellbeing with physical activity training. Improved psychological wellbeing is also the most common comment made on self-reported feedback questionnaires.

- ❖ The Well-being feelings of Exercise
 - ✓ Relaxed, Satisfied ,Clear Minded
 - ✓ Positive Fitter
 - ✓ Calm Worthwhile
 - ✓ Invigorated
 - ✓ Healthy
 - ✓ Alive Good

2.4.5. Dementia

Dementia is a word used to describe a group of symptoms including memory loss, confusion, mood changes and difficulty with day to day tasks. It encompasses several forms with Alzheimer's disease being the commonest and vascular dementia the second. The risk of dementia rises with age, with 1 in 3 people over 65 affected.

There is a higher risk of vascular dementia for those with a family history, hypertension, high cholesterol, smoking and diabetes, with vascular factors being potentially modifiable by physical activity. Up to a third of patients with Alzheimer's, the disease may also be attributable by modifiable risk factors, the highest factor being physical inactivity

There is clear strong evidence that people who follow recommended levels of physical activity have a reduction in risk of cognitive decline in the order of 18-30%. Higher levels of physical activity are associated with better cognitive function and a 20% lower risk of cognitive impairment in the highest quartile of activity.

- ❖ A review of exercise programs for this population has demonstrated that exercise can lead to:
 - A significant improvement in cognitive functioning
 - Enhanced mobility

- An improved ability to perform activities of daily function
- A likelihood of reducing the burden on family members
- No adverse effects

The prevention of falls with exercise for the healthy elderly is well established but a recent meta-analysis suggests that physical activity may also have a positive effect on the prevention of falls in the older adult with cognitive impairment.

2.5. Musculoskeletal Health

2.5.1. Fibro-myalgia

Fibro-myalgia consists of a multi symptom syndrome characterized by widespread diffuse treatment-resistant, non-inflammatory joint and muscle pains of at least 3 months duration. Two common symptoms are: reduced muscle strength and rapid fatigue with patients typically being unfit.

Fibro-myalgia is difficult to manage, but physical training combined with cognitive behavioral therapy has been recognized as being the most promising treatment. Evidence from a meta-analysis of random controlled trials concluded that aerobic training had a beneficial effect on fibro-myalgia. The highest quality trials show significantly better improvements in the exercise groups for fitness and tender point pain thresholds.

2.5.2. Osteoarthritis

Contrary to common belief, there is no evidence that regular physical activity promotes the development of osteoarthritis (OA), provided there is no associated major joint injury.

Major joint osteoarthritis is the commonest chronic disease in older people. The evidence is best for OA of the knee, but studies on hip and hand point to the same conclusions. Once present, both fitness training and dynamic strength training have been shown to:

- ❖ Reduce pain
- ❖ Improve function
- ❖ Improve overall well-being.

Aerobic activity is thought to increase endorphin levels which reduce the sensation of pain, whilst increased muscle strength and improved neuromuscular function improve the stability around a joint. These factors, coupled with any associated weight control, will help reduce the load through the joint and hence reduce pain, improve function and improve well-being.

Exercise training also reduces pain and improves function (strength, gait, balance) in the absence of weight loss. A key message about exercise and weight loss is that it is better to talk about fat loss, as weight loss is often compromised by an increase in lean mass (i.e. muscle mass). For example, exercise might produce very impressive improvements in body composition, e.g. a 2kg increase in lean mass and a 2.5kg decrease in fat mass, but an unimpressive overall change in body weight, tending to discourage patients who are primarily motivated by weight loss and not an improvement in health.

There appears to be a dose-response relationship where strength and fitness improvements, lead to better gains. Training is best planned with small but steady increases in load on the joint and with exercise; there is a greater reduction in pain compared to NSAID treatment occurring after 6-8 weeks of activity. This gives a clear choice of activity over NSAID medication for many patients and a choice with relatively few side effects.

Perhaps the greatest incentive for exercise in osteoarthritis patients from 35 upwards with comorbidity of cardiovascular disease, diabetes, cancer and walking disability is that they are at significantly enhanced risk of dying prematurely. It has been suggested even light exercise e.g.: moving around the house during commercial breaks for those patients with OA who watch many hours of TV, might mitigate the risk. Practical recommendations have been made regarding specific exercise prescription in terms of type, duration and delivery and can be discussed by the clinician or refer to a physiotherapist.

2.5.3. Osteoporosis

Prevention: The peak bone mass is achieved by 20 – 30 years of age, so to achieve maximum bone mass during adolescence, a balanced diet and multi-activity physical education in schools with weight bearing exercise needs to be encouraged from early years and even from first walking. Once our peak bone mass is achieved, a gradual bone loss commences and there is now

increasing evidence that physical activity can help prevent the bone loss associated with ageing across the lifespan of individuals.

Weight bearing exercise, especially resistance exercise, appears to have the greatest effect on bone mineral density. There is an inverse relationship of physical activity with the relative risk of hip and vertebral fracture with risk reduction for hip fracture of 36 - 68% at the highest level of activity. Warning: excessive physical activity can have an unintentional negative effect on bones in girls, who may develop exercise dependent secondary amenorrhea and then lose bone most commonly around a weight of 45kg.

Established disease: weight bearing exercise is still encouraged to minimize further bone loss, but also to help prevent falls and subsequent fractures; Balance, strength and coordination exercise combined with walking is complementary.

2.5.4. Rheumatoid Arthritis

Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease characterized by reduced joint flexibility, muscle function and aerobic fitness. There is also an increased risk of cardiovascular disease, which combined with an increased risk of type 2 diabetes, metabolic syndrome and osteoporosis and its related fractures, provides a very strong indication for promoting physical activity in patients with this common condition. In addition, exercise can counter the important effect of rheumatoid cachexia, whereby 2/3 of patients with controlled RA have significant muscle wasting and increased obesity. This low muscle mass and adiposity are strong independent predictors of disability in RA patients and controlling disease activity by standard drug therapy including ant-TNF therapy fails to restore either muscle mass or reduce fat mass. Consequently there is a strong case for progressive resistance training in patients with RA.

Historically, it has been widely held by many that increasing the level of stress on the joints would increase pain, disease activity and joint damage. However, major reviews on dynamic exercise therapy, have found a positive effect on aerobic capacity, muscle strength and functional ability. Exercise training has been shown to redress the adverse effects of rheumatoid cachexia on body composition and also to restore normal levels of physical function in established RA patients.

Importantly there has been no increase in pain or disease activity and with long term exercise programs no significant differences in radiological progression were observed. Despite being aware of the importance of exercise, many RA patients are less active than the general population. Patients' perceptions of the effects of exercise are a fear of exacerbation of pain, fatigue and joint damage. They also perceive that health professionals lack exercise knowledge regarding specific exercise recommendations and the occurrence of joint damage.

All patients with RA should be encouraged to be physically active. Low intensity exercise can be recommended for all patients with RA regardless of their disease state. However, to increase aerobic function and muscle function the patient needs to be encouraged to progress into moderate to high intensity exercises, with the knowledge and evidence of improved muscle function and quality of life without evidence of progression of joint destruction.

- ✓ Precautions and considerations:
- ✓ Increased physical activity should be introduced slowly to minimize the risk of aggravating symptoms and in smaller increments than normally recommended.
- ✓ Caution also needs to be taken after any cortisone injections and joint replacement surgery that may not stand up to intense exercise initially.
- ✓ Physical activity program should include a range of activity including stretching, resistance exercises and aerobic conditioning
- ✓ High impact activities or contact sports are not recommended

2.5.5. Fall and fracture

In the elderly, with or without other health conditions, diminishing muscle function with or without coexisting pain can limit daily activity and increase the risk of a fall and fracture. General physical activity such as walking and cycling is not thought to have any effect of falls prevention. However, the available evidence for this age is that group and home based programme with muscle strengthening and balance reduces the rate of falls and risk of falling. Tai Chi has been also shown to reduce the risk of falling and overall exercise interventions significantly reduced the risk of a falls related fracture.

Although most evidence on fall prevention has been with cognitive healthy elderly people, recent evidence supports the evidence that physical activity also has a positive effect in the prevention

of falls in the elderly with cognitive impairment. Strength training may need to precede walking exercise to make the physical activity possible. In the elderly two decades of loss of strength and muscle mass can be regained by two months of strength training.

Identifying the optimum characteristics of an exercise intervention for falls prevention has been assessed on present research and it is thought that:

- Exercising for a minimum of 1 hour/week for at least 40 hours of an intervention programme is required to reduce the risk of falling
- The optimum frequency of exercise is three times a week, but duration time of a session remains unclear
- Balance training should be of moderate to high challenge
- Strength training is most effective when combined with balance training.

2.6. Obesity

Overweight and obesity are defined as ‘abnormal or excessive fat accumulation that may impair health’. Using Body Mass Index (weight (kg) / height² (m)(BMI) overweight is classified as a BMI of 25-30 and obesity as >30.

- ✓ Obesity is a major risk factor for many non-communicable diseases (NCD) such as:
 - Cardiovascular disease (mainly heart disease and stroke).
 - Diabetes
 - Musculoskeletal disease (mainly osteoarthritis)
 - Some cancers (mainly colon and breast)

Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. However, in addition to future risks, childhood obesity is associated with considerable emotional and behavioral problems including in boys, conduct problems, hyperactivity and inattention problems, peer relationship problems, prosaically behaviors and total social difficulties.

Weight loss in obesity has been associated with improvements in most cardio metabolic factors, whilst significant weight loss (>5% of baseline weight) has been shown to be more effective in

reducing cardiac and diabetic risk factors, and even death rates. **Weight gain:** An increase in weight is affected by the amount of energy expended versus the amount of calories consumed. If energy expended is low and diet consumption excessive then weight gain will occur.

Physical activity alone or with diet: There is no strong evidence that physical activity of 150 minutes or less a week, on its own achieves any significant weight loss. Without a dietary plan involving calorific restriction individuals will experience weight loss in a range of nil to no more than 2kg. Exercise when combined with diet plans may result in a slight greater weight loss than diet alone but the amounts are small and confirm that the majority of weight loss is to be gained from the calorific restriction.

Physical activity and increased intensity: Significant weight loss can occur with aerobic exercise without calorific restriction, but it requires a high exercise volume of the order of >225 minutes a week. For the majority, these levels may not be practical or achievable. **Physical activity and prevention of weight gain:** To prevent the shift from normal weight to overweight and obesity, it is recommended that levels of 150-250 min/week of moderate to vigorous physical activity are required.

Physical activity and weight maintenance: After successful weight loss physical activity levels of 200-300 min/week should be maintained to avoid regaining weight. Nice guidelines suggest even higher levels of 300-450 min/week.

Aerobic exercise or resistance training and weight loss: Aerobic exercise is most beneficial by virtue of energy expenditure and health benefits of important risk factors. There is little evidence that resistance training alone produces any significant weight loss. However, resistance strength training has also been shown to maintain overall health, muscle strength (preventing sarcopenia), preserve bone strength and reduce mortality in men.

The real health message of physical activity in obesity: It is very important to stress that aerobic physical activity offers substantial health benefits even if weight loss is not achieved, as patients often have unrealistic weight loss expectations. However, weight loss is still recommended in obese patients to reduce the risk of NCD's and premature death. Many trials of

exercise therapy have reported little or no weight loss (<5kgs) but still have reported many health benefits including:

- Endothelial function
- Lipoprotein particle size
- High density lipoprotein
- Triglycerides
- Improved cardiovascular fitness
- Lower blood pressure
- Glucose control
- Quality of life

Exercise may produce impressive improvements in body composition, e.g. a 2kg increase in lean mass and 2.5kg decrease in fat mass but with an unimpressive change in total body weight which might discourage patients who are often primarily motivated by weight loss. This is the key concept to get across to overweight patients, that they can reduce their disease potential if they are active, compared to an inactive individual of similar weight.

An example of this is a study of 58 sedentary and overweight men who undertook a supervised aerobic exercise program for 12 weeks. The mean reduction in weight was 3.63kg. However, 26 of the 58 failed to achieve predicted weight loss and only had a mean weight loss of 0.9kg.

However other health parameters showed the following significant findings:

- ❖ Increased aerobic capacity (6-3 ml/kg/min, $p < 0.01$)
- ❖ Decreased systolic blood pressure (-6 mm Hg, $p < 0.05$)
- ❖ Decreased diastolic blood pressure (-3.9 mm Hg, $p < 0.01$)
- ❖ Decreased waist circumference (-3.7 cm, $p < 0.01$)
- ❖ Decreased resting pulse (-4.8 bpm, $p < 0.001$)

In addition, these individuals experienced an acute exercise induced increase in positive mood. Advice to obese individuals must be realistic as they are often unfit and have coexisting co-morbidities present. Be aware of the effort required to lose weight,

What is a reasonable expectation of weight loss and of the stigma patients that may be felt by overweight or obese? Small steps in gained activity through everyday changes should be encouraged and maintained even if more formal physical activity.

2.7. Cancer

Cancer develops at a cellular level influenced by genetic, environmental and lifestyle factors via a number of interacting biological mechanisms. A sedentary lifestyle is now widely recognized as a key component in the risk factors of several cancers. There is clear data for the positive effects of physical activity both on the prevention of some cancers and on clinical outcomes after diagnosis.

2.7.1. Colon cancer.

There is strong evidence that physically active men and women have a 30-40% lower risk of colon cancer compared to inactive individuals (O'Donovan G, 2010). Studies indicate a positive dose-response relationship so that the longer the duration and the higher the intensity of physical activity, the better the protective effect found for colon cancer (Thune I. Cancer ch, 2010). Likely biological mechanisms of physical activity reducing the risk of colon cancer include a reduced intestinal transit time, increased insulin sensitivity and cell proliferation of the intestinal epithelium. (World cancer research fund, 2007)

2.7.2. Breast cancer.

Physically active women have a 20-30% lower risk of breast cancer, with the evidence strongest in post-menopausal women (Warburton, 2007). Likely mechanisms include the impact of physical activity on the metabolism of sex hormones. High estrogen levels are associated with breast cancer and physical activity reduces the cumulative estrogen dose that women experience via a number of pathways (Thune I, Ch., 2010)

2.7.3. Endometrial cancer.

There is moderate evidence of a 30% lower risk of endometrial cancer. High levels of estrogen are also associated with uterine cancers. A potential mechanism for the lower risk with increased physical activity is the lower lifetime accumulation of estrogen. Increased insulin sensitivity is also thought to contribute.

2.7.4. Prostate cancer

There is moderate evidence of a lower risk of high grade prostate cancer, but with higher doses of activity required. 30 minutes or more of walking or cycling per day during adult life is associated with a reduced incidence of prostatic cancer. Compared to those who did 30 minutes of walking or cycling per day, every additional 30 minutes reduces the risk of prostate cancer by 7%. 9 Plausible mechanisms include the effect of physical activity on testosterone and insulin sensitivity (Thune L2010).

2.7.5. Lung cancer

There is some evidence of a lower risk of lung cancer, but the problems of adjusting for the risk factor of smoking makes it difficult to draw firm conclusions. (United State Department Of Health And Human Service, 2008., Thune L2010). Potential mechanisms relate to how physical activity affects the time that potential carcinogens are in contact with lung cells through improved blood capacity and blood flow.

2.7.6. Oesophageal cancer

There is emerging evidence based on meta-analysis of observational studies that the risk of esophageal adenocarcinoma may be 21-32% lower in the most physically active people compared to the least. (Behrens G., Singh S, Devanna 2014). It remains unclear which type, intensity, frequency and time period of physical activity is required to achieve a risk reduction.

2.7.7. Gastric cancer

Meta-analysis of observed studies has also suggested that gastric cancer risk may be 13-28% lower in the most physically active people compared to the least (Singh Newton ru 2013). As with esophageal cancer, the evidence of required doses of physical activity is needed to prove the observed associations.

Physical activity pretreatment: Pre surgical exercise, through aerobic, resistance or pelvic floor training, may benefit cancer patients through effects on function and cardiovascular and pulmonary fitness with significant improvements shown in: (SINGH Newton RU, Galvao, 2013)

- ❖ Rates of incontinence in prostate cancer
- ❖ Functional walking capacity
- ❖ Cardio respiratory fitness

Physical activity during treatment: Although patients often feel unwell before or during treatment for cancer, we know that physical activity during treatment (Speck RM, 2010).

- significantly improves fitness and muscle strength
- shows small improvements in anxiety levels and self esteem
- shows no worsening of fatigue levels and some small evidence of an improvement
- Increases lean muscle mass
- Improves arm function with no worsening of lymph oedema in breast cancer patients

Physical activity after treatment: Patients often experience loss of physical function as a result of their cancer treatments, but evidence shows that physical activity after treatment can improve several aspects:(Cramp Byron-Daniel J,2012)

- ✓ Increase in fitness and muscular strength
- ✓ Reduced fatigue
- ✓ Improvements in quality of life, anxiety and depression
- ✓ Some reductions in body fat and increase in muscle mass

Physical activity has been shown to improve cancer patients' quality of life during both the treatment and rehabilitation phase and should therefore be encouraged (Doyle C, Kushi LH, Grant B, et al., 2006, Courneya KS, 2003).

Physical activity and survival rates: A number of recent studies have looked at whether physical activity benefits actual cancer survival, something that had previously been uncertain. There are three meta-analyses available on breast (Ibrahim EM, Al-Homaidh A., 2011) colon (Je Y, Jeon JY.2013) or both types of cancer (Schmid D, leitzmann, 20123. Each has shown an inverse relationship between physical activity and mortality in patients going on to develop breast or colon cancer. With survivors of breast and colon who increased their physical activity from any level from pre to post diagnosis, a decreased mortality risk of 39% was shown (Schmid D, leitzmann, 20123.)

CHAPTER THREE

3. METHODOLOGY OF THE STUDY

The research of this study was present the underlying principles of research method and material choice of the appropriate research method for the study. This chapter is arranged as follows, research design, description study area, total population of the study, sample size and technique, source of the data, methods of the data collection, method of the data analysis and interpretation and so on.

3.1. Research Design

Descriptive survey method would be used to conduct this study because the issue itself needs very careful gathering and collecting information over patients while they are affected by different communicable diseases in hospitals and their home. It is help to obtain sufficient information from large numbers of respondents and to describe the exercise prescription by professionals and opinion related ongoing of exercise is medicine to patients prescribing by professionals, it is help to draw valid general conclusion in order to achieve this objective.

Kumar (2006) says descriptive survey research design is an excellent research type for obtaining thick description of complex issue in its context. The quantitative research approach was conducted because the problems under investigation demands considering the quantitative approach, this analysis framework is developing as theoretical framework that will help inform the analysis and interpretation of the study.

Therefore, the context of the various issues is survey on study implementation of exercise as a medicine prescribing by health professionals in four hospital and sport science professionals. The quantitative way of researching would be utilized in the study area. This way of research is try to explain way, in what way, and how questions and attempting to increase the understanding of patients to do exercise by prescribing their health professionals and sport science professionals.

3.2. Description of the study

This research is conducted in Jimma town is located in the Oromia national regional state; Jimma town is the capital and administrative centre of the zone and is located at a distance of 350 km away from the capital city of Ethiopia (Addis Ababa). the study area is situated between 1689

and 3018 meter above sea level; and receives an average rain fall between 1200 and 2400 millimeter per annum .the area of the study is four hospitals in Jimmatown in two government hospitals, such as, Jimma university specialized hospital and Shanen gibe general hospital, two private hospitals in Oda hulle primary hospital and Fromsis primary hospital and sport science professionals in Jimmatown..

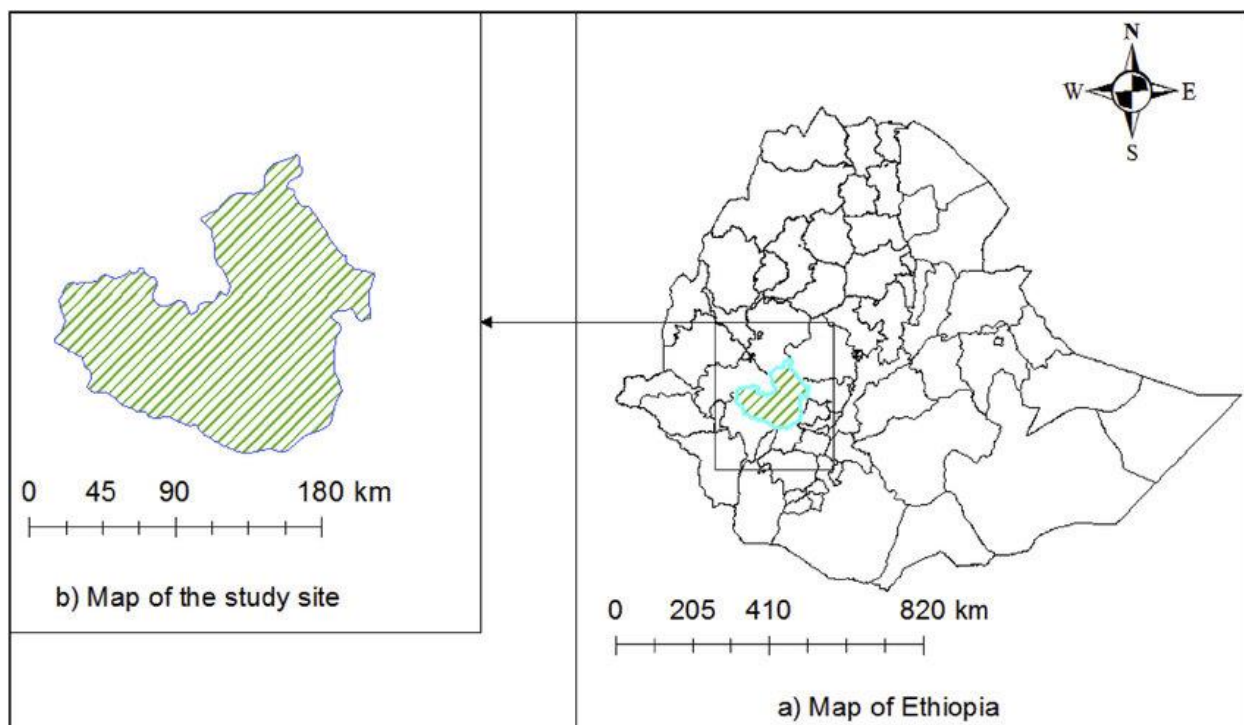


Figure 1.1. Geographical location of the study area-Jimma zone in Ethiopia

3. 3. Total population of the study

The researcher is implementing the study on four selecting hospitals and sport science professionals. In this study, the researcher believed that the population of the health professionals of study was large to participate the health professionals in this study. So due to different constraints such as time, large size of population up to data materials and other the researcher would enforce to take representative of the total population from each four hospitals and sport science professionals to use.

The total population of the study was 1000 from health professionals 927 and from sport science professionals 73. The target populations of the study were Jimma specialized hospital (=450 health

care professionals),Shenen Gibe(n=200= health care professionals),Odahulle(n=150= health care professionals),Fromsis(n=127 health care professionals),(n=73Sport science professionals)Among the total population of 1000 health professionals and sport science professionals the researcher was conducted on 300 professionals select using random sampling techniques.

3.4. Sample size and techniques

The study is implemented on the four hospitals of health professionals and sport professionals. The sampling technique of the study is simple random sampling techniques, the techniques werechoosing because of the fact that, it gives equal chance to all sample subjects of the study. Thetypes of sample is health professionals from each hospital and sport science professionals select by using the random sampling techniques therefore the sample size of the study is 227health professionals and 73 sport science professionals.

The quota from each hospital is129 for Jimma university specialized hospital, 38 for Shanen gibe general hospital, 38 for Odahulleprimary hospital, 22 for Fromsisprimary hospital by using proportionally sampling techniques would be usedto limit the number of respondents of health professionals.And73 from sport science professionals by using availability sampling techniques would be usedto limit the number of respondents of sport science professionals. Due to the fact that at Jimma town OdaHulle and Fromsis Hospitals were the only primary hospital and also at Jimma town Jimma University specialized hospital and Shenen gibe were public hospital and it was selected by using comprehensive sampling technique. Total number of sample size is 300 health professionals and sport science professionals.

Table.3.1.shows the number of respondent's in each hospitals and sport science professionals

No	Name of hospital	Number of respondents
1	Jimma university specialized hospital	129
2	Shenen gibe general hospital	38
3	Odahulleprimary hospital	38
4	Fromsisprimary hospital	22
5	Sport science professionals	73

3.5. Source of data

This study was used primary source of data. For primary source of data the researcher was collected by questionnaire.

3.6. Method of Data Collection

The researcher was prepared questionnaires to collect data from 300 health professionals and sport science professionals from four hospitals and fitness centres in Jimmatown. The data collected from two government hospital in Jimma university specialized hospital, Shanen gibe general hospital and two private hospital in Odahulleprimary hospital and Fromsisprimary hospital. This study is used to gather precise data through close ended questionnaire.

3.7. Questionnaire

The researcher had used questionnaires to collect data from health professional and sport science professional respondents. It is a kind of questionnaires with rating scale at which respondents report what is true for them or the material being evaluated (Kothari,2004).this types of instrument is used when there is a need to examine health and sport science professionals attitude or reaction on the material being evaluated (Morrison and Scott, cited in various previous studies and prepared by the researchers) questionnaires were believed to better to get

large amount of from large number of respondents in relatively shorter time with minimum cost. Hence questionnaires had been prepared in English language.

The questionnaires is consists four parts. The first part deals with the general back ground of the respondent, the second part is the question that health professionals ask themselves in terms of what they do when they treating, the third part is also the question asked when visiting patients and the fourth part is the question asked in-terms of prescription restriction items that helps the researcher to address the basic research question of the study. Closed ended question is developed by using likertscale (yes or no) to identify to what extent the respondents yes or no .likert scale is easy to construct; it take less time less time to construct; simplest way to describe opinion and provide more freedom to the respondent.

3.8. Method of Data Analysis and Interpretation

The researcher was analysed and interpreted the questionnaires were by using percentage, frequency or numbers and tabulation. The data was analyzed by quantitative data analysis and interpretations that is implemented through the help of table, percentage, frequency or numbers and descriptive analysis.

3.9. Validity of instruments

In this study the questionnaire items alignment with the objective of the study was evaluated by advisor so that the feedback the correction had been the researcher what is intended to.

3.10. Reliability of the instruments

To ensure the reliability the researcher choose only the health professionals working in the mentioned hospitals and sport science experts working around Jimma town to fill out the questionnaire and give feed backs .the respondents would be selected randomly and the participant of the study were nurse, physician, internist and fitness sport science professionals, it is regardless of gender and age.

3.11. Ethical consideration

After receiving official letters of cooperation from JimmaUniversity, the researcher was communicating all professionals legally and smoothly. The purpose of this study was made clear and understandable for all respondents. Any communication with concerned body would be

accomplished at their voluntary consent without harming and threatening the personal hospital wellbeing in addition all information obtained from individual respondents and hospital recorded would be kept confidential.

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

This chapter deals with presentation and analyzing of data collected through questionnaires .the data were presented in tables, frequency, analyzing using percentages and textual description .this section deals with the general back ground information, sample representative and general feedback of questions of the research data obtained from respondents.

4.1. RESULTS

4.1.1. Demographic information of health and sport science professionals

As shown in table 2.the population of the study 300 professionals which were health professionals and sport science professionals in selected hospitals in Jimma town. The researcher decided to take some professionals as participants of the study.

Table 4.1 sex, institution, specialization, service year and marital status distribution of respondents (300)

		Frequency	Column N%
Gender	Male	199	66.3%
	Female	101	33.7%
Institution	Primary hospital	60	20.0%
	general hospital	38	12.7%
	referral hospital	129	43.0%
	Sport science professional	73	24.3%
Specialization	Nurse	86	28.7%
	Physician	107	35.7%

	Internist	34	11.3%
	Fitness instructor	73	24.3%
Service year	Less than 5	142	47.3%
	6 to 10	118	39.3%
	11 to 15	27	9.0%
	Greater than 15	13	4.3%
Maritalstatus	Married	155	51.7%
	Non-married	145	48.3%

Table 4.1 shows that the sex of the respondents from the total sample 199(66.3%) male professionals and 101 (33.7%) female professionals. This shows that among all 300 professionals who are selected for this study 66.3% male and 33.7% female professionals ,this indicates that the female professionals participation who are selected for this study are very less than that of male health professionals,

when I came to the level of institutions from the four institutions selected in primary hospital 60 (20%),in general hospital 38 (12.7%) in referral hospital 129(43%)and in fitness institution 73 (24.3%) among the four institutions the referral hospitals take the maximum quota than of the other .the third distribution is specialization from this study four specialization were selected like nurses 86 (28.7%),physicians 107(35.7%),internists 34(11.3%) and fitness instructors 73(24.3%)among those specialty physician were take the highest numbers for this study.

The fourth distribution is service year of professional less than 5 year 142(47.3%), 6 to 10 year 118(39.3%), 11to 15 year 27(9%) and greater than 15 year 13(4.3%) from the given year 6 year

to 10 year is the maximum. and the last distribution weremarital status 155(51.7%) were married and 145 (48.3%) were un married.

Table 4.2 life style distribution of therespondents

Items	Life style				
		Physical active		Physical inactive	
		Frequency	Column N%	frequency	Column N%
Alcohol use	User	59	21.1%	0	0.0%
	Non user	220	78.9%	21	100.0%
Chat chewing	User	7	2.5%	1	4.8%
	non user	272	97.5%	20	95.2%
Tobacco	User	3	1,1%	0	0.0%
	Non user	276	98.9%	21	100%

Table 4.2shows that the life style of the respondents from the total sample 59 (21.1%) physical active alcohol user ,0(0.0%)physical in active users,220(78%) physical active non-user and 21(100%) physical inactivenon-user.it indicates that most of health care providers are non-alcohol users.

The second life style is chat chewing from the total sample 7(2.5%) physical active users and 1(4.8%) physical in active user and 272(97.5%) physical active non-user and 20(95.2%) physical inactivenon-users. This shows that almost professional are not addicted by chat.

The third life style of the respondents is tobacco from the total sample 3(1.1%) user physical active, 0(0.00%) non-user physical active and 276(98.9%) non-user physical active and 21(100%) non-user physical active. ,this also that all most not to use tobacco.

Table 4.3 Age distribution of the respondents (300)

Item(age)	Frequency	Percent (%)	Validpercent (%)	Cumulative percent
20-25	94	31.33	31.33	31.33
25-30	123	41	41	41
30-35	58	19.33..	19.33	19.33
>35	25	8.33..	8.33	8.33

Table 4.3. revealed that the age of respondent who are selected for this study 31.33% of the respondents were between 20-25 years. 41% of respondents were between 25-30 years, 19.33% of respondents were between 30-35 years and 8.33% of respondents were greater than 35 years. Among all of health care provider respondents 41% of respondents were between 25-30 years this indicates that most of the respondents participated in this study were adult professionals.

Table 4.4. The presence of physical activity in clinical practice

		Physical activity in their clinical practice				Chi - square	P -value
		No		Yes			
		frequency	Row N%	Frequency	Row N%		
Gender	Male	45	22.60%	154	77.40%	3.52	0.0600

	Female	33	32.70%	68	67.30%		
Age cate22	20-25	26	27.70%	68	72.30%	3.53	0.3170
	25-30	36	29.30%	87	70.70%		
	30-35	11	19.00%	47	81.00%		
	>35	5	20.00%	20	80.00%		
Institution	Primary hospital	12	20.00%	48	80.00%	25.86	0.0001
	General hospital	3	7.90%	35	92,10%		
	Referral hospital	52	40.30%	77	59.70%		
	Sport science professional	11	15.10%	62	84.90%		
Specialization	Nurse	17	19.80%	69	80.20%	17.52	0.0001
	Physician	33	30.80%	74	69.20%		
	Internist	17	50.00%	17	50.00%		
	Sport professional	11	15.10%	62	84.90%		
Service year	Less than 5 year	47	33.10%	95	66.90%	8.23	0.0420
	6 to 10	23	19,50%	95	80.50%		
	11 to 15	4	14.80%	23	85.20%		
	Greater than 15	4	30.80%	9	69.20%		

Marital status	Married	32	20.60%	123	79.40%	4.78	0.0290
	Non married	46	31.70%	99	68.30%		
Life style	Physical active	73	26.20%	206	73.80%	0.056	0.8120
	Physical inactive	5	23.80%	16	76.20%		
Alcohol use	Non user	57	23.70%	184	76.30%	3.51	0.0610
	User	21	35.60%	38	64.40%		
Chat chewing	Non user	76	26.00%	216	74.00%	0.004	0.9480
	User	2	25.00%	6	75.00%		
Tobacco	Non user	78	26.30%	219	73.70%	1.82	0.1780
	User	0	0.00%	3	100.00%		

Table 4.4 revealed that the health professionals reported that they responded few of many professionals had poor exercise prescription of physical activities in their clinical practice, regarding to written prescription for their patients.

Most of professionals had prescribe exercise for their patients caused by non-communicable diseases 45(22.60%) male professionals say no or give negative responses about physical activities in their clinical practices. And 154 (77.40%) professionals says yes or give positive responses about physical activities in their clinical practice generally male professionals were had better physical activities prescription in their clinical practice.

And 33(32.7%) of female respondent give negative responses and 68(67.3%) of female professionals respondents also more or less better physical activities prescriptions in their clinical practice in their hospitals (chi square value =3.52 and p= 0.0600) for the all average of gender.

when their age levels of concerning to physical activity prescription in their clinical practice 20-25 year =26(27.70%) said no and 68(72.30%) responded positively ,age of 25-30=36(29.70) they said no and 87(70.70%) are responded positively and 30-35 years =11(19%)) of respondents said no 47(81%) they said yes ,the age >35 years 5(20%) responded no and 20 (80%)n are yes the all average of age chi square value=3.53 and p-value =0.3170.

The physical activity prescription in their hospitals in primary hospital 12(20%) said no and 48(80%) they said yes ,general hospital=3(7.90%) said no and 35(92.10%) said yes, referral hospital =52(40.30%) said no and 77(59.70%) they said yes, and in fitness center 11(15.10 %) they said yes the all average of institution chi square value =25.86 and p-value=0.0001.

Concerning on specialization nurses= 17(19.86%) said no and 69(80.20%) are given positive response, ,physicians=33(30.30%) they said no and 74(69.20%) said yes ,internists= 17(50%) they said no ,and 17(50%) said yes they are answered in equal proportion , fitness instructors =11(15.10%) said no and 62(84.90%) they said yes most of them are practice exercise prescriptions to their patient in their clinical practice. The all average of professionals specialization chi square =17.52 and p-values=0.0001.

Table 4.5 Distribution of Variables in the equation

Step 1a	B	S.E.	Df	Sig	Exp(B)	95%CL	
						lower	Upper
Gender (male)	-.671	.313	1	.032	.511	.277	.944
Institution			3	.010			
Primary (hospital)	1.220	0.696	1	0.080	3.388	0.865	13.267
General hospital	-.826	.434	1	.057	.438	.187	1.025

Referral hospital	.017	.517	1	.974	1.017	.369	2.800
Service year			3	.432			
<5 year	.200	.388	1	.606	1.221	.571	2.611
6 to 10 year	.357	.654	1	.585	1.430	.397	5.155
11 to 15 year	.829	.746	1	.266	.436	.101	1.882
Specialty(nurse)	.416	.400	1	.297	.659	.301	1.443
Marital status(married)	.057	.373	1	.0878	.944	.455	1.960
Constant	1.787	.534	1	.001	5.974		

A. Variables (s) entered on step 1: gender, institution, service year, specialization, and marital Status.

Key words B=beta, SE=significant error, DF=, SIG =significant difference

The analysis of regression shows that gender(male:OR0.51,95%CL 0.27to 0.94),institution(primary hospital :OR3.38,95%CL 0.86 to 13.2),service years(6 to 10 years: OR 1.43,95CL 0.39 to5.15),specialty(nurse: OR 0.66,95% CL 0.3 to1.4),,marital status(married: OR 0.94,95% CL0.45 to 1.96)were associated with physical exercise prescription for their patients.

Tables 4.6.time spend with your patients regarding the different types of physical guidelines during your work time at your institution.

Question	No		Yes	
	frequency	Row N%	Frequency	Row N''%
I discuss the topic of physical activity with my	80	26.7%	220	73.3%

patients				
I advise my patients to became more physical active	21	7.0%	279	93.0%
I discuss the benefit of physical activity with my patients	25	8.3%	275	91.7%
I discuss my patients past physical activity experiences with them	98	32.7%	202	67.3%
I discuss the difficulty patients may encounter to became more physical active with them	120	40.0%	180	60.0%
I inform my patients about how often (frequency)they should be physically active	64	21.3%	236	78.7%
I inform my patients about how long(duration)they should be physically active	72	24.0%	228	76.0%
I inform my patients about how hard (intensity)their physical activity should be	68	22.7%	232	77.3%
I inform my patients about the types of activity they should do	53	17.7%	247	82.3%
My patients and I develop a written exercise plan to make them more physically active	183	61.0%	117	39.0%
I provide my patients with written information about physical activity during each first visit	214	71.3%	86	28.7%

I inform patients that I will monitor their physical activity levels at their next visit	169	56.3%	131	43.7%
--	-----	-------	-----	-------

In table 4.6 item 1 respondents were asked themselves do I discuss the topic of physical activity with my patient? 80(26.7%) respondents gave negative responses and 220 (73.3%) respondents gave a positive responses this indicated that most of professionals discussed the topic of physical activity freely with their patients.

Table 4.6 item 2 respondents were asked themselves do I advised my patients to became more physically active? 21(7%) of respondents give a negative response (no) and 279(93%) of respondents give a positive responses (yes) this indicates that almost professionals do their works properly discussed with their patients the topics of physical activity.

Table 4.6 item 3 respondents were asked themselves do I discuss the benefit of physical activity? 25(8.3%) respondents give a negative response (no) and 275 (91.7%) of respondents gave a positive response (yes) thus indicated that all most of professionals create an awareness about the benefit of physical activities or support their patients to teach the benefit.

Table 4.6 item 4 respondents were asked themselves do I discuss my patients past physical activity experience with patients? 98(32.7%) of respondents give a negative response (no) and 202(67.3%) of respondents were give positive responses (yes) it indicated most of professionals discuss with their patients about physical activity experience or they know their level of performance of patients.

In table 4.6 item 5 professionals were asked themselves do I discuss the difficulty patients may encounter to became more physically active with patients? 120(40%) of respondents give a negative response (no) and 180(60%) of respondents give a positive response (yes) so it indicated most of professionals discuss with their patients some of professional were late

Table 4.6 item 6 respondents were asked themselves do I inform my patients about how often (frequency) they should be physically active? 64(21.3%) of respondents give a negative response (no) 236(98.7%) of respondents were give a positive response this indicates that all most professionals they inform their patients how many time a week they must be do.

In table 4.6 item 7 the respondents asked themselves do I inform my patients about how long (duration) they should be physically active? 72(24%) respondents give a negative response (no) and 228(76%) respondents responded positively (yes) this shows that most of professionals inform their patients how many hours they perform per a day what they prescribe.

Table 4.6 item 8 the respondents asked themselves do I inform my patients about how hard (intensity) their physical activity should be? 68(22.7%) respondents were give a negative response (no) and 232(77.3%) of respondents were give a positive responses (yes) this indicates most of professionals inform their patients from which activity they start.

In table 4.6 item 9 the respondents asked themselves do I inform my patient about the types of physical activity they should do? 53(17.7%) of respondents give a negative response (no) and 247(82.3%) of respondents were give appositve response (yes) this indicates all most professionals inform their patients what types of activity they do.

Table 4.6.item 10 respondents were asked themselves does I develop a written exercise plan to make patients more physically active? 183(61%) of respondents were a negative response (no) and 117(39%) of respondents were give a positive response it indicated that most of professionals have not a written exercise plane to prescribe physical activities to patients.

Table 4.6 item 11 respondents were asked themselves do I provide my patients with written information about physical activity during each first visit? 214(71.3%) of respondents were a negative response (no) whereas 86(28.7%) of respondents were give a positive response (yes) this indicated that all most not provide a written information about physical activity during each first visit.

In table 4.6 item 12 respondents were asked themselves does I inform patients that I will monitor their physical activity levels at their next visit? 169(56.3%) of respondents were give negative

response (no) and 131(43.7%) of respondents were give positive responses this shows that most half of professionals not monitor their physical activity level of patients.

Table 4.7.during any of their visit, were you advised your patients to do:

Question	NO		YES	
	Frequency	Row N%	Frequency	Row N%
Reduce screen time in most of time	123	41.0%	177	59.0%
Participate in moderate intensity physical activity each day	128	42.7%	172	57.3%
Reduce sedentary life style or prolonged sitting	62	20.7%	238	79.3%
Start or do more physical activity	47	15.7%	253	84.3%
Maintain a healthy body weight or lose weight	28	9.3%	272	90.7%

Table 4.7 item 1 respondents were asked during any of their visit were you advised your patients to do: reduce screen time in most of the time? 123(41%) of respondents give negative response (no) and 177(59%) of respondents were give a positive response (yes) this indicated that more than half of professionals give advised the screen time to the restraints to patients.

Table 4.7 item 2 respondents were asked during any of their visit were you advised your patients to do: participate in moderate intensity physical activity each day? 128(42.7%) of respondents give negative response (no) and 172(57.3%) of respondents were give a positive response (yes) this shows most half of professionals advised their patients to do starts from moderately.

Table 4.7item 3respondents were asked during any of their visit were you advised your patients to do: reduce sedentary life style or prolonged sitting? 62(20.7%)ofrespondents give negative response(no) and 238(79.3%) of respondents were give a positive response(yes) this impliesthat all most of professionals advised their patients to reduce prolonged sittings in order to improve health problems.

Table 4.7item 4 respondents were asked during any of their visit were you advised your patients to do: startor do more physical activity? 47(15.7%) ofrespondents give negative response (no) and 253(84.3%) of respondents were give a positive response (yes) this indicated that all most of professionals they restraints to prescribe to consider current health problems.

Table 4.7item 5respondents were asked during any of their visit were you advised your patients to do: maintain a healthy body weight or lose weight? 28(9.3%) ofrespondents give negative response (no) and 272(90.7%) of respondents were give a positive response (yes) this indicated that all of professionals give advised their patients to do physical activity to reduce fat accumulations in order to sustain their weight.

Table 4.8.rate the restraints to prescribe physical activity for your patients.

Question	No		Yes	
	frequency	Row N%	Frequency	Row N%
Patients ignorance about benefits of physical activity	102	34.0%	198	66.0%
Patients fear of injury or re injury	110	36.7%	190	63.3%
Patients limiting current health problems	70	23.3%	230	76.7%
Practitioners inadequate knowledge, experience,desire, how to prescribephysical activity	90	30.0%	210	70.0%

The lack of physical activity prescription guidelines in your institution	102	34.0%	198	66.0%
The lack of physical activity prescription Center in your institution	82	27.3%	218	72.7%

As shown in item 1 of table 4.8 respondents were asked to their response on patients ignorance about benefits of physical activity 102 (34%) respondents were gave negative responses and 198(66%) of respondents were gave positive responses which shows that the professionals are helping patients know about the benefits of exercise.

Table 4.8 item 2 respondents were asked concerning on rate the restraints to prescribe physical activity for your patients fear of injury or re injury? 110(36.7%) of respondents give negative response (no) and 190(63.3%) of respondents were give a positive response (yes) this indicated that most of professionals rate the restraints of physical activity to their patients to avoid fear of injury.

Table 4.8 item 3 respondents were asked concerning on rate the restraints to prescribe physical activity for your Patients limiting current health problems? 70(23.3%) of respondents give negative response (no) and 230(76.7%) of respondents were give a positive response (yes) this indicated that all most of professionals rate restraints to limit current health problems to support their patients.

Table 4.8 item 4 respondents were asked concerning on rate the restraints to prescribe physical activity for your Patients: Practitioners inadequate knowledge how to prescribe physical activity? 90(30%) of respondents give negative response (no) and 210(70%) of respondents were give a positive response (yes) this indicated that all most of professionals not have sufficient knowledge to prescribe physical activities for their patients.

Table 4.8 item 5 respondents were asked concerning on rate the restraints to prescribe physical activity for your Patients: for the lack of physical activity prescription guidelines in hospitals? 102(34%) of respondents give negative response (no) and 198(66%) of respondents were give a

positive response (yes) this indicated that most of professionals they prepared physical activity guidelines for their patients. Others are had not knowledge to prepared presctpion guidelines.

Table 4.8 item 6 respondents were asked concerning on rate the restraints to prescribe physical activity is their r the lack of physical activity prescription center in hospitals? 82(27.3%) of respondents give negative response (no) and 218(72.7%) of respondents were give a positive response (yes) this indicated that all most hospitals had not or insufficient of prescription centers to prescribe physical activity to their patients.

4.2. Discussion on the finding of the study

This part of the study is devoted to present discussion of the data obtained from respondents in relation to exercise is medicine: does professionals it to patients in with non-communicable diseases in five institutions of four hospitals and sport science professionals around Jimma town. The data are presented in tables, analyzed by using frequency, percentage, chi square and p-values.

In this study the first section deals with the general back ground in formations of the total populations can be presented. The second section deals with sample representatives analyzed by SPSS version 26 analyses. Methods those are as a subject or respondents and the third section was in light of the basic questions of the research.

Data collected have been analyzed and interpreted .as it can be seen from the table below the researcher have seen that the written closed ended questions analyzed by using percentages, frequency, chi square and p-values, the respondents included in this study were 227 health professionals and 73 sport science professionals responded closed ended from five institutions.

The total sample size of this study were 300 professionals responded to and resulting answers interpreted in terms of the frequency, percentages, chi square and p-values.

The purpose of this study to study exercise is medicine: does professionals prescribing it to patients with non-communicable diseases in some selected hospitals and sport science professionals in Jimma town. The main finding of this study shows more of professionals had prescribed physical exercise to patients in their clinical practice but more of less professionals

had not prescribe physical activities in their clinical practice. According to the knowledge of authors this research were the primary for investigating of exercise prescription of professionals to patients with non-communicable diseases in four hospitals and sport science professionals in Jimma town.

In the present study the data were collected through the professionals (health and sport professionals) by questionnaires. The study design what the researcher choose here in the present study were chosen by several previous study (Desalew Endalew & Getu Teferi., 2021, Silva et al., 2022).

Regarding to exercise medicine prescription professionals were reported by professionals themselves on descriptive cross sectional research design by collected the questionnaire. The professional were asked to report the time when spend with their patients regarding the different types of physical activity guidelines, during any of their visit, were their advised their patients and rate the restraints to prescribe physical activity for their patients. Due to the reason, that there is no study which follow this method of recording of prescription results so it might be a little bit difficulty to make compression.

In line with the present study conducted by Desalew Endalew , 2021 in Debre markos on exercise prescription for non-communicable diseases reported a major of 80.6% of professionals had poor exercise prescription regarding to written prescription to patients and 62.5% of health care professionals agreed they had no knowledge on WHO and ACSM recommendations to prescribe for non-communicable diseases .having this in the present study 71.3% of professionals had poor written exercise prescription ,70% of professionals ha inadequate knowledge about exercise prescription.

The same with the current study conducted in Patiala ,India, by (Getu Teferi, 2017) on physical activity prescription for non-communicable diseases practice of health care providers in hospital setting shows that they very frequently asked patients about their physical activity 21.4% of professional provide patients with written directions.(8.8%) of professionals assess patients fitness,(5.2%) refer patients for other fitness as a part of physical exam. The same is true the

current study result 28.7% of professionals provide a written prescription for non-communicable diseases to patients but not frequently asked patients about physical activities.

The other previous study (Persson et al., BMC Family practice; 2013) on physical activity on prescription from the general practitioners perspective reported there is low values. status, priority regarding to distrusts and lack of guidelines, there is no discussion between professionals and patients. The current study shows 66% of professionals responded that there is written guidelines in their hospitals and sport science professionals. In addition to this some professionals do not discuss with their patients frequently.

In addition to the above previous study in line with the present study in Portugal (Silva et al., 2022) on predictors of physical activity prescription promotion to patients reported that majority of professionals 84.6% professionals promoted patients physical activity and 15.4% of professionals do not promote frequently physical activity. When 74% of professionals came to the present study responded that there is physical activity in their clinical practice and 26% of professionals reported a negative response that there is no physical activity in their clinical practice.

In reverse to the current study the study conducted in at the university of Limerick in India by (Andrew O' Regan, Pollock M, D' Sa S, et al., 2014) on ABC of prescribing exercise as a medicine reported financial bonus must be paid to participate practice when prescription target were reached and regarding to the barriers to prescribe and adherence to exercise prescription and levers to outcomes, patient factors the main barriers to prescribe exercise to patients. This result not faced in the current study.

CHAPTER FIVE

5. Summery, Conclusion and recommendation

One of the basis of analysis and interpretation of the data collecting from questionnaires the following summary conclusion and recommendation were made.

5.1 summery

It is believed that lack of professionals prescription, trends and knowledge, experience and that affect patients they treat easily, lack of restraints, and lack of prescription of health professionals and sport science is one of the obstacle of increasing non-communicable diseases and to create healthful communities to achieve the objectives. To assess various problems that affect the improving communities health is important to determine what exercise prescription is good, who good the hospitals, how good the individual professionals are changing or come up to prescribe to their patients.

To answer the research question health professionals and sport science professionals in Jimma town are taken. As the population size was 1000 professionals. From the total population 227 health professional and 73 are sport science professionals. 300 sample were conducted to the study. In order to achieve the intended objective; quantitative descriptive cross-sectional research design is chosen. The data was gathered by primary sources of data.

The primary source of data were health professionals and sport science professionals conducting by simple random sampling techniques and instrument have been developed and employed, in four hospitals and sport science professionals, such as Jimma specialized hospital, Shenen gibe general hospital, Odahulle primary hospital and Fromsis primary hospital and fitness center around Jimma town. And document analysis review was also used to strengthen and enrich the data obtained from the questionnaires. The collected data response was tabulated and interpreted and was made using statistical method such as percentage and frequency or numbers.

There is a great need for professionals (to develop and to share information on how to improve and strengthen the delivery of exercises prescriptions to patients in hospitals. The purpose of this study was to investigate and know the prescription of professionals for patients to use exercise as a medicine in selected hospitals in Jimma town.

In order to achieve this purpose the following research questions were answered,

- How can the reveal of the predictors of physical exercise prescription in clinical practice in your fitness centers and hospitals health care system in Jimma town?
- What is the reveal of the position of physical exercise in clinical practice, experiences to prevent non-communicable diseases in selected hospitals and fitness centers in Jimma town?
- Who assess the restraints to exercise prescription knowledge to prevent non-communicable diseases in selected hospitals and fitness centers in Jimma town?
- After the analysis and interpretation of the data the following points taking as the main finding of the study.

5.1.1. The time professionals spend with their patients regarding the different types of physical activity guidelines during their work time at their institution:

regard of spend their time with their patients were lack of discussion, advise of professionals to patients to became physical activity as most of the respondents were responded on table 4.6 item 1-5 did not give a good answers that is not satisfied they perform.

Regarding to give information about physical activities to patients by professionals in table 4.6 item 6-9 the respondents give respondents were that there is a problem when it comes to notifying the movements on time, for how many days .hoursthey should be done, from which activity to start and what kinds of activities should be done.

Regarding to written exercise prescription in table 4.6 item 10-12respondants were give more negative responded not enough to prescribe physical exercise to patients to became more physically active. Generally

- Lack of advice of professionals
- Professionals did not discuss about physical activity with their patients
- Professionals did not know the patients previous history of their physical activity
- Absence of prescription planes written by professionals
- Trends of giving orders prescribing

5.1.2. During any of their visits were professionals advised their patients to do:

With regard to their visit were they advised their patients, reducing screen time in most of the time, participate in moderate intensity of physical activity, prolong sitting and maintain a healthy body .in table 4.7 item 1-respondents give not satisfied or good answers to perform physical activities.

5.1.3. Rate the restraints to prescribe physical activities for their patients to prevent non-communicable disease

With regard to rates that restraints to prescribe physical activities for their patients in hospitals and fitness centers respondents were give negative answers in table 4.8 item 1-6 there was:

- ❖ Lack of physical activities prescription guidelines in hospitals and fitness centers
- ❖ Lack of physical activity prescription centers in hospitals and fitness centers
- ❖ Inadequate knowledge, experience, confidence, interests of professionals for physical activities
- ❖ Fear of injury of patients
- ❖ Problems of limiting current health problems
- ❖ Awareness of patients towards physical activity
- ❖ Negligence of internists, nurses, physicians and fitness instructors

5.2. Conclusion

The exercise prescription of knowledge, practice, confidence, trends and desire of majority of health professionals regarding to prescribe exercise for non-communicable diseases to patients were poor. The health professional's curriculum should include sufficiently about physical exercise as a strategy how to prevent and manage non-communicable diseases.

Exercise is a medicine Ethiopia initiatives should established and exercise prescription also established in organizational structure as a unit in health care setting there should be a standardized recommendation guidelines prepared at a national level to prescribe exercises used as a bench mark for health care provides for every health care setting, there will be design a continuous training program for health professionals to be a role models or how to prescribe physical activity to prevent and manage non-communicable disease for their patients.

Through the data gathered by questionnaires had come up the following major conclusions.

- ✓ In Jimmatown hospitals some health professionals is not appreciated patients to do exercise. This is because most professionals have lack experiences, desire, knowledge, confidence and practices prescription.
- ✓ The problems of rating of the limitations of prescribing physical activities for patients.
- ✓ Inadequate awareness of professional's concerning to benefits of exercises to patients.
- ✓ Fewer professionals in Jimma town do not help patients learn about the importance of exercise
- ✓ In Jimmatown Professionals do not discuss their past exercise history with their patients.
- ✓ Failure to discuss with patients the difficulties they may have in becoming more physical active.
- ✓ most of health professionals and sport science professionals in Jimma town do not give orders to choose what kind of exercise they should do, how many times a week they should do it, how many hours they should do it, and not giving them understanding of when and where they should do it.

In general most of the patients are suffering and dying by non-communicable diseases such as diabetes, hypertension, heart diseases, cancer, obesity, osteoporosis, rheumatoid arthritis, osteoarthritis, dementia, depression, anxiety and so on due to the failure of professionals to address these and similar programs.

5.3. Recommendations

Based on the above findings of the study the following recommendation were forwarded

5.3.1. Recommendations for Jimma town health and sport science professionals:

- ❖ All health professionals should develop exercise prescription guidelines in hospitals.
- ❖ Every hospital should have exercise prescription center and all health professional that working in these hospitals should support this idea.
- ❖ All sport science professionals should develop exercise prescription guidelines at their center.
- ❖ Health professionals should inform their patients what kinds of physical activity they do, how many times a week they perform, how many hours they should do per a day.

- ❖ Health and sport science professionals should discuss with their patients about the concepts of physical exercise and its benefits, their previous exercise experience, and how they should be physically fit by working hard.
- ❖ All professionals (health and sport science) should provide their patients with a written exercise prescription plan provide complete information and monitor their physical fitness when visiting patients.
- ❖ Professionals should prescribe and teach for patients about the benefits of exercise, identify activities that can help patients recover from their pain and not afraid of exercises.
- ❖ All professionals should have knowledge, experience, and confidence, interest, for physical activities when they prescribe, visit, and treat patients.
- ❖ Both professionals should inform patients to control their body weight that they will be more physically if they exercise, explain that sitting too often is very harmful, and inform them that they should start from light to vigorous activity when work out in general they should be informed about the benefits and limitation of exercise prescription.

References

World Health Organization. (2009) Global health risks: mortality and burden of disease attributable to selected major risks. Available at:

www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf Last accessed on 10/08/2013.

- Department of Health. (2011) Start Active, Stay Active. A report on physical activity for health from the four home countries' Chief Medical Officers. Available at:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_128209
- Wen, C.P., Wai, J.P.M., Tsai, S.P., Wu, X. (2011) Minimum effort of physical activity for reduced mortality and extended life expectancy. *The Lancet*; 378 :(9798): 1244- 1253.
- Blair, S.N. (2009) Physical inactivity: the biggest public health problem of the 21st century. *British Journal of Sports Medicine*; 43:1-2
- O'Donovan, G., Blazevich, A. Gately, P., J.J., Saxton, J.M., Stamatakis, E. (2010) The ABC of physical Activity for Health: a consensus statement from the British Association of Sport and Exercises Sciences. *Journal of Sport Sciences*; 28:6: 573-591
- United States Department of Health and Human Services.(2008) Physical Activity Guidelines for Americans. Available at: <http://www.health.gov/paguidelines/guidelines/default.aspx>
- Warburton, D.E.R., Katzmarzyk, P.T., Rhodes, R.E., Shephard, J. (2007) Evidence-informed physical activity guidelines for Canadian adults. *Applied Physiology, Nutrition and Metabolism*; 32 :(2): S16-S68.
- Swedish National Institute of Public Health. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://www.fyss.se/fyss-in-english/>
- Pedersen, B.K., Saltin, B. (2006) Review. Evidence for prescribing exercise as therapy in chronic disease. *Scandinavian Journal of Medicine and Science in Sports*; 16 :(1): 3-63.
- Tuomilehto, J., Lindström, J., Hamalanien, H., Ilanne-.,Aunola, M. (2001) Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine*; 344: 1343-1350.
- Williamson, D.F., Vinicor, F., Bowman, B.A. (2004) Primary prevention of type 2 diabetes mellitus by lifestyle intervention; implications for health policy. *Annals of Internal Medicine*: 140:951-957.
- Diabetes Prevention Program Research Group. (2002, 2009) Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine*;

- 346: 393-403. Windstorm J, Aunola S, Eriksson G, Hemiö K, et al. (2006) Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet*. 368:1673-86
- Yudkin JS, Montori JM. (2014) the epidemic of pre-diabetes: the medicine and the politics. *BMJ*. 349:g4485
- Sigal ,R.J., Kenny, G.P., Wells, Reid, R.D., Tulloch, H. (2007) Effects of aerobic training, resistance training, or both on glycaemic control in Type 2 diabetes: a randomized trial. *Annals of Internal Medicine*; 147(6): 357-369
- Umpierre D, Ribeiro PAB, Kramer CK, Azevedo MJ, Gross JL, Ribeiro JP, Schaan BD. (2011) Physical Activity Advice Only or Structured Exercise Training and Association With HbA1c Levels in Type 2 Diabetes. *JAMA* 305:17:1790-1799
- Pierce, N.S., (1999) Diabetes and exercise. *British Journal of Sports and Medicine*; 33:161-172: Quiz 172-3, 222.
- Bowman AM (2008) Promoting safe exercise and foot care for clients with type 2 diabetes. *The Canadian Nurse*. 104 (2) 23-7
- National Institutes for Health and Clinical Excellence. (2012) Preventing type2 diabetes: risk identification and interventions for individuals at high risk: NICE public health guideline 38. London: National Institute for Health and Clinical Excellence.
- BACR (2006) Phase IV Exercise Instructor Training Manual and ACSM (2009) Guidelines for Exercise Testing and Prescription. Courtesy of Wales NERS guidelines
- Wilson MG, Ellison GM, Cable NT. Basic science behind the cardiovascular benefits of exercise. *Heart* 2015; 101: 758-765
- Cider A, Tyni-Lenné, Schaufelberger M. Ch. 29 Heart failure. *Swedish National Institute of Public Health*. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://fyss.se/wp-content/uploads/2011/06/29.-Heartfailure.pdf>
- Taylor RS, Sagar VA, Rees K, Singh S. Exercise-based rehabilitation for heart failure. *Cochrane Database of Systematic Reviews* 2014, Issue 4. Art. No.: CD003331. DOI: 10.1002/14651858.CD003331.pub4.

- Pina, I.L., Apstein, C.S., Balady, G.J. (2003) Exercise and heart failure: a statement from the American Heart Association committee on exercise, rehabilitation and prevention. *Circulation*; 107:1210-6
- Whelton SP, Chin A, Xin X, He J. (2013) Effect of aerobic exercise on blood pressure: A meta-analysis of randomized, controlled trials. *Ann Int Med*. 136 (7): 493-503
- Fagard, R.H., Cornelissen, V.A. (2007) Effect of exercise on blood pressure control in hypertensive patients. *European Journal Cardiovascular Prevention and Rehabilitation*; 14:12-17
- Cornelissen VA, Fagard RH. (2005) Effect of resistance training on resting blood pressure. A meta-analysis of randomized controlled trials. *Journal of Hypertension*. 23:251-9
- American College of Sports medicine. Position stand. (1993) Physical activity, physical fitness and hypertension. *Medicine and Science in Sport and Exercise*. 25:i-x
- Musini VM, Tejjani A M, Bassett K, Wright JM. (2009) Pharmacotherapy for hypertension in the elderly. *Cochrane Database of Systematic Reviews* 2009, Issue 4. Art. No.: CD000028. DOI: 10.1002/14651858.CD000028.pub2
- Brooks JHM, Ferro A. (2012) The physician's role in prescribing physical activity for the prevention and treatment of essential hypertension. *JRSM Cardiovascular Disease*. 1:4:12
- Nocon M, Hiemann T, Müller-Riemenschneider F, Thalau F, Roll S, Willich SN. (2008) Association of physical activity with all-cause and cardiovascular mortality: a systemic review and meta-analysis. *European Journal of Cardiovascular Prevention and Rehabilitation*. 15:239-46.
- Kodama S, Tanaka S, Saiko K, et al. (2007) Effect of aerobic exercise training on serum levels of high-density lipoprotein cholesterol: a meta-analysis. *Arch Int Med*. 167:999-1008
- Björck L, Thelle DS. Ch. 33 Lipids. Swedish National Institute of Public Health. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://fyss.se/wp-content/uploads/2011/06/33.-Lipids.pdf>
- Trans-Atlantic Intersociety Consensus (TASC). (2000) Management of peripheral arterial disease. *European Journal of Vascular and Endovascular Surgery*; 19:S1-S250

- Bandsman, J.W., Robeer, B.G., Wittens, C.H., Oostendorp, R.A. (1998) the effect of exercise on walking distance with intermittent claudication: a study of randomized clinical trials. *Physical Therapy*; 78:278-286.
- Cooney GM, Dwan K, Greig CA, et al. Exercise for depression. *Cochrane Database of Systematic Reviews* 2013, Issue 9. Art. No.: CD004366. DOI: 10.1002/14651858.CD004366.pub6.
- Dunn AL, Trivedi MH, Kampert JB, et al. (2005) Exercise treatment for depression: efficacy and dose response. *American Journal of Preventative Medicine*; 1:281-288
- Larun L, Nordheim LV, Ekelund E, et al. (2006) Exercise in prevention and treatment of anxiety and depression among young children and people. *Cochrane Database Syst Rev*.(3):CD004691
- Mammen G, Faulkner G. (2013) Physical activity and the prevention of depression. *American Journal of Preventative Medicine*; 45(5): 649-657 55
- McKercher C, Sanderson K, Schmidt MD, et al. (2014) Physical activity patterns and risk of depression in young adulthood: a 20-year cohort study since childhood. *Social Psychiatry and Psychiatric Epidemiology*.DOI 10.1007/s00127-014-0863-7.,
- Gorczyński P, Faulkner G. Exercise therapy for schizophrenia. *Cochrane Database of Systematic Reviews* 2010, Issue 5. Art. No.: CD004412. DOI: 10.1002/14651858.CD004412.pub2.
- Martinsen EW, Taube J. Ch 44 Schizophrenia. Swedish National Institute of Public Health. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://fyss.se/wp-content/uploads/2011/06/44.-Schizophrenia.pdf>
- Vancamfort D, Stubbs B, Ward PB, et al. (2015) Why moving more should be promoted for severe mental illness. *The Lancet Psychiatry* 2 (4) 95
- Jonsdottir IH, Ursin H. Ch 46 Stress. Swedish National Institute of Public Health. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://fyss.se/wp-content/uploads/2011/06/46.-Stress.pdf>
- Arslan D, Sardahaee FS, Andersenn S, Ballard C and the Alzheimer's Society Systematic Review group. (2010) Is physical activity a potential preventable factor for vascular dementia? A systemic review. *Aging and Mental Health*. 14:4:386-395

- Blondell SJ, Hammersley-Mather R, Veerman JL. (2014) Does physical activity prevent cognitive decline and dementia?: A systemic review and meta-analysis of longitudinal studies. *BMC Public Health*. 14: 510
- Saxena S, Van Ommeren M, Tang MC, Armstrong TP (2005) Mental health benefits of physical activity. *Journal of Mental Health*; 14(5):445-52
- Forbes D, Thiessen EJ, Blake CM, Forbes SC, Forbes S. Exercise programs for people with dementia. *Cochrane Database of Systematic Reviews* 2013, Issue 12. Art. No.: CD006489. DOI: 10.1002/14651858.CD006489.pub3.
- Clark, S.R., Burckhardt, C.S., O’Rielly, C., Bennett, R.M. (1993,1999) Fitness characteristics and perceived exertion in women with fibromyalgia. *Journal of Musculoskeletal Pain*;1(3/4): 191-197.
- Rossy, L.A., Buckelew, S.P., Dorr, N., Hagglund, K.J., Thayer, J.F., McIntosh, M.J., Hewett, J.E. Johnson, J.C. (1999) A metaanalysis of fibromyalgia syndrome. *Annals of Behavioural Medicine*; 21:180-191
- Roos E. Ch 37. Swedish National Institute of Public Health. (2010) Physical Activity in the prevention and treatment of disease. Available at: <http://fyss.se/wp-content/uploads/2011/06/37.-Osteoarthritis.pdf>
- Devos-Comby, L., Cronan, T., Roesch, S.C. (2006) Do exercise and self-management interventions benefit patients with osteoarthritis of the knee? A metanalysize review. *Journal of Rheumatology*; 33:744-56.
- Juhl C. Christensen R. Roos EM. et al (2014). Impact of exercise type and dose on pain and disability in knee osteoarthritis: a systematic review and meta-regression analysis of randomized controlled trials. *Arthritis Rheumatol* 66(3): 622-36
- Vainionpau, A., Korpelainen, R., Leppaluoto, J., Jamsa, T. (2005) Effects of high-impact exercise on bone mineral density: A randomised controlled trial in premenopausal woman. *Osteoporosis International*; 16:191-197.
- Heinonen, A., Kannus, P., Sievanen, H. (1996,1999) Good maintenance of high-impact activity-induced bone gain by voluntary, unsupervised exercises: An 8-month follow-up of a randomized controlled trial. *Journal of Bone and Mineral Research*; 14(1):125-128.

- Gregg, E.W., Cawley, J.A., Seeley, D.G. (1998) Physical activity and osteoporotic fracture risk in older women. Study of osteoporotic fractures group. *Annals of Internal Medicine*; 129:81-88.
- Walsmith, J and Roubenoff, R.(2002) Cachexia in rheumatoid arthritis. *International Journal of Cardiology*; 85:89-99
- Marcora SM, Chester K, Mittal G, Lemmey AB and Maddison PJ.(2006) A randomized pfasw II trial of anti-TNF therapy for cachexia in patients with early rheumatoid arthritis. *American Journal of Clinical Nutrition* 84:1463-1472
- Gaudin P, Leguen-Guegan S, Allenet B, Baillet A, Grange L, Juvin R. Is dynamic exercise beneficial in patients with rheumatoid arthritis? *Joint, Bone, Spine: Revue du Rhumatisme* 2007;75(1):11-7
- Hakkinen A. Effectiveness and safety of strength training in rheumatoid arthritis. *Current Opinion in Rheumatology* 2004;16(20):132-7.
- Stenstrom, C.H., Minor, M.A. (2003) Evidence for the benefits of aerobic and strengthening exercise in rheumatoid arthritis. *Arthritis Rheumatology*; 49:428-34
- Brodin, N., Eurenus, E., Jensen, I., Nisell, R., Opava, C.H. (2008) Coaching patients with early rheumatoid arthritis to healthy physical activity. A multicenter randomized, controlled study. *Arthritis Rheumatology*; 59:325-31.
- Howe TE, Rochester L, Neil F, Skelton DA, Ballinger C. (2011) Exercise for improving balance in older people. *Cochrane Database of Systematic Reviews* 2011, Issue 11. Art. No.: CD004963. DOI: 10.1002/14651858.CD004963.pub3.
- Hunter, G.R., Wetzstein, C.J., Fields, D.A. Brown, A., Bamman, M.M. (2000) Resistance training increases total energy expenditure and free-living physical activity in older adults. *Journal of Applied Physiology*; 89:977-984.
- World Cancer Research Fund, American Institute for Cancer Research. (2011,2007) Colorectal Cancer: Food, nutrition, physical activity, and the prevention of colorectal cancer. <http://www.wcrf.org/int/research-we-fund/continuous-update-projectfindings-reports/colorectal-cancer>

- Chen Y, Yu C, Li Y. (2014) Physical activity and risks of esophageal and gastric cancers: a meta-analysis. *PLoS One*. 2014 Feb 6;9(2):e88082. doi: 10.1371/journal.pone.0088082. Collection 2014
- Singh F, Newton RU, Galvão DA, Spry N, Baker MK (2013). A systematic review of pre-surgical exercise intervention studies with cancer patients. *Surgical Oncol* 22, 92-104
- Speck RM, Courneya KS, Masse LC, Duval S, Schmitz KH. (2010) An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. *Journal of Cancer Survivorship* 4(2):87-100.
- Cramp F, Byron-Daniel J. (2012) Exercise for the management of cancer-related fatigue in adults. *Cochrane Database Syst Rev*. 2012 Nov 14; 11:CD006145. doi: 10.1002/14651858.CD006145.pub3.
- Chan DNS, Lui LYY, So WKW.(2010) Effectiveness of exercise programmes on shoulder mobility and lymphoedema after axillary lymph node dissection for breast cancer: systematic review. *Journal of Advanced Nursing*. 66(9):1902–1914 .
- Thorsen I, Skovlund E, Strømme SB, Hornslien K, Dahl AA, (2005) Effectiveness of physical activity on physical activity on cardiorespiratory fitness and health-related quality of life in young and middle-aged cancer patients shortly after chemotherapy. *Journal of Clinical Oncology*; 23:2378-88.
- Thue I, Smeland S. (2000) Can physical activity prevents cancer? *TidsskrNorLaegeforen*; 120:3296-301.
- Ibrahim EM, Al-Homaidh A. (2011) Physical activity and survival after breast cancer diagnosis: meta-analysis of published studies. *Medical Oncology*; 28:3:753-65
- Schmid D, Leitzmann MF. (2013) Association between physical activity and mortality among breast cancer and colorectal cancer survivors: a systematic review and meta-analysis. *Annals of Oncology*. 25:7:1293-1311
- Campbell PT. (2014) Obesity; a certain and avoidable cause of cancer. *The Lancet*. 384 (995): 727-728
- Reilly JJ, Kelly J. (2011) Long-term impact of overweight and obesity in childhood and adolescents on morbidity and premature mortality in adulthood: systemic review. *International Journal of Obesity*. 35 (7):891-8

- Griffiths LJ, Dezateux C, Hill A (2011) Is obesity associated with emotional and behavioural problems in childhood. *International journal of pediatric obesity* 6 (2-2) e423-32
- Wing RR, Lang W, Wadden TA, et al. (2011) Benefits of modest weight loss in improving cardiovascular factors in overweight and obese individuals with type 2 diabetes. *Diabetes Care*. 34 (7) 1481-6
- Winett RA, Carpinelli RN. (2001) Potential health-related benefits of resistance training. *Prev Med*. 33:503–13.
- Swift DL, Earnest CP, Blair SN, et al. (2012) The effect of different doses of aerobic exercise training on endothelial function in postmenopausal women with elevated blood pressure: Results from the drew study. *Br J Sports Med.*; 46:753–8.
- Kraus WE, Houmard JA, Duscha BD, et al. (2002) Effects of the amount and intensity of exercise on plasma lipoproteins. *N Engl J Med.*; 347:1483–92
- Johannsen NM, Swift DL, Lavie CJ, et al. (2013) Categorical analysis of the impact of aerobic and resistance exercise training, alone and in combination, on cardiorespiratory fitness levels in patients with type 2 diabetes mellitus: Results from the hart-d study. *Diabetes Care*. 36(10):3305-12
- Martin CK, Church TS, Thompson AM, et al. (2009) Exercise dose and quality of life: A randomized controlled trial. *Arch Intern Med*; 169:269–78
- Royal College of Obstetricians and Gynaecologists. Exercise in pregnancy. Statement 2006 January; 4.
- Kramer MS, McDonald SW. Aerobic exercise for women during pregnancy. *Cochrane Database of Systematic Reviews* 2006; 3.
- Ceysens G, Rouiller D, Boulvain M. Exercise for diabetic pregnant women. *Cochrane Database of Systematic Reviews* 2006; 3.
- Meher S, Duley L. Exercise or other physical activity for preventing pre-eclampsia and its complications. *Cochrane Database of Systematic Reviews* 2006; 2.
- Artal R, O'Toole M. Guidelines of the American College of Obstetricians and Gynecologists for exercise during pregnancy and the postpartum period. *Br J Sports Med* 2003; 37:6-12.
- Hunnskaar S, Burgio K, Clark A, Lapitan MC, Nelson R, Sillen U, et al. Epidemiology of urinary (UI) and faecal (FI) incontinence and pelvic organ prolapse (POP). In: Abrams P,

Andrew O' Regan, Pollock M, D' Sa S, et al precipitation of professionals of Limerick. In India, 2014

DesalewEndalew&GetuTeferi., on physical activity on prescription for non communicable diseases practice on health care providers in hospital setting in2021

Persson et al BMC family Practice, on physical activity on prescription from the general practitioners perspective in 2013

Silva et al., on predictors of physical activity on prescription promotion to patients. 2022

POST GRADUATE PROGRAM

SPORT ACADEMY

Department of sport science studies

Questionnaire for health professionals and sport science professionals

This questionnaire is to be filled by health professionals and sport science professionals on **Exercise Is Medicine: Does Professionals' Prescribing It to Patients with Non-Communicable Disease?**

Good day

I am a Postgraduate Student at Jimma University Sports Academy. You are invited to participate in a research project entitled: Exercise Is Medicine: Does Professionals' Prescribing It to Patients with Non-Communicable Disease? The study aims to investigate whether healthcare Professionals' are Prescribing physical activity to Patients with Non-Communicable Disease and the factors limiting them not to prescribe physical activity in some selected hospitals in Jimma town.

Your participation in the study would contribute to a better understanding of the issue under investigation. I guarantee that your responses would not be identified with you. Your participation is voluntary and there is no penalty if you do not participate in the study. You are free to contact the investigator at below address and phone number to discuss the study. Please sign on the dotted line to show that you have read and understood the contents of this letter. The questionnaire is not taking much more of time.

Part One: Demographic Information

1. Your gender: Male Female

2. **Your age:**

3. **Institution:** Primary Hospital General Hospital Referral fitness center

4. **Specialization:** Nurse Physician Internist fitness instructor

5. **Your service year:** ≤5 6-10 11-15 ≥16

6. **Life style:** Physically active not active

7. **Alcohol use:** User No-User

8. **Chat Chewing:** User Non-User

9. **Tobacco:** User No-User

10. **Marital Status:** Married Never married

No.	Part Two: Now I am going to ask you some questions about the time you spend with your patients regarding the different types of physical activity guidance during your work time at your institution. Please think about all those mentioned above when answering the next question.	
1	I discuss the topic of physical activity with my patient	Yes No
2	I advise my patients to become more physically active	Yes No
3	I discuss the benefits of physical activity with my patients	Yes No
4	I discuss my patient's past physical activity experiences with them	Yes No
5	I discuss the difficulty patients may encounter to become more physically active with them	Yes No
6	I have a trends to inform my patients about how often (frequency) they should be physically active	Yes No
7	I inform my patients about how long (duration) they should be physically active	Yes No
8	I inform my patients about how hard (intensity) their physical activity	Yes No

	should be		
9	I inform my patients about the type of activity they should do	Yes	No
10	My patients and I develop a written exercise plan to make them more physically active	Yes	No
11	I provide my patients with written information about physical activity during each first visit	Yes	No
12	I inform patients that I will monitor their physical activity levels at their next visit	Yes	No
Part three: During any of your visits ,were you advised your patients to do:			
13	Reduce screen time in most of the time	Yes	No
14	Participate in moderate intensity physical activity each day	Yes	No
15	Reduce sedentary life style or prolonged sitting	Yes	No
16	Start or do more physical activity	Yes	No
17	Mention a healthy body weight or loss weight	Yes	No
Part Four: rate the restraints to prescribe physical activity for your patient			
18	Patients ignorance about benefits of physical activity	Yes	No
29	Patients free of injury or re injure	Yes	No
20	Patients limiting current health problems	Yes	No
21	Practitioners inadequate knowledge how to prescribe physical activity	Yes	No
22	The lack of physical activity prescription guidelines in hospitals	Yes	No
23	The lack of physical activity prescription center in hospitals	Yes	No