# Self reported practice and advice on physical activity by doctors in Trivandrum city

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**Dissertation submitted in partial fulfillment of the requirement for the award of the degree of Master of Public Health**

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# Dedication

To my dear family members for their unconditional support, patience and encouragement throughout the entire study period; and in particular, to my beloved mother, whose constant inspiration for each and everything I have stood up for and especially to be a person of social value.

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Above all, I would like to thank God Almighty who has been with me through out, as a constant source of encouragement and support, for helping me take it one day at a time to its completion, especially when the going was tough.

# Certificate

I hereby certify that the work embodied in this dissertation entitled "Self reported practice and advice on physical activity by doctors in Trivandrum city" is a bona fide record of original research work undertaken by Dr. Lipika Patra in partial fulfillment of the requirements for the award of degree of 'Masters of Public Health' under my guidance and supervision.

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# DECLARATION

**I hereby declare that the work embodied in this dissertation entitled "Self reported practice and advice on physical activity by doctors in Trivandrum city" is the result of original research and has not been submitted for any degree in any other university or institution.**

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| | |
|---|---|
| CI | Confidence interval |
| CVD | Cardio vascular disease |
| CHD | Coronary heart disease |
| Govt. | Government |
| GPAQ | Global Physical Activity Questionnaire |
| METS | Metabolic equivalents |
| NCD | Non-communicable diseases |
| PA | Physical activity |
| T2DM | Type 2 diabetes mellitus |
| OR | Odds Ratio |
| WHO | World Health Organization |

## ABSTRACT

**Background:** Very little information is available on physical activity (PA) profile of doctors and their counseling for PA. The objectives of this study were 1.To assess the level of self reported PA and its correlates among Doctors.2. To assess the routine self reported PA counseling by doctors and its correlates.

**Methods**: A cross-sectional survey was conducted among 146 doctors (median age 42years; men 58.9%), selected by multistage random sampling. Information on demographic details, self reported PA and counseling offered to their patients was collected using a pre-tested structured interview schedule. Multiple logistic regression analysis was done to find the predictors of PA and physical activity counseling offered to the patients.

**Results:** Close to two thirds of the sample were inactive. Moderate activity was reported by 37.7% (95% CI 29.84 – 45.56) without any gender difference. Doctors who used the facilities in the neighborhood were two times (OR 2.30; CI 1.07 – 4.95), who used exercise equipment at home were three times (OR 3.71; CI 1.53 – 8.92) and those were reported to be motivated to do PA were four times (OR 4.06; CI 1.68 – 9.78) more likely to be moderately active compared to their counterparts. A quarter of the doctors always asked and advised their patients on PA. Doctors who consulted less than 30 patients per day were four times (OR 4.47; CI 1.44 - 12.81), who knew WHO recommendation of PA were three times (OR 3.07; CI 1.23 – 7.63) and those who believed that their own healthy behavior can definitely influence their advice were three times (OR 3.88; CI 1.83 – 9.96) more likely to always ask and advice their patients on PA compared to their counterparts. Written prescription was given by 24% (95% CI 17.08 - 30.92). Doctors received training for PA counseling were four times (OR 4.48; CI 1.73 – 11.56), those who asked and advised always about PA were three times (OR 2.96 CI 1.19 – 7.35) more likely to provide written prescription compared to their counterparts.

**Conclusion:** Nearly two third of doctors were physically inactive and none of them reported vigorous activity. Doctors should be encouraged to use facilities in the neighborhood and at home to enhance their level of PA. Providing training on PA and reducing the patient load are likely to improve doctor's PA counseling practices.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background

Non communicable diseases (NCDs) are the greatest emerging public health problem in most countries around the world.[1] Heart disease, stroke, diabetes, cancer, chronic obstructive lung diseases and other non-communicable diseases contributed to 35 of the 58 million deaths (60.3%) in the world in 2005.[2] Changes in lifestyle due to social, environmental and cultural determinants have forced humankind to alter their physical activity profile to a sedentary one. This has led to the emergence of a wide range of diseases that affect physical as well as mental health. At least 60% of the world's population fails to complete the recommended amount of physical activity required to induce health benefits. This is partly due to insufficient participation in physical activity during leisure time and an increase in sedentary behavior during occupational and domestic activities (WHO 2004). Physical inactivity is a modifiable independent risk factor for chronic diseases.[3]

## 1.2 Problem Statement

Kerala is a state with very good health indicators as well as infrastructure. Kerala is at present closer to developed nations in terms of health indicators. However, Kerala is now facing a heavy burden of aged population, which along with changing life styles has led to an epidemic of NCDs in the State. However, till date no study has been done either on the Physical activity level of doctors as a community or on their prescription or advice practices on physical activity, which has a major impact on the society. This study aims at filling that gap and to provide information on the current knowledge and practice of physical activity among doctors, which will be helpful in planning interventions among doctors with the aim of improving their skills in dealing with physical inactivity.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

Worldwide, substantial gains have been achieved in economic growth, health, and living standards in the past century. This progress is now threatened by crises of own creation—climate change, finance and food insecurities, and the crisis in non-communicable diseases (NCDs). Heart disease, stroke, diabetes, cancer and chronic respiratory diseases contributed to 35 of the 58 million deaths (60.3%) in the world in 2005.[1] The spread of non-communicable diseases presents a global crisis; in almost all countries and in all income groups, men, women and children are at risk of these diseases. This has given rise to new challenges of providing acute and chronic care for NCDs, especially in low resource countries such as India with an already existing mismatch between health care needs and resources.[2] Even at the present stage of health transition, India contributes substantially to the global burden of NCDs. In 1990, India accounted for 19 per cent of all deaths, 16 per cent of all NCD deaths, and 17 per cent of all cardio vascular diseases (CVD) deaths in the world[3] while India's population was 17.5 % of the global population.

## 2.2 Risk factors of NCDs and physical inactivity as a risk factor

Chronic diseases share common risk factors and conditions. While some risk factors, such as age, sex and genetic make-up cannot be changed, many behavioral risk factors can be modified, as well as a number of intermediate biological factors including hypertension, being overweight, hyperlipidemia, and glucose intolerance. The recognition of these common risk factors and conditions is the conceptual basis for an integrated approach to chronic disease control. The lag period between exposure to risk factors of NCDs and their clinical manifestations make current mortality rates suitable for prospective public health planning, since they only represent past exposures over some

decades. The risk factors underlying the major chronic NCDs are well documented and are relatively few in number. According to the World Health Report 2002, the major risk factors include: tobacco use, alcohol use, high blood pressure, physical inactivity, high cholesterol, overweight and unhealthy diet (low in fruits and vegetables and high in salt, fat, and sugar). Only tobacco, physical inactivity and unhealthy diet may explain 75% of the chronic NCD conditions.[4] Evidence shows that the major chronic NCDs operate through a cluster of common risk factors, whose presence or absence determines the occurrence and severity of the disease. Since the focus of this research is physical inactivity the other risk factors are not discussed in detail.

Physical inactivity is a modifiable independent risk factor for various chronic diseases[3] and has been identified as the fourth leading risk factor for global mortality in both developed and developing nations (6% of deaths globally). This has led to the emergence of a wide range of diseases that affect physical as well as mental health. At least 60% of the world's population fails to complete the recommended amount of physical activity required to induce health benefits. This is partly due to insufficient participation in physical activity during leisure time and an increase in sedentary behavior during occupational and domestic activities.[5]

Exercise improves cardio-respiratory fitness, muscular strength and endurance, body mass and fat composition. Seven chronic diseases in particular have been associated with physical inactivity: coronary heart disease (CHD), stroke, hypertension, type 2 diabetes mellitus (T2DM), osteoporosis, breast cancer and colon cancer.[6] Moreover, compelling evidence links physical inactivity to the development of obesity, sarcopenia, arthritis, physical disability, depression and several other psychological disorders. Overall, physical activity is thought to benefit over 25 chronic conditions.[7] Studies have

consistently shown that physically active men and women have a 20%–35% lower all-cause and cardiovascular-related mortality than their sedentary peers.[8]

Sedentary lifestyle has been proved to cost the individuals, society and largely the nation. The annual direct medical expenditure among 15 years and older individuals without physical limitations and regularly engaged in physical activity has been estimated to be US $1,019 against $1,349 for those who reported to be physically inactive.[9]

### 2.3 Physical activity

#### 2.3.1 Concepts

Although the terms "Physical activity", "physical fitness" and "exercise" are used synonymously they impart different concepts.

"Physical activity is any bodily movement produced by skeletal muscles that results in energy expenditure above the resting level" and the energy expenditure is measured in Kilojoules. Oppositely, inactivity refers to a state of no marked increase in energy expenditure above resting level.[10] Sedentary lifestyle includes some activity, but usually not enough for gaining health effects .While active living is a way of life that integrates at least half an hour of physical activity each day into daily routines.[11,12]

"Exercise is a subset of physical activity that is planned, structured and repetitive and has a final and intermediate objective of improvement and maintenance of physical fitness".

"Physical fitness is a set of attributes that are either health or skill related". Physical fitness is defined as the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies.[13]

"Health Enhancing Physical Activity" is any form of physical activity that benefits health and fitness without undue harm or risk. This can be all daily activities and can, but does not necessarily, include sports. Not all physical activity is beneficial for health. To be

beneficial for health, physical activity should be 'moderate' or 'vigorous'. Moderate-intensity physical activity e.g brisk walking, raises the heart-beat and leaves the person feeling warm and slightly out of breath. It increases the body's metabolism to 3-6 times the resting level (3-6 MET's). Vigorous-intensity physical activity enables people to work up a sweat and become out of breath. They usually involve sports or exercise, like running or fast cycling. They raise the metabolism to more than six times the resting level.[14] There is evidence that intensity of physical activity is inversely and linearly associated with mortality.

### 2.3.2 Health benefits (evidence based)

There is irrefutable evidence of the effectiveness of regular physical activity in the primary and secondary prevention of several chronic diseases (e.g., cardiovascular disease, diabetes, cancer, hypertension, obesity, depression and osteoporosis) and premature death. Numerous longitudinal studies have examined the beneficial effects of exercise training on bone health in children, adolescents, and young, middle-aged and older adults.[15] There appears to be a linear relation between physical activity and health status, such that a further increase in physical activity and fitness will lead to additional improvements in health status. Recent investigations have revealed that being fit or active was associated with 50% reduction in the risk of death from any cause and from cardiovascular disease.[16] Physically inactive middle-aged women (engaging in less than one hour of exercise per week) experienced a 52% increase in all-cause mortality, a doubling of cardiovascular related mortality and a 29% increase in cancer related mortality compared with physically active women. Moreover, it appears that people who are fit yet have other risk factors for cardiovascular disease may be at lower risk of premature death than people who are sedentary with no risk factors for cardiovascular disease.[16] Also the benefits of physical activity and fitness extend to patients with

established cardiovascular disease.[17] Therefore, a dose–response relation appears to exist, such that people who have the highest level of physical activity and fitness are at lowest risk of premature death. Sedentary lifestyles have been associated with a 1.5 to 2.4 fold elevation in CHD risk. A recent study reported that sitting for long periods of time can increase the chance of death from heart disease significantly. Regardless of physical activity or fitness level, people in this study who sat for more than four hours at a time were 80 percent more likely to die from heart disease

Physical activity has been shown to be associated with a decreased risk and with effective management of type 2 diabetes.[18,19] A study among 21271 male physicians, those who reported weekly physical activity sufficient to cause a sweat had a reduced incidence of type 2 diabetes.[19]

Also there is compelling evidence that routine physical activity is associated with reduction in the incidence of specific cancers, in particular breast and colon cancer [20,21] and an improvement in overall quality of life and health status of patients with cancer.

### 2.3.3 Global recommendation

WHO developed the "Global Recommendation on Physical Activity for Health" with the overall aim of providing national and regional level policy makers with guidance on the dose response relationship between the frequency, duration, intensity, type and total amount of physical activity needed for the prevention of NCDs.

The amount of energy expended by carrying out an activity is measured as metabolic equivalents (METS).The frequency measures the number of times the activity is performed. Duration of exercise is usually measured in hours or minutes.

The WHO recommendations address three age groups: 5–17 years old; 18–64 years old; and 65 years old and above.[3]

- Children and youth aged 5–17 should accumulate at least 60 minutes of moderate to vigorous intensity physical activity daily. Amounts of physical activity greater than 60 minutes provide additional health benefits.
- Adults aged 18–64 should do at least 150 minutes of moderate intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous intensity aerobic physical activity throughout the week. For additional health benefits, adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous intensity aerobic physical activity per week, or an equivalent combination of moderate and vigorous intensity activity.
- In older adults aged 65 years and above, physical activity includes leisure time physical activity (for example: walking, gardening, swimming), transportation (e.g. walking or cycling), occupational (if the individual is still engaged in work) and household chores.

### 2.3.4 Correlates

Although it is known that physical activity has the "public health potential" in preventing death and disability attributed to chronic diseases, very few people have been found to be meeting the recommendations. Increasing participation in regular physical activity is a national health priority for many industrialized nations. Interventions are most effective when they alter the underlying variables that influence physical activity. Thus, studying "determinants" or correlates of physical activity is an important prerequisite for designing relevant policies and effective programs.

## 2.4 Situation analysis

### 2.4.1 Global

The WHO estimated that globally physical inactivity causes two million premature deaths each year, including 10%–16% of cases of breast cancer, colon cancer, rectal cancer, T2DM and 22% of cases of CHD.

Physical inactivity is highly prevalent in North America and European countries. In the United States, in 1991, fifty four percent of adults reported little or no regular physical activity. The national surveillance programs have documented that more than 25 percent of U.S. adults don’t engage in any leisure time physical activity. Only one in three exercises regularly and one in four does not exercise at all.

Over the last few decades, traditional societies in many developing countries have experienced rapid and unplanned urbanization, which has led to lifestyles characterized by unhealthy nutrition, reduced physical activity and tobacco consumption. These unhealthy lifestyles are associated with common modifiable risk factors for chronic diseases such as hypertension, diabetes mellitus, dyslipidaemia and obesity. Traditionally, populations in South and South East Asia have been rural based agrarian workers but rapid socioeconomic transition in this region has resulted in change of occupation from farming to formal industry based jobs with declining regular occupational physical activity.

### 2.4.2 India

In India, it was reported in mid 1970's that almost all the rural men were involved in regular or irregular strenuous physical activity. This proportion declined to 70% in early 1990's. Data among urban Indian populations show that moderate and high grade physical activity is uncommon. In early 1990's only 14% subjects were reportedly involved in

regular non-occupational physical activity and the proportions did not change significantly over the next ten years.[15]

Few studies have estimated the physical activity levels in Indian population so far. A study was done to find out the prevalence of overweight, obesity, under nutrition and physical activity status in the urban populations of five cities (Trivandrum, Calcutta, Bombay, Moradabad and Nagpur) of India. The prevalence of obesity and sedentary behavior was significantly higher in Trivandrum, Calcutta and Bombay compared to Moradabad and Nagpur. The overall prevalence of sedentary behavior was 59.3% among women and 58.5% among men. Both sedentary behavior and mild activity showed a significant increasing trend in women after the age of 35-44 years.[16]

According to World Health Report 2002, cardiovascular diseases will be the largest cause of death and disability by 2020 in India. India is experiencing a rapid health transition; NCDs are responsible for 53% of deaths and 44% of disability adjusted life years lost. The Indian Council of Medical Research conducted a multi-centric study on NCD risk factor surveillance in 2010 (ICMR-WHO six site study).The result showed that almost 76% male and 86% female were physically inactive during their leisure time in urban areas. More than 60% were physically inactive during their work in urban areas.[17]

A survey conducted by IDSP in Tamil Nadu (2008) among the urban population showed that around 66% of respondents reported low level of physical activity, while 30% and 4% of respondents reported medium and high level of activity respectively. Majority (79%) of respondents spent more than four hours in sedentary activities. The study also highlighted that six out of ten adults were in low level of physical activity.[18]

**Kerala**, well known for health at low cost, is the most advanced state in epidemiological transition. One of the most important contributors to the modern ills of Kerala is lack of physical activity. Indolence breeds heart attacks; it invites overweight and obesity and

creates a favorable milieu for diabetes and hypertension. A community-based study in Kerala showed high burden of NCD risk factors, comparable to that in the United States, with highest prevalence of Coronary Artery Disease of 7.5% rural prevalence and 12% urban prevalence. Prevalence of co-morbid conditions like hypertension and obesity were also high in Kerala.[19]

Hence, promoting physical activity is an important public health strategy for long term reductions in incidence and severity of chronic diseases and also provides benefits to health-related quality of life (HRQL) and practicing physicians involved in clinical care are an important segment of public health care to disseminate this message.

### 2.5 Doctors and physical activity

#### 2.5.1 Role of a doctor

As a group, doctors are expected to be healthier and to have healthy lifestyles. Furthermore, doctors' health behaviors appear to affect patients' attitudes and motivation to make lifestyle changes. Building on this relationship between personal and clinical practices could encourage doctors to include preventive counseling more often in their practices and to do it more effectively.[20]

A vast majority of studies cite that doctors are the primary source of information regarding healthy lifestyle decisions. They have good access to information on disease frequency and determinants. Therefore, knowledge and awareness regarding the health consequences of lifestyle changes are generally expected to be high among doctors. This in turn could influence the prevalence of lifestyle diseases such as diabetes and hypertension among them. There are some data on the lifestyle associated disorders among doctors from developed countries like Australia [21,] New Zealand [22], United Kingdom and United States of America[23] but sparse data from developing countries.

### 2.5.2 Level of physical activity among doctors

Physician delivered preventive counseling is important for the prevention and management of chronic diseases. Data from the U.S. indicate that physicians with healthy personal habits have a better attitude towards preventive counselling.[24]

The "Healthy Doctors = Healthy Patients" study showed that:

- Doctors with healthier life style => positive influence on their patients
- Doctors who practice preventive health => positive influence on their patients
- Doctor's revelation about healthy habits => believable and motivating for patients.[25]

A study was done among 451 doctors in three Saskatoon hospitals, Canada. Only 47% doctors responded and of the respondents 30% were in active category as compared with the national average of 39%.[26.] A cross sectional study among the post graduate doctors working in a tertiary care hospital of public sector in Karachi, Pakistan showed that 50% doctors were physically inactive.[27]

A study was done in seven states of India (2004-2006) among 2499 practicing doctors from urban and semi urban areas. The study showed that doctors had significantly higher ($p<0.001$) prevalence of all abnormalities except diabetes, compared with the general population.[28]

The high prevalence of cardiovascular disease (CVD) risk factors reported from South India among doctors is disturbing. One study was done among 4000 doctors of different specialties from eight southern districts in Tamil Nadu. The study identified 49% of female doctors and 41% of male doctors as having metabolic syndrome and only 17% were physically active.[29]

### 2.5.3 Prescription and advice practice

Most clinicians have multiple opportunities to intervene with patients on matters related to behavioral change like sustaining individual motivation, assessing progress, providing feedback etc. Several studies in the west have shown that health professionals' especially doctors' advice for physical activity enhances the activity level either in terms of energy expenditure or in the stage of behavior change.[30] But a few studies have been conducted in developing countries on how often the doctors ask, assess and advice patients about their physical activity practice. A public opinion survey conducted by the American College of Sports Medicine (**ACSM**) found that nearly two-thirds of patients (65%) would be more interested in exercising to stay healthy if advised by their doctors and given additional resources.[31]

A written goal oriented exercise prescription, in addition to verbal advice, is a useful tool for doctors in motivating their patients to increase physical activity.[32] Physician counseling alone either makes people active or it makes people change their stage of behavior from pre-contemplation to contemplation.[33,34] Also physician based interventions were found to be cost effective.[35] So the prescription pad is the ideal place to start.

### 2.6. Rationale of the study

"Exercise is Medicine", is a global initiative calling on physicians to ask, assess and review every patient's physical activity pattern at every visit. There is an urgent need to spread new evidence on physical activity as well as evidence on how to promote physical activity. Very little information is known about the healthcare professionals' up-to-date scientific knowledge on how to prevent and treat various diseases and conditions using physical activity. Doctor's attitude, behavior and skills for promotion of physical activity matter a lot. Hence my study is to assess the doctor's knowledge about current WHO

recommendations for physical activity, their own level of physical activity and about their advice and prescription practice regarding physical activity.

## 2.7 **Research Objectives**

1. To assess the level of self reported physical activity and its correlates among doctors.
2. To assess the routine self reported physical activity counseling by doctors and its correlates.

# CHAPTER THREE: METHODOLOGY

## 3.1 Study Design:

A cross-sectional survey was conducted among registered modern medicine practicing doctors.

## 3.2 Study Setting:

Study was planned among modern medical practioners in Trivandrum Municipal Corporation. The city corporation is spread over 314.86 square kilometers and a population of 9, 57,730 inhabitants (as per the 2001 census) and with an estimated number of 1500 doctors. All doctors with a basic qualification of M.B.B.S or above were eligible to be included in the study. Place of practice included clinics, nursing homes or hospitals. Doctors from both Government and private sectors were considered. Doctors from other systems of medicine and Dentists were not included.

## 3.3 Study Population:

Modern medicine Doctors practicing at Government institutions, private hospitals and private clinics of Trivandrum city

## 3.4 Sample Size:

Sample size was estimated using Statcalc, Epi info version 6. Keeping anticipated physical activity prevalence as 20% [source: IDSP,NCD risk factor surveillance,2008 ] and worst acceptable result as 13%, alpha error of five percent and a non-response rate of 15% the sample size was estimated to be 150.

**3.5 Inclusion Criteria**:

The inclusion criteria consisted of following four specialties and general practitioners because these are centrally involved in medical and behavioral management of chronic disease /condition and more likely to give advice on physical activity to patients.

a) General practitioners
b) Medicine specialists
c) Cardiologists
d) Diabetologists
e) Paediatricians

**3.6 Exclusion Criteria**:

a) Specialists other than those mentioned above
b) Non clinical Doctors
c) Visiting Doctors from outside the city limits

**3.7 Sample Selection Procedure**:

The selection of doctors was done by multi stage random sampling. The list of hospitals was made by the principal investigator using four sources namely the Indian Medical Association, Trivandrum; Centre for Development Studies, Trivandrum; telephone directory and through internet. From this sample frame, a list of modern medicine practicing hospitals was prepared. This consisted of 31 Government institutions including 12 primary health centers (PHC) and 5 community health centers (CHC), 37 private hospitals and 36 single doctor private clinics. The 12 PHCs also had single doctors. From this list, 22 government institutions including 8 PHCs and 3 CHCs, 29 private hospitals and 19 single doctor private clinics were selected randomly.

Out of the 70 institutions approached, five private hospitals refused to participate. Permission to conduct the survey among doctors in the 22 Government institutions was taken from the Director of Health Services (DHS), Trivandrum. Permission was taken from the respective hospital administrators for the 29 private hospitals and 19 private clinics.

In each hospital, a list of doctors was prepared based on the selection criteria. The number of doctors to be selected from each hospital was proportional to the bed strength of the hospital. From this list, doctors were randomly selected and approached. Appointment for the interview was taken from the doctors who expressed willingness to participate. Written informed consent was taken prior to the interview on the given day. Those who were unwilling to participate were substituted by the next doctor in the list. Doctors who were unavailable on the given day were asked of their willingness to participate in the study again. If they were willing, another appointment was taken. If the doctor was unavailable for this appointment as well, he/she was considered as non-respondent.

Out of 177 doctors approached, 146 (82.4%) agreed for the interview. The pre-tested structured questionnaires were self administered. Out of the 71 doctors from 22 Govt. institutions 48 doctors (67.6%), 79 out of 87 doctors from 29 private hospitals (90.8%) and all the 19 doctors from the private clinics completed the questionnaire.

During the first part of study, it was noticed through interactions with the patients that there was some level of over reporting of advice regarding physical activity by some doctors. In order to understand the magnitude of over reporting, a few exit interviews were conducted among 65 patients after obtaining their verbal consent (annexure 3). The exit interview was limited to patients attending medicine specialists, cardiologists and diabetologists due to time constraints. The participants were asked whether the consulted

doctor did ask and give advice to them in their routine checkups and did they receive any written prescription on PA (annexure 4).

### 3.8 Data collection techniques and tools:

Data collection was done by the principal investigator between 16th June 2011 to 15th September 2011.Self administered questionnaire was the tool for the survey. The questionnaire was administered to doctors at the time of data collection after obtaining written informed consent (annexure 2). The questionnaire was close ended and semi-structured in English and was developed in consultation with a subject expert. The questionnaire comprised of five sections (annexure 1)

**Section 1**: This section included information on socio-demographic characteristics such as age, sex, height, weight, waist circumference, marital status, specialty, type of working place

**Section 2:** Included perception about their own health, awareness about the WHO recommendation for PA and beneficial roles of PA for prevention of NCDs

**Section 3:** Captured level of physical activity of the doctors, using Global Physical Activity Questionnaire (GPAQ). It collected information on physical activity participation in three settings (or domains) as well as sedentary behavior, comprising 16 questions (P1-P16). The domains were: Activity at work, travel to and from places and recreational activities.

**Section 4:** Collected information on determinants of PA (environmental, personal and behavioral attributes)

**Section 5**: PA advice practice. These questions were added based on evidence of the effectiveness of physical activity on the management of chronic health problems[1] and also based on the importance of counseling of physical activity by doctors.[50]

**3.9 Outcome Variable:** (a) Level of physical activity among doctors. This was grouped into doctors with moderate level of physical activity and low level of PA (b) Self reported physical activity advice both verbal and written.

**3.10 Operational definition for level of PA:**

In this study, the operational definition of physically inactive individual was "failure to meet WHO guidelines for minimum reported amount of physical activity i.e 30 minutes of moderate physical activity at least five days per week. Those participants who met the recommended guideline were considered as 'moderately active'

**3.11 Measurement of PA as outcome variable:**

**Physical activity measure: - GPAQ –**The PA tool used was the Global Physical Activity Questionnaire (GPAQ), because of its high reliability and validity.[51] The instrument included 16 questions and gathered information on physical activity in three domains (activity at work, travel to and from places, and recreational activities) in a typical or usual week, as well as time spent on sitting in a day. The GPAQ asked about the frequency (days) and time (minutes/hours) spent doing moderate and vigorous –intensity PA. All the data collection and processing followed the GPAQ analysis protocol.[52]

METs (Metabolic equivalents) were used to express the intensity of PA. MET is defined as the energy cost of sitting quietly and is equivalent to a caloric consumption of one kcal/kg/hour. Using the compendium of Ainsworth et al, an average MET score was derived for each type of activity and were set as 4 MET for moderate-intensity, 8 MET for vigorous-intensity physical activity, and 4 MET for transport-related walking or cycling.[53] The total physical activity score was computed as the sum of all MET or metabolic equivalent (MET min/week) from moderate to vigorous intensity PA performed at work, commuting and recreation. PA levels were initially classified into three categories of low, moderate, and high (vigorous) as defined by the GPAQ analysis framework:

**High:** Any one of the following two criteria was used to categorize an individual with high PA: (a) Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET minutes/weeks or (b) 7 or more days of any combination of walking, moderate or vigorous-intensity activities achieving a minimum of at least 3,000 MET minutes per week.

**Moderate:** If any one of the following three criteria was met the individual was categorized as having moderate PA: (a) 3 or more days of vigorous-intensity activity of at least 30 minutes per day or (b) 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day or (c) 5 or more days of any combination of walking, moderate- or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes per week.

**Low:** A person not meeting any of the above mentioned criteria fell in this category.

Since nobody belonged to the category of vigorous activity the entire sample was divided into two groups: individuals with moderate activity and with low activity. These three groupings were then categorized into two groups; moderately active and inactive.

### 3.12 Determinants/correlates of PA

#### 3.12.1 Participant characteristics:

**Sex:** it was recorded as male or female. Usually males were engaged in outdoor labor intensive work and thus tend to be more physically active.

**Age:** age was recorded in completed years as reported by the participants. With increasing age, work involvement gets lesser. So it is expected that older peoples will tend to be less physically active.

**Marital status:** this variable was collected as single, married, divorced, widow/widower etc

**Specialty:** the level of qualification was enquired about and recorded as general practitioners and specialist. Only selected specialty was included.

**Work place:** Private sector and government sector were expected to have different work culture and quantity. The workload in government hospitals was expected to be more which might have an influence on the PA pattern of doctors and their advice practices.

### 3.12.2 Individual correlates (health related)

**Healthy behavior**: A habit of eating healthy diet can be positively correlated with PA level as PA helps in weight control. The doctors were asked about tobacco and alcohol use in last one month. The survey also enquired about their number of hours of TV watching per day; work on computer at home and about any membership in sports club/gym.

**Perceived health:** Doctors were asked about their opinion regarding own health such as excellent, good, or poor. People who perceive themselves to be healthy are more likely to be active than those who report poor.

**Actual health**: It was asked if they had any chronic diseases such as diabetes, hypertension, heart disease, asthma or dyslipidaemia. It is expected that healthy people are more likely to be active than persons with medical problem.

### 3.12.3 Individual correlates (Physical activity behavior)

**Knowledge:** It was enquired as to how important they thought was PA for health. People with greater knowledge and belief in the health benefits of PA are more likely to adopt a physically active lifestyle.

**Perception:** They were asked as to whether they considered themselves to be adequately physically active. Also it was asked if they felt it was needed for their health and if they were making additional efforts to pursue PA. Perceived activity status and the need of it along with additional efforts to be physically active may contribute to PA status.

**Perceived barriers:** They were asked about some things they thought might be interfering or preventing them from exercising or being physically active. For example, lack of motivation may be a factor resulting in lower PA level. Very commonly, lack of time for PA, real or perceived may be responsible for the people not pursuing physical activity on a routine basis. Lack of energy or feeling too tired to carry out PA, obtaining enough exercise at one's job or household work or care giving duties such as child and elderly care can be a reason for limited participation in PA.

### 3.12.4 Environmental correlates of PA

It was asked if they felt that the lack of access to requisite place such as a park, playground or sports club to carry out PA was interfering or preventing them from exercising or being physically active. The use of facility for exercise in the neighborhood and at home can have an impact on PA level. Neighborhood safety and traffic interference might have an influence on PA.

### 3.13 Correlate of PA counseling:

**3.13.1 Attitude and awareness:** better attitude and awareness toward preventive aspects of chronic disease along with treatment part, may lead to greater participation in preventive counseling practices.

**3.13.2 Work environment**: they were asked about the number of patients they consult per day and how much time they spend on each patient. Those who consult less number of patients per day and those spend more time in consultation are more likely to ask and advice always regarding PA level of the patients.

**3.13.3 Training received on PA counseling**: Those who have attended any classes or sessions on benefits of PA in medical college or, those who received any training to counsel patients about PA are more likely to advise more.

### 3.14 Definitions used:

1) Overweight was defined as BMI of more than or equal to 25 kg /$m^2$ and obesity as more than or equal 30 kg/$m^2$.[54]
2) Abdominal obesity was defined as a waist circumference of ≥ 90 cm in men and ≥ 85 cm in women. BMI ≥ 25kg/$m^2$ and waist circumference ≥ 90cms for men and ≥ 85cms for women were considered abnormal.[55]
3) Hypertension, Diabetes, Dyslipidaemia: self reported
4) Low, moderate and high levels of physical activity were defined as <600, 600–3999, and ≥ 3000 MET-minutes per week, respectively.[56]
5) Any form of tobacco use or alcohol use in the last one month was considered as current use of tobacco and alcohol respectively

### 3.15 Data storage and analysis:

All the information collected from the respondents was checked manually before data entry. Anonymity was maintained throughout this survey from the data collection stage up to the write-up of the dissertation. The hard copies of data collected were stored in the safe custody of the principal investigator. The collected data were coded, entered, and cleaned, and analyzed by SPSS for windows version 17. Quantitative analyses using univariate / bivariate and multivariate analysis were carried out. Chi square test were used for bivariate statistical analysis.

### 3.16 Ethical consideration

Ethical clearance for the study was obtained from Institute Ethics Committee (IEC) of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Written informed consent was obtained from individuals found to be eligible and willing to participate in the study.

## CHAPTER FOUR: RESULTS

### 4.1 Sample characteristics

The characteristics of these 146 doctors are presented in Table 1. Mean age of the participating doctors was 43.3 ± 11.3years (median 42 years). In the sample, 58.9 percent (86) were male and 41.1 percent (60) were female doctors. Out of the 146 doctors interviewed, 98 were specialists which comprised of 40 medicine specialists, 23 paediatricians, 21 cardiologists and 14 diabetologists. Out of 146 doctors interviewed, 61 percent (90) were from private sector. More than three fourth of the sample population were married and 13 percent were divorced or separated.

**Table 1: Background Characteristics of Doctors by Sex**

| Characteristics | Male (N=86) n (%) | Female (N=60) n (%) | Total (N=146) n (%) |
|---|---|---|---|
| Age(yr) | | | |
| < 40 | 39 (45.3) | 22(36.7) | 61(41.8) |
| 40-59 | 37(43.0) | 31(51.7) | 68(46.6) |
| >=60 | 10(11.6) | 7(11.7) | 17(11.6) |
| Category of Practice | | | |
| General practitioners | 29(33.7) | 19(31.7) | 48(32.9) |
| Specialists | 57(66.3) | 41(68.3) | 98(67.1) |
| Working Place | | | |
| Govt. sector | 30(34.9) | 26(43.3) | 56(38.4) |
| Private sector | 56(65.1) | 34(56.7) | 90(61.6) |
| Marital status | | | |
| Married | 71(82.6) | 43(71.7) | 114(78.1) |
| *others | 15(17.4) | 17(28.3) | 32(21.9) |
| *BMI ($kg/m^2$) | | | |
| Normal | 38(44.2) | 35(58.3) | 73(50.0) |
| Overweight | 38(44.2) | 16(26.7) | 54(37.0) |
| Obese | 10(11.6) | 9(15.0) | 19(13.0) |

* others (unmarried/separated/widowed)

* Estimated BMI from self reported height and weight: < 25 (normal weight ), 25-29.99 (over weight), ≥ 30 (obese)

From the self reported height and weight, body mass index (BMI) [54] was calculated. Nine doctors measured height and 26 doctors measured their weight at the time of survey since

they were not sure of these measurements and scales were available in their consulting rooms. Mean BMI for male was 25.6 ± 3.1 and for female was 24.9 ± 4.0. According to the body mass index (BMI), half of the doctors were having BMI less than 25. Among all, 20.5 percent (30) doctors didn't report their waist circumference. Mean waist circumference among those who had reported (79.5percent) was (89.64 ± 9.17) [Male: 90.8 ± 7.5 and Female: 87.5 ± 11.3].

**4.2 Risk factor profile of the doctors**

The overall risk profile, including overweight/obesity, abdominal obesity, diabetes, hypertension, dyslipidaemia was high (Table 2). The abdominal obesity[55] was computed using Asia Pacific WHO guidelines as waist circumference ≥ 90 cm for males and ≥ 80 cm for females. Among those (116) who had reported their waist circumference, the overall prevalence of abdominal obesity was 52.1percent and there was no significant difference between men (52.3percent) and women (51.7percent) for abdominal obesity prevalence.

The prevalence of all the NCD risk factors was higher among male compared to female. More than half of the doctors reported a family history of diabetes and hypertension. Among other chronic diseases like asthma and heart disease the prevalence was 11.6 percent and 8.2 percent respectively.

**Table 2: Self reported risk factor profile of doctors by sex**

| Variables | Male (N=86) n( %) | Female (N=60) n (%) | Total (N=146) n (%) | p value |
|---|---|---|---|---|
| *Overweight/obese | 48(55.8) | 24(40.0) | 73(50.0) | 0.06 |
| *Abdominal obesity | 45(52.3) | 31(51.7) | 64(61.0) | 0.93 |
| Diabetes | 30(34.9) | 13(21.7) | 43(29.5) | 0.08 |
| Hypertension | 21(24.4) | 12(20.0) | 33(22.6) | 0.53 |
| Dyslipidemia | 23(26.7) | 11(18.3) | 34(23.3) | 0.32 |
| Family h/o DM | 43(50.0) | 40(66.7) | 83(56.8) | 0.06 |
| Family h/o HTN | 45(52.3) | 30(50.0) | 75(51.4) | 0.78 |
| Current tobacco users | 16(18.6) | 0.0 | 16(11.0) | < 0.001 |
| Current alcohol users | 35(40.7) | 0.0 | 35(24.0) | < 0.001 |

* BMI ≥ 25

* (n=116) abdominal obesity: waist circumference ≥ 90cms for men and ≥ 80cms for women

To understand the risk profile, a variable was computed to give a score of total number of chronic conditions or risk factors each person had and it was presented in the table 3.The most commonly considered risk factors of chronic diseases/conditions (obesity, diabetes, hypertension, dyslipidaemia, tobacco use and alcohol use) were used for scoring.

**Table 3: Number of self reported risk factors of NCDs among doctors by sex**

| No of R.Fs present* | Male (N=86) n (%) | Female (N=60) n (%) | Total (N=146) n (%) |
|---|---|---|---|
| **0** | 9(10.5) | 23(38.3) | 32(21.9) |
| **1** | 23(26.7) | 21(35.0) | 44(30.1) |
| **2** | 26(30.2) | 9(15.0) | 35(24.0) |
| **3 and above** | 28(32.6) | 7(11.7) | 35(24.0) |

*Total of six risk factors included were obesity, diabetes, hypertension, dyslipidaemia, tobacco use and alcohol use

Only one fifth of doctors had no chronic disease risk factors. Slightly more than one third of females had only one risk factor. Compared to female doctors, males were having more number of risk factors. Multiple risk factors were reported more among older age group (age more than 43 years) compared to doctors in the age group of less than 43 years.

### 4.3 Doctor's awareness of physical activity:

About half of the doctors were familiar with WHO recommendation for PA. About three fourth of doctors agreed that PA has a role in primary prevention and secondary prevention of NCD. In response to the question; "in your opinion PA is beneficial for which of the diseases?" All the doctors acknowledged that PA is beneficial for diabetes, obesity and heart disease. Half of them (52percent) said it is also beneficial for depression, but very low proportion agreed for chronic obstructive pulmonary disease (COPD) (22.6percent) and cancers (19.8 percent).

**Table 4: Doctor's opinion about the importance of PA**

| Opinion | Male(N=86) n (%) | Female(N=60) n (%) | Total(N=146) n (%) |
|---|---|---|---|
| Role of PA in primary prevention of NCDs | | | |
| Yes | 67(77.9) | 47(78.3) | 114(78.1) |
| No | 19(22.1) | 13(21.7) | 32(21.9) |
| Role of PA in secondary prevention of NCDs | | | |
| Yes | 64(74.4) | 44(73.3) | 108(74.0) |
| No | 22(25.6) | 16(26.7) | 38(26.0) |

### 4.4 Doctor's perception

Among the doctors, majority (97.3percent) perceived that they were in good health. Among those who perceived their overall health as good/fair, 30.6% and 22.4% were diabetic and hypertensive respectively. About half of the doctors felt that they were having normal weight, but according to calculated BMI, about one fifth of them were

overweight / obese. Among those who perceived that they were overweight/obese, one fifth of doctors were in normal weight category as per the calculated BMI

About 70% of doctors perceived that they were moderately active, however among them only 40% were moderately active as per the calculated total PA using GPAQ. One fifth perceived that they were very active, but among them almost 40% were physically inactive. These findings suggested consistency in what their perceived and actual PA.

A majority of (80.8percent) doctors perceived the importance of exercise apart from daily work related activities. However, only 34.9 % reported that they always make a conscious effort to do regular exercise and those who made a conscious effort always were comparatively more physically active than their counterparts (p=0.007).

**4.5 Physical activity level of doctors**

In the sample, only 37.7% (36.7 % female and 38.4% male) of the doctors reported moderate physical activity (MET 600-3000)[56]. The mean physical activity of the doctors was 463.9 ± 40 MET min /week (median 430.0). The Mean level of PA among female (498 ± 45MET) and male (440 ±35MET) was low and not significantly different.

The survey reported a negative correlation between sitting hours per day, BMI and waist circumference and the amount of physical activity (Pearson's correlation coefficient -0.113, -0.134, -0.053).There was no significant difference between 'physically inactive' male and female doctors regarding 'number of hours of watching TV or of hours of working on computer at home, having personal and family history of diabetes or hypertension'.

**The mean time (hours/day) spent on sitting** was about eight hours per day (Male: 7.9 ± 2.4 and Female: 7.6 ± 2.9). Taking median (8 hours) as cut off level, the sitting hours per day was categorized into less than eight and eight or more hours per day.

### 4.6 Determinants of physical activity

Factors associated with physical activity (environmental, personal and family or behavioral) are presented in Table 9. Among the personal attributes such as lack of time, lack of energy/too tiring, care giving duties, having some health problem, support by family or friend had no significant association on physical activity level. However, lack of time was reported as an important barrier by more than half of the doctors for not doing any exercise. The most common motivator was self encouragement. Compared to male (68.6%) more proportion of female (81.7%) reported that self encouragement could be a facilitator for being physically active and also it was found to be a significant factor of being active for both male and female.

There was no significant difference between male and female doctors in behavioral attributes like spending time in front of TV and computer at home ; past sports activity history at school or college; use of tobacco and alcohol. About 65% of doctors reported that they ensure their regular diet to the standards of a healthy diet and a majority (83%) told they do that for their personal fitness.

**Table 5: Correlates of moderate physical activity: results of bivariate analysis (n=146)**

| Variable | | Moderately active (%) | Unadjusted OR | 95% CI | p value |
|---|---|---|---|---|---|
| Sex | Female | 36.7 | Reference | | |
| | Male | 38.4 | 1.07 | 0.54 – 2.12 | 0.83 |
| Age(yr) | ≥ 60 | 35.3 | Reference | | |
| | 40-59 | 39.7 | 1.03 | 0.39 – 3.65 | 0.74 |
| | < 40 | 36.1 | 1.20 | 0.33- 3.18 | 0.95 |
| Marital status | Married | 36.8 | Reference | | |
| | *Others | 40.6 | 1.17 | 0.52 – 2.61 | 0.71 |
| Use of facility in the neighborhood | No | 28.6 | Reference | | |
| | Yes | 52.7 | 2.78 | 1.38 – 5.60 | 0.004 |
| Time available for exercise | No | 32.5 | Reference | | |
| | Yes | 43.9 | 1.62 | 0.82 – 3.12 | 0.15 |
| Motivation for PA | No | 23.2 | Reference | | |
| | Yes | 50.6 | 3.40 | 1.66 – 6.95 | 0.001 |
| Use of exercise equipment at home | No | 30.0 | Reference | | |
| | Yes | 61.1 | 4.14 | 1.58 – 10.87 | 0.001 |
| Previous sports activities | No | 32.1 | Reference | | |
| | Yes | 45.2 | 1.73 | 0.88 – 3.42 | 0.11 |
| Eats healthy diet | No | 30.0 | Reference | | |
| | Yes | 41.7 | 1.66 | 0.80 – 3.45 | 0.17 |
| Member of health club/gym | No | 34.6 | Reference | | |
| | Yes | 57.9 | 2.64 | 0.96 – 6.92 | 0.05 |

*others - unmarried/divorced/separated/widowed

The significant variables in bivariate analysis were included in multivariate logistic regression to elicit the factors influencing the level of activity and results are shown in the Table 6.

**Table 6: Correlates of moderate physical activity: results of multivariate analysis**

| Variable | | Adjusted OR | 95% CI | p value |
|---|---|---|---|---|
| Use of facility for PA in the neighborhood | No | Reference | 1.07 – 4.95 | 0.03 |
| | Yes | 2.30 | | |
| Motivation for doing PA | No | Reference | 1.68 – 9.78 | 0.007 |
| | Yes | 4.06 | | |
| Use of exercise equipment at home | No | Reference | 1.53 – 8.92 | 0.02 |
| | Yes | 3.71 | | |

Dependant variable: Moderate Physical Activity. Other independent variables included in the model and found to be not significant were sex, age, category of practice, type of work place, time available for exercise, previous sports activities, eats healthy diet and member of health club/gym.
OR: Odds Ratio.CI: confidence interval.

### 4.7 Doctors attitude towards health promotion

Responses to questions regarding their attitude toward health promotion activities are summarized in Table 7. Most doctors (65.2%) acknowledged that health promotion should ‘always’ be a part of the routine consultation and significant difference was seen among general practitioner (77%) and specialists (58%) in this opinion (p=0.02). About one third opined that health promotion activities should be incorporated into the routine consultation.

Overall, 62.3% doctors felt that health promotion activities like diet and PA counseling should preferably be done by ‘other health care professionals’ and only 37.7% doctors thought that the ‘Doctor’ himself or herself should do the health promotion activities. There was significant difference among general practitioner (77percent) and Specialists (55percent) in this opinion that ‘other health care professionals should be entrusted for health promotion’

(p= 0.01)

### 4.8 Advice practice regarding PA and its correlates:

**4.8.1 Number of patients per day:** The average number of patients the doctors consulted per day was thirty. Majority (76%) doctors consulted less than 30 patients per day without any sex and specialty wise differentiation. Yet, significant difference was seen between government sector (39.3%) and private sector (13.3 %) on consultation of more than 30 patients per day.

**4.8.2 Time spent per patient:** Doctors reported that the average time taken was usually more than or equal to 10 minutes per patient. More than half of the doctors spent more than 10mins/patient without any sex and sector differentiation. However there was significant difference between general practitioners (31.2 %) and specialists (70.4%) regarding time spent more than 10mins per patient. Compared to general practitioners, majority (70 %) of specialists spent more than 10mins per patient during routine consultation in both the sectors.

**Table 7: Sector and Specialty Wise Doctors' Characteristics**

| | **Govt. sector** | | | **Private sector** | | |
|---|---|---|---|---|---|---|
| | GP,% (N=48) | Specialist,% (N=98) | Total,% (N=146) | GP,% (N=48) | Specialist,% (N=98) | Total,% (N=146) |
| **Number of patients /day** | | | | | | |
| **≤ 30** | 60.9 | 60.6 | 60.7 | 96.0 | 83.1 | 86.7 |
| **>30** | 39.1 | 39.4 | 39.3 | 4.0 | 16.9 | 13.3 |
| **Time(min)spent /patient** | | | | | | |
| **< 10** | 69.6 | 30.3 | 46.4 | 68.0 | 29.2 | 40.0 |
| **≥10** | 30.4 | 69.7 | 53.6 | 32.0 | 70.8 | 60.0 |

### 4.8.3 Ask and advise always:

Overall, 42.5 % doctors always 'ask' patients about their current PA levels and 46.6% doctors always give 'verbal advice'. However, only one fourth always 'ask and advise' regarding PA. There was hardly any agreement between doctor and patient on this opinion. There was no gender, specialty and sector wise differentiation in 'always asking and advising' practice.

**Table 8: Correlates of 'Ask and advise always': results of bivariate analysis (n=146)**

| Variable | | Ask and advise always (%) | Unadjusted OR | 95% CI | p value |
|---|---|---|---|---|---|
| Sex | Female | 43.2 | Reference | | 0.78 |
| | Male | 56.8 | 0.88 | 0.25 – 1.87 | |
| Working place | Govt. | 32.4 | Reference | | 0.38 |
| | Private | 67.6 | 1.41 | 0.64 – 3.10 | |
| Category of practice | Gen. practitioner | 36.8 | Reference | | 0.71 |
| | Specialist | 40.6 | 1.17 | 0.52 – 2.61 | |
| Knows WHO recommendation of PA | No | 28.6 | Reference | | 0.009 |
| | Yes | 52.7 | 2.94 | 1.38 – 6.43 | |
| Attended classes in medical college | No | 64.9 | Reference | | 0.08 |
| | Yes | 32.5 | 2.02 | 0.82 – 4.58 | |
| Received training for PA counseling | No | 67.6 | Reference | | 0.01 |
| | Yes | 32.4 | 1.53 | 0.66–10.48 | |
| Level of activity | Inactive | 56.8 | Reference | | 0.23 |
| | Moderately active | 43.2 | 1.86 | 0.24 – 2.92 | |
| Number of patients consulted /day | >30 (n=34) | 8.1 | Reference | | 0.11 |
| | ≤ 30 (n=112) | 91.1 | 4.51 | 1.28- 15.74 | |
| Time(min)spent/patient | < 10 | 35.1 | Reference | | 0.31 |
| | ≥10 | 64.9 | 1.56 | 0.68 – 3.45 | |
| Believes own healthy life style can influence advice practice | No | 8.1 | Reference | | 0.03 |
| | Yes | 87.9 | 5.67 | 2.12–16.53 | |

Independent variables for modeling were chosen based on the findings from literature, significance in bivariate analysis. Enter method was used for modeling.

**Table 9: Correlates of 'Ask and advice always'- results of multivariate logistic regression analysis**

| Variable | | Adjusted OR | (95% CI) | p value |
|---|---|---|---|---|
| Knows WHO recommendation of PA | No | Reference | | 0.01 |
| | Yes | 3.07 | 1.23 – 7.63 | |
| Believes own healthy life style can definitely influence advice practice | No | Reference | | 0.002 |
| | Yes | 3.88 | 1.83 - 9.96 | |
| No. of patients consulted /day | >30 | Reference | 1.44 – 12.81 | 0.007 |
| | ≤ 30 | 4.47 | | |

Dependant variable: Ask and advise always. Other independent variables included in the model and found to be not significant were sex, category of practice, working place, level of PA, training received for PA counseling and time spent/patient
OR: Odds Ratio.CI: confidence interval.

### 4.8.4 Written Prescription Practice:

Written prescription for PA was given by 35 (24 %) of the doctors without any gender, sector and specialty wise differentiation. Out of them only 18 (12.3 %) quantified or wrote the amount of PA which is beneficial for health. However, there was very minimal agreement between doctors and patients for written prescription on PA. Majority (67%) of the doctors both male and female agreed that 'Written prescription was more effective than verbal advice'. Close to half of the participants reported 'lack of sufficient time' as a barrier for written prescription. About 18% said because of 'lack of standard protocols for exercise prescription' it was difficult to write and 11 percent reported that written prescription was given only for drugs. Others reasons for not giving an exercise

prescription were, they didn't think of it /didn't know it's important / seniors don't write / patients don't comply.

A variable was created 'always ask, advice and give written prescription for PA' to the patients keeping in mind as a best practice by the doctors. Only 10% (95 % CI; 5.37 – 15.23) practiced this protocol routinely. Those doctors who had received training on PA counseling were three times higher in practicing this protocol.

**Written prescription practice - Results of Multivariate Logistic Regression Analysis**

Independent variables for modeling were chosen based on the significance in bivariate analysis. Enter method was used for modeling.

**Table 10: Correlates of written prescription – Results of multivariate logistic regression analysis**

| Variable | | Adjusted OR | (95% CI) | p value |
|---|---|---|---|---|
| Received training on PA counseling | No | Reference | | 0.002 |
| | Yes | 4.48 | 1.73 – 11.56 | |
| Ask and advise always | No | Reference | | 0.01 |
| | Yes | 2.96 | 1.19 – 7.35 | |

Dependant variable: written prescription. Other independent variables included in the model and found to be not significant were category of practice, working place, level of PA, attended classes in medical college, no. of patients seen per day, time spent per patient and knows WHO recommendation of PA.

OR: Odds Ratio.CI: confidence interval.

# CHAPTER FIVE: DISCUSSION

This study aimed to assess PA patterns and the factors associated, among doctors in Trivandrum city, Kerala. It also looked into their verbal and written prescription practice on PA to the patients. Doctors are usually a group of professionals having hectic and erratic routines. As a consequence doctors have little or no time for recreational and occupational physical activity.

## 5.1 Physical activity pattern among doctors and the comparison with general population

This study revealed that about 62% reported having no or low level of overall physical activity (MET < 600) and were considered as 'physically inactive'. Nobody was in the category of vigorous or high level of PA. According to the study findings, only one third of doctors were moderately active. This level of physical activity was higher than that reported by a study done among doctors in Tamilnadu[41] in 2009 (17 %). A study in Canada showed a similar prevalence of PA among doctors which suggests that the PA pattern among doctors in Kerala are comparable to their peers in developed countries.[38] Physical activity level was found to be lower among the doctors when compared to a study among the general population in Kerala [31]. Similar findings were reported from Canada where PA prevalence among doctors in Canada was found to be lower than the national average among general population[38], while in Bahrain doctors had higher prevalence of PA than the general population.[57]

Domain specific analysis of physical activity revealed that recreational or leisure time activity was the main attributing factor to the overall PA among doctors. Walking in their leisure time for the purpose of exercise was the most common activity (78%) among doctors. However, job and travel related PA was largely absent. This could be due to the

fact that there are inadequate opportunities to do some kind of activity in their profession /work set up. Although comparative figures on studies in India among doctors are not available, studies from developed countries reveal the same pattern where leisure time PA was the major component of total PA[58, 59]. The difference in the PA behavior among doctors could be due to the higher availability and accessibility of sports or recreational facilities as well as organized PA programs or sports in developed country settings.

**5.2 Risk factor profile of the doctors**

This study illustrates huge burden of chronic conditions and its associated risk factors among the doctors. Lack of physical activity has been associated with most of the chronic diseases. Nearly 63 % were physically inactive and among them more than half were men (58.2%) and almost half were overweight or obese which shows that doctors may be at a higher risk for most of the chronic diseases.

Prevalence of overweight and abdominal obesity among those who reported were found to be higher than the general population of Kerala while the prevalence of diabetes and hypertension are at par with the general population[31]. High prevalence of obesity, diabetes, hypertension and dyslipidaemia had been reported in another study among doctors in northern India.[60] The findings from this study is comparable with other studies in India which shows higher prevalence of chronic disease among doctors.[40, 41]

It has been found that 20% were not aware of the waist circumference and 17% were not aware of the weight and measured it at the time of survey. Most studies from developed countries also show that doctors, generally do not take good care of their health[33, 61] and the current study findings are in agreement with this.

Tobacco use was limited only to the male doctors similar to the trends in the general population. About one fifth of doctors were current tobacco users which shows slightly

higher prevalence compared to a study in Kerala among doctors in 2009 which reported a prevalence of 10.8%.[62]

Large proportion of male doctors (68%) when compared to female doctors were spending more than eight hours per day in recline and among them two third were physically inactive, more than half were obese, about 30% and 22% were diabetic and hypertensive respectively. This sedentary behavior increases their risk several folds to develop cardiovascular disease.[20, 21]

Presence of multiple risk factors/chronic diseases was analyzed among the study participants and it was observed that there were a higher proportion of males with multiple risk factors when compared to females. This may be due to the prevailing tobacco and alcohol use pattern in the Kerala society where use of tobacco and alcohol is a taboo for women like in other Asian countries.

**5.3 Perception on Health and physical activity**

Among the doctors, majority (97.3%) perceived themselves having good health. Among those who perceived their overall health was good/fair, 30.6% and 22.4% were diabetic and hypertensive respectively. Doctors probably did not consider these as major health problems. More than half of the doctors were having one or two risk factors. Even though they were having h/o of chronic disease and other chronic disease risk factors, they believed that they were in good health and this attitude was also likely to be reflected in their counseling practice. So this misconception needs to be addressed.

Physical fitness refers to a physiologic state of well-being that allows one to meet the demands of daily living. Though, the assessment of physical fitness is often not feasible but studies have consistently shown an inverse gradient of health risk across self-reported physical activity groups. From a public health perspective, it is preferable to encourage

people to become more physically active rather than to become physically fit which is only a perception.[63] This study indicates that about one fifth of the doctors perceived that they were very active, but actually among them majority (62%) were only moderately active. More than two third perceived that they were moderately active but as per the calculated PA level, about 60% were physically inactive. This indicates that there is over reporting of activity level and inconsistency between the perceived and actual PA.

Awareness of personal risk behavior is supposed to be especially important to proceed from pre-contemplation to contemplation. Changing from pre-contemplation may require motivation that fosters confidence to proceed to contemplation.[64] For risk behaviors that are clearly defined, often dichotomous and for all to see (like smoking), awareness is not an issue. For more complex risk behaviors e.g. physical inactivity, research has shown that many people are indeed not aware of their risk behavior and consequently do not perceive a need to change. As a result they may not be motivated to change. [65, 66] Therefore evaluations of the adequacy of one's own level of PA might act as a potential determinant to increase the level of PA.

Physicians involved in clinical care are an important segment of public health care as they are the primary contacts to the people and studies have shown that more people were interested in exercising on advice by the physician.[43] Therefore, knowledge and awareness regarding the health consequences of lifestyle changes should be high among clinicians. In this study only half of the doctors were familiar with WHO recommendation on PA for health benefits. All the doctors acknowledged that PA is beneficial for diabetes, obesity and heart disease. Half of them (52%) said it was also beneficial for treating depression, but very less proportion agreed that PA was useful for prevention and control of COPD and cancers. Ample number of studies concluded that physical activity

influence prevention of most of the chronic diseases, cancer survival and modulating insulin activity [25, 26].

### 5.4 Correlates /Determinants of physical activity

Lack of time was reported as an important barrier by more than half of the doctors for not doing any exercise. However no significant association was found between perceived lack of time and PA. Doctors who reported to be motivated were five times more likely to be moderately active compared to their counterparts. Among other personal attributes lack of energy/too tiring, obtaining enough exercise at work place, care giving duties, having some health problem, support by family or friend had no significant association on doctor's physical activity level. Lack of time and lack of motivation was most frequently cited as a barrier by other studies for insufficient physical activity.[67, 68, 69]

Almost two third reported that the facility for exercise such as park, foot path and open ground was available in their neighborhood. Doctors who were using the exercise facility in the neighborhood were two times more likely to be physically active, which is consistent with several studies[70,71] in which existence of more exercise facilities in the neighborhood was positively associated with physical activity participation. However the study found no association with physical activity for perceived neighborhood safety and heavy traffic. It was also evident that those doctors who were using the exercise equipment at home were three times more active compared to their counterpart which is consistent with another study which revealed similar findings that the odds of being physically inactive were being a non member of sports club.[72] The reasons cited for participation in PA and those that posed barriers to participation were consistent with the existing literature.[73]

### 5.5 Advice practice regarding PA by the doctors

Physician-delivered preventive counseling is important for the prevention and management of chronic diseases. Data from various studies indicated that physicians with healthy personal habits have a better attitude towards preventive counselling.[74] In this study though there was no significant association between their own level of activity and their advice on PA to patients, but it was found that physically active doctors were more likely to ask and advise always regarding PA compared to physically inactive groups. Physicians' disclosure of healthy personal behavior has been shown to improve both their credibility and their ability to motivate patients. Results of our study showed that doctors had high rates of cardio metabolic risk factors and therefore do need more motivation to follow good health care practices which they advocate to their patients.

### 5.6 Factors influencing "Ask and Advice always" and "written prescription practice"

Only one fourth of the doctors asked and advised for PA to the patients in this study. Factors that influenced ask and advise

It has been observed that those who were aware of the WHO recommendation for PA were more likely to always ask and advise their patients. Doctors who are up to date with recent literature are likely to be more scientific in their practice. Efforts should be made for providing continuing medical education for doctors in order to influence their medical practice with latest developments in the field.

Those who believed their own healthy lifestyle can influence the advice practice were found to be asking and advising always. Health behaviors are expected to be first followed by medical practitioners who will then influence the general population. For example, tobacco use reduction first occurred in among the doctors which then helped to reduce tobacco among general population.

Work load also was found to be associated with ask and advise practice. Those who consulted less than 30 patients per day were four times more likely to always ask and advice.

It has also been found that those who received PA counseling training and those who always ask and advice were four and three times more likely to give written prescription .Only a small proportion of doctors (24.7%) had ever attended any class/session on PA in medical college and only 26% reported that they received any formal training for PA counseling during their career. This throws light on the importance of including PA training in the medical or in service training curriculum.

As a best practice the doctor should always ask, advice and prescribe physical activity in routine consultation. In some developed countries a mere inquiry about the PA status of patients by doctors increased PA level.[43] Health promotion or disease prevention activities are highly relevant when investigating topics related to physician – patient interaction i.e number of patients seen per day and time spent per patient.[75,76] Other previous analyses have suggested that especially primary care doctors did not have enough time to deliver all the preventive and chronic disease services.[77,78] A study among doctors in Kerala showed that the average time taken for each patient consultation to be around one minute.[79] However this study showed that majority of the doctors from private and public sector reported that they usually consult less than 30 patients per day and they spend more than ten minutes per patient. Yet, no significant difference was found in advising PA for those who spend more time with the patient which reveals that lack of time was not a constraint for not giving advice on PA. It is, therefore, crucial that doctors should incorporate the PA status as a vital sign when taking a patient's medical history.

Majority of the doctors felt that health promotion activities should be entrusted to other health care professionals such as nurses, dieticians and social workers. Several studies have also demonstrated patient satisfaction with midlevel providers.[80, 81] In such scenarios where there is large patient load for the physicians, it is suggested that the physician should ask, advice and prescribe physical activity while the other team members can go about more with counseling, goal setting and other strategies. This may be an efficient use of support staff to reinforce the doctor's message and elicit patient needs.

### 5.7 Strengths of the study

The data collection was carried out by a single investigator thus eliminating the chances of inter-observer bias. Response rate of 82% among practicing doctors was strength of this study.

### 5.8 Limitations of the study

The study was a cross-sectional survey and as such all the limitations of a cross sectional design apply to this study as well. The doctors those who agreed to participate in the study might be a group who practice healthy behavior. Therefore this may be an overestimate of the self reported PA and advice practice. Another limitation is no validation was done for self reported information. Even with self reports majority of doctors were sedentary and less than half reported always asking and advising their patients on PA.

## 5.9 Conclusion

None of the doctors were reported to have vigorous physical activity in this study. One third reported to have moderate PA and the rest were sedentary. Those who were using the facilities in the neighborhood or using exercise equipments at home and those who were motivated to do PA were significantly more likely to be active compared to their counterparts. Providing more exercise facilities in the neighborhood and in the homes and motivating the doctors for PA is likely to enhance their PA levels.

Only a quarter of the doctors always asked and advises their patients on PA. The major predictors for always ask and advise were knowledge of WHO recommendations, belief that their own healthy life style can influence their advice practice and those who had lesser work load were more likely to ask and advise always. Providing continuing medical education for doctors on NCD Risk factors particularly on physical inactivity, encouraging healthy life styles among doctors and reducing work load are likely to enhance their PA advice practice

Only a quarter of the doctors provided written prescription to their patients for PA. Major predictors were receiving training for PA counseling and the practice of always asking and advising on PA. Providing training to doctors on PA counseling is likely to enhance written prescription for PA.

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## ANNEX 1: Doctor's Written Informed Consent Form

Dear Doctor,

I am Dr. Lipika Patra, a student of Masters of Public Health (MPH), at Achutha Menon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences &Technology (SCTIMST), Trivandrum.

As part of my dissertation, I am conducting a study on "Self reported practice and advice on physical activity among Doctors in Trivandrum city". I am collecting information on various parameters of physical activity, such as awareness of doctors, their personal physical activity pattern as well as the prescription and advice of physical activity to patients. I would like you to answer a questionnaire which will take about 10-15 minutes.

Participation in this study is voluntary. While there is no direct benefit for you individually, the findings of the study will enhance scientific knowledge and enable to develop better health policies. The information given by you will be used exclusively for research and your name and that of your department/institution will not be identified in any manner if the results of the study are published. I therefore, request you to participate in this study.

You are free to refuse participation. You can withdraw from the survey any time during answering if you feel so. If you have any queries or doubts please feel free to clarify those. I will try my level best to answer to any of your queries right now or in future as well.

**Contact Information:** If you have any research related questions, you may contact me or any of the below mentioned persons at the following address:

| | | |
|---|---|---|
| Dr. Lipika Patra<br>MPH scholar 2010<br>AMCHSS,SCTIMST<br>Trivandrum-11<br>Cell: 9633363470 | Dr. K. R. Thankappan<br>Professor & Head<br>AMCHSS,SCTIMST<br>Trivandrum-11<br>Tel: 0471-2524231 | Dr. Anoop Kumar T<br>Member secretary<br>Institute Ethics Committee<br>Public Health-SCTIMST<br>Tel:0471-2520256 |

If you are willing to participate, kindly do sign below.

Signature of the participant: Signature of the interviewer:

Date:

Place

## ANNEX 2: Doctor's Interview Questionnaire

### SECTION 1: PERSONAL DETAILS

1.1. Age (in completed years): _____

1.2. Sex: 1.Male 2.Female

1.3. Height (in cms):_____

1.4. Weight (in Kgs):_____

1.5. Waist circumference (in inches / cms):_____

1.6. Category of practice:
1. General practitioner
2. Specialist, please specify _____
3. Super specialist, please specify _____

1.7. Marital status:
1. Married
2. Unmarried
3. Separated / divorced
4. Widowed

1.8. Your present working place:

1. Govt hospital
2. Private hospital
3. Private clinic
4. other: please specify _____

## SECTION 2: PERCEPTION, AWARENESS AND ATTITUDE

2.1. How would you describe your weight?

1. Normal weight
2. Overweight
3. Obese
4. Underweight

2.2. How would you rate your overall health?

1. Excellent
2. Good
3. Fair
4. Poor

2.3. How physically active do you consider yourself to be?

1. Very active
2. Moderately active
3. Not active

2.4. Do you have any history of the following illness in your family or personally? (You may tick more than one)

| Sl.No | Diseases | Personal History | Family History |
|---|---|---|---|
| 1 | Diabetes | | |
| 2 | High BP | | |
| 3 | Heart diseases | | |
| 4 | Asthma | | |
| 5 | Dyslipidaemia | | |
| 6 | Any other major disease (please specify) | | |

2.5. Do you think physical activity has a risk modifying role in certain chronic diseases (CAD, diabetes, dyslipidaemia, obesity etc.)?

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

2.6. Does physical activity has a role in Primary prevention of any chronic disease to some extent?

1. Yes 2. No **(If No, go to Q 2.8)**

2.7. If yes, please list **1** disease: _____

2.8. Does physical activity has a role in Secondary prevention of any chronic disease?

1. Yes 2.No **(If No, go to Q 2.10)**

2.9. If yes, please list **1** disease: _____

2.10. In your opinion, physical activity is beneficial for which type of disease **(**You may tick more than one)

1. Heart disease
2. Obesity
3. Chronic respiratory disease
4. Depression
5. Cancers
6. Diabetes

2.11. Are you aware of WHO recommendation regarding Physical activity?

1. Yes 2. No **(If No, go to Q 2.13)**

2.12. If yes, what is the WHO recommendation of amount of Physical activity for adults required for health benefits?

1. 10 minutes of walking everyday
2. 15 minutes of walking everyday or at least 3days a week
3. 30 minutes of brisk walking everyday or at least 5days a week
4. 60 minutes of brisk walking everyday or at least 5days a week

2.13. Do you think it is important to do exercise apart from your daily work related activities?

1. Very important
2. Somewhat important
3. Not important

2.14. Do you consciously make an effort to be physically active in addition to your routine household activities?

1. Always
2. sometimes
3. Never

2.15. Have you attended any classes / sessions on benefits of physical activity in medical college?

1. Yes 2. No

2.16. Have you ever received any formal training for physical activity counselling during your career?

1. Yes 2. No

## SECTION.3 -PRACTICE OF PHYSICAL ACTIVITY

[*Please don't tick on the code box* ☐ *right side of the page*]

| **Questions** | | **Response** | **Code** |
|---|---|---|---|
| ***JOB RELATED PHYSICAL ACTIVITY*** | | | |
| **Q.1** | Does your work involve vigorous-intensity activity for at least *10 minutes continuously*?<br><br>"vigorous-intensity activities" are activities that require hard physical effort and cause large increases in breathing or heart rate such as walking upstairs carrying some heavy weights. | (✓ tick one)<br><br>1. Yes ☐<br><br>2. No ☐<br><br>**-> If No, go to Q 4** | **P1** ☐ |
| **Q.2** | In a typical week, on how many days do you do vigorous-intensity activities as part of your work? | Number of days ------- | **P2** ☐ |

| | | | |
|---|---|---|---|
| **Q.3** | How much time do you spend doing vigorous-intensity activities at work on a typical day? | Hours **:** Minutes<br>--------- -------- | **P3** ☐ |
| **Q.4** | Does your work involve moderate-intensity activity for at least *10 minutes continuously*?<br><br>"moderate-intensity activities" are activities that require moderate physical effort and cause small increases in breathing or heart rate such as walking up stairs instead of taking an elevator. | (✓ tick one)<br>1. Yes ☐<br>2. No ☐<br>**-> If No, go to Q 7** | **P4** ☐ |
| **Q.5** | In a typical week, on how many days do you do moderate-intensity activities as part of your work? | Number of days ------- | **P5** ☐ |
| **Q.6** | How much time do you spend doing moderate-intensity activities at work on a typical day? | Hours **:** Minutes<br>--------- -------- | **P6** ☐ |
| ***TRANSPORT RELATED PHYSICAL ACTIVITY*** | | | |
| • About the usual way you travel to and from places for example from house to work, for shopping, to market, to place of worship | | | |
| **Q.7** | Do you walk or use a bicycle for at least ***10 minutes continuously*** to get to and from places? | (✓ tick one)<br>1. Yes ☐<br>2. No ☐<br>**-> If No, go to Q 10** | **P7** ☐ |
| **Q.8** | In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? | Number of days ------- | **P8** ☐ |
| **Q.9** | How much time do you spend walking or bicycling for travel on a typical day? | Hours **:** Minutes<br>--------- -------- | **P9** ☐ |
| ***RECREATION / SPORTS / LEISURE TIME PHYSICAL ACTIVITY*** | | | |
| • It includes sports and exercise but is not limited to participation competitions.<br>• Activities reported should be ***done regularly and not just occasionally***.<br>• It is important to focus on only recreational activities and ***not to include any activities already mentioned.*** | | | |

| | | | |
|---|---|---|---|
| **Q.10** | Do you do any vigorous-intensity sports, fitness or recreational activities that cause large increases in breathing or heart rate for at least *10 minutes continuously?*<br><br>For example, Jogging or running, fast bicycling, playing volleyball or football etc. | (✓ tick one)<br>1. Yes □<br>2. No □<br>**-> If No, go to Q 13** | **P10** |
| **Q.11** | In a typical week, on how many days do you do vigorous-intensity recreational activities? | Number of days ------- | **P11** |
| **Q.12** | How much time do you spend doing vigorous-intensity recreational activities on a typical day? | Hours **:** Minutes<br>--------- -------- | **P12** |
| **Q.13** | Do you do any moderate-intensity sports, fitness or recreational activities that cause a small increase in breathing or heart rate for at least *10 minutes continuously?*<br><br>For example, brisk walking ,gardening, house cleaning, vehicle cleaning, doing exercises while watching television, swimming, dancing, playing golf, badminton or doubles tennis etc. | (✓ tick one)<br>1. Yes □<br>2. No □<br>**-> If No, go to Q 16** | **P13** |
| **Q.14** | In a typical week, on how many days do you do moderate-intensity recreational activities? | Number of days ------- | **P14** |
| **Q.15** | How much time do you spend doing moderate-intensity recreational activities on a typical day? | Hours **:** Minutes<br>--------- -------- | **P15** |

***TIME SPENT IN SITTING***

- The following question is about sitting or reclining at work, at home, getting to and from places
- For example, time spent sitting at a desk, sitting with friends, travelling in car/bus/train, reading, talking over phone, resting, playing cards ,watching television, using a computer, doing hand craft like knitting etc. *but do not include time spent in sleeping*

| | | | |
|---|---|---|---|
| **Q.16** | How much time do you usually spend sitting or reclining on a typical day? | Hours **:** Minutes<br>--------- -------- | **P16** |

| | | | |
|---|---|---|---|
| | | | |

## SECTION 4: DETERMINANTS OF PHYSICAL ACTIVITY

### (4.A)ENVIRONMENTAL ATTRIBUTES

Below are few factors which could **influence** your exercise or being physically active. For each point tick whichever is appropriate for you.

| | | **1.Yes** | **2.No** |
|---|---|---|---|
| 1 | Are the facilities (such as parks, grounds, foot paths, gym or sports club) available near your house for exercise? | | |
| 2 | Do you use above mentioned facilities for exercise? | | |
| 3 | Do you consider your neighborhood safe to go for a walk in any time of the day? | | |
| 4 | Does your neighborhood traffic interfere with walking or cycling? | | |

### (4.B)Personal Attributes

Below are few factors which could prevent you from exercising or, being physically active. Tick whichever is most appropriate in your case (you may tick more than one)

| | | |
|---|---|---|
| 1. | Lack of motivation to exercise | |
| 2. | Lack of time | |
| 3. | Lack of energy / too tired | |
| 4. | Obtaining enough exercise at one's job / household work | |
| 5. | Care giving duties (child, elderly, sick care) | |
| 6. | Health problem (having an injury or disease /not being in good health) | |

### (4.C) FAMILY ATTRIBUTES

Below are few factors which could facilitate you to do regular exercise or, being physically active. Tick whichever is most appropriate in your case (you may tick more than one)

| | | |
|---|---|---|
| 1. | Self encouragement | |
| 2. | Encouragement by family members | |
| 3. | Friends, neighbors or colleagues support | |

### (4.D) Behavioral Attributes

4.1. Do you have any exercise equipment at home?

1. Yes 2. No

4.2. If yes, do you use it regularly?

1. Yes 2. No

4.3. Were you involved in outdoor games at school or college?

1. Yes 2. No

4.4. At home, how long do you watch Television in a day?

1. <1 hr
2. 1-2 hrs
3. >2hrs
4. Nil

4.5. At home, how long do you work on your computer in a day?

1. <1 hr
2. 1-2 hrs
3. >2hrs
4. Nil

4.6. Do you ensure that your regular diet conforms to the standards of a 'healthy diet'?

1. Yes 2. No

4.7**.** If yes, why? **(**You may tick more than one)

1. For prevention of any chronic disease
2. For prevention of complications of any existing disease
3. For personal fitness
4. Other(specify) _____

4.8. Did you use any form of tobacco in the last one month?

1. Yes 2. No

4.9. Did you use any alcoholic drinks in the last one month?

1. Yes 2. No

4.10. Are you a member of any social network such as health club, sports club which encourages physical activity?

1. Yes 2. No

## (SECTION.5) PHYSICAL ACTIVITY ADVICE PRACTICE

5.1. On an average, how many patients do you see per day in your OPD? -

_____

5.2. How much time (in minutes) do you spend per patient? _____

5.3. Do you think 'health promotion should be a part of routine consultation?

1. Always
2. If necessary

5.4. Do you 'always ask' your patients about their current physical activity level?

1. Yes 2. No

5.5. Do you 'always advice' your patients to undertake regular physical activity?

1. Yes 2. No

5.6. Do you give written prescription for exercise along with drugs?

1. Yes 2. No **(If No, go to Q 5.7)**

5.7. **If yes**, do you write the amount of physical activity which is beneficial for health?

1. Yes 2. No

5.8. **If No to Q 5.5**, why not?

1. No standard protocol for exercise prescription
2. No time to write
3. Written prescription only for drugs
4. Others specify_____

5.9. 'Written prescription for exercise is more effective than Verbal advice'. Choose your appropriate answer.

1. Yes 2. No

5.10. Do you think your own healthy life style can definitely influence your advice practice?

1. Yes 2. No

5.11. In your opinion, who should be entrusted to counsel the patient to undertake regular physical activity?

1. Doctors
2. Other health care professionals

## ANNEX 3: Patient Verbal Consent

I am Dr Lipika Patra, a student of Master of Public Health program at Sree Chitra Tirunal Institute conducting a survey regarding advice on physical activity to patients by the Doctors. I am looking at what sort of advice patients get regarding physical activity from their physicians. I would like you also to take part in this study. The study involves answering a few questions which will take less than 5 minutes. I assure you that your answers will be kept confidential and will not be disclosed to anyone including your Doctor. If you are willing to take part in the study, kindly express your consent for the same.

## ANNEX 4: Patient Exit Interview Questionnaire

Date of interview:

Type of Patient:

□ With cardiovascular disease
□ With diabetes
□ other disease

1. Did the Doctor ask always about your current physical activity level?
   a. Yes b. No
2. Did the Doctor advise always you verbally to do regular exercise?
   a. Yes b. No
3. Did the Doctor give written prescription for exercise in your follow up visits in past one year?
   a. Yes b. No

## ANNEX 5: Bivariate and multivariate analysis of 'Ask always' and 'Advice always'

**Table 1:** Ask Always: results of bivariate analysis

| **Ask always** | **Yes, n (%)** | **No, n (%)** | **Total, n (%)** |
|---|---|---|---|
| **Govt. sector** | | | |
| GP | 6(26.0) | 17(73.9) | 23(100.0)* |
| specialist | 15(45.5) | 18(54.5) | 33(100.0) |
| **Private sector** | | | |
| GP | 7(28.0) | 18(72.0) | 25(100.0)* |
| specialist | 36(55.4) | 29(44.6) | 65(100.0) |
| * p< 0.05 | | | |

**Table 2:** Correlates of Ask Always – results of multivariate logistic regression analysis

| **Variable** | **Adjusted OR** | **(95% CI)** | **p value** |
|---|---|---|---|
| Attended classes/sessions in medical college | | | 0.04 |
| No | Reference | | |
| Yes | 2.63 | 1.14 - 8.67 | |
| Own healthy life style can definitely influence advice practice | | | 0.002 |
| No | Reference | | |
| Yes | 3.88 | 1.83 - 8.96 | |
| Patients /day | | | |
| >30 | Reference | | 0.007 |
| ≤ 30 | 4.47 | 1.38 - 12.39 | |
| Time(min)/patient | | | |
| <10 | Reference | | 0.02 |
| ≥10 | 2.52 | 1.11 – 5.74 | |

Dependant variable: Ask always. Other independent variables included in the model and found to be not significant were sex, age, category of practice, working place, own level of PA and training received for PA counseling.
OR: Odds Ratio.CI: confidence interval.

**Table 3:** Advice Always: Results of bivariate analysis

| **Advice always** | | | |
|---|---|---|---|
| | **Yes, n (%)** | **No, n (%)** | **Total, n (%)** |
| **Govt. sector** | | | |
| GP | 12(52.2) | 11(47.8) | 23(100.0) |
| specialist | 14(42.4) | 19(57.6) | 33(100.0) |
| **Private sector** | | | |
| GP | 12(48.0) | 13(52.0) | 25(100.0) |
| specialist | 30(46.2) | 35(53.8) | 65(100.0) |

**Table 4:** Correlates of Advice always - results of multivariate logistic regression analysis

| **Variable** | **Adjusted OR** | **(95% CI)** | **p value** |
|---|---|---|---|
| **Own healthy life style can definitely influence the advice practice** | | | 0.02 |
| **No** | Reference | | |
| **Yes** | 2.87 | 1.38 – 7.46 | |
| **Patients /day** | | | |
| **>30** | Reference | | 0.03 |
| **≤ 30** | 3.08 | 1.32- 10.37 | |
| **Time(min)/patient** | | | 0.04 |
| **<10** | Reference | | |
| **≥10** | 2.43 | 1.05 – 5.62 | |

**Dependant variable: Advice always. Other independent variables included in the model and found to be not significant were sex, age, category of practice, working place, own level of PA, attended classes in medical college and training received for PA counseling. OR: Odds Ratio.CI: confidence interval.**