Prevalence of musculoskeletal disorders and its factors associated among recreational football enthusiasts in Trivandrum district, Kerala

Sreenath M R

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Master of Public Health

ACHUTHA MENON CENTRE FOR HEALTH SCIENCE STUDIES
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND
TECHNOLOGY, TRIVANDRUM

Thiruvananthapuram, Kerala. India–695011

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Sreenath M R

DECLARATION

I hereby declare that this dissertation titled “Prevalence of musculoskeletal disorders and its factors associated among recreational football enthusiasts in Trivandrum district, Kerala” is a bonafide record of my original research. It has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published and unpublished work of others has been duly acknowledged in the text.

Sreenath M R

(Emp code: 50170)

Achutha Menon Centre for Health Science Studies

Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum

Thiruvananthapuram, Kerala, India – 695011

June 2024

CERTIFICATE

Certified that the dissertation titled - “Prevalence of musculoskeletal disorders and its factors associated among recreational football enthusiasts in Trivandrum district, Kerala” is a record of the research work undertaken by Sreenath M R, in partial fulfilment of the requirements for the award of the degree of Master of Public Health under my guidance and supervision.

Guide: **Dr Srinivasan K**

Professor

Achutha Menon Centre for Health Science Studies

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum

Thiruvananthapuram, Kerala. India -695011

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LIST OF ABBREVIATIONS

AOR	Adjusted odds ratio
BMI	Body mass index
CI	Confidence Interval
COR	Crude odds ratio
CRS	Collegiate recreational sports
MCQ	Multiple choice question
MSD	Musculoskeletal disorders
MVPA	Moderate to vigorous intensity physical activity
NCD	Non communicable disease
OR	Odds ratio
PI	Principal Investigator
RCT	Rnadomized control trial
REF	Reference category
SDG	Sustainable Development Goal
UEFA	Union of European football association
WHO	World Health Organization

Abstract

Introduction: Playing recreational football helps to lower the chance of acquiring lifestyle diseases by effectively boosting musculoskeletal, metabolic, and cardiovascular adaptations that are essential to health. Musculoskeletal problems are continuously ranked among the leading causes of disability by the Global Burden of Disease Study. There are limited studies on musculoskeletal disorders among sports persons with a specific reference to recreational sports therefore it is important to study the subjects. Considering the recent changes in sports culture, study on recreational football players, which is a sizable population, particularly in urban areas is very important. In an effort to bridge this knowledge gap, objective of the study is to estimate the prevalence of musculoskeletal disorders and factors associated among recreational football enthusiasts of Trivandrum district, Kerala.

Methods: Cross sectional study conducted among 368 participants aged above 18 years playing in 36 football turfs in Trivandrum. Sampling strategy adopted was multi stage random sampling. Structured interview schedule on socio-demographic, sports related, and life style related variables along with measuring anthropometry was also done.

Results: Prevalence of MSD among recreational football enthusiasts was 62.5% (95%CI: 57.3% to 66.6%). The factors associated with MSD include, age, sex, play days in a week, total time spent on football during a week, alcohol consumption in 12 months and 30 days. In further analysis MSD were associated with sex (adj. OR: 4.377, 95% CI: 1.13 to 16.9), and play days in a week. (adj. OR: 1.72, 95% CI: 1.09 to 2.7).

Conclusion: Sports participation is critical for the prevention of non-communicable diseases, and it has also been linked to MSD among recreational players who lack awareness similar to that of professional players. While recommending physical activity for prevention of chronic disease, it is advisable to consider safe practices to minimize MSD among recreational sports enthusiasts.

Chapter 1

Introduction

1.1 Background

1.1.1 Musculoskeletal disorders

Musculoskeletal problems are continuously ranked among the leading causes of disability by the Global Burden of Disease Study, which offers an extensive yearly evaluation of health loss associated with certain diseases, accidents, and risk factors (*Selected Health Conditions and Likelihood of Improvement with Treatment*, 2020). Musculoskeletal disorders (MSD's) span a range of ailments affecting the soft tissues which is part of musculoskeletal system, together with tendons, ligaments, cartilage, muscles and nerves (Dennerlein, 2008). Several risk factors related to musculoskeletal injuries have been documented in literature. Age, gender, and anthropometrics are amongst the non-modifiable risk aspects that is been repeatedly linked with a higher prevalence of musculoskeletal injuries; however, age and gender appear to have sufficient data to be regarded as real risk factors (Lisman et al., 2017). Musculoskeletal disorders affect people at all stages of life, from early childhood. They range from acute, temporary disorders (fractures, sprains, and strains, accompanied by pain and functional restrictions) to chronic, life-threatening diseases (chronic primary low back pain, osteoarthritis, etc.) ("Musculoskeletal health," 2022). Knowledge of the causes, consequences, and treatments for musculoskeletal illnesses in general has been severely constrained as a result of a shortage of funding for research (*Selected Health Conditions and Likelihood of Improvement with Treatment*, 2020). A common indirect approach for assessing the MSD and the psychosocial and labour concerns connected with it is the Nordic questionnaire (López-Aragón et al., 2017). And self-reported pain numeric rating scale is also used while assessing pain ("Evaluation of

Pain - Neurologic Disorders," 2022). In this study one question regarding any experience of musculoskeletal disorders (joint pain, muscle strain, ligament injury and so on) in one year from the date of administering the questionnaire has been taken in to consideration for assessing MSD among participants. A time period should be specified by the examiner while assessing pain ("Evaluation of Pain - Neurologic Disorders," 2022) . Joints, bones, muscles, several bodily systems or locations, diseases associated with musculoskeletal symptoms, such as vasculitis and connective tissue disorders, and confined (e.g., neck and back pain) and widespread (e.g., fibromyalgia) pain conditions are all considered musculoskeletal disorder ("Musculoskeletal health," 2022).

1.1.2 Sports and Health

Sport and health go hand in hand, providing people with the chance to live happier, healthier, and more productive lives anywhere in the globe, regardless of age or ability("WHO Sport for Health Programme," 2024). As Sedentary lifestyle is a threat to physical health, WHO suggests all countries to develop and implement appropriate national and subnational policies and programmes to enable people of all ages and capacities to be physically active (Bull et al., 2020). Engaging in sports activities can foster physical and mental development in children and young individuals, offering Valuable health benefits when exercise and training programmes are tailored to accommodate individual capabilities, social context, and the stages of biological and psychological malnutrition. The challenge of non-compliance with exercise is a substantial barrier to reaching health objectives and meeting overall physical activity guidelines between adults and the elderly (Malm et al., 2019). Extensive evidence support that the organized and consistent application of sports can play a important role in promoting public health (Beutler, 2008). The utilisation of sports as an engaging and adaptable platform for health education and empowerment also aligns with the achievement of Sustainable Development Goals(SDG's) 3.3, 3.5, 3.7 targets, which encompasses efforts related to

communicable diseases, substance abuse, and sexual and reproductive health (Lindsey and Chapman, 2017). The WHO suggest to restrict the quantity of time spent inactive. Taking up any amount of idle time and substituting it with 75–150 minutes a week of equal moderate- and vigorous-intensity exercise ("Physical activity," 2024). Moderate to vigorous intensity physical activity (MVPA) is commonly recommended for health benefits (Tremblay et al., 2011).

1.1.3 Recreational sports

Recreational sports are a major part of free time and have a substantial effect on human psychology and health. Studies conducted in some countries also showed that urban residents primarily engage in moderate- to high-intensity recreational sports, whereas rural populations typically engage in low-intensity activities related to household and agriculture (Chen et al., 2017). Engaging in physical activity can boost one's mood and well-being. Physical recreation is typically more planned and organized, but it also has a more limited organizational structure. While some very competitive and structured sports are played for relaxation the biggest reason to participate is to stay healthy ("physical recreation," 2024).As per the study in the National Association of Student Personnel Administrators (NASPA) Assessment and Knowledge Consortium among the surveyed students, around 75% expressed agreement, to varying degrees that engaging in collegiate recreational sports activities had sparked their interest in maintaining fitness and wellbeing. Additionally, over 90% of the students disclosed that they had definitely experienced improvements in the overall sense of wellbeing, health and fitness level through their engagement with CRS activities and facilities (Forrester, 2015). In a study led among university students It is found that the students engage in sports recreation for health-related achievement (Durhan et al., 2024). At present older people are carrying out things that used to be carried out by younger people. Injuries from recreational motor vehicle use, cycling, and skiing are more common in the elderly population (Joyal et al., 2024).

1.2 Literature Review

1.2.1 Musculoskeletal disorders in sports

Sportspersons commonly experience musculoskeletal injuries such as fractures, dislocations, sprains, strains, tendinitis, bursitis, and more. The lion share of sports-related injuries include more or one of the musculoskeletal issues categories mentioned before (Branch, 2017). A cross-sectional study of undergraduate medical students found a correlation between students' participation in sports and sports-related injuries to the knee. 35.5% of people reported having musculoskeletal problems at some stage in their daily lives (Jad et al., 2023). Ignorance of sports injuries and failure to seek medical attention can result in needless, extra morbidity and expenses. Reducing the number of untreated sports related injuries may be possible with education aimed at these groups, their doctors, and legislators (Gutierrez et al., 2006). For some persons, an injury is a quitting. It's OK to take a "time out" from a sport until you truly wish to stop playing. It's essential to determine, though, if that individual is truly prepared to give up on the sport or whether they are fearful or hesitant to make the necessary sacrifices to make a comeback (Robbins, 2012). Nearly one-fifth of medical students who partaken in a study reported having had a musculoskeletal injury as a consequence of their sports activities. The risk components linked to these injuries were male gender, team sports involvement, noncontact sports participation, and inadequate practice or preparation (Champawat et al., 2024). A study conducted in Denmark indicate that sports injuries are common, as 18.4% of adults and 19.3% of children indicated they suffered one or more injuries in the previous 12 months, which amounts to lost time from physical activity and/or visits to the hospital (Bueno et al., 2018). Healthcare professionals who treat athletes face major challenges in secondary and tertiary prevention of sport-related injuries, which is the reduction of reinjury and its consequences to allow an effective sport participation, even though primary prevention primarily involves coaches and trainers (Edouard and Ford, 2020).

1.2.2 Recreational football

Football programs that are mainly focused on the growth and enjoyment of players, rather than on travel or intense competition, are known as recreational football programs. Recreational football is meant to give players a chance to have fun, learn the game, and develop life skills, including a long-lasting passion for it ("What is Recreational Soccer," 2024). Playing recreational football appears to lower the chance of acquiring lifestyle diseases by effectively boosting musculoskeletal, metabolic, and cardiovascular adaptations that are essential to health(Krustrup et al., 2010). Recreational football presents itself as a viable exercise option for untrained middle-aged and older adults, regardless of their health status and gender. It offers an opportunity to lead an active lifestyle and counteract various physical and biological changes associated with aging (Luo et al., 2018). Although the further advantage is minimal, recreational football is preferable to long-term endurance exercising. This type of exercise is excellent for improving aerobic fitness, treating and preventing non-communicable diseases, and addressing motivation problems, which are a major cause of physical inactivity (Milanović et al., 2015). The study among non-professional football players found that non-professional were more likely to sustain injuries due to their flawed fundamental movement pattern (Hameed et al., 2023). Football players who play recreationally are those who do not have the luxury of constant training. Additionally, compared to professional football players, recreational players condition level and technical knowledge are lower when it comes to match preparation. The most crucial step in the dynamic process for injury prevention interventions is analysing and comprehending injuries because of their complexity (Tekyol et al., 2022).

1.2.3 Football Global scenario

In several parts of the world, football is referred to be "the world's game," and its appeal has not appeared to be declining, encouraged by the growing diversity of engagement at grassroots levels (Zhang and Pitts, 2018). Almost everywhere, in Europe, South America, North America, Africa, the Middle East, Central America, and Asia, football is the utmost popular sport. There are 250 million players spread throughout 200 nations globally, and the sport has about 3.5 billion spectators worldwide (“Most Popular Sport by Country 2024,” 2024) . This athletic game consists of two forty-five-minute periods, separated by a fifteen-minute break at halftime. This sport is said to be amongst the most popular and often performed, with 211 countries participating at least in some form (Hameed et al., 2023). More than 40% of adults in major global population centres more than any additional sport consider themselves to be interested in or extremely interested in enjoying football (“Fan Favorite,” 2023). Football research should benefit referees, coaches, spectators, and players alike. This kind of brief is quite wide and lends itself to multidisciplinary methods (Bangsbo, 1999). To make sure that future methods for hazard management are supported by evidence and to improve the safety of football for persons who are more vulnerable, further research has to be done (Gilbert et al., 2022).

1.2.4 Football Indian scenario

India's first major international competition was the 1948 London Olympics, where a team that predominantly consisted up of barefoot Indians fell 2-1 to France and eliminated in the first round. However, everyone was fascinated with the game the team was playing, including King George VI (“History,” 2024). The All India Football Federation's grassroots development programs aim to promote football at the grassroots level and improve health outcomes mainly in children (“Grassroots,” 2024).

1.2.5 Artificial Turf

More than 50 years ago witnessed the first use of artificial turf into sports, but it has only gained attention recently as a significant component of athletics for player health and performance. The rise in popularity of artificial turfs demonstrates its use in National Football League (NFL) stadiums to elementary school playgrounds across USA (Jastifer et al., 2019). Worldwide, artificial turfs are available for use in playgrounds, soccer, football, and rugby fields, as well as in backyard gardens and recreational buildings. Their successful growth is aided by reduced expenses, increased sustainability in terms of material recycling, water conservation, and additional benefits pertaining to sports training and competition (Sánchez-Sánchez et al., 2018). Due to bad weather, a match between Russia and England took place in Moscow's Luzhniki Stadium in 2007, among the first to be held on artificial turf. The 2008 UEFA Champions League final match was also scheduled to take place in Moscow; however, UEFA eventually decided that games could only be played on artificial turf in the event that bad weather stopped play ("Players will face problems on artificial turf: Bhutia | Football News - Times of India," 2009). The prevalence of noncontact injuries in a variety of sports, which frequently include some level of athlete-playing contact with the surface, indicates the critical role that playing surfaces has influence in player health and safety(Jastifer et al., 2019)

1.2.6 Football Kerala scenario

Latest sporting trend in Kerala is artificial turfs, with facilities popping up even in remote areas, turf football, a game played on artificial fields composed of synthetic fibre that resembles natural grass is becoming a highly sought-after form of physical activity for the typical football lovers in this area. But before players hit the ground, health professionals advise some caution since while numerous others have had severe leg injuries (Jayanth, 2019). From temporary pitches on riverbeds to harvested paddy fields, Kerala's football passion has significantly

expanded into new areas. There are now artificial turf fields everywhere mostly in northern Kerala where football players can be found sweating it out under the floodlights night after night (“In football-crazy Kerala, the night gamechanger,” 2020). There are about 500 artificial turfs in the state; 150 of them are in the Kozhikode district. These are maintained and built by individuals from the area, who are primarily Gulf returnees. The Childline sounds the alarms about lifelong injuries as well as falling victim to drug and sex abuse due to boys' growing interest to play football late into the night on football fields in the State (“Lure of late-night football on turf triggers alarm,” 2021). Numerous children come to these hourly charging centres at night, when their schedules are packed with football games and other events. Though, it is concerning that these playgrounds do not adhere to the safety regulations, which makes them unsuitable for games of five or seven a side. A few players have expressed their disappointment with these places' substandard bathrooms (R, 2020).

1.2.7 Prevalence of MSD in sports

The prevalence of musculoskeletal injuries in professional athletes is estimated to be in the range of 10% to 42.8%, in spite of the fact that the number of players varies and the epidemiology varies among sports (Jacobsson et al., 2012). Posttraumatic musculoskeletal abnormalities were most common among contact sport players, intermediate among runners, and least common among noncontact sport participants. Seventy participants (70.8%) have experienced sports-related musculoskeletal problems in the past (Raskin and Rebecca, 1983). Sports-related activities account for the majority of muscle injuries (10 to 55% of all injuries). The most often impacted muscles are the gastrocnemius, quadriceps, and hamstrings (Barroso and Thiele, 2011). The incidence of injuries ranged from 9.5 to 48.7 injuries/1000 hours in a study of competitive male youth football players, with the majority of injuries occurring during the sport (Owoeye et al., 2020). Football, handball, and volleyball are among the sports with the highest total musculoskeletal injuries. Sports like cycling and

running, on the other hand, often show reduced injury rates, with an emphasis on overuse injuries. Sports injuries are caused by a number of variables, such as player age, gender, skill level, training volume, equipment use, playing surface, and regulation changes (Gurau et al., 2023).

1.2.8 Factors associated with MSD

1.2.8.1 Socio demographic factors

According to a study among novice runners, being older has been linked with an increased likelihood of injury. Individuals over age 45 years are probably more prone compared to younger people to have injuries to their lower extremities (Nielsen et al., 2013). Male football players who are professional are at a significant risk of injury, particularly during games. In football, the pooled incidence rates of match injuries are around 36 injuries per exposure hours of 1000 in males (López-Valenciano et al., 2020). In a meta-regression study, variables such as the kind of sport, injury definition, age range, competition (tournament vs. season), and methodological quality score were thought to be possible moderators of sex differences in injury rates (Carter et al., 2018). In a cross-sectional study including middle school students in China, founded that there were differences between the incidence of injuries related to physical activity in boys and girls, also differences in the risk variables that influenced them (Tang et al., 2019). The body of human is adversely affected by sedentary lifestyle in many ways, including musculoskeletal conditions like osteoporosis and arthralgia. Encouraging public health necessitates both reducing sedentary behaviour and boosting physical exercise (Park et al., 2020). According to a study, persons with osteoarthritis of the knee who would spend most of their time sitting down should find it fair to begin with at least 10 minutes of consistent moderate/vigorous physical activity or exercise once a week (Master et al., 2021). A study conducted in an urban context on musculoskeletal diseases in high-risk occupational workers

discovered that these conditions are frequent and have a significant bearing on these individuals (Ovais et al., 2022). Based to a Kuala Lumpur study, people from low-income households are more prone to suffer from musculoskeletal diseases and have trouble accessing healthcare (Saat et al., 2022).

1.2.8.2 Anthropometric factors

BMI was shown to be associated significantly with musculoskeletal symptoms in the low back, knees, ankles, and feet in research involving MSD within the weaving community (Nag et al., 2010). Increased body mass index (BMI) has been related to a higher risk of injuries in young football players and adult females (lower back and lower extremities (Venturelli et al., 2011).

1.2.8.3 Sports related factors

In a meta-analysis of RCT, the intervention group continued significantly less injuries while wearing modified shoes and external joint support in comparison to the control group (Leppänen et al., 2014). Both competitive and recreation players frequently adopt warm-up and stretching methods to enhance physical performance and reduce the risk of sports-related injuries (Shellock and Prentice, 1985). A warm-up injury prevention program was found to significantly lower the risk of injury in a cluster-randomised controlled study involving soccer players in Rwanda. Furthermore, the injuries received were less serious (Nuhu et al., 2021). According to a study involving young ice hockey players, using protective equipment has decreased the chance of injury. Players with protective gear reports had a 28% reduced risk of concussions (Kolstad et al., 2023). Additional eccentric hamstring exercise reduced the rate of total, new, and recurring acute hamstring injuries in male soccer players, both amateur and professional. Eccentric strength training also significantly decreased the risk of hamstring injuries (Petersen et al., 2011). Football accounted for 38.1% of all serious injuries in a study of high school athletes in the United States, the highest percentage of any sport. Football was

followed by wrestling, basketball, and girls' soccer (Darrow et al., 2009). Excessive involvement in sports can lead to exhaustion from overscheduling as well as repetitive motion injuries from extensive training sessions. Training hours ought to be reduced at this time (D'Hemecourt, 2009).

1.2.8.4 Lifestyle factors

In a research which was conducted among young people, tobacco, alcohol, and cannabis use were shown to be prevalent, and they may have varied relationships with psychiatric symptoms classified as internalizing or externalizing (Bierhoff et al., 2019). Adolescents experiencing musculoskeletal discomfort should have their lifestyle behaviours assessed according to a study, and an accumulation of several harmful lifestyle behaviours ought to be considered for future health care and secondary preventive initiatives (Smedbråten et al., 2022). A study conducted among 22 professional football players in the top German football league found that lower quality of sleep ratings were associated with an increased risk of injury in the future (Laux et al., 2015).

1.2.9 Rationale

Only few studies exist on the prevalence of musculoskeletal issues in recreation sports, based on the literatures mentioned above. Many of the studies that are currently available were conducted among professional sportspersons who engaged in a variety of sports, including football, rugby, swimming, basketball, athletics, and so on. Studies on musculoskeletal conditions in recreational football are not available. The prevalence of musculoskeletal disorders and the factors that are associated with them in the Indian setting are a few. Studies on the recreational football players in the Trivandrum district have not been conducted.

Considering the recent changes in sports culture, study on recreational football players, which is a sizable population, particularly in urban areas is extremely scarce.

Proposed study is an effort to address the gap by estimating the prevalence of musculoskeletal disorders and factors associated with the same among recreational football enthusiasts of Trivandrum district.

1.2.10 Objectives and Research question

Primary objective

- To estimate the prevalence of musculoskeletal disorders in last one year, among recreational Football enthusiasts of the age more than 18 years within Trivandrum district, Kerala
- To study the associated factors with Musculoskeletal disorders among recreational football enthusiasts in Trivandrum.

Secondary objective

- To analyze the treatment seeking behavior and cost among participants who have MSD.

The study seeks to answer the following research questions:

What is the prevalence of MSD among recreational football enthusiasts of Trivandrum district and what are the factors associated with MSD among the recreational football enthusiasts of Trivandrum district?

Chapter 2

Methodology

2.1 Study design

The study is a quantitative cross-sectional survey

2.2 Study setting

The survey was conducted in 36 selected artificial turfs in Trivandrum Districts of Kerala. The capital city of the state of Kerala is Trivandrum. It is situated on the western coast of India. has 3307284 population as per the 2011 census, and an area of 2192 square kilometres. In the 2011 census, it came in second place in Kerala in terms of population, following the Malappuram district. The district has a population density of 1509 people per square kilometre. Administrative divisions for the district are separated between rural and urban areas. There are four subdivisions in the urban area and five in the rural one. Cantonment, Fort, Shanghumugham, and Cyber City are the subdivisions that fall within the purview of the urban administrative division. The following subdivisions are under the rural administrative division's purview, Varkala, Attingal, Nedumangadu, Kattakada, and Neyyattinkara.

2.3 Study population

Participants were the recreational football enthusiasts from the selected playgrounds (Turf) of Trivandrum. The age group was above 18 years.

2.3.1 Inclusion Criteria

Recreational football players who engage in the sport for nonprofessional purpose, of the age above 18 years of Trivandrum District.

Recreational football players who engage in playing for at least one year.

2.3.2 Exclusion Criteria

Professional football players.

2.4 Time Frame

The data was collected between January 12, 2024, and March 7, 2024.

2.5 Sample size estimation

With reference to (Malam Moussa Ahmet et al., 2023) , (Romero-Morales et al., 2023) studies the prevalence rate of musculoskeletal disorders was assumed at 40% for sample size estimation. Thus, with prevalence of 40 percent, confidence interval of 95 percent and precision or margin of error as 5 percent, the sample size required was estimated to be 368.

2.6 Sample selection procedures

The study method consisted of collecting data from recreational football players of age more than 18 years from the selected turfs. The availability of participants for the study was uniform across the turfs. Sample selection was planned as **Multi stage random sampling** since the selection of participants was random across different stages.

The sampling includes participants and respondents of both sexes.

For identifying turfs used play spot application, 108 football turfs were registered in the application on 13-10-2023.

Using Calculator.net, 36 turfs were chosen at random from a list of 108 football turfs.

2.7 List of selected football turfs

Table 3.1

Sl no	Football Turf
1	Up strike Arena
2	Anfield
3	Camp Nou
4	Diago
5	Nirmo
6	Sparta Arena
7	Pro 6 club
8	Camp6
9	Club D
10	Kalikkalam
11	N&M
12	Stones and Feathers
13	Sportive
14	Sportigo
15	TFC Arena
16	MOT Playaza
17	Decathlon
18	Sydney sports hub
19	Ksbc arcadium
20	JP sportshub
21	Dribble
22	One 4 all sports
23	Field sports hub
24	Godha
25	Slide n Tackle
26	Pascat 6
27	Friday FC arena
28	Sports bay
29	Infinity pro sporting
30	Sports fit sports bay
31	Maracana
32	7/10 arena
33	FIFA world link turf
34	Ozone turf
35	Sphinx sports hub
36	Boot camp

2.8 Geographical mapping

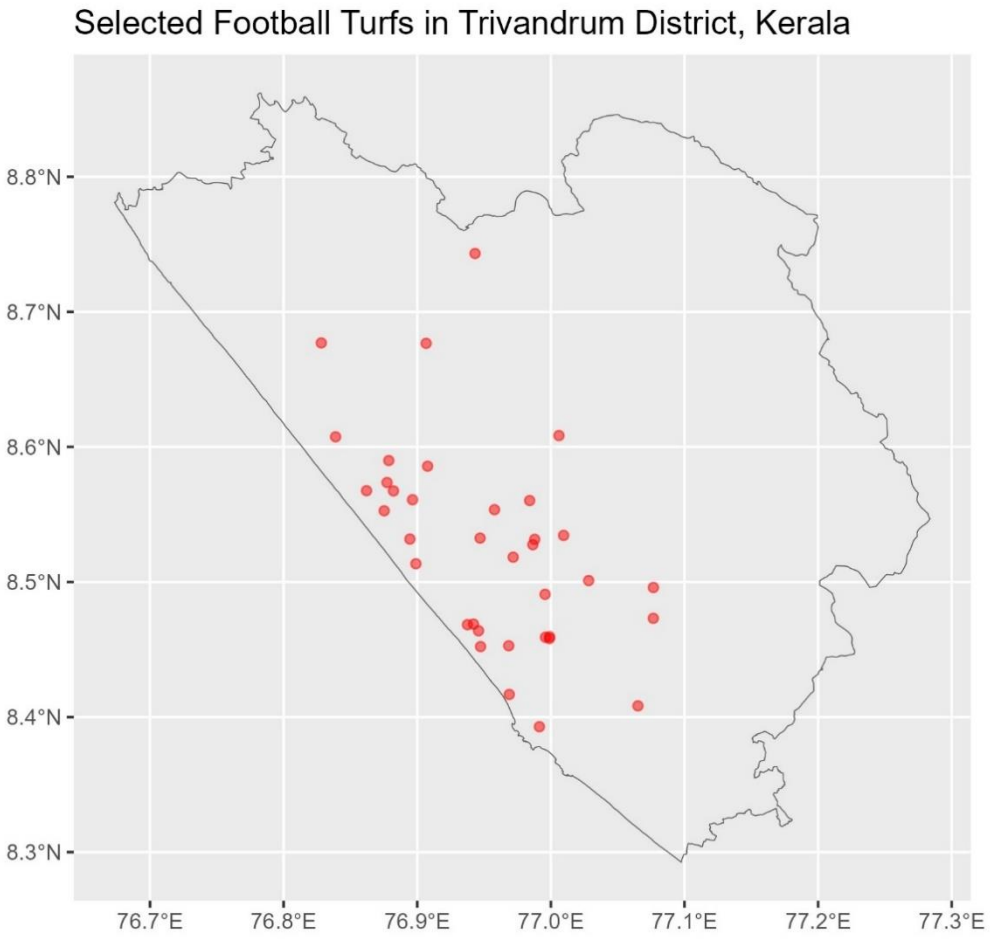

Figure 2.1 Geographical mapping of turfs

2.9 Sampling procedures

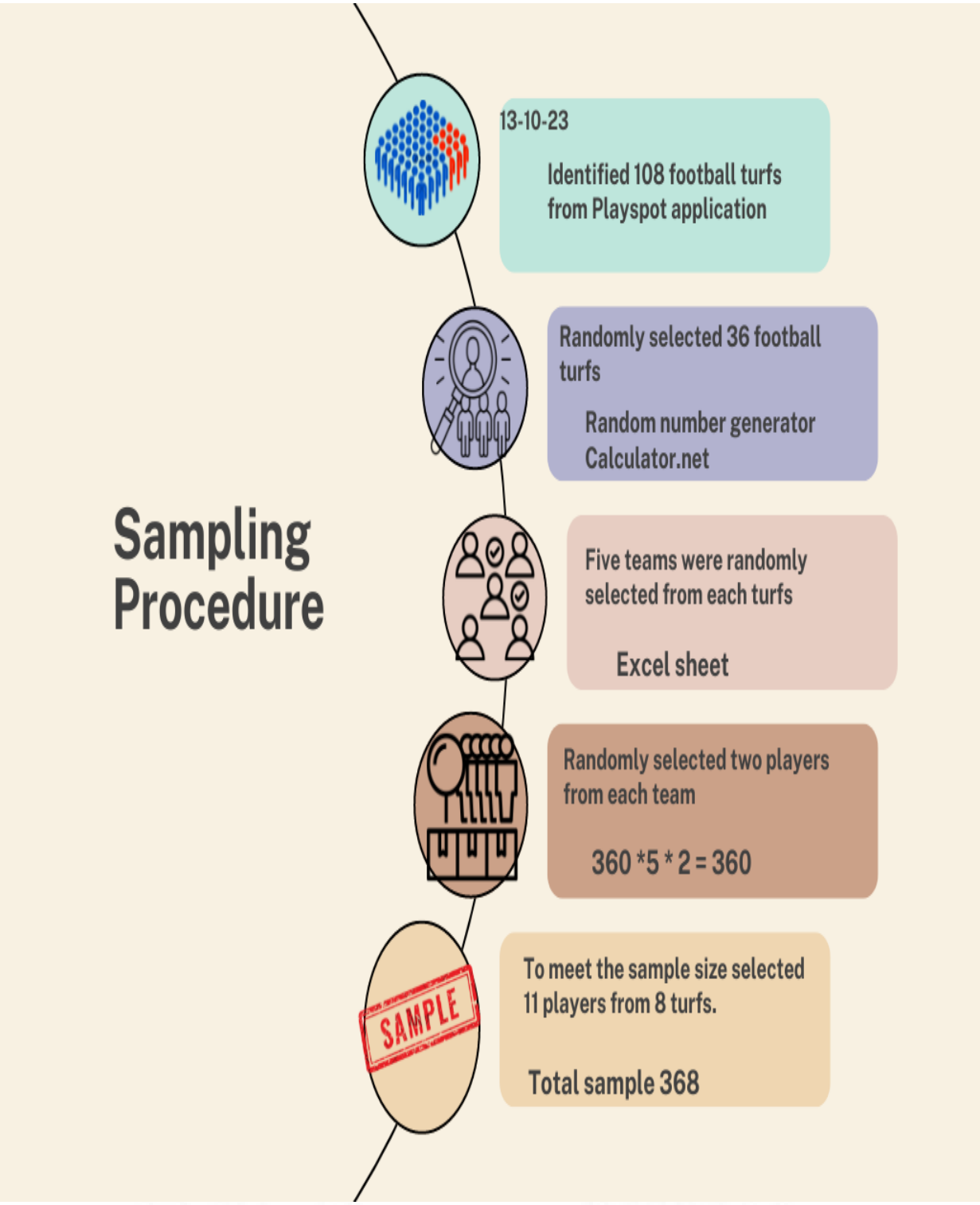

Figure 2.2 Sampling

2.10 Data collection

The study is done in such a way that from recreational football players above age of 18 in the selected turfs the information was collected through an interview schedule. The participants from all sex has been involved in the study after having the informed consent. The informed consent collected after giving the participant information sheet regarding the research topic and clarifying the doubts if any. The participant information sheet have been read out and explained by the principal investigator on instance in which participant was not able to read. The interview was done one to one basis until sample saturation is arrived.

The interview schedule is having four major themes.

- Socio demographic information and Personal details
- Sports related factors
- Life style factors
- Anthropometric measurements

The themes for the data collection were selected aimed at collecting information on the ground realities regarding the knowledge, attitude, practices, barriers etc of the recreational football players who were the potential samples. It was expected that the information's gathered from this critical samples at the grassroot level shall help to pave the long-term strategies of management and knowledge of musculoskeletal disorders. The schedule for the interview was translated into Malayalam language and then either schedule was utilized to collect data. 368 recreational football players were administered with the questionnaire.

2.11 Variables in the interview schedule

Outcome variables

Experienced any musculoskeletal disorders in last one year

"Any MSD experienced in one year" was a dichotomous variable; subjects reported ” Yes” and "No". If “Yes” it is considered to estimate the prevalence.

Independent variables

Socio-demographic characteristics: age, education, sex, occupation, family type, family annual income.

Sports related characteristics: Sports participation frequency, Vigorous & moderate intensity physical activity, period of playing football, fluid drinking pattern, football position, warm up, supplement usage, football play days in a week, football play timing in a day, multiple sports participation status, protective gear usage**,** strength training/ physical conditioning status

Life style characteristics: Alcohole and smoking status, Sleep hours

Anthropometric characteristics: Height, weight, BMI

2.11.1 Other questions administered

Standard Nordic Questionnaire, Pain numeric rating scale, Immediate aid received, frequency of MSD experienced, treatment seeking behaviour, cost of treatment, recovery.

2.12 Operational definitions used in the study

Musculoskeletal Disorders Musculoskeletal disorders (MSD's) span a range of ailments affecting the soft tissues of the musculoskeletal system, including ligaments, tendons, cartilage, muscles and nerves. (Dennerlein, 2008)

2.13 Data Storage

The permission forms were among the data that the researcher safeguarded. It was the researcher's duty to protect the secrecy and security of the data. In compliance with legal standards, all completed interview schedules, consent forms, and notes would be securely stored for a period of five years beyond the day the thesis was accepted.

2.14 Analysis of data

The information was collected using printed questionnaire as well as with ODK platform. The data was kept and stored. It could only be accessed via the researcher's password-protected account. A Microsoft Excel export of the data was made. The data's soft copy is safely stored with the researcher and encrypted.

2.15 Statistical Data Analysis

Using frequencies, the descriptive statistics were generated. The variables were explained at the descriptive level using percentages and numbers. There was cross tabulation and bivariate logistic regression. Multivariate analysis using binary logistic regression

was used to identify independent factors associated with MSD. The data were analysed using IBM SPSS Statistics for Windows version 25.

2.16 Ethical Considerations

After the review of the study, the Institutional Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology's approved its conduct (SCT/IEC/2180/DECEMBER/2023). Prior to the interview schedule was distributed, signed informed permission was given by each study participant. At the start of the study or at any point, the participants were given the option to refuse participation. The informed consent was gathered only after giving the participant information sheet to the participant in local language and clarifying doubts if any regarding the study.

2.17 Risks to the participants

There were no risks involved in participating in the interviews regarding prevalence of MSD in recreational football players except the loss of time. This was no more than what the subjects would encounter by way of routine everyday life experiences. The interview schedule was refined by including only the essential variables to reduce the time taken for participation.

2.18 Privacy and confidentiality

The address of the participant was not enquired. The consent form was separately filed and not linked to the questionnaire. Interview schedules were only identified by serial number.

2.19 Benefits

There will be no immediate direct benefit to the participants, but their participation has helped to inform stakeholders about the current situation of knowledge, practice, and the prevalence of football injuries. This will in turn pave the way for future research to find a solution to

improve the safety and knowledge about football sports injuries. In long-term the study will give a basic idea of musculoskeletal disorders in football and the stakeholders can take corrective measure and decrease the risk of injuries as the necessity for sports is essential in for a healthy society.

2.20 Project Gantt chart

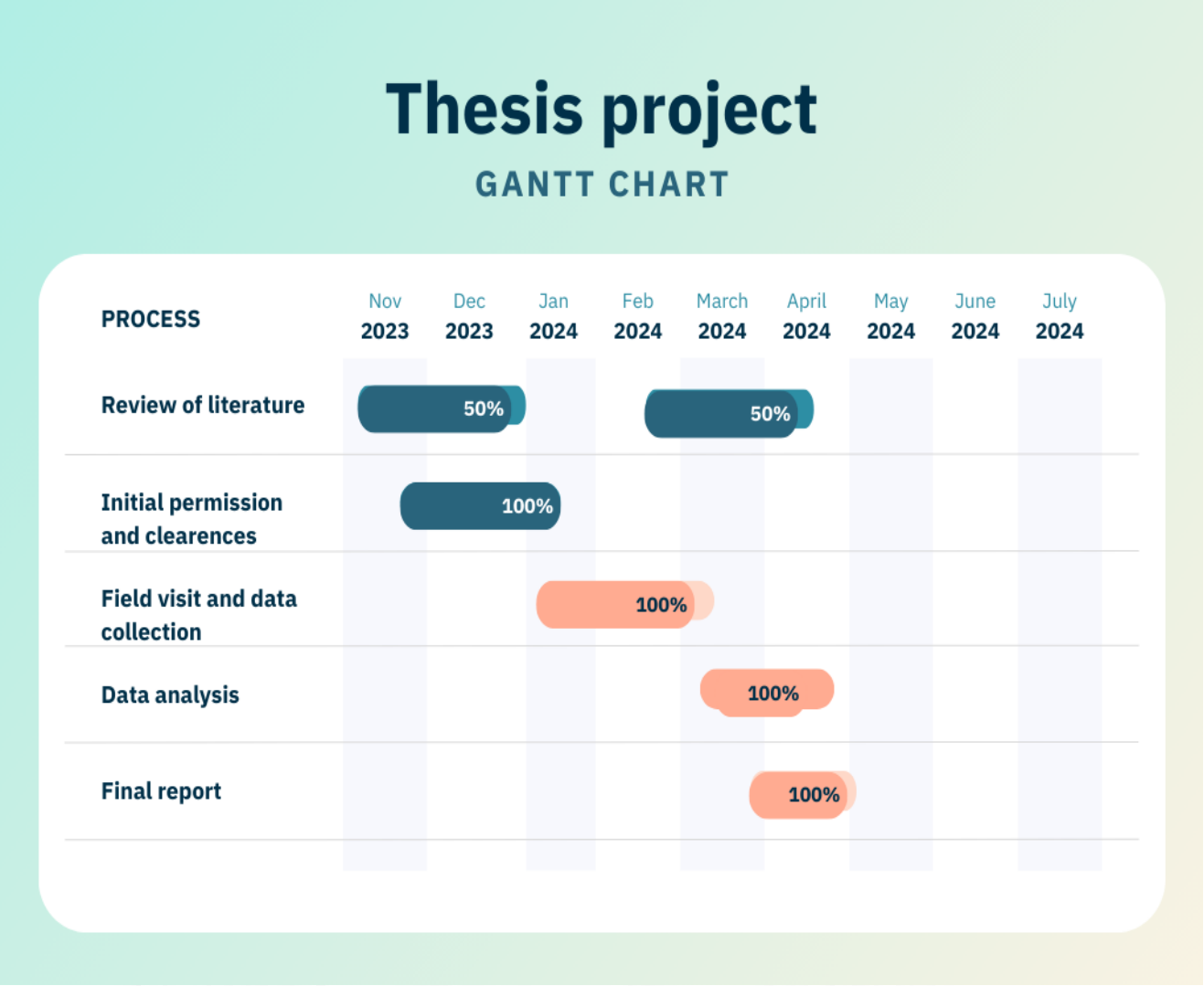

Figure 2.3 Gantt chart of thesis

Chapter 3
RESULTS

The study participants were selected randomly from the randomly selected 36 football turfs of Trivandrum district, Kerala. Over all, information was collected from 368 recreational football players out of which 12 participants were females, 358 were males. Tables 4.1 describes the social, demographic details of study participants

Table 3.1 Socio demographic factors

Socio demographic variable N = 368			
Sex		**N**	**%**
	Male	356	96.7
	Female	12	3.3
Education			
	PG & Above	74	20.1
	Graduation	202	54.9
	Others	92	25
Family type			
	Joint family	67	18.2
	Nuclear family	301	81.8
Occupation status			
	Professional	144	39.1
	Semi Professional	19	5.2
	Clerical/Shop/Farmer	11	3
	Skilled worker	40	10.9
	Semi-skilled worker	2	0.5
	Unskilled worker	5	1.4
	Unemployed	147	39.9
Family Income			
	Less than 5 lakh PA	192	52.2
	Between 5-8 lakh PA	113	30.7
	More than 8 lakh PA	63	17.1

3.1 Social and demographic details of study participants

The participants were selected from the age above 18 years. The average age of study participants was 27 years, and most of them were males (96.7%). Figure 4.1 shows the box and whisker plot of age variable. On considering educational status, Graduates were more than half of the participants (54.9%) and Among the participants majority lives in nuclear families (81.8%). The study participants include Unemployed participants (39.9%) and employed participants (60.1%). Among employed participants majority participants are professionals. When we look at the physical exertion of job among professional participants majority have sedentary type of job (47.5%). Among the participants who have physically demanding work the majority was among skilled workers (50.8%). Table 4.2 shows the physical exertion in job.

Out of the 368 participants majority of the participants have family income per year below five lakhs. When we analysed family income in relation to sports participation, more than half of the individual who engage in sports regularly comes under the less than five lakh income categories.

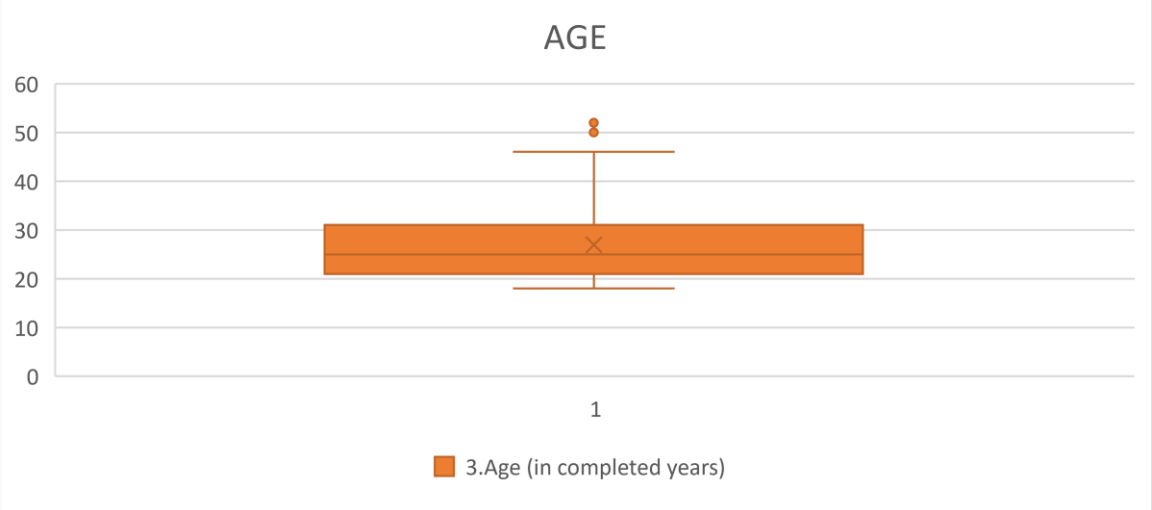

Figure 3.1 Age range of participants in the study with mean and outliers

3.1.1 Degree Physical exertion during job

The Physical exertion among the employed participants (N = 221) is given below. Majority of participants have sedentary job (47.5%) and the rest have moderately active jobs and physically demanding jobs.

Table 3.1.1 Physical exertion among the employed participants

Physical exertion	Frequency	Percentage	Cumulative
Physically demanding job	61	27.6	27.6
Moderately active job	55	24.8	52.4
Sedentary job	105	47.5	100
Total	221		

3.2 Sports related variables

The analysis of sports-related variables reveals several key insights into the behaviors and preferences of football participants

Table 3.2 Sports related factors

Sports related variables N=368		
Participation in multiple sports	**N**	**%**
Yes	253	69
No	115	31
How long are the participants playing football		
1 – 5 years	84	23
6 – 10 years	83	23
>10 years	201	55
Favourite/Strong football position		
Goal Keeper	23	6.3
Forward	106	29
Defender	113	31
Midfield & others	126	34
Protective gear usage while playing		
YES	335	91
NO	33	9

Warm up/stretch		
YES	308	84
NO	60	16
Physical conditioning/ strength training status		
Never	128	35
Occasionally	72	20
Rarely	44	12
Regularly	124	34
Usually plays football in		
Artificial turf	203	55
Open ground	16	4.3
Both	149	41
Fluid drinking while playing		
Yes	204	56
No	164	45

A significant majority of participants (68.8%) engage in multiple sports. Major multiple sports are given in the Table 4.3.1. The distribution of participants' football playing experience is reasonably even for those in the 1–5 and 6–10-year groups. However, 54.6% have been playing football for more than a decade. The distribution of favourite or strong positions among football players shows a relatively balanced preference, with midfield and others (34.2%) somewhat preferred over defence (30.7%), forward (28.8%), and goalkeeper (6.3%). A large percentage of participants (91%) said they wear protective gear when playing. A significant percentage of participants (83.7%) warm up and stretch before an activity. Significant number recognizing the importance of physical conditioning/strength training while a comparable group does not engage in it regularly. A lesser percentage of participants—occasionally (19.6%) or rarely (12%)—engage in physical conditioning or strength training, with the majority falling between never (34.8%) and regularly (33.7%). Most players (55.2%) often play football on artificial grounds, a small fraction (4.3%) of participants play on open ground, a significant portion (40.5%) of participants plays football in both artificial turf and open ground. Over half of the

participants (55.5%) reported drinking fluids while playing football, a considerable number (44.5%) do not drink fluids while playing.

Table 3.2.1 Major sports other than football

Major sports	Frequency	Percentage
Cricket	165	65.2
Badminton	93	36.7
Volleyball	36	14.22

The most popular sports among participants outside football are cricket (65.2%) and badminton (36.7%), with volleyball (14.22%) being less popular.

3.3 Lifestyle variables

This study provides insights into the lifestyle choices of the participants, particularly regarding smoking and alcohol consumption.

Table 3.3 Alcohol and Smoking factors

Alcohol and Smoking habit N = 368			
Currently Smoke		**N**	**%**
	Yes	84	22.8
	No	284	77.2
Ever Smoking			
	Yes	109	26.6
	No	259	70.4
Alcohol consumption (12 months)			
	Yes	180	48.9
	No	188	51.1
Alcohol consumption (30 days)			
	Yes	144	39.1
	No	224	60.9

3.3.1 Ever smoking and currently smoke

From the Participants 22.8% currently smoke and 77.2% did not currently smoke. Individual who had ever smoked was 26.6% and 70.4% whom reported they did not smoked ever.

3.3.2 Alcohol consumption in past 12 month

Alcohol History: Among individuals 48.9% reported consumed alcohol within the previous 12 months. This suggests that even when a significant number of participants drink alcohol. Did Not Drink: Among participants 51.1% reported not consuming any alcohol within the previous 12 months.

3.3.3 Alcohol consumption in the past one month

Recent Alcohol Consumption: Only 39.1% of respondents said they had consumed alcohol in the previous 30 days. No Recent Alcohol Consumption: The majority 60.9% informed abstaining from alcohol use in the previous 30 days.

3.4 Numerical variables of the study

Table 3.4 Description of numerical variables in the study.

Numeric variable	N	Mean	Median	Std Deviation	Min	Max
Age	368	26.98	25	7.573	18	53
Weight	368	70.56	71	12.15	39	107
Height	368	170.84	171.15	6.96	153	189
BMI	368	24.12	24	3.79	16	39
Sleep	368	6.86	7	1.174	3	12
Vigorous activity in minute	368	91.03	60	75.46	0	480
Moderate activity in minute	368	63.04	45	63.869	0	480
Football time (min)	368	97.17	90	46.53	15	300

Numeric variable	N	Mean	Median	Std Deviation	Min	Max
football participation in days	368	2.86	2	1.776	1	7
Fitness/Physical activity in days (in week)	368	3.86	4	1.992	1	7
Total time for football in a week (in min)	368	309.82	180	314.02	15	2100
Total cost of treatment (Rs)	128	16809.1	3000	43557	0	255500

The average age of participants is approximately 27 years, with a standard deviation of 7.573 years. The median age is 25, suggesting that half of the participants are younger than 25. Participants have an average weight of 70.56 kg, with a standard deviation of 12.15 kg, indicating a moderate variation in weight among participants. The weights range from 39 kg to 107 kg, with a median weight of 71 kg. The average height is 170.84 cm, with a standard deviation of 6.96 cm. Heights range from 153 cm to 189 cm, with a median very close to the mean at 171.15 cm. The average BMI is 24.12, with a standard deviation of 3.79. BMIs range from 16 to 39, with a median of 24. On average, participants report sleeping 6.86 hours per night, with a standard deviation of 1.174 hours. Sleep duration ranges from 3 to 12 hours, with a median of 7 hours. Participants engage in an average of 91.03 minutes of vigorous activity, with a extensive range of activity levels (0 to 480 minutes) and a high standard deviation of 75.46 minutes. The median of 60 minutes suggests that half of the participants engage in vigorous activity for 60 minutes or less. On average, participants engage in 63.04 minutes of moderate activity, with a similar range and standard deviation to vigorous activity. The median of 45 minutes indicates that half of the participants engage in moderate activity for 45 minutes or less. Participants spend an average of 96.81 minutes playing football in a day, with a range from 0 to 300 minutes and a standard deviation of 47.23 minutes. The median of 90 minutes

suggests a common interest in football among the participants. On average, participants play football on 2.84 days per week, with a range from 0 to 7 days and a standard deviation of 1.801 days. Participants engage in fitness or physical activities an average of 3.86 days per week, with a range from 0 to 7 days. For 128 participants who reported their treatment costs, the average cost is Rs 16,809.08, with a very high standard deviation of Rs 43,557, indicating a wide range of treatment costs among participants. The costs range from 0 to Rs 255,500, with a median of 3,000 Rs, suggesting that while some people have very high treatment costs, half of the people spent Rs 3,000 or less.

3.5 Prevalence

The table 4.6 presents the prevalence of Musculoskeletal Disorders (MSD) among the participants, along with the confidence intervals for the observed percentages

Table 3.5 Prevalence in the study

MSD Status	Frequency	Percentage	95% C.I	
YES	230	62.5	57.3	66.6
NO	138	37.5	33.4	42.7
Total	368	100		

Prevalence = Total no: with outcome/ Population at risk for the outcome

= 230/368 = 0.625

= **62.5%**

230 participants have reported experiencing Musculoskeletal Disorders (MSD), which represents the majority of the study population indicating a high prevalence of MSD 62.5%. Significant portion of the sample 37.5% reported not experiencing Musculoskeletal Disorders (MSD).For this group, the confidence interval is from 57.3% to 66.6%. This interval indicates a high degree of precision in the estimate, meaning that if the study were to be replicated with

the identical settings, Ninety-five percent of the people who have MSD probably fall into this group.

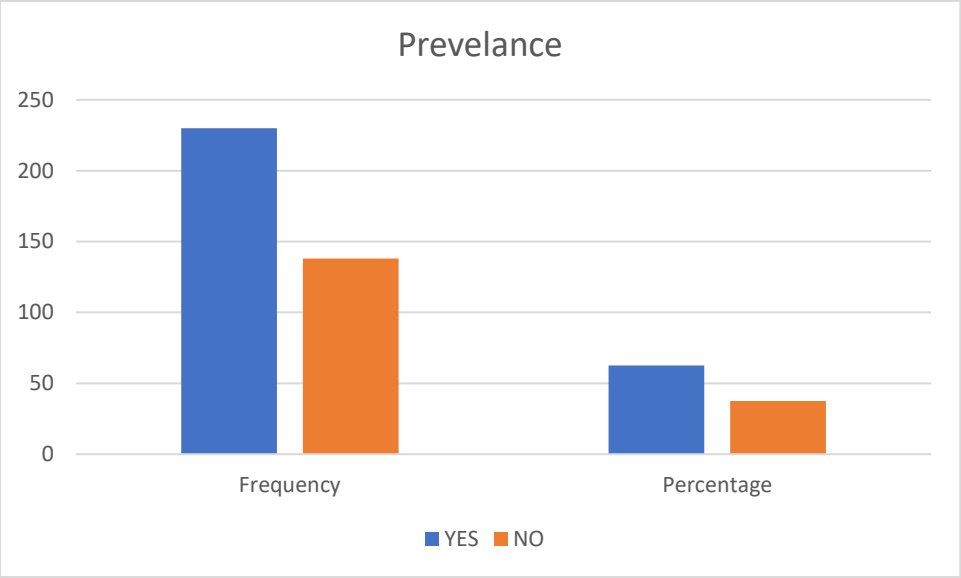

Figure 3.2 Frequency and Percentage of outcome MSD.

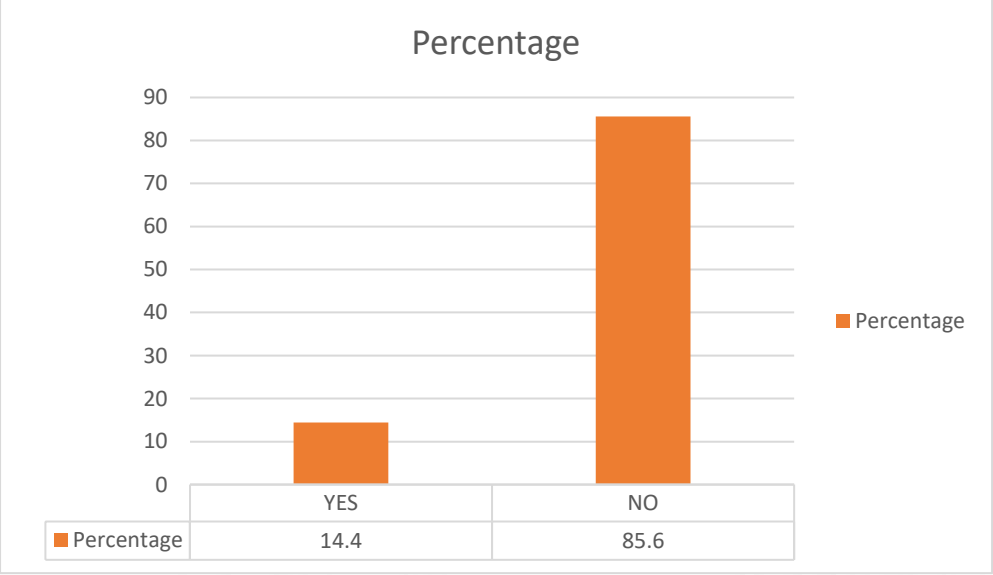

Figure 3.3 Preexisting MSD due to accident/illness

Majority of the participants 85.6% does not have any preexisting MSD due to accident/illness and 14.4% had some preexisting MSD due to accident/illness.

3.6 Treatment related factors

Table 3.6 Treatment seeking behaviour of participants

Treatment related variables		**N = 230**
Treatment		
YES	136	59.13
NO	94	40.86
No Treatment reasons (MCQ)		
Belief that the injury was not severe enough	77	81.90%
Fear of missing sports or physical activity	19	20.21%
Fear of serious diagnosis	2	2.10%
Concerns regarding absenteeism in professional life.	5	5.30%
Cost of medical care	4	4.25%
lack of health insurance	2	2.10%
lack of access to sport medicine specialist	1	1.06%
Treatment done	**N = 136**	
Allopathy (modern medicine)	90	66.17%
Ayurveda	24	17.60%
Both	10	7.35%
Other	12	8.82%

Among participants who had MSD 59.13% had undergone treatment for MSD and 40.86% hadn't gone for treatment for various reason. Most individual 81.9% responded that the MSD was not severe enough to undergo treatment. Subsequently 20.21% participants also responded fear of missing sports as also a reason for not undergoing treatment. Among the participants who had undertaken treatment for MSD 66.17% were taken treatment in modern medicine (Allopathy), 17.6% had taken treatment in Ayurveda and 7.35% were undergone

modern medicine and ayurvedic treatments. A small portion of participants 8.82% had treatment in the other category.

Table 3.6.1 Treatment stream and its average cost of treatment.

Treatment	Mean cost in Rs
Allopathy	19378.4
Ayurveda	5695.23
Both	25760
Other	6015

For modern medicine the average cost of treatment among participant is Rs 19378.43 and for individuals who had undertaken ayurveda treatment is Rs 5695.23. Individuals who had taken ayurveda and allopathy treatment had a average treatment cost of Rs 25760. Figure 4.4 represents reasons for not taking treatment.

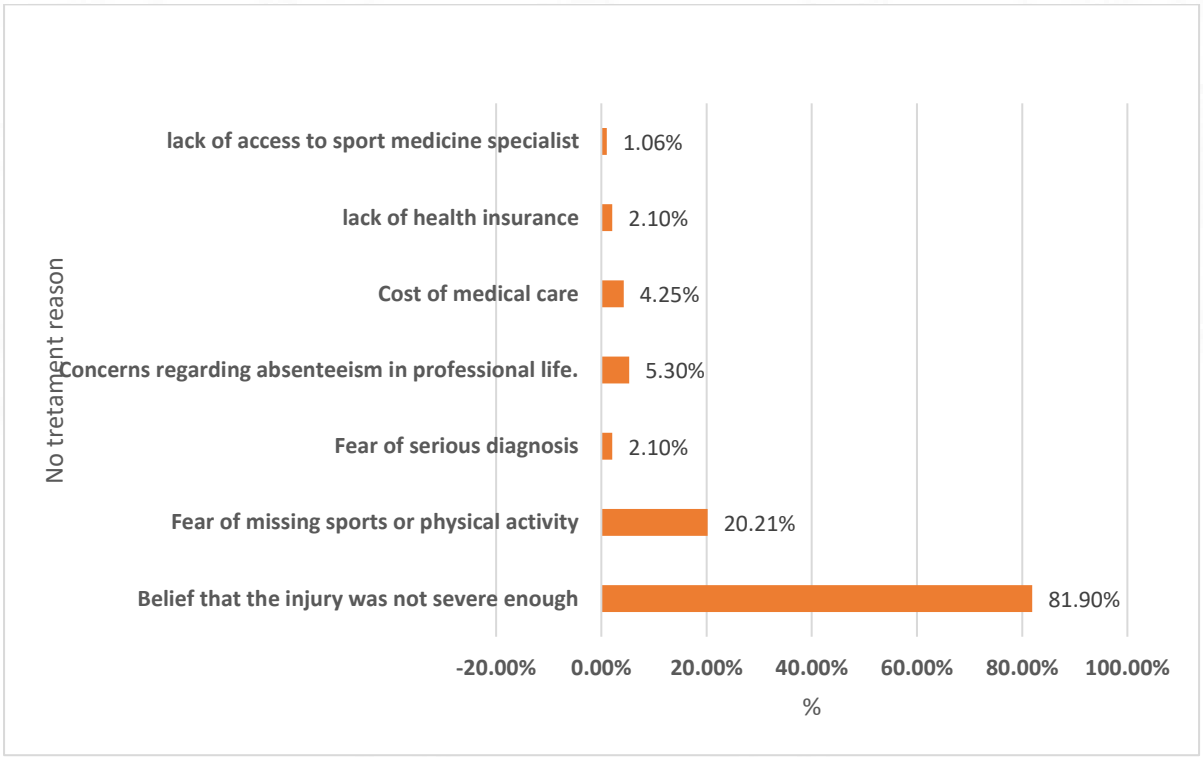

Figure 3.4 No treatment reasons (MCQ)

3.7 Two sample T test

Table 4.8 show the result of t-test comparing means of various factors between individuals with MSD and not.

Table 3.7 Mean difference of numeric variables

Mean	Outcome		Mean Difference	p -value
	MSD Yes	MSD No		
Age - Mean	27.29	26.46	-0.835	0.675
Playtime football	99.22	92.79	6.428	0.388
Vigorous intensity activity	96.54	81.85	14.696	0.115
Moderate intensity	65.07	59.67	5.391	0.183
Football participation in week	2.92	2.7	0.214	0.757
sleep	6.81	6.94	0.129	0.516
BMI	24.22	23.95	0.273	0.516
Sports participation in week	3.91	3.77	0.141	0.196

The difference in means for each independent variable between those with and without MSD is shown and It displays the mean variation in values between the two sets. The p-values for

the subsequent variables are all higher than 0.05: age, playtime football, vigorous intensity activity, moderate intensity, football involvement in a week, sleep, BMI, and sports participation in a week. This shows that there isn't a significant variance in these characteristics between people with MSD and people without MSD

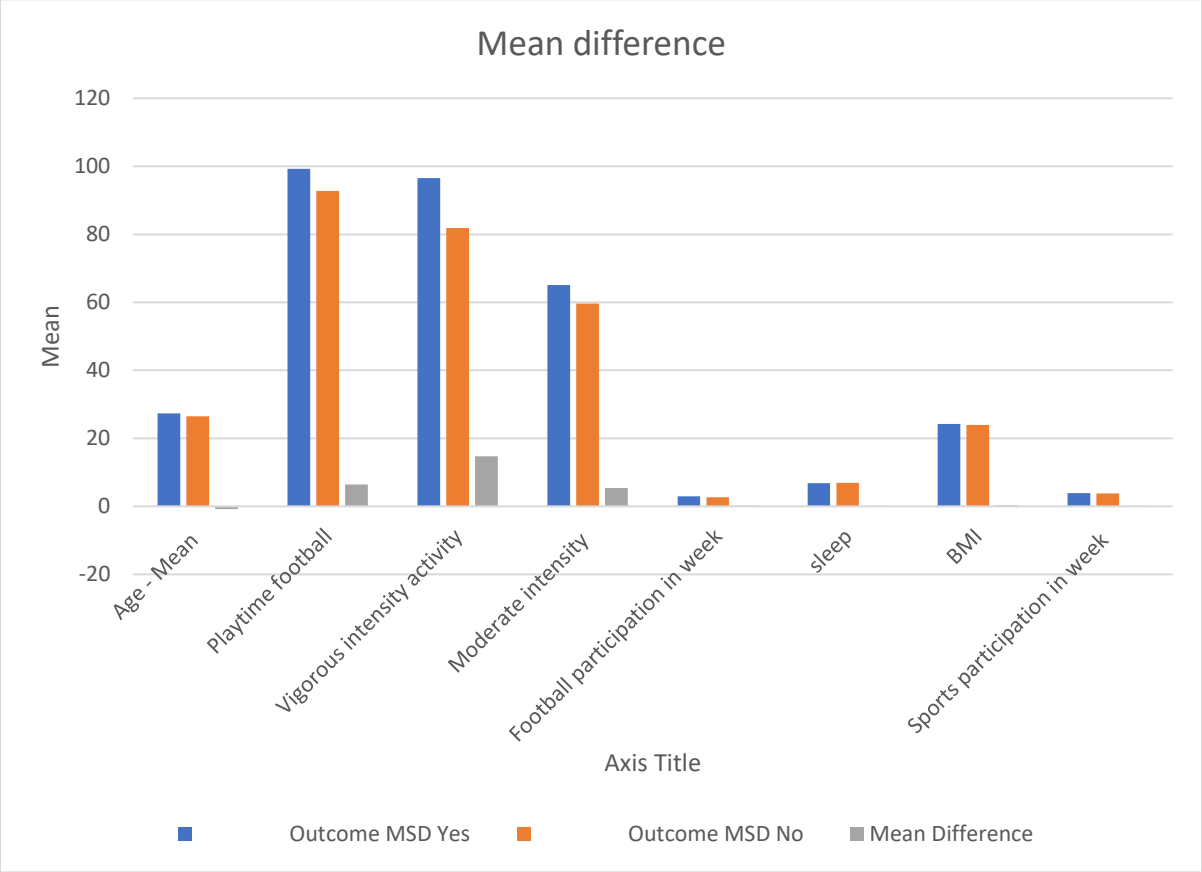

Figure 3.5 Mean difference.

3.8 Measures of central tendency

Table 4.8 shows measures of central tendency for various health and activity-related variables, with a focus on medians for several variables. This interpretation will help in setting cut-off values for further analysis

Table 3.8 Central tendency measure

Variables	Measure of central tendency Cut off
Age	25 years
Participation of sport in a week	4 days*
Football participation in a week	2days*
Time spend on Vigorous intensity sports	60min*
Time spend on moderate intensity sports	45min*
Time spend for football in a day	90min*
Hours of sleep per day	7 Hr*
Total cost of Medical care	Rs 3000*
Weight in Kg	70.5kg
Height in cm	171cm
We ist circumference in cm	82cm
BMI	24.12
Recovery in days	27days

***Median**

The study population has a median age of 25 years. This age may be used as a cut-off point to categorise individuals into two age groups for subsequent analysis. Participation in Sport per Week shows that, on average, participants play sports for around half of the week, with a median of 4 days. Football Participation Per Week, a median of two days suggests that, while not the most popular sport among the participants, football is still a popular pastime.

Time Spent on Vigorous Intensity Sports, the 60-minute median. Time Spent on Moderate-Intensity Sports with a median of 45 minutes. Football Time Spent Daily, a median of 90

minutes. Hours of Sleep per Day, the individuals appear to be getting a healthy amount of sleep on average, since the median of 7 hours is within the adult recommended range. Total Medical Cost, the participants' financial burden of paying for healthcare is shown by the median cost of Rs 3000. The following medians—weight, height, waist circumference, and BMI are used to measure individuals' physical health and risk aspects for obesity or underweight: 70.5 kg for weight, 171 cm for height, 82 cm for waist circumference, and 24.12 BMI. A median of 27 days for recovery suggests the average time taken by participants to recover from illnesses or injuries.

3.9 Bivariate analysis

Table 3.9 Crosstabulation and Chi-Square Tests with between Musculoskeletal disorders Present or Absent and socio demographic factors, Life style factors and Anthropometric factors

Variable	Category	Participants(n)	MSD NO (N,%)	MSD YES (N, %)	P value
Sex	Female	12	9(75.0%)	3(25%)	0.012 (Fisher's)
	Male	356	129(36.2%)	227(63.8%)	
Age	<=25	190	80(42.1%)	110(57.9%)	0.059
	>25	178	58(32.6%)	120(67.4%)	
Education	Below Graduation	92	34(37%)	58(63%)	0.338
	Graduation	202	81(40.1%)	121(59.9%)	
	PG & Above	74	23(31.1%)	51(68.9)	
Family type	Joint	67	26(38.8%)	41(61.2%)	0.807
	Nuclear	301	112(37.2%)	189(62.8%)	

Occupation Status	Employed	221	77(34.8%)	144(65.2%)	0.197
	Unemployed	147	61(41.5%)	86(58.5%)	
Physical exertion on job	Physically active	61	18(29.5%)	43(70.5%)	0.254
	Moderately active	55	24(43.6%)	31(56.4%)	
	Sedentary	105	35(33.3%)	70(66.7%)	
Family Income	< Five lakh	192	75(39.1%)	117(60.9%)	0.576
	Five to Eight lakh	113	43(38.1%)	70(61.9%)	
	>Eight lakh	63	20(31.7%)	43(68.3)	
Alcohol consumption (12 months)	Yes	180	56(30.6%)	108(69.4%)	0.007
	No	188	83(44.1%)	105(55.9%)	
Alcohol consumption (30 days)	Yes	144	42(29.2%)	102(70.8%)	0.008
	No	224	96(42.9%)	128(57.1%)	
Sleep	<=7hr	265	94(35.5%)	171(64.5%)	0.197
	>7hr	103	44(42.7%)	59(57.3%)	
Ever Smoke	Yes	109	37(33.9%)	72(66.1%)	0.361
	No	259	101(39%)	158(61%)	
Currently Smoke	Yes	84	30(35.7%)	54(64.3%)	0.7
	No	284	108(38%)	176(62%)	
BMI	Underweight	22	6(27.3%)	16(72.7%)	0.399
	Normal weight	186	77(41.4%)	109(58.6%)	
	Over weight	133	45(33.8%)	88(66.2%)	
	Obese	27	10(37%)	17(63%)	

Sex: The data suggests that a higher proportion of males (63.8%) reported MSD compared to females (25%). The p-value (fisher's test) of 0.012 (< 0.05) indicates an association between sex and the presence of MSD which is significant statistically.

Age: The p-value of 0.059 is slightly above the conventional significance level of 0.05, suggesting a marginally non-significant association between age and MSD. However, the data shows a higher proportion of participants aged >25 years (67.4%) reported MSD compared to those aged ≤25 years (57.9%). And it clearly shows that the prevalence is more in participants who have age more than 25 years.

Education: The p-value of 0.338 (> 0.05) indicates no association between education level and the presence of MSD. The proportions of participants reporting MSD are similar across the education levels

Household Structure: The p-value of 0.807 (> 0.05) suggests no statistical significant association between household structure (joint or nuclear) and the occurrence of MSD. The proportions of participants reporting MSD are comparable between joint and nuclear households.

Occupation Status: The p-value of 0.197 (> 0.05) indicates no statistical association of significance between occupation status (employed or unemployed) and the status of MSD. However, a slightly higher proportion of employed participants (65.2%) reported MSD compared to unemployed participants (58.5%)

Physical exertion in job: In Physically active: 70.5% have MSD, which is the highest percentage among the three categories. The p-value of 0.254 suggests no association which is statistically significant between physical exertion levels and MSD.

Family income: Among participants having Eight lakh and more: 68.3% have MSD, indicating a higher prevalence of MSD with higher income. The p-value of 0.576 indicates no significant association between MSD and family income levels.

Alcohol Consumption (12 Months): A majority (69.4%) of participants who used up/consumed alcohol in the past 12 months have MSD, 55.9% of those who did not consume alcohol have MSD. The p-value of 0.007 indicates a association which is statistically significant between consumption of alcohol in the past 12 months and the prevalence of MSD.

Alcohol Consumption (30 Days): A higher percentage 70.8% of individuals who consumed alcohol in the past one month have MSD. Among 57.1% of those who did not consume alcohol in the past one month have reported MSD. The p-value of 0.008 suggests recent alcohol consumption and MSD have association and is statistically significant.

Sleep: 64.5% of persons who sleep 7 hours or less have MSD. A lower percentage (57.3%) of persons who sleep more than 7 hours have MSD. The p-value of 0.197 suggests that the association between sleep duration and MSD is not statistically significant.

Ever Smoke: The percentage of players who have never smoked and do not have MSD (39%) is slightly higher than that of players who have smoked at some point (33.9%). The p-value of 0.361 suggests that there is no significant association between smoking history and MSD.

Currently Smoke: Similar to the "Ever Smoke" category, there is no significant difference in MSD prevalence between current smokers (35.7% not having MSD) and non-smokers (38% not having MSD), with a p-value of 0.7 indicating no significant association.

BMI: There is no statistically significant evidence to suggest an association between BMI categories and the prevalence of MSD in this dataset. Prevalence of MSD is higher in underweight category, subsequently more than 60% overweight and obese participants have MSD.

Table 3.10 Chi-Square tests for the association between various sports related factors and the presence or absence of musculoskeletal disorders (MSD).

Variable	Category	Participants(n)	MSD NO (n, %)	MSD YES (n, %)	P value
Sports Participation	<=4 day	225	82(36.4%)	143(63.6%)	0.6
	>4 days	143	56(39.2%)	87(60.8%)	
Period of playing football	1 to 5 years	84	40(47.6%)	44(52.4%)	0.355
	6 to 10 years	83	33(39.8%)	50(60.2%)	
	> 10 years	201	69(34.3%)	132(65.7%)	
Fluid drinking while playing	Yes	204	136(88.3%)	18(11.7%)	0.233
	No	164	82(78.9%)	122(21.1%)	
Vigorous sports timing per day	<= 60 min	192	77(40.1%)	115(59.9%)	0.281
	>60 min	176	61(34.7%)	115(65.3%)	
Moderate sports timing per day	<=45	187	75(40.1%)	112(59.9%)	0.293
	>45	181	63(34.8%)	118(65.2%)	
Favourite football position	Defender	113	44(38.9%)	69(61.1%)	0.865
	Forward	106	42(39.6%)	64(60.4%)	
	Goal Keeper	23	8(34.8%)	15(65.2%)	
	Midfield & others	126	44(34.9%)	82(65.1%)	
Warm up	Yes	308	119(38.6%)	189(61.4%)	0.308
	No	60	19(31.7%)	41(68.3%)	
Supplements usage	Yes	47	16(34%)	31(66%)	0.6

	No	321	122(38%)	199(62%)	
Protective gears usage	Yes	335	125(37.3%)	210(62.7%)	0.814
	No	33	13(39.4%)	20(60.6%)	
No of days Football playing in a week	<=2days	196	82(41.8%)	114(58.2%)	0.067
	>2days	172	56(32.6%)	116(67.4%)	
Football play timing in a day	<=90min	219	83(37.9%)	136(62.1%)	0.842
	>90min	149	55(36.9%)	94(63.1%)	
Participation in multiple sports	Yes	253	96(37.9%)	157(62.1%)	0.794
	No	115	42(36.5%)	73(63.5%)	
Physical conditioning/ strength training	Regularly	124	55(44.4%)	69(55.6%)	0.136
	Occasionally	72	20(27.8%)	52(72.8%)	
	Rarely	44	17(38.6%)	27(61.4%)	
	Never	128	46(35.9%)	82(64.1%)	
Total football time in a week	<=180min	189	81(42.9%	108(57.1%)	0.029
	>180min	179	57(31.8%)	122(68.2%)	

*Sports Participation***:** 63.6% participants who plays equal to or less than 4 days have MSD, More than 4 days: 60.8% have MSD. The p-value of 0.6 suggests no significant association between the frequency of sports participation and MSD

Period of playing football: More than 10 years 65.7% have MSD, indicating a higher prevalence of MSD with a longer period of playing football, 6 to 10 years: 60.2% have MSD, 1 to 5 years: 52.4% have MSD. The p-value of 0.355 suggests no significant association between the period of playing football and MSD.

Fluid drinking: A high percentage (88.3%) of those who drink fluids while playing do not have MSD, A lower percentage (78.9%) of those who do not drink fluids while playing are free from MSD. The p-value of 0.233 suggests that the association between fluid drinking while playing and MSD is not statistically significant

*Vigorous Sports Timing Per Day***:** 59.9% of those who engage in vigorous sports for up to 60 minutes a day have MSD. A slightly higher percentage (65.3%) of those who engage in more than 60 minutes of vigorous sports a day have MSD. The p-value of 0.281 suggests no significant association between the duration of vigorous sports and MSD

*Moderate Sports Timing Per Day***:** 59.9% of those who engage in moderate sports for up to 45 minutes a day have MSD. A slightly higher percentage (65.2%) of those who engage in more than 45 minutes of moderate sports a day have MSD. The p-value of 0.293 indicates no significant association between the duration of moderate sports and MSD.

*Favourite Football Position***:** The percentages of MSD prevalence among different positions (Defender, Forward, Goal Keeper, Midfield & other) are relatively close, ranging from 34.8% to 39.6% for those without MSD. The p-value of 0.865 suggests that there is no statistically significant association between a player's favorite football position and the prevalence of MSD

*Warm-up***:** Players who warm up have a slightly higher percentage of not having MSD (38.6%) compared to those who do not warm up (31.7%). However, the p-value of 0.308 indicates that this difference is not statistically significant

*Supplements Usage***:** The prevalence of MSD among those who use supplements and those who do not is similar, with 34% of supplement users and 38% of non-users not having MSD. The p-value of 0.6 suggests no significant association between supplement usage and MSD.

No of days Football playing in a week: Majority that is 67.4% participants who plays more than two days have MSD, compared to participants who plays equal to or less than two days:

58.2% have MSD. The p-value of 0.067 is closer to significance but suggests no significant association with MSD.

*Football play timing in a day***:** Among participants 69.4% who plays more than 90 minute have MSD, 62.1% of those who plays equal to or less than 90 minute have MSD. The p-value of 0.842 indicates no significant association between football play timing in a day with MSD.

*Multiple sports participation***:** Among participants 63.5% who doesn't play multiple sports have MSD, 62.1% of those who engage in multiple sports have MSD. The p-value of 0.794 indicates no significant association between multiple sports participation and MSD.

*Physical conditioning/ strength training***:** The percentages of MSD prevalence among different categories is ranging from 55.6% to 72.8%. Among the respondents 72.8% who occasionally engage in physical conditioning has MSD compared to respondents who engage regularly (55.6%), rarely (61.4%) and never (64.1%). The p-value of 0.136 suggests that there is no significant association between physical conditioning/ strength training and the prevalence of MSD

Total football time in a week: Out of the 189 participants having played football for less than 180 minutes 42.9% have no MSD and 57.1% have MSD. Out of the 179 participants, 31.8% said "MSD NO" and 68.2% said "MSD YES" in category >180min. The p-value of 0.029 suggests a significant difference between the two categories and is significant.

3.10 Multivariate analysis (Logistic regression)

The logistic regression study provides understandings into the association between various factors (Gender, Age category, Alcohol consumption over 12 months, Alcohol consumption over 30 days, and Football participation in days) and the outcome variable (MSD Yes). The

various factors included in the logistic regression was selected which came significant and closer to significant values in the chi square test. Table 1.9 show the Unadjusted and adjusted odds ratio and p value.

Table 3.11 Finding from the logistic regression analysis

Variable	Category	MSD Yes (n, %)	COR 95% CI	AOR 95% CI	P value
Gender	Female	3(25)		**Reference**	
	Male	227(63.8)	5.279 (1.4,19.9)	4.377 (1.13,16.9)	**0.032**
Age category	<=25	110(57.9)		**Reference**	
	>25	120(67.4)	1.505 (0.98, 2.3)	1.331 (0.83, 2.12)	0.231
Alcohol consumption (12 months)	Yes	108(69.4)	1.797 (1.17, 2.76)	1.247 (0.58,2.7)	0.576
	No	105(55.9)		**Reference**	
Alcohol consumption (30 days)	Yes	102(70.8)	1.821 (1.17. 2.85)	1.322 (0.6, 2.94)	0.492
	No	128(57.1)		**Reference**	
football participation in days	<=2days	114(58.2)		**Reference**	
	>2days	116(67.4)	1.49 (0.97, 2.28)	1.72 (1.09, 2.71)	**0.02**
Total football time in a week	<=180min	108(57.1)		**Reference**	
	>180min	122(68.2)	1.605 (1.05,2.46)	1.335 (0.86, 2.08)	0.203

COR: Crude odds ratio

AOR: Adjusted odds ratio

Logistic regression analysis provide understandings on the relationships that exist between the outcome variable (MSD Yes) and a number of covariates, including gender, age category, alcohol intake over the course of 12 months, alcohol consumption over 30 days, and football involvement in days. The main conclusions are as follows

Sex: Men have 4.377 times more likely to have outcome versus females. Gender is a strong predictor of the result, as shown by this statistically significant correlation (P value = 0.032).

Age Category: For those over 25 years old have 1.331 times more likely to have outcome versus 25 years of age or younger. P value of 0.231 indicates that there is no significant correlation among those who are 25 years of age or younger and those who are older with the result.

Alcohol consumption (12 months): The data propose that those who consumed alcohol in 12 months have 1.247 odds of getting outcome. Although the Crude Odds Ratio COR suggests that those who consumed alcohol in the past 12 months have 1.797 odds of getting outcome , the adjusted analysis does not support a statistically significant association P value = 0.576

Alcohol consumption (30 days): The data suggests that those who consumed alcohol in 30 days have 1.322 odds of getting outcome. P value is 0.492 does not show a statistically significant association with the outcome in the adjusted analysis.

Football participation in days: Football participation appears to be a significant predictor of the outcome. Those participating in football for more than 2 days have 1.72 higher odds of getting outcome compared to those participating 2 days or less. This association is significant statistically with P value of 0.02.

Total football time in a week: For those who plays more than 180 min in a week have 1.335 times more probable to have outcome versus playing equal to or less than 180 min . P value of 0.203 indicates that there is no significant correlation between those who are playing equal to or less than 180 min those who are playing more than 180 min in a week.

Chapter 4

Discussion

Musculoskeletal disorders have been an area of interest for various occupational groups, however musculoskeletal disorders among sports persons with specific reference to recreational sports are scarce. There are studies of MSD among professional sports persons. Present study is an effort to fill the gap and this might be one of the few studies conducted among recreational football sports persons. Studies show professional athletes reported in the range of 10% to 42.8%.(Romero-Morales et al., 2023). Most muscle injuries (between 10% and 55% of all injuries) occur while actively engaged in sports. (Barroso and Thiele, 2011). In a study led among competitive male young football players found the frequency of injuries varied from 9.5 to 48.7 injuries/1000 hours, with the majority proportion of injuries occurred during the sports (Owoeye et al., 2020). Present study found the prevalence of MSD among recreational sportsperson as 62.5% in the previous one year from the date of administering the questionnaire.

4.1 Socio demographic variables

In the current study the study participants were the recreational football players of age above 18 years selected from 36 football turfs in Trivandrum district. A study found age as a contributing factor for MSD (Nielsen et al., 2013) the current study finding also found similar findings. A cross-sectional study led among middle school students in southern China showed a significant sex difference in the incidence of injuries(Tang et al., 2019), (Carter et al., 2018), (López-Valenciano et al., 2020), which is similar to that of the present study. While analysing the educational qualification among participants it was found that majority of participants had graduation. The present study found that a substantial proportion of the participants are unemployed the cause for that is significant portion of participants are higher secondary or just

completed their education. Among employed participants majority were employed in professional jobs. When professional work categories were further analysed, it was found that a sizable percentage had sedentary jobs. Being inactive may raise the chance of developing functional limitation in persons with osteoarthritis of the knee, regardless of the category of sedentary behaviour. (Mast er et al., 2021). A significant problem affecting high-risk occupational workers is the prevalence of musculoskeletal problems, according to a research done among these individuals in an urban context.(Ovais et al., 2022). In terms of physical exertion at work, the study found that most people has sedentary job. More than half of the participants stated that their family incomes less than Rupees five lakhs per year. In a study conducted in Kuala Lumpur suggest that there is difficulty for members of low-income households to access healthcare and more likely to have musculoskeletal disorders (Saat et al., 2022). Present study there was no association between family income and MSD. According to a study increased body weight was associated with outcomes of musculoskeletal conditions. (Gwinnutt et al., 2022). A study which was conducted among nurses discovered that BMI were significantly associated with increasing musculoskeletal disorders. (Laal et al., 2022), but in this study there is no statistically significant evidence to suggest an association between BMI and MSD. The mean BMI among participants in this study is 24.12 which is in confirmation with the study. (Paajanen et al., 2011).

4.2 Sports related variables

In the present study majority participants engaged in multiple sports. Among the sports other than football, cricket is the most preferred sport. A study among logistic operation workers in turkey demonstrated that increased working years in a freezing production setting may cause pain and discomfort in many body parts, impacting with routine tasks.(Altuntaş, 2020), but present study has not found any significant association between period of playing football and MSD. In a meta-analysis of RCT, compared to the control group, the intervention group

experienced considerably fewer injuries in wearing external joint support and modified shoes.(Leppänen et al., 2014). A study among youth ice hockey, suggested that the use protective gears has reduced this risk of injury (Kolstad et al., 2023). The present study show more participants uses protective gears, however their was no association between protective gears and MSD. In a meta-analysis the warm up practices showed a significant result in preventing sports injuries.(Leppänen et al., 2014). Warm-up and stretching exercises are commonly used by both competitive and recreational athletes to improve physical performance and prevent injuries linked to sports.(Shellock and Prentice, 1985). In Present study show a high percentage of participants engaging in warm ups and stretching exercises before physical activity, however the study finds no association between warm up/stretch and MSD. There is opportunity for improvement, though, as a sizable percentage stated they did not engage in warm ups. According to a study strength training exercise significantly reduced the risk of injuries among football players.(Leppänen et al., 2014). Present study also show that individuals are engaged in different degrees of strength training or physical conditioning. However in the present study there was no statistical association between strength training and MSD. Regarding playing environments, there are studies suggesting association between playing surface and MSD (Winson et al., 2020) , this factor was also not significant in this study. The majority of individuals in present study reported drinking water while playing. However, a significant percentage do not adhere to this practice. Among novice runners who participated in 15, 30, and 45-minute running groups experienced an increased prevalence of injuries (22%, 24%, and 54%, respectively), according to (Pollock et al., 1977). In a cross-sectional study involving physical therapists, engaging in vigorous leisure-time physical exercise for at least 75 minutes per week was linked to reduced musculoskeletal pain levels. (Ezzatvar et al., 2020). In a study the 45-minute and 5-day/week groups demonstrated greater improvements in cardiorespiratory fitness, these practices are not recommended for starting

joggers due to the much higher percentage of injuries.(Pollock et al., 1977). In other study the mean total time spent in football training in a week was 15 hour (Paajanen et al., 2011). Excess participation in sports activity can contribute to MSD (D'Hemecourt, 2009) and also engaging in overtime work is a contributing factor for MSD (Tomioka and Matsunaga, 2007), similarly in the present study engaging in sports particularly in football for multiple days is associated with occurrence of MSD and also participating in football for a longer time in a week is also associated with MSD. There is no association between vigorous intensity, moderate intensity physical activity and MSD in this study.

4.3 Lifestyle variables

Behavioural factors such as tobacco use and alcohol consumption are contributing factors of MSD in several studies (Smedbråten et al., 2022), The present study found a sizable proportion of participants engage in smoking behaviour, and high percentage of participants consume alcohol. In the present study only alcohol consumption is associated with MSD prevalence. According to a study done on 22 professional football players in the top German football league, poor sleep quality ratings were linked to a greater likelihood of injury later on.(Laux et al., 2015). The duration of sleep and MSD were not significantly correlated in this study.

According to the literatures various factors contributing to MSD are socio demographic variables, occupation related variables, sports related variables, anthropometric factors etc. From this study it is clear that engagement in sports is an unique activity that contributes to musculoskeletal disorders with a high prevalence among recreational football enthusiasts. In this study factors associated with musculoskeletal disorders includes: age, sex, football participation in days, total time spend for football in a week, alcohol consumption in 12 months and 30 days.

4.4 Conclusion

Studies on musculoskeletal disorders among recreational sportspersons in general are scarce. Two third of recreational football players in present study had MSD. This prevalence is similar to that of professional players and some of the occupational groups. Engagement in recreational sports especially in artificial turfs is popular in the recent years. This is not only popular among younger population but also popular among older age groups. Access to such turfs is decided by the affordability of using such facilities and moderate level to high level educational qualification. Due to the occupation related factors such as sedentary behaviour, BMI associated with such behaviour, alcoholism and so on are contributed to MSD among recreational football players regulating these aspects could minimise the impact of MSD. Additionally, factors specific to sports also determines the MSD. Pre sports activity such as warm-ups, stretching, strength training/physical conditioning, use of protective gears, duration of sports, regularity in participation and playing positions that are some of the sports related factors contributing to MSD. Compared to those in other occupations, studying MSD among sportspersons need a unique approach. The approach must take into con factors specific to intrinsic as well as extrinsic factors of sports. Engaging in sports is essential for non-communicable disease prevention which also contributing to musculoskeletal disorders among recreational players who lack awareness similar to that of professional players. In one side we recommend physical activity for relieving the risk of non-communicable diseases on other side there is a significant burden of MSD due to improper practice of physical activities. So we should have a balanced approach without compromising MSD while recommending interventions for non-communicable diseases.

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4.5 Strength and Limitation of the study

4.5.1 Strength

This is the first study in recreational sports in Trivandrum district and it is the first study among recreational football players in Kerala. As per my knowledge it is one of the few studies conducted in artificial turfs. Thes structured questionnaire was developed by the principal investigator (PI) itself. And the data collection was solely done by PI by proper informed consent.

4.5.2 Limitation

Since sports is not an organized sector it is difficult to study with defined frame when compared to other occupational studies. Did not include sufficient number of women, due to nature of study setting. All finding is based on one question for assessing MSD.

4.6 Recommendations

- There should be a monitoring mechanism for the purpose of assessing the potential MSD risk by regulating the duration of playtime.
- Display information regarding risk of sports injuries in sports facilities.
- Like other occupational studies, larger studies on MSD among sportspersons will help in improving the safety mechanism and preventing MSD among players.
- Interventions on NCD prevention should take into consideration the side effect of physical activity, which has a potential cause for MSD.
- Information Education and Communication of demerits of substance use among recreational sports community should be encouraged.

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ANNEXURE 1 Participant Information sheet (English)

SL NO

PARTICIPANT INFORMATION SHEET

Hello. I am Sreenath M R, currently enrolled in the Master of Public Health programme at the Achutha Menon Centre for Health Sciences Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram. As part of my academic research, I am now conducting a survey entitled examining "**Prevalence of musculoskeletal disorders and its factors associated among recreational Football sportspersons in Trivandrum district**"

As you are aware, rrecreational football presents itself as a viable exercise option for untrained young,middle-aged and older adults, regardless of their health status and gender. It offers an opportunity to lead an active lifestyle and counteract various physical and physiological changes associated with aging. Physical activity has multiple health benefits but may also increase the risk of developing musculoskeletal disorders. Correspondingly there is a dire need to enhance our knowledge, perception and awareness of physical activity and its impact on individual's health, ultimately contributing to developing a healthy society.

I am inviting you to be part of this research survey work. Before you decide to be a participant in this survey or not, you can talk to anyone you feel comfortable with about this research survey. The findings from this research will help us better understand the safety of recreational football activities and may lead to recommendations for prevention and management of musculoskeletal disorders.

This consent form may contain words that you do not understand. Please ask me to stop as we go through the questions and I will clarify your doubts before proceeding further.

If you have questions later, you can ask them either to me or can contact the Member Secretary of the Institution Ethics Committee.

This research survey will require you to complete out a questionnaire for approximately 15 to 20 minutes. You are invited to participate in this study because I recognize you as a key participant. It would be beneficial to pave the way for future implementation and recommendations for prevention and management of musculoskeletal disorders and safe sports culture.

You voluntarily choose to participate in the research. You are free to choose to take part or not. Your decision will not affect your work or reporting in any way. Even though you gave your consent previously, you are free to withdraw later if you change your mind. Whether you choose to participate or not, no authority will be able to find out who you are or what your name is. There will not be any rewards or incentives for participating in the study.

Risks

There is no risk anticipated in the study.

You may experience some discomfort or inconvenience when completing the questionnaire, and there is possibility of a breach of confidentiality. However, we will take every precaution to protect your privacy.

Benefits

There will be no immediate direct benefit to you, but your participation in this study include contributing to the body of knowledge about recreational football injuries, potentially helping to improve safety guidelines and injury prevention measures for future.

Confidentiality

I will not be sharing information about you to anyone else. The information that I collect from this research survey work will be kept private. Any information about you will have a number on it instead of your name.

Who to contact

If you have any questions, you can ask them now or later.

If you wish to ask questions later, you may contact anyone of the following.

Sreenath M R, 8547278177/sreenathmph2022@sctimst.ac.in

Dr. Srinivas G, Member Secretary, I E C, SCTIMST, & Scientist – G, Department of Biochemistry, SCTIMST, (email iec.mem.sec@sctimst.ac.in).

ANNEXURE 2 Consent form (English)

SL NO

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Sciences

&Technology,

Trivandrum, Kerala, India- 695011

Consent Form

I _____ have read/heard and understood all the information provided in the Research information sheet.

By signing/putting thumb impression I confirm my voluntary participation in this study. I understand that I can withdraw my participation at any time during the data collection process without any explanation and also, I understand that my identity and personal information will be kept confidential. I have been informed who should be contacted for further clarifications.

Participant ID : **Name of the participant :**

Mobile Number : **Signature :**

Name of the Witness :

Signature :

Place :

I confirm that the participant was allowed to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent and the consent has been given freely and voluntarily.

Name of the Researcher :

Date :

Signature of the Researcher:

ANNEXURE 3 Interview Schedule (English)

SL NO

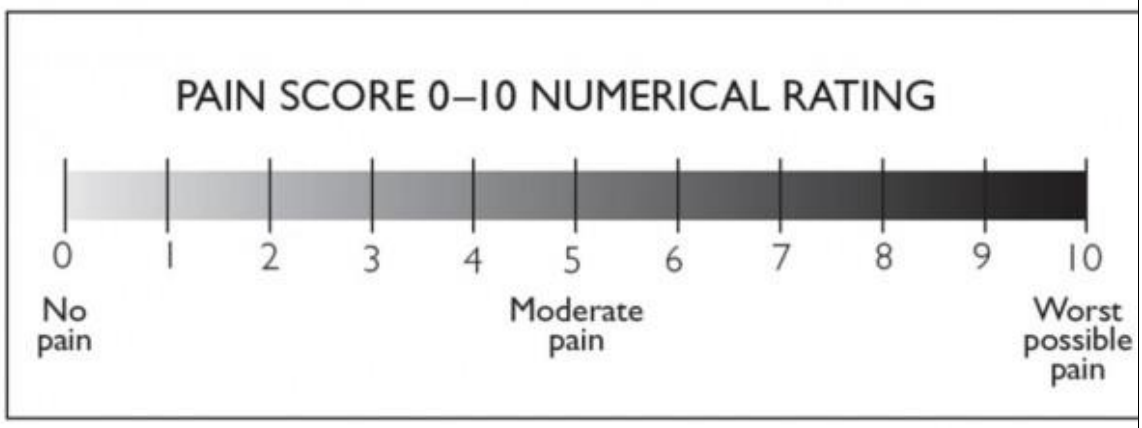
Prevalence of musculoskeletal disorders and its factors associated among recreational Football sportspersons in Trivandrum district- A cross sectional study

Questionnaire

Q. No.	**Section1: Demographic& Social Details**		**Code**
1	Age (in completed years)		
2	Gender	☐Male ☐Female ☐Others	**1** **2** **3**
3	What is your highest education qualification?		
4	Household Structure	☐Nuclear family (**consists of two married parents and their children)** ☐Joint family (Several generation)	**1** **2**
5	Occupation	☐Professional ☐Semi-professional ☐Clerical/Shop/Farmer ☐Skilled worker ☐Semi-skilled worker ☐Unskilled worker ☐Unemployed_____	**1** **2** **3** **4** **5** **6** **7** **8**
6	Please select the degree of physical exertion required for your job as well.	☐ Physically demanding (involving significant physical effort or labor) ☐ Moderately active (Jobs with a mix of physical and sedentary tasks) ☐ Mostly sedentary	**1** **2** **3**
7	Family income	☐<5 lakh PA ☒ 5 to 8 lakh PA ☐> 8 lakh PA	**1** **2** **3**

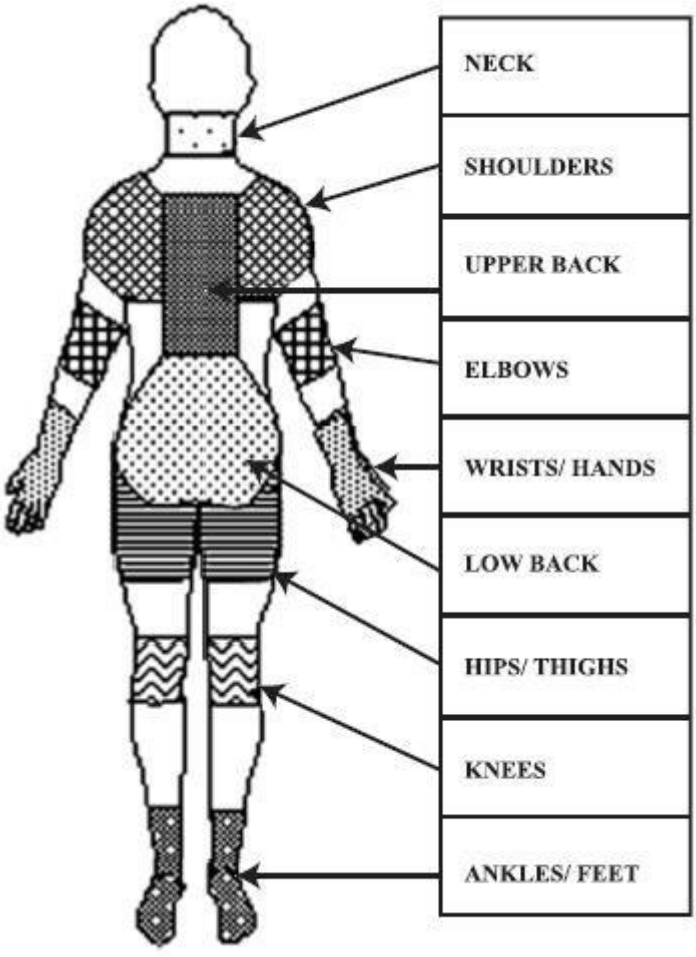
8	Do you participate in sports or physical activities regularly?	☐ Yes ☐ No	**1** **0**

Q. No.	Section 2: Factors associated with Musculoskeletal disorders		
9	How long are you playing football?	☐ 1-5 years ☐ 6-10 years ☐ <10 years	**0** **1** **2**
10	In a typical week, on how many days do you do fitness or recreational physical activity?	No: of days ----------	
11	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?(Running, Jogging, aerobic exercise, swimming, Hiking etc)	---- Hr:-----min	
12	How much time do you spend doing moderate-intensity sports, fitness or recreational activities on a typical day?(Brisk walking, Gardening, bicycling light effort(10-12mph)etc)	---- Hr:-----min	
12	You participate in multiple sports in a day?	☐Yes ☐No	1 0
13	If yes, how much time you spend for football?	---- Hr:-----min	
14	How many day in a week you play football?		
15	You usually plays football in?	☐Artificial Turf ☐Open ground ☐Both	1 2 3
16	Which is your favourite/strong football position ?	☐Goalkeeper ☐Defender ☐Midfielder ☐Forward ☐Others, specify	1 2 3 4 5 6
17	Have you ever experienced any musculoskeletal disorder (Eg ; Join pain, muscle strain, ligament injury etc) in last year?	☐Yes ☐No	**1** **0**

18	Did you have any pre existing musculoskeletal disorder due to accidents/illness?	☐Yes ☐No	**1** **0**
If yes, please rate your pain in the 11-point numeric scale ranges from '0' representing one pain extreme (e.g. "no pain") to '10' representing the other pain extreme  If Yes, please rate pain intensity in the morning, afternoon, evening, and with activity over the past 2 days			
On average, how bad has your pain been ... No Pain — Pain as bad as it can be In the morning over the past 2 days? 0 1 2 3 4 5 6 7 8 9 10 In the afternoon over the past 2 days? 0 1 2 3 4 5 6 7 8 9 10 In the evening over the past 2 days? 0 1 2 3 4 5 6 7 8 9 10 With activity over the past 2 days? 0 1 2 3 4 5 6 7 8 9 10			
19	If yes, please specify the type of musculoskeletal disorders you have experienced?	☐Knee pain and swelling ☐Ankle pain and swelling ☐Muscle pain ☐Back pain ☐Pain due to collision (injury) ☐Others, specify_____	**1** **2** **3** **4** **5** **6** **7**
20	When you've experienced a musculoskeletal disorder in recreational sports activity, what is the immediate aid or care received? (Select all that apply)	☐ Resting the injured area ☐ Using ice or heat therapy ☐ Compression or elevation of the injured area ☐Prescription medication	1 2 3 4 5

		☐Physiotherapy or rehabilitation exercise ☐Massage therapy ☐Active rest ☐Other	6 7 8 9
21	How frequently have you experienced these musculoskeletal disorders in the last one year?	☐Not experienced ☐Once or twice ☐ Less than 10 times ☐Weekly ☐Daily	1 2 3 4 5 6

Section 3: Standardized Nordic questionnaire



This picture shows parts of the body that are referred to in the questionnaire. You should decide yourself about which part you have trouble (if any).

Have you at any time during the last 12 months had trouble (ache, pain, discomfort) in:	Have you at any given time during the last 12 months been prevented from doing your normal work (at home or	Have you had trouble any time during last 7 days?

	away from home) because of the trouble:			
1. NECK ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
2. SHOULDER ☐No ☐YES, IN RIGHTHOULDER ☐YES, IN LEFT SHOULDER ☐YES, IN BOTH SHOULDERS	☐No ☐Yes	☐No ☐Yes		
3. ELBOW ☐No ☐YES, IN RIGHT ELBOWS ☐YES, IN LEFT ELBOWS ☐YES, IN BOTH ELBOWS	☐No ☐Yes	☐No ☐Yes		
4. WRIST/HANDS ☐NO ☐YES, IN RIGHT WRISTS ☐YES, IN LEFT WRISTS ☐YES, IN BOTH WRISTS	☐No ☐Yes	☐No ☐Yes		
5. UPPER BACK ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
6. LOWER BACK ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
7. ONE OR BOTH HIPS/THIGHS ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
8. ONE OR BOTH KNEES ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
9. ONE OR BOTH ANKLES ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes		
22	Did you seek medical treatment for any of these musculoskeletal disorders?	☐Yes ☐No		**10**
	If no, go to Q. 27			

23	If yes specify the type of treatment	☐Allopathy ☐Ayush ☐Self Treatment ☐Others	**1** **2** **3** **4**
24	Please specify the treatment undergone?		
25	Please provide the details of treatment related cost of your recent injury.	Doctor's fee ------ Hospitalization ------ Medication ------ Transportation ------ Loss of pay (per day) -----	
26	Did your family face any financial difficulties due to the costs associated with treatment?	☐Yes ☐No	**1** **0**
27	What is the time taken for your recovery?	In days -----	
28	How soon did you start playing sports again after treatment?	☐Less than a week ☐ More than a week ☐ After a month ☐ Less than a year ☐More than a year	**1** **2** **3** **4** **5**
29	After the treatment how did you conclude the safety to return for sports or any other physical activity?	☐Medical fitness certificate from health care professional ☐Personal judgement and comfort ☐Guidance from coach or trainer ☐Others(specify)	**1** **2** **3** **4**
30	If No, Why? Pleases select the reason	☐ Cost of medical care ☐ lack of health insurance ☐ Fear of serious diagnosis ☐Belief that the injury was not severe enough ☐lack of access to sport medicine specialist ☐Fear of missing sports or physical activity ☐Concerns regarding absenteeism in professional life. ☐Other	1 2 3 4 5 6 7

			8
31	Do you warm up and stretch before playing football?	☐Yes ☐No	**1** **0**
32	How frequently do you engage in physical conditioning or strength training exercises?	☐Regularly (multiple times a week) ☐Occasionally (once a week) ☐Rarely (once in a month) ☐Never	**1** **2** **3** **4**
33	What are advantages of conditioning/strength training in football?		
34	Do you currently smoke any tobacco products, such as cigarettes, cigars or pipes??	☐Yes ☐No	**1** **0**
35	In the past, did you ever smoke any tobacco products?	☐Yes ☐No	**1** **0**
36	Do you consumed any alcohol within the past 12 months ?	☐Yes ☐No	**1** **0**
37	Have you consumed any alcohol within the past 30 days?	☐Yes ☐No	**1** **0**
38	On average, how many hours of sleep do you get per night?		
39	How often do you drink fluids during sports ?	☐Every 15 minutes ☐Every 30 minutes ☐Every hour ☐Only when thirsty ☐Never_____	**1** **2** **3** **4** **5**
40	Do you use any nutritional supplements, such as vitamins, proteins, minerals, enzymes, amino acids or herbs?	☐Yes ☐No	**1** **0**
41	Do you use any protective gear or requirements when participating in football? If yes, please select from the list.	☐Gloves ☐Knee and leg pad ☐Thigh and Hip pads ☐Boot/cleats ☐Compression gear ☐Helmets ☐others	**1** **2** **3** **4** **5** **6** **7**
42	If no, why?		
	Section 4 :Anthropometric measurement (by investigator)		

	Participants should be asked to stand upright without footwear with their back against the wall, heels together and eyes directed forward. For measuring weight, participants are requested to remove footwear. Weight to be recorded in kilograms. The participants should be asked to stand erect in a relaxed position with both feet together.		
	Weight	_____ kg	
	Height	_____ cm	
	Waist circumference	_____ cm	

ANNEXURE 4 Participant information sheet (Malayalam)

SL NO

പങ്കാളിയുടെ വിവര ഷീറ്റ്

ഹലോ. തിരുവനന്തപുരം ശ്രീചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ് ആൻഡ് ടെക്നോളജിയിലെ അച്യുതമേനോൻ സെന്റർ ഫോർ ഹെൽത്ത് സയൻസസ് സ്റ്റഡീസിൽ മാസ്റ്റർ ഓഫ് പബ്ലിക് ഹെൽത്ത് പ്രോഗ്രാമിൽ ചേർന്ന ശ്രീനാഥ് എം.ആർ. എന്റെ അക്കാദമിക് ഗവേഷണത്തിന്റെ ഭാഗമായി, "തിരുവനന്തപുരം ജില്ലയിലെ വിനോദ ഫുട്ബോൾ കായികതാരങ്ങൾക്കിടയിൽ മസ്കുലോസ്കെലെറ്റൽ ഡിസോർഡറുകളുടെ വ്യാപനവും അതുമായി ബന്ധപ്പെട്ട ഘടകങ്ങളും" എന്ന തലക്കെട്ടിൽ ഞാൻ ഇപ്പോൾ ഒരു സർവേ നടത്തുന്നു നിങ്ങൾക്കറിയാവുന്നതുപോലെ, പരിശീലനം ലഭിക്കാത്ത ചെറുപ്പക്കാർക്കും മധ്യവയസ്കർക്കും പ്രായമായവർക്കും അവരുടെ ആരോഗ്യ നിലയും ലിംഗഭേദവും കണക്കിലെടുക്കാതെ ഒരു പ്രായോഗിക വ്യായാമ ഓപ്ഷനായി ഫുട്ബോൾ സ്വയം അവതരിപ്പിക്കുന്നു. സജീവമായ ഒരു ജീവിതശൈലി നയിക്കാനും വാർദ്ധക്യവുമായി ബന്ധപ്പെട്ട വിവിധ ശാരീരികവും ശാരീരികവുമായ മാറ്റങ്ങളെ പ്രതിരോധിക്കാനും ഇത് അവസരം നൽകുന്നു. ശാരീരിക പ്രവർത്തനങ്ങൾക്ക് ഒന്നിലധികം ആരോഗ്യ ഗുണങ്ങളുണ്ട്, പക്ഷേ മസ്കുലോസ്കെലെറ്റൽ ക്രമക്കേടുകൾ ഉണ്ടാകാനുള്ള സാധ്യതയും വർദ്ധിപ്പിച്ചേക്കാം. അതിനനുസൃതമായി നമ്മുടെ അറിവ് വർദ്ധിപ്പിക്കേണ്ട ആവശ്യകതയുണ്ട് ശാരീരിക പ്രവർത്തനത്തെക്കുറിച്ചുള്ള ധാരണയും അവബോധവും വ്യക്തിയുടെ ആരോഗ്യത്തിൽ അതിന്റെ സ്വാധീനവും ആത്യന്തികമായി ആരോഗ്യകരമായ ഒരു സമൂഹം വികസിപ്പിക്കുന്നതിന് സംഭാവന നൽകുന്നു.

ഈ ഗവേഷണ സർവേ വേലയുടെ ഭാഗമാകാൻ ഞാൻ നിങ്ങളെ ക്ഷണിക്കുകയാണ്. ഈ സർവേയിൽ പങ്കെടുക്കണോ വേണ്ടയോ എന്ന് തീരുമാനിക്കുന്നതിന് മുമ്പ്, ഈ ഗവേഷണ സർവേയെ കുറിച്ച് നിങ്ങൾക്ക് സൗകര്യപ്രദമെന്ന് തോന്നുന്ന ആരുമായും നിങ്ങൾക്ക് സംസാരിക്കാവുന്നതാണ്. ഈ ഗവേഷണത്തിൽ നിന്നുള്ള കണ്ടെത്തലുകൾ വിനോദ ഫുട്ബോൾ പ്രവർത്തനങ്ങളുടെ സുരക്ഷ നന്നായി മനസ്സിലാക്കാൻ ഞങ്ങളെ സഹായിക്കും, കൂടാതെ മസ്കുലോസ്കെലെറ്റൽ ക്രമക്കേടുകൾ തടയുന്നതിനും കൈകാര്യം ചെയ്യുന്നതിനുമുള്ള ശുപാർശകളിലേക്ക് നയിച്ചേക്കാം.

ഈ സമ്മത പത്രത്തിൽ നിങ്ങൾക്ക് മനസ്സിലാകാത്ത വാക്കുകൾ അടങ്ങിയിരിക്കാം. ഞങ്ങൾ ചോദ്യങ്ങളിലൂടെ കടന്നുപോകുമ്പോൾ

നിർത്താൻ ദയവായി എന്നോട് ആവശ്യപ്പെടുക, കൂടുതൽ മുന്നോട്ട് പോകുന്നതിനുമുമ്പ് ഞാൻ നിങ്ങളുടെ സംശയങ്ങൾ വ്യക്തമാക്കും.

നിങ്ങൾക്ക് പിന്നീട് ചോദ്യങ്ങൾ ഉണ്ടെങ്കിൽ, നിങ്ങൾക്ക് അവ എന്നോട് ചോദിക്കാം അല്ലെങ്കിൽ സ്ഥാപന നൈതിക സമിതിയുടെ മെമ്പർ സെക്രട്ടറിയുമായി ബന്ധപ്പെടാം.

ഈ ഗവേഷണ സർവേയിൽ ഏകദേശം 15 മുതൽ 20 മിനിറ്റ് വരെ ഒരു ചോദ്യാവലി പൂർത്തിയാക്കേണ്ടതുണ്ട്. നിങ്ങളെ ഒരു പ്രധാന പങ്കാളിയായി ഞാൻ അംഗീകരിക്കുന്നതിനാലാണ് ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ നിങ്ങളെ ക്ഷണിക്കുന്നത്. മസ്കുലോസ്കെലെറ്റൽ വൈകല്യങ്ങൾ തടയുന്നതിനും കൈകാര്യം ചെയ്യുന്നതിനും സുരക്ഷിതമായ കായിക സംസ്കാരത്തിനും ഭാവിയിൽ നടപ്പാക്കലിനും ശുപാർശകൾക്കും വഴിയൊരുക്കുന്നത് പ്രയോജനകരമാകും.

ഗവേഷണത്തിൽ പങ്കെടുക്കാൻ നിങ്ങൾ സ്വമേധയാ തീരുമാനിക്കുന്നു. പങ്കെടുക്കണോ വേണ്ടയോ എന്ന് തിരഞ്ഞെടുക്കാൻ നിങ്ങൾക്ക് സ്വാതന്ത്ര്യമുണ്ട്. നിങ്ങളുടെ തീരുമാനം നിങ്ങളുടെ ജോലിയെയോ റിപ്പോർട്ടിംഗിനെയോ ഒരു തരത്തിലും ബാധിക്കില്ല. നിങ്ങൾ മുമ്പ് സമ്മതം നൽകിയിട്ടുണ്ടെങ്കിലും, നിങ്ങളുടെ തീരുമാനം മാറ്റുകയാണെങ്കിൽ പിന്നീട് പിൻവാങ്ങാൻ നിങ്ങൾക്ക് സ്വാതന്ത്ര്യമുണ്ട്. നിങ്ങൾ പങ്കെടുക്കാൻ തീരുമാനിച്ചാലും ഇല്ലെങ്കിലും, നിങ്ങൾ ആരാണെന്നോ നിങ്ങളുടെ പേര് എന്താണെന്നോ കണ്ടെത്താൻ ഒരു അതോറിറ്റിക്കും കഴിയില്ല. പഠനത്തിൽ പങ്കെടുക്കുന്നതിന് പ്രതിഫലങ്ങളോ പ്രോത്സാഹനങ്ങളോ ഉണ്ടാകില്ല.

അപകടസാധ്യതകൾ

പഠനത്തിൽ അപകടസാധ്യതയൊന്നും പ്രതീക്ഷിക്കുന്നില്ല.

ചോദ്യാവലി പൂർത്തിയാക്കുമ്പോൾ നിങ്ങൾക്ക് ചില അസ്വസ്ഥതകളോ അസൗകര്യങ്ങളോ അനുഭവപ്പെട്ടേക്കാം, കൂടാതെ രഹസ്യസ്വഭാവം ലംഘിക്കപ്പെടാനുള്ള സാധ്യതയുമുണ്ട്. എന്നിരുന്നാലും, നിങ്ങളുടെ സ്വകാര്യത പരിരക്ഷിക്കുന്നതിന് ഞങ്ങൾ എല്ലാ മുൻകരുതലുകളും എടുക്കും.

ആനുകൂല്യങ്ങൾ

നിങ്ങൾക്ക് ഉടനടി നേരിട്ടുള്ള പ്രയോജനമൊന്നും ഉണ്ടാകില്ല, എന്നാൽ ഈ പഠനത്തിലെ നിങ്ങളുടെ പങ്കാളിത്തത്തിൽ വിനോദ ഫുട്ബോൾ പരിക്കുകളെക്കുറിച്ചുള്ള അറിവിന്റെ ശേഖരത്തിലേക്ക് സംഭാവന ചെയ്യുന്നത് ഉൾപ്പെടുന്നു, സുരക്ഷാ മാർഗ്ഗനിർദ്ദേശങ്ങളും

ഭാവിയിലേക്കുള്ള പരിക്ക് പ്രതിരോധ നടപടികളും മെച്ചപ്പെടുത്താൻ സഹായിക്കും.

രഹസ്യാത്മകത

നിങ്ങളെക്കുറിച്ചുള്ള വിവരങ്ങൾ ഞാൻ മറ്റാരോടും പങ്കിടില്ല. ഈ ഗവേഷണ സർവേ ജോലിയിൽ നിന്ന് ഞാൻ ശേഖരിക്കുന്ന വിവരങ്ങൾ സ്വകാര്യമായി സൂക്ഷിക്കും. നിങ്ങളെക്കുറിച്ചുള്ള ഏതൊരു വിവരത്തിനും നിങ്ങളുടെ പേരിന് പകരം ഒരു നമ്പർ ഉണ്ടായിരിക്കും.

ആരെ ബന്ധപ്പെടണം

നിങ്ങൾക്ക് എന്തെങ്കിലും ചോദ്യങ്ങൾ ഉണ്ടെങ്കിൽ, നിങ്ങൾക്ക് ഇപ്പോൾ അല്ലെങ്കിൽ പിന്നീട് അവരോട് ചോദിക്കാം.

നിങ്ങൾ പിന്നീട് ചോദ്യങ്ങൾ ചോദിക്കാൻ ആഗ്രഹിക്കുന്നുവെങ്കിൽ, ഇനിപ്പറയുന്നവരിൽ ആരെയെങ്കിലും നിങ്ങൾക്ക് ബന്ധപ്പെടാം.

ശ്രീനാഥ് എം.ആർ, 8547278177/sreenathmph2022@sctimst.ac.in

ശ്രീനിവാസ് ജി, മെമ്പർ സെക്രട്ടറി, ഐ ഇ സി, എസ് സി ടി ഐ എം എസ് ടി, & സയന്റിസ്റ്റ് - ജി, ബയോകെമിസ്ട്രി വകുപ്പ്, എസ് സി ടി ഐ എം എസ് ടി, (ഇമെയിൽ iec.mem.sec@sctimst.ac.in).

ANNEXURE 5 Consent form (Malayalam)

SL NO

അച്യുതമേനോൻ സെന്ററർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്,

ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്

&ടെക്നോളജി,

തിരുവനന്തപുരം, കേരളം, ഇന്ത്യ- 695011

സമ്മത പത്രം

ഞാൻ _____ ഗവേഷണ വിവര ഷീറ്റിൽ നൽകിയിട്ടുള്ള എല്ലാ വിവരങ്ങളും വായിക്കുകയും കേൾക്കുകയും മനസ്സിലാക്കുകയും ചെയ്തിട്ടുണ്ട്.

ഒപ്പിടുന്നതിലൂടെ/പെരുവിരലടയാളം ഇടുന്നതിലൂടെ, ഈ പഠനത്തിലെ എന്റെ സ്വമേധയാ ഉള്ള പങ്കാളിത്തം ഞാൻ സ്ഥിരീകരിക്കുന്നു. ഒരു വിശദീകരണവുമില്ലാതെ ഡാറ്റാ ശേഖരണ പ്രക്രിയയിൽ ഏത് സമയത്തും എനിക്ക് എന്റെ പങ്കാളിത്തം പിൻവലിക്കാൻ കഴിയുമെന്ന് ഞാൻ മനസ്സിലാക്കുന്നു, കൂടാതെ, എന്റെ ഐഡന്റിറ്റിയും വ്യക്തിഗത വിവരങ്ങളും രഹസ്യസ്വഭാവത്തോടെ സൂക്ഷിക്കുമെന്നും ഞാൻ മനസ്സിലാക്കുന്നു. കൂടുതൽ വിശദീകരണങ്ങൾക്കായി ആരെ ബന്ധപ്പെടണമെന്ന് എന്നെ അറിയിച്ചിട്ടുണ്ട്.

പങ്കാളി ഐഡി : പങ്കാളിയുടെ പേര് :

മൊബൈൽ നമ്പർ : ഒപ്പ് :

സാക്ഷിയുടെ പേര് :

ഒപ്പ്:

സ്ഥലം:

പഠനത്തെ കുറിച്ച് ചോദ്യങ്ങൾ ചോദിക്കാൻ പങ്കാളിയെ അനുവദിച്ചിട്ടുണ്ടെന്നും പങ്കാളി ചോദിച്ച എല്ലാ ചോദ്യങ്ങൾക്കും ശരിയായും എന്റെ കഴിവിന്റെ പരമാവധിയും ഉത്തരം ലഭിച്ചിട്ടുണ്ടെന്നും ഞാൻ സ്ഥിരീകരിക്കുന്നു. സമ്മതം നൽകുന്നതിന് വ്യക്തിയെ നിർബന്ധിച്ചിട്ടില്ലെന്നും സമ്മതം സ്വതന്ത്രമായും സ്വമേധയാ നൽകിയിട്ടുണ്ടെന്നും ഞാൻ സ്ഥിരീകരിക്കുന്നു

ഒപ്പ്

ഗവേഷകന്റെപേര്:

തിയതി:

ANNEXURE 6 Interview schedule (Malayalam)

തിരുവനന്തപുരം ജില്ലയിലെ വിനോദ ഫുട്ബോൾ കായികതാരങ്ങൾക്കിടയിൽ മസ്കുലോസ്കെലെറ്റൽ വൈകല്യങ്ങളുടെ വ്യാപനവും അതുമായി ബന്ധപ്പെട്ട ഘടകങ്ങളും – ഒരു ക്രോസ് സെക്ഷൻ പഠനം

ചോദ്യാവലി

Q. No.	വിഭാഗം 1: ഡെമോഗ്രാഫിക് & സോഷ്യൽ വിശദാംശങ്ങൾ		
1	പ്രായം (പൂർത്തിയായ വർഷങ്ങളിൽ)		
2	ലിംഗം	☐പുരുഷൻ ☐സ്ത്രീ ☐മറ്റുള്ളവർ	1 2 3
3	നിങ്ങളുടെ ഏറ്റവും ഉയർന്ന വിദ്യാഭ്യാസ യോഗ്യത എന്താണ്?		
4	കുടുംബ തരം	☐ന്യൂക്ലിയർ കുടുംബം (വിവാഹിതരായ രണ്ട് മാതാപിതാക്കളും അവരുടെ കുട്ടികളും ഉൾപ്പെടുന്നു) ☐കൂട്ടുകുടുംബം (നിരവധി തലമുറകൾ)	1 2
5	നിലവിലെ തൊഴിൽ	☐പ്രൊഫഷണൽ ☐സെമി പ്രൊഫഷണൽ ☐ക്ലറിക്കൽ / ഷോപ്പ് / കർഷകൻ ☐വിദഗ്ധ തൊഴിലാളി ☐അർദ്ധ വിദഗ്ധ തൊഴിലാളി ☐അവിദഗ്ധ തൊഴിലാളി	1 2 3 4 5 6 7

		☐തൊഴിൽ രഹിതൻ	
6	കുടുംബ വരുമാനം	☐ <5 ലക്ഷം പ്രതിവർഷം ☐ 5 മുതൽ 8 ലക്ഷം പ്രതിവർഷം ☐ > 8 ലക്ഷം പ്രതിവർഷം	1 2 3
7	നിങ്ങൾ പതിവായി സ്പോർട്സ് അല്ലെങ്കിൽ ശാരീരിക പ്രവർത്തനങ്ങളിൽ പങ്കെടുക്കാറുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	1 0

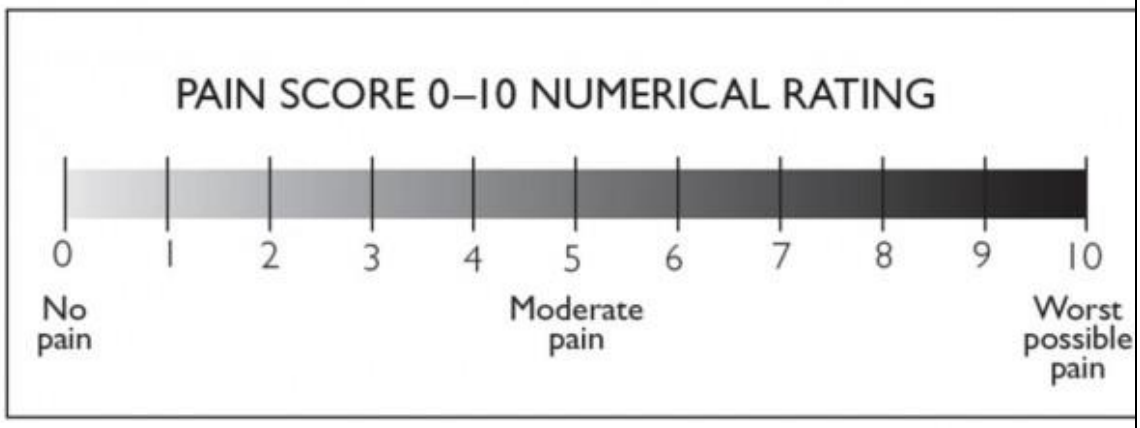
Q. No.	വിഭാഗം 2: മസ്കുലോസ്കെലെറ്റൽ ഡിസോർഡറുകളുമായി ബന്ധപ്പെട്ട ഘടകങ്ങൾ		
8	നിങ്ങൾ എത്ര കാലമായി ഫുട്ബോൾ കളിക്കുന്നു?	☐ 1–5 വർഷം ☐ 6–10 വർഷം ☐ <10 വർഷം	1 2 3
9	ഒരു ആഴ്ചയിൽ, സാധാരണ എത്ര ദിവസങ്ങളിൽ നിങ്ങൾ ഫിറ്റ്നസ് അല്ലെങ്കിൽ വിനോദ ശാരീരിക പ്രവർത്തനങ്ങൾ നടത്തുന്നു?	ദിവസങ്ങളുടെ എണ്ണം ----------	
10	ഒരു സാധാരണ ദിവസത്തിൽ ഊർജ്ജസ്വല	---- Hr:-----min	

	മായ തീവ്രതയുള്ള സ്പോർട്സ്, ഫിറ്റ്നസ് അല്ലെങ്കിൽ വിനോദ പ്രവർത്തനങ്ങൾ ചെയ്യാൻ നിങ്ങൾ എത്ര സമയം ചെലവഴിക്കുന്നു?(ഓട്ടം, ജോഗിംഗ്, എയറോബിക് വ്യായാമം, നീന്തൽ, ദുഷ്കരമായ ഭൂപ്രദേശങ്ങളിൽ കാൽനടയാത്ര തുടങ്ങിയവ)		
11	ഒരു സാധാരണ ദിവസത്തിൽ മിതമായ തീവ്രതയുള്ള സ്പോർട്സ്, ഫിറ്റ്നസ് അല്ലെങ്കിൽ വിനോദ പ്രവർത്തനങ്ങൾ ചെയ്യാൻ നിങ്ങൾ എത്ര സമയം ചെലവഴിക്കുന്നു?	---- Hr:-----min	

	(വേഗതയേറിയ നടത്തം, പൂന്തോട്ടപരി പാലനം, സൈക്കിൾ ചവിട്ടൽ (10–12 മൈൽ),		
12	നിങ്ങൾ ഒരു ദിവസം ഒന്നിലധികം കായിക ഇനങ്ങളിൽ പങ്കെടുക്കുന്നുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	1 0
13	ഉണ്ടെങ്കിൽ, എന്താണ് കളികൾ?		
13	ഉണ്ടെങ്കിൽ, ഫുട്ബോളിനായി നിങ്ങൾ എത്ര സമയം ചെലവഴിക്കുന്നു?	---- Hr:-----min	
14	ആഴ്ചയിൽ എത്ര ദിവസം നിങ്ങൾ ഫുട്ബോൾ കളിക്കുന്നു?		
15	നിങ്ങൾ സാധാരണയായി ഏത് തരം ഗ്രൗണ്ടിലാണ് ഫുട്ബോൾ കളിക്കുന്നത്	☐കൃത്രിമ ടർഫ് ☐ഉറച്ച മൈതാനം ☐രണ്ടും	1 2 3

16	നിങ്ങളുടെ പ്രിയപ്പെട്ട / ശക്തമായ ഫുട്ബോൾ സ്ഥാനം ഏതാണ്?position	☐ഗോൾകീപ്പർ ☐ഡിഫെൻഡർ ☐മിഡ്ഫീൽഡർ ☐ഫോർവേഡ് ☐മറ്റുള്ളവ, വ്യക്തമാക്കുക	1 2 3 4 5 6
17	നിങ്ങൾ എപ്പോഴെങ്കിലും മസ്കുലോസ്കെലെറ്റൽ ക്രമക്കേടുകൾ അനുഭവിച്ചിട്ടുണ്ടോ (ഉദാ. കഴിഞ്ഞ 6 മാസങ്ങളിൽ വേദന, പേശികളുടെ സ്ട്രെയിൻ, ലിഗമെന്റ് പരിക്ക് മുതലായവ ചേരുമോ?	☐ ഉണ്ട് ☐ അല്ല	1 0
ഉണ്ടെങ്കിൽ, 11 പോയിന്റ് സംഖ്യാ സ്കെയിലിൽ നിങ്ങളുടെ വേദനയെ റേറ്റുചെയ്യുക, ഒരു വേദന തീവ്രതയെ പ്രതിനിധീകരിക്കുന്ന '0' മുതൽ മറ്റൊരു വേദന തീവ്രതയെ			

പ്രതിനിധീകരിക്കുന്ന '10' വരെ



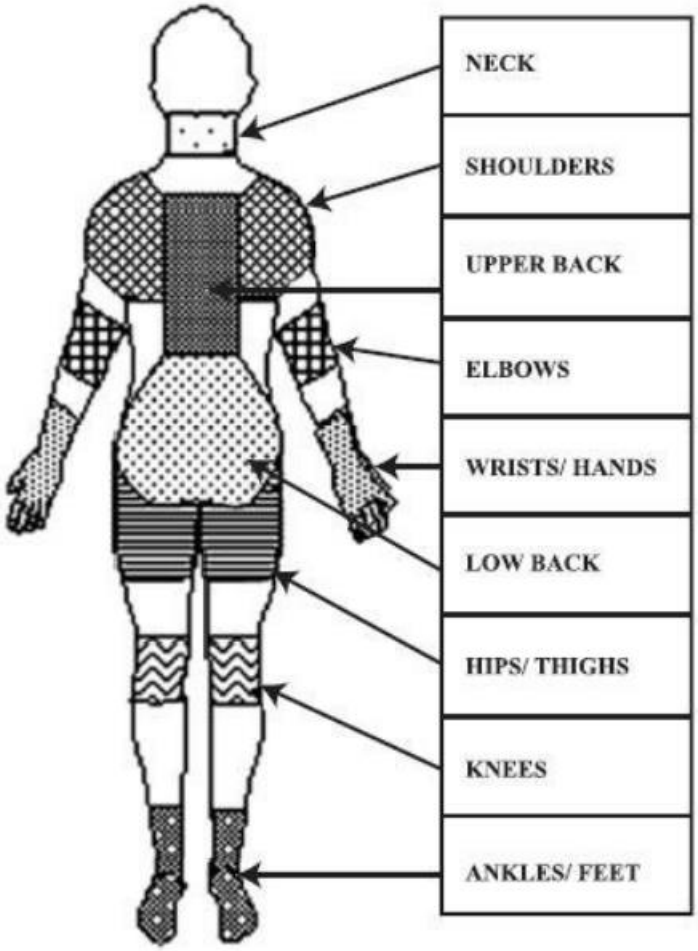
ഉണ്ടെങ്കിൽ, കഴിഞ്ഞ 2 ദിവസങ്ങളിലെ രാവിലെയും ഉച്ചയ്ക്കും വൈകുന്നേരവും പ്രവർത്തനത്തിലും വേദനയുടെ തീവ്രത റേറ്റുചെയ്യുക

ശരാശരി, നിങ്ങളുടെ വേദന എത്രമോശമാണ്?

	വേദനയില്ല									വേദന അത്രയും മോശമാണ്
കഴിഞ്ഞ 2 ദിവസമായി രാവിലെ ?	1	2	3	4	5	6	7	8	9	10
കഴിഞ്ഞ 2 ദിവസങ്ങളിൽ ഉച്ചകഴിഞ്ഞ് ?	1	2	3	4	5	6	7	8	9	10
കഴിഞ്ഞ 2 ദിവസമായി	1	2	3	4	5	6	7	8	9	10

വൈകുന്നേരങ്ങളിൽ												
കഴിഞ്ഞ 2 ദിവസത്തെ പ്രവർത്തനത്തോടെ?	1	2	3	4	5	6	7	8	9	10		
18	ഉണ്ടെങ്കിൽ, നിങ്ങൾ അനുഭവിച്ച മസ്കുലോസ്കെലെറ്റൽ ക്രമക്കേടുകളുടെ തരം വ്യക്തമാക്കുക?	☐കാൽമുട്ട് വേദനയും നീർവീക്കവും ☐കണങ്കാൽ വേദനയും നീർവീക്കവും ☐പേശി വേദന ☐നടുവേദന ☐കൂട്ടിയിടി മൂലമുള്ള വേദന (പരിക്ക്) ☐മറ്റുള്ളവർ, specify_____										1 2 3 4 5 6 7
19	വിനോദ കായിക പ്രവർത്തനങ്ങളിൽ നിങ്ങൾക്ക് മസ്കുലോസ്കെലെറ്റൽ	☐ പരിക്കേറ്റ പ്രദേശം വിശ്രമിക്കുന്നു ☐ ഐസ് അല്ലെങ്കിൽ ഹീറ്റ് തെറാപ്പി ഉപയോഗിക്കുന്നു										1 2 3 4 5

	ക്രമക്കേടുകൾ അനുഭവപ്പെടുമ്പോൾ, ഉടനടി ലഭിക്കുന്ന സഹായമോ പരിചരണമോ എന്താണ്? (ബാധകമായതെല്ലാം തിരഞ്ഞെടുക്കുക)	☐ പരിക്കേറ്റ പ്രദേശത്തിന്റെ കംപ്രഷൻ അല്ലെങ്കിൽ ഉയരം ☐കുറിപ്പടി മരുന്ന് ☐ഫിസിയോതെറാപ്പി അല്ലെങ്കിൽ പുനരധിവാസ വ്യായാമം ☐മസാജ് തെറാപ്പി ☐സജീവ വിശ്രമം ☐മറ്റുള്ളവ	6 7 8 9
20	കഴിഞ്ഞ ഒരു വർഷത്തിൽ ഈ മസ്കുലോസ്കെലെറ്റൽ ക്രമക്കേടുകൾ നിങ്ങൾക്ക് എത്ര ഇടവിട്ട് അനുഭവപ്പെട്ടിട്ടുണ്ട്?	☐അനുഭവിച്ചിട്ടില്ല ☐ഒന്നോ രണ്ടോ തവണ ☐ 10 തവണയിൽ കുറവ് ☐പ്രതിവാരം ☐ദിവസവും	0 1 2 3 4 5
വിഭാഗം 4: മാംസപേശി സംബന്ധമായ വേദനയെ കുറിച്ചുള്ള ചോദ്യങ്ങൾ			



ചോദ്യാവലിയിൽ പരാമർശിച്ചിരിക്കുന്ന ശരീരഭാഗങ്ങൾ ഈ ചിത്രം കാണിക്കുന്നു. നിങ്ങൾക്ക് ഏത് ഭാഗത്താണ് പ്രശ്നമുള്ളതെന്ന് (എന്തെങ്കിലും ഉണ്ടെങ്കിൽ) നിങ്ങൾ സ്വയം തീരുമാനിക്കണം.

കഴിഞ്ഞ 12 മാസത്തിനിടയിൽ നിങ്ങൾക്ക് എപ്പോഴെങ്കിലും പ്രശ്നങ്ങൾ (വേദന, അസ്വസ്ഥത) ഉണ്ടായിട്ടുണ്ടോ:	പ്രശ്നങ്ങൾ കാരണം കഴിഞ്ഞ 12 മാസത്തിനിടയിൽ ഏതെങ്കിലും സമയത്ത് നിങ്ങളുടെ സാധാരണ ജോലിയിൽ നിന്ന് (വീട്ടിൽ അല്ലെങ്കിൽ വീട്ടിൽ നിന്ന് പുറത്ത്) നിങ്ങളെ തടഞ്ഞിട്ടുണ്ടോ:	കഴിഞ്ഞ 7 ദിവസങ്ങളിൽ നിങ്ങൾക്ക് എപ്പോഴെങ്കിലും പ്രശ്നമുണ്ടായിട്ടു
1. കഴുത്ത് ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ

2. തോൾ ☐ ഇല്ല ☐ അതെ, വലത്തെ തോളിൽ ☐ അതെ, ഇടത്തെ തോളിൽ ☐ അതെ, രണ്ട് തോളിലും	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
3. കൈമുട്ട് ☐ ഇല്ല ☐ അതെ, വലതു കൈമുട്ടിൽ ☐ അതെ, ഇടത് കൈമുട്ടിൽ ☐ അതെ, രണ്ട് കൈമുട്ടുകളിലും	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
4. കൈത്തണ്ട / കൈകൾ ☐ ഇല്ല ☐ അതെ, വലത് കൈത്തണ്ടയിൽ ☐ അതെ, ഇടതു കൈത്തണ്ടയിൽ ☐ അതെ, രണ്ട് കൈത്തണ്ടയിലും	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
5. പിൻഭാഗം (മുകളിൽ) ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
6. നടുവ് ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		

7. ഇടുപ്പ്/തുടകൾ ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
8. കാൽമുട്ടുകൾ ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
9. കണങ്കാൽ ☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ	☐ ഇല്ല ☐ അതെ		
21	ഈ മസ്കലോസ്കെലെറ്റൽ ക്രമക്കേടുകൾക് നിങ്ങൾ വൈദ്യചികിത്സ തേടിയിട്ടുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
	ഇല്ലെങ്കിൽ Q. 29 ലേക്ക് പോകുക		
22	ഉണ്ടെങ്കിൽ ചികിത്സയുടെ തരം വ്യക്തമാക്കുക	☐അലോപ്പതി ☐ആയുഷ് ☐സ്വയം ചികിത്സ ☐ഫിസിയോതെറാപ്പി ☐മറ്റുള്ളവർ	1 2 3 4 5
23	നടത്തിയ ചികിത്സ ദയവായി		

	വ്യക്തമാക്കാമോ?		
24	നിങ്ങളുടെ സമീപകാല പരിക്കിന്റെ ചികിത്സയുമായി ബന്ധപ്പെട്ട ചെലവിന്റെ വിശദാംശങ്ങൾ നൽകുക.	ഡോക്ടറുടെ ഫീസ് ------ ആശുപത്രിയിൽ പ്രവേശിപ്പിക്കുന്ന ------ മരുന്നുകളുടെ ------ ഗതാഗത ------ ശമ്പള നഷ്ടം (പ്രതിദിനം) -----	
25	ചികിത്സയുമായി ബന്ധപ്പെട്ട ചെലവുകൾ കാരണം നിങ്ങളുടെ കുടുംബത്തിന് എന്തെങ്കിലും സാമ്പത്തിക ബുദ്ധിമുട്ടുകൾ നേരിടേണ്ടി വന്നിട്ടുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
26	നിങ്ങളുടെ സുഖം പ്രാപിക്കലിനു എടുത്ത സമയം എത്രയാണ്?	----- ദിവസങ്ങളിൽ	
27	ചികിത്സയ്ക്ക് ശേഷം എത്ര പെട്ടെന്നാണ് നിങ്ങൾ വീണ്ടും കളിക്കാൻ തുടങ്ങിയത്?	☐ഒരാഴ്ചയിൽ താഴെ ☐ ഒരാഴ്ചയിൽ കൂടുതൽ ☐ ഒരു മാസത്തിനു ശേഷം ☐ ഒരു വർഷത്തിൽ താഴെ ☐ഒരു വർഷത്തിലേറെ	1 2 3 4 5

28	ചികിത്സയ്ക്ക് ശേഷം സ്പോർട്സിനോ മറ്റേതെങ്കിലും ശാരീരിക പ്രവർത്തനങ്ങൾക്കോ മടങ്ങുന്നതിനുള്ള സുരക്ഷ നിങ്ങൾ എങ്ങനെ നിഗമനം ചെയ്തു?	☐ഹെൽത്ത് കെയർ പ്രൊഫഷണലിൽ നിന്നുള്ള മെഡിക്കൽ ഫിറ്റ്നസ് സർട്ടിഫിക്കറ്റ് ☐വ്യക്തിപരമായ വിലയിരുത്തലും ആശ്വാസവും ☐കോച്ചിൽ നിന്നോ പരിശീലകനിൽ നിന്നോ ഉള്ള മാർഗ്ഗനിർദ്ദേശം ☐മറ്റുള്ളവ(വ്യക്തമാക്കുക)	1 2 3 4
29	ഇല്ലെങ്കില് എന്തുകൊണ്ട്? ദയവായി കാരണം തിരഞ്ഞെടുക്കുക	☐ വൈദ്യസഹായത്തിന്റെ ചെലവ് ☐ ആരോഗ്യ ഇൻഷുറൻസിന്റെ അഭാവം ☐ ഗുരുതരമായ രോഗനിർണയത്തിന്റെ ഭയം ☐ പരിക്ക് വേണ്ടത്ര ഗുരുതരമല്ലെന്ന വിശ്വാസം ☐സ്പോർട്സ് മെഡിസിൻ സ്പെഷ്യലിസ്റ്റിലേക്കുള്ള പ്രവേശനത്തിന്റെ അഭാവം ☐സ്പോർട്സ് അല്ലെങ്കിൽ ശാരീരിക	1 2 3 4 5 6 7

		പ്രവർത്തനങ്ങൾ നഷ്ടപ്പെടുമെന്ന ഭയം ☐ഔദ്യോഗിക ജീവിതത്തിൽ ഹാജരില്ലാത്തത് സംബന്ധിച്ച ആശങ്കകൾ. ☐മറ്റുള്ളവ	8
30	ഫുട്ബോൾ കളിക്കുന്നതിന് മുമ്പ് നിങ്ങൾ ലളിതമായ വ്യായാമം അല്ലെങ്കിൽ സ്ട്രെച്ചിംഗ് ചെയ്യാറുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
31	ഫിസിക്കൽ കണ്ടീഷനിംഗ് അല്ലെങ്കിൽ ശക്തി പരിശീലന വ്യായാമങ്ങളിൽ നിങ്ങൾ എത്ര ഇടവിട്ട് ഏർപ്പെടുന്നു?	☐പതിവായി (ആഴ്ചയിൽ ഒന്നിലധികം തവണ) ☐ഇടയ്ക്കിടെ (ആഴ്ചയിൽ ഒരിക്കൽ) ☐അപൂർവമായി (മാസത്തിലൊരിക്കൽ) ☐ഒരിക്കലുമില്ല	1 2 3 4
32	ഫുട്ബോളിൽ കണ്ടീഷനിംഗ് / ശക്തി പരിശീലനത്തിന്റെ ഗുണങ്ങൾ എന്തൊക്കെയാണ്?		
33	നിങ്ങൾ നിലവിൽ സിഗരറ്റ്, സിഗരറ്റ്	☐ ഉണ്ട് ☐ അല്ല	0 1

	അല്ലെങ്കിൽ പൈപ്പുകൾ പോലുള്ള ഏതെങ്കിലും പുകയില ഉൽപ്പന്നങ്ങൾ വലിക്കുന്നുണ്ടോ?		
34	മുൻകാലങ്ങളിൽ, നിങ്ങൾ എപ്പോഴെങ്കിലും ഏതെങ്കിലും പുകയില ഉൽപ്പന്നങ്ങൾ പുകവലിച്ചിട്ടുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
35	കഴിഞ്ഞ 12 മാസത്തിനുള്ളിൽ നിങ്ങൾ എന്തെങ്കിലും മദ്യം കഴിച്ചിട്ടുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
36	കഴിഞ്ഞ 30 ദിവസത്തിനുള്ളിൽ നിങ്ങൾ എന്തെങ്കിലും മദ്യം കഴിച്ചിട്ടുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
37	ഒരു രാത്രിയിൽ ശരാശരി എത്ര മണിക്കൂർ ഉറക്കം ലഭിക്കുന്നു?		
38	സ്പോർട്സ് സമയത്ത് നിങ്ങൾ എത്ര	☐ഓരോ 15 മിനിറ്റിലും ☐ഓരോ 30 മിനിറ്റിലും	1 2 3

	ഇടവിട്ട് ദ്രാവകങ്ങൾ കുടിക്കുന്നു?	☐ഓരോ മണിക്കൂറും ☐ദാഹിക്കുമ്പോൾ മാത്രം ☐ഒരിക്കലുമില്ല_____	4 5
39	വിറ്റാമിനുകൾ, പ്രോട്ടീൻ, ധാതുക്കൾ, എൻസൈമുകൾ, അമിനോ ആസിഡുകൾ അല്ലെങ്കിൽ ഔഷധസസ്യങ്ങൾ പോലുള്ള ഏതെങ്കിലും പോഷക സപ്ലിമെന്റുകൾ നിങ്ങൾ ഉപയോഗിക്കുന്നുണ്ടോ?	☐ ഉണ്ട് ☐ അല്ല	0 1
40	ഫുട്ബോളിൽ പങ്കെടുക്കുമ്പോൾ നിങ്ങൾ എന്തെങ്കിലും സംരക്ഷണ ഉപകരണങ്ങൾ ഉപയോഗിക്കുന്നുണ്ടോ? ഉണ്ടെങ്കിൽ, ദയവായി ലിസ്റ്റിൽ നിന്ന് തിരഞ്ഞെടുക്കുക.	☐കയ്യുറകൾ ☐കാൽമുട്ട്, ലെഗ് പാഡ് ☐തുട, ഹിപ് പാഡുകൾ ☐ബൂട്ട്/ക്ലീറ്റസ് ☐കംപ്രഷൻ ഗിയർ ☐ഹെൽമെറ്റ് ☐ മറ്റുള്ളവ	0 1 2 3 4 5 6
41	ഇല്ലെങ്കില് എന്തുകൊണ്ട്?		

	വിഭാഗം 5: ആന്ത്രോപോമെട്രിക് അളവെടുക്കൽ (അന്വേഷകൻ)		
	പങ്കെടുക്കുന്നവരോട് പാദരക്ഷകൾ ഇല്ലാതെ ചുമരിൽ ചാരി നിൽക്കാൻ ആവശ്യപ്പെടണം, കാൽപ്പാദങ്ങൾ ഒരുമിച്ച് ചേർത്ത് കണ്ണുകൾ മുന്നോട്ട് തിരിക്കുക. ഭാരം അളക്കുന്നതിന്, പങ്കെടുക്കുന്നവരോട് പാദരക്ഷകൾ നീക്കംചെയ്യാൻ അഭ്യർത്ഥിക്കുന്നു. ഭാരം കിലോഗ്രാമിൽ രേഖപ്പെടുത്തണം. പങ്കെടുക്കുന്നവരോട് രണ്ട് കാലുകളും ചേർത്ത് ശാന്തമായ സ്ഥാനത്ത് നിവർന്ന് നിൽക്കാൻ ആവശ്യപ്പെടണം.		
	ഭാരം	_____ kg	
	ഉയരം	_____ cm	
	അരക്കെട്ടിന്റെ ചുറ്റളവ്	_____ cm	

ANNEXURE 7 Nordic table and PNRS analysis

Pain related factors and Nordic scale analysis among participants who reported MSD

Pain related variable			**N = 230**
Pain score		**N**	**%**
	Mild	44	19.1
	Medium	110	47.8
	Severe	76	33
Nordic Scale (N = 230)			
	Neck	93	40.43%
	Shoulder	97	42.17%
	Elbow	35	15.21%
	Wrist	43	18.70%
	Upper back	42	18.26%
	Lower back	130	56.52%
	Hip/Thigh	57	24.80%
	Knee	114	49.60%

Description of pain numeric rating scale

Numeric variable	**N**	**Mean**	**Median**	**Std Deviation**	**Min**	**Max**
Pain numeric scale	230	5.82	6	1.78	1	10
Morning pain in 2 days	230	2.44	2	2.667	0	9
Afternoon pain in 2 days	230	1.27	0	2.076	0	9
Evening pain in 2 days	230	1.52	0	2.242	0	9
While activity pain in 2 days	230	2.45	1	2.821	0	10

ANNEXURE 7 IEC Clearances

श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram - 695 011, Kerala, India
(An Institute of National Importance under Govt. of India)
Grams : Chitramet, Phone : +91-471-2443152, Fax : +91-471-2550728 / 2446433, E-mail : sct@sctimst.ac.in, Website : www.sctimst.ac.in

Institutional Ethics Committee

CDSCO Registration No: ECR/189/Inst/KL/2013/RR-21
DHR Registration No:EC/NEW/INST/2022/2775

SCT/IEC/2180/DECEMBER/2023 11.01.2024

Mr. Sreenath MR
MPH Student, AMCHSS
SCTIMST, Thiruvananathapuram

Dear Dr. Sreenath,

The Institutional Ethics Committee held on 30th December, 2023, reviewed and discussed your application to conduct the study titled "**PREVALENCE OF MUSCULOSKELETAL DISORDERS AND ITS FACTORS ASSOCIATED AMONG RECREATIONAL FOOTBALL ENTHUSIASTS IN TRIVANDRUM DISTRICT"" (IEC /2180)** "

Principal Investigator	Mr. Sreenath M R, MPH Student, AMCHSS, SCTIMST
Co-Principal Investigator(s)	Dr Srinivasan K, Associate Professor, AMCHSS, SCTIMST
Duration of the study	6 months, January to June 2024

The following members of the Ethics Committee were present at the meeting held on 30th December, 2023

SL. No.	Member Name	Highest Degree	Gender	Scientific /Non Scientific	Affiliation with Institution(s)
1.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
2.	Dr. Kala Kesavan P	MBBS,MD	Female	Basic Medical Scientist	No
3.	Adv. Priya Kaimal	LLM, MBL	Female	Legal Expert	No
4.	Dr. P. Manickam	BSMS, MSc (Epid).,PhD	Male	Health Science Expert/ Social Scientist	No
5.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
6.	Dr. Narayanan Namboodiri. K K	MBBS,MD,DM	Male	Clinician	Yes
7.	Dr. Biju Soman	MBBS,MD, DPH, MSc, DLSHTM	Male	Basic Medical Scientist	Yes

1

The following documents were reviewed:

Original submission

1. *Checklist Form*
2. *Covering letter addressed to the Chairman, IEC, SCTIMST dated 02.12.2023*
3. *Responses/Amendments made based on the Reviewer's comments*
4. *IEC Application Form*
5. *Declaration Form*
6. *Research Proposal*
7. *Participant Information Sheet and Consent Form in English and Malayalam*
8. *Questionnaire in English and Malayalam*
9. *Interview schedule 2 Oral Health Impact Profile (OHIP) in English and Malayalam*
10. *CV of Principal Investigator and Co-PI*
11. *SRC Recommendation Letter*

Revised submission

1. *Checklist Form*
2. *Covering letter addressed to the Chairman, IEC, SCTIMST dated 10.01.2024*
3. *Copy of IEC Recommendation letter dated 09.01.2024*
4. *Responses/Amendments made based on the Reviewer's comments*
5. *IEC Application Form*
6. *Declaration Form*
7. *Research Proposal*
8. *Participant Information Sheet and Consent Form in English and Malayalam*
9. *Questionnaire in English and Malayalam*
10. *Interview schedule 2 Oral Health Impact Profile (OHIP) in English and Malayalam*
11. *CV of Principal Investigator and Co-PI*

IEC Decision
The IEC approved the conduct of the study in the present form.

Remarks:
The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team / Guide who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,

Dr. G. Srinivas
Member Secretary, IEC

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE (IEC)
SCTIMST, THIRUVANANTHAPURAM

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
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ANNEXURE 8 Plagiarism report

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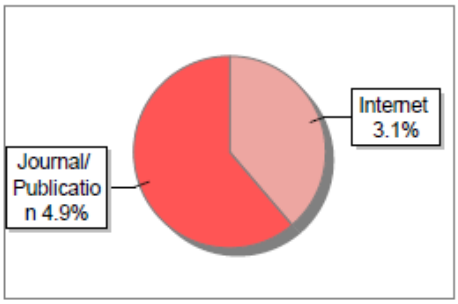

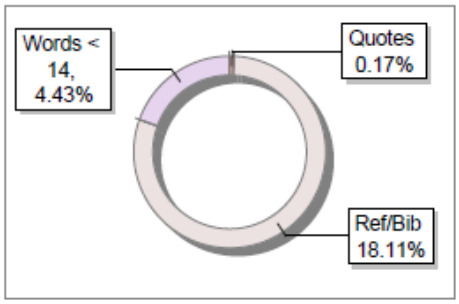

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