A STUDY TO ASSESS THE KNOWLEDGE REGARDING PREVENTION OF MUSCULOSKELETAL INJURIES DURING RUNNING AMONG MARATHON RUNNERS IN SELECTED REGIONS OF MAHARASHTRA IN VIEW TO DEVELOP THE INFORMATION BOOKLET

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ABSTRACT

Background: *Health and fitness as an invention presently drive India's metropolitan market. Publics are now prepared to expend a rational quantity of their money going to the gym, health devices such as Fit bit and much more. Running actions or we can say Marathon events are now a day's more and more popular in India, especially in Metropolitan cities. Marathons and also difficult races like the Devil Circuit and iron man races are a huge success in India. The number of professional athletes in India who trained year-round to participate in marathons is increasing at a rate of three times a year. Running is a popular activity among the many professionals and the general public due to its health advantages as well as its practicality and low cost.*

Objectives

This research carried out by researcher with following objectives:-

1. *To assess the existing knowledge of marathon runners regarding prevention of musculoskeletal injuries during marathon.*
2. *To find out association between knowledge and demographic variables.*
3. *To find out the risk factors of musculoskeletal injury.*
4. *To develop and validate the information booklet for marathon runners.*

Methodology: *This study utilized a non-experimental research design with a descriptive survey approach to assess the knowledge and attitude of middle-aged individuals regarding Peripheral Vascular Disease (PVD)**.** The researcher also examined the association between knowledge scores and demographic variables using a structured questionnaire. The study utilized a structured tool to assess demographic variables, health habits, and knowledge about marathons. The tool was designed with three sections, including multiple-choice questions to evaluate knowledge levels, which were categorized into poor, average, good, and excellent based on a total score of 60.*

Major Findings of the Study: *This study highlights a significant association between knowledge of musculoskeletal injury prevention in marathon running and various demographic and lifestyle factors. The majority (59.00%) of participants demonstrated good knowledge, with 22.50% having excellent knowledge, 18.00% having average knowledge, and only 0.50% showing poor knowledge. demographic variables such as age, education, diet, and BMI were significantly associated with knowledge scores, while gender, occupation, and type of work did not show a significant relationship. Additionally, lifestyle factors, including exercise habits, previous marathon participation, training engagement, and dietary patterns**,** also had a strong correlation with knowledge levels. Since the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted, it can be concluded that knowledge about preventing musculoskeletal injuries in marathon running is significantly influenced by selected demographic characteristics and health-related behaviors*

Conclusion: *The study concludes that the knowledge level among marathon participants regarding the prevention of running-related musculoskeletal injuries is insufficient to effectively prevent injuries.*

Several gaps in awareness have been identified, highlighting the need for targeted education and training.

Key worlds: *BMI:-* Body mass index, WHO:- World health Organization. ECG:- Electrocardiogram

Introduction: Endurance running is an effective way to improve stamina, promote cardiovascular health, and lower cholesterol**,** making it a popular activity worldwide for both recreational and competitive purposes. The increasing participation in fun runs, marathons, and fundraising events—especially in affluent countries—highlights its growing appeal. In India, 65% of runs are 10K or shorter**,** emphasizing the dominance of shorter races. Despite its benefits**,** running-related injuries and health risks should not be overlooked. Common issues include musculoskeletal injuries**,** gastrointestinal disturbances**,** electrolyte imbalances**,** and **c**ardiac concerns**.** The repetitive impact of running places strain on bones and muscles, leading to conditions like leg cramps, knee injuries, and muscle spasms**.** Additionally, long-distance running can trigger GI distress (nausea, vomiting, diarrhea), cardiovascular complications, and even sudden cardiac events in predisposed individuals. One of the significant risks associated with marathon running is hyponatremia**,** which results from electrolyte imbalances and can cause dizziness, unconsciousness, cerebral and pulmonary edema, or even death**.** Moreover, exercise-induced renal impairment is another serious consequence, ranging from minor kidney function changes to acute renal failure**.** While running has undeniable health advantages, it is crucial to prioritize proper training, hydration, and injury prevention strategies**.** Awareness and education about potential risks can help runners make informed decisions, reduce injury rates, and ensure a safer and more sustainable running experience.

REVIEW OF LITERATURE:

Bojana Galic et al.(2021) The global running landscape has seen significant growth over the past decade, with a 50% increase in race participation across various distances, including 5K, 10K, half-marathons, marathons, and ultramarathons**.** However, recent years have witnessed a decline in participation due to chronic diseases and other lifestyle factors**,** though running remains a popular and accessible fitness activity worldwide. Different countries have emerged as leaders in specific race distances. Ireland has the highest percentage of race participants relative to its population**,** while the Philippines, South Africa, and the United States excel in 5K races**.** Denmark and Norway have the largest number of 10K runners, whereas France and the Czech Republic dominate half-marathon participation**.** Switzerland is home to the fastest marathon runners**,** and South Africa leads in ultramarathon speed**.** Additionally**,** Finland boasts the highest female participation in trail running, with 43% of its runners being women**.** These trends indicate a growing interest in endurance sports worldwide**,** despite certain health challenges associated with running. With its numerous physical and mental health benefits, running continues to be a widely practiced sport that promotes fitness, competition, and community engagement**.**

Hsu C. L et al.(2020), The study on Taroko Gorge Marathon runners from 2013 to 2018 provides valuable insights into the prevalence of muscle injuries and associated risk factors in marathon running. A total of 718 runners who visited the physiotherapy station provided medical records and injury data for statistical analysis. The findings indicate that the most commonly injured areas among runners after the marathon were knees (28%), calves (20%), thighs (13%), ankles (10%), and feet (8%)**.** Additionally, the study identified key risk factors influencing injury rates. Male runners had a higher risk of hamstring injuries than female runners. Furthermore, underweight athletes were significantly more prone to hamstring injuries (OR = 3.35, p = 0.006). The results highlight a notable increase in knee, calf, thigh, and foot injuries in the canyon marathon setting. These findings can serve as a valuable resource for medical professionals, trainers, and runners to develop preventive strategies aimed at reducing injury risks in marathon participation. Understanding these risks can help runners improve their training methods, enhance physical preparedness, and adopt injury prevention measures for safer marathon experiences.

METHODOLOGY: This study utilized a Non-Experimental - Descriptive Survey Design with a Quantitative Research Approach to assess knowledge and risk factors among marathon participants. The research population comprised clients who have participated in marathons**,** specifically targeting those from a Metropolitan City. The accessible population included individuals who had participated or were planning to participate in marathons and were available during the study period, meeting the inclusion criteria. A total of 400 samples were selected using power analysis**.** Data collection was conducted using a demographic data tool and a structured questionnaire designed by the researcher. The findings of this study provide critical insights into marathon-related knowledge, injury risks, and demographic influences**,** contributing to improved training and prevention strategies for runners.

Sampling: The subjects of this study comprised individuals who had participated in or intended to enroll in the Maharashtra State Marathon and were present during data collection. Participants were selected based on specific inclusion and exclusion criteria and their willingness to take part in the study.

Inclusion Criteria:

- Clients who are willing to participate in the marathon race.
- Clients who are willing to participate in research study.
- Clients who are present during data collection.
- Clients who are mentally and physically fit.
- Clients with all age group and gender.

Data Collection Procedure:

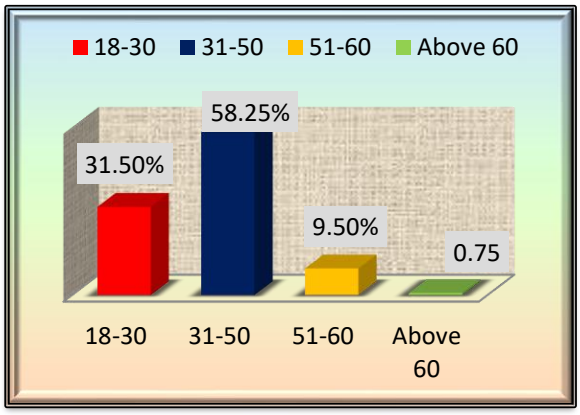
- The researcher approached the various marathon organizer before a main study to obtain permission to conduct the study and collect the data from various group of the marathon.

- Before the study, necessary electronic consent forms were filled up by the subjects. Period of data collection
- The researcher introduced self to the participants, then gave a brief explanation of the study's objectives, and informed the participants that the information they provided would be kept private.
- The researcher used a variety of strategies to choose the study samples for the research before settling on the non-probability handy sampling strategy.
- On an average, total 500 samples were included in the study and Google link was prepared by the researcher which include all the knowledge based questions.

DATA ANALYSIS & INTERPRETATION

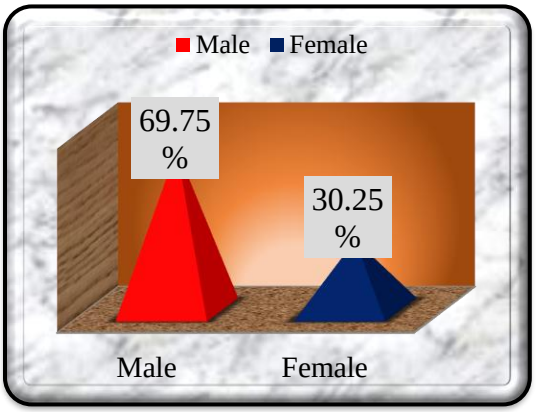
The collected data was tabulated, organized and analysed by using descriptive and inferential statistics.

➢ **Section I: Demographic Data of Respondent**



This study found that the majority of marathon participants (58.25%) were aged 31-50 years**,** with participation declining after 60 years due to musculoskeletal issues**.** Aging leads to reduced muscle strength, flexibility, and shock absorption**,** increasing injury risks. Older runners experience higher impact forces, limited knee movement, and reduced dorsiflexion**.** These insights emphasize the need for age-specific training and injury prevention strategies for sustained marathon participation.

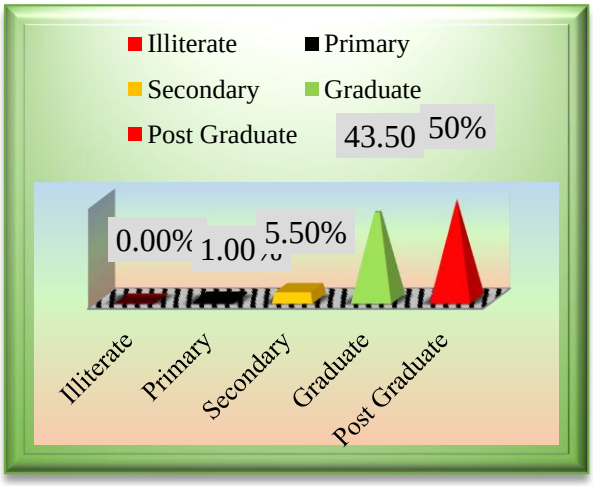
Section II: Question related Health Habits and general information regarding marathon



This study found that male participants (69.75%) outnumbered female participants (30.25%)**,** indicating a higher interest in marathon running among men in India. However, the gender gap is gradually closing as more women overcome societal challenges and engage in running through women-

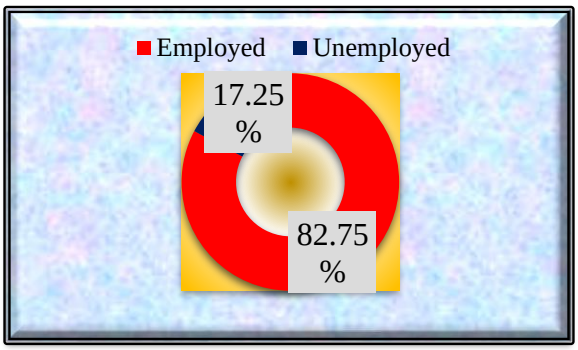
only groups and growing athletic networks. This trend highlights positive progress toward greater female participation in marathons.

Section III: Assessment of knowledge score regarding marathon



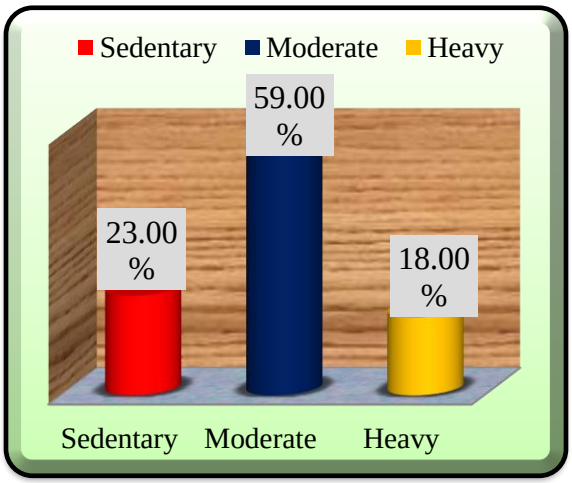
This study found that marathon participation is higher among educated individuals, with 50% holding a postgraduate degree or higher, followed by graduates (43.5%), secondary education (5%), and primary education (1%). This suggests that marathons are more popular among literate individuals, while awareness remains low in rural areas. Additionally, many participants view marathon running as a symbol of social status.

Section IV: Association between knowledge and demographic variables

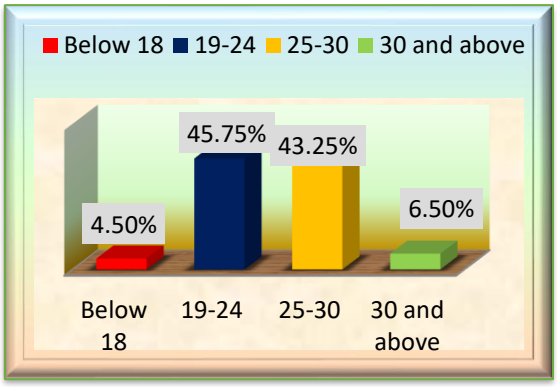


The figures in the above table and figure reveal that, majority (82.75%) samples were employed and only (17.25%) were unemployed. People will continue participate in marathons even if the cost of entry increases since they are very inelastic. Before the event ever takes place, the expenses of staging a marathon from licenses to advertising costs take months.

Section V: Find out the risk factors of musculoskeletal injury



Section VI: Develop and validate the information booklet for marathon runners and Assessment of risk factors of musculoskeletal injury



This study found that 45.75% of participants had a BMI between 19-24, followed by 43.25% with a BMI of 25-30, 6.5% with a BMI above 30, and 4.5% below 18. Obesity is a global epidemic, increasing the risk of musculoskeletal injuries in marathon runners. Higher BMI individuals require additional training to complete a marathon successfully. BMI serves as a key performance indicator, highlighting the importance of maintaining an optimal weight for endurance running.

Below the Distribution of the samples according to running interest

This study found that the majority of participants (63.5%) run for fitness and fun**,** while fewer participants run for other reasons. 7% run for recreational and social purposes**,** 6.5% for multiple reasons including fitness, socializing, and multisport**,** and 4% for multisport alone**.** A smaller percentage run for performance improvement (3%) or awards (3.75%)**.** These findings indicate that most marathon participants prioritize fitness and enjoyment over competition**.**

Conclusion:

This study found that 59% of participants had good knowledge about marathons, 22.5% had excellent knowledge**,** 18% had average knowledge**,** and 0.5% had poor knowledge**.** Key risk factors for musculoskeletal injuries in marathon runners include age, gender, diet, BMI, and ill habits**.** With age, calcium levels decline (hypocalcemia) and muscle strength weakens**,** increasing the risk of injury**.** These findings highlight the need for awareness and preventive strategies to reduce injury risks in marathon runners.

Recommendations:

- A large sample can be used for a comparable research.
- A comparative study can undertake to evaluate the knowledge level associated with prevention of musculoskeletal injuries among marathon runners of selected districts of Maharashtra.
- A comparative study can be conducted between varies district or group of marathon runners.
- A study can be conducted at various setting.
- A study can be carry out to assess the effectiveness of information booklet over the knowledge of participants.

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