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## Prevalence of musculoskeletal pain among elite and recreational runners of South Gujarat: A cross sectional study

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### Abstract

**Background:** In last two decades, running has been increased steadily even in India as a result; total events held in 2013 was 176 and which has increased to 700 by 2016. Various factors have been already identified for running related musculoskeletal injuries. As the athlete does not always recognize symptoms as an injury, significant number of recreational runners might unknowingly be suffering an overuse injury while still participating.

**Aim and Objective:** To find the prevalence of musculoskeletal pain in recreational runners & its possible correction with age, BMI, weekly running distance, running experience and training surface.

**Materials and Methods:** Self-reported questionnaire was used in present cross-sectional observational study. Demographic data, running and pain related data were collected from 134 recreational runners participating in two different running events held in south Gujarat from January to February 2018.

**Results:** Present study found 19.40% prevalence of musculoskeletal pain among runners of south Gujarat being 19.44% and 19.23% in male and female respectively. Highest prevalence of musculoskeletal pain was found at knee joint irrespective of gender. No correlation was found with prevalence and running parameters except weekly running distance.

**Conclusion:** Musculoskeletal pain is common in recreational runners of South Gujarat with the prevalence of 19.40% with knee joint being the most common site of pain among all the runners.

**Clinical Implementation:** It is possible that individual is not aware about their overuse injury. Hence, it's a role of a physiotherapist to provide education and preventive strategies for the same.

**Keywords:** Recreational runners, musculoskeletal pain, prevalence, correlation

### Introduction

“Don’t dream of winning, train for it”- well quoted by Mohamed Farah who earned Olympic gold medals in the 5,000 and 10,000 meter races, and repeated that double victory at 2013 world championships. In last two decades running has been increased steadily even in India as a result; total events held in 2013 was 176 and which has increased to 700 by 2016. As per ACSM’s (American Collage Sports Medicine) guidelines for fitness; running has been considered as one of the most common form of exercise, thus, running is getting widely popular for general health benefits. (India running association)<sup>[1]</sup>.

Various factors have been enlisted for running injuries in recreational runners. These factors can be categorized as risk factors for overuse injuries and further categorized as intrinsic/extrinsic and modifiable/non-modifiable. Intrinsic factors are those contained within a person, including sex, race, bone structure, bone density, muscle length, muscle strength, joint range of motion, diet, and body composition. Extrinsic factors are those outside of a person, including training volume (frequency, duration, and intensity), types of conditioning activities, specific sport activities, training surface, shoes, and environmental conditions. Modifiable risk factors are those factors that can be altered by prevention strategies. Non modifiable risk factors cannot be changed but may be useful in identifying and monitoring at risk individuals<sup>[2, 3]</sup>. Few studies have reported common injuries related to recreational running are overuse or gradual onset injuries, i.e., injuries caused by repeated micro-trauma without a single, identifiable event (Bahr 2009, Tonoli *et al.* 2010)<sup>[4, 6]</sup>. The majority of the studies cited above have identified these injuries with a definition related to time lost from sporting activity.

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However, most overuse injuries do not result in cessation of participation in sports (Lopes *et al.* 2009, Tscholl *et al.* 2008) [5, 8]. Recent research has indicated the importance of describing overuse injuries in terms of pain and reduced performance (Bahr 2009) [4]. As the athlete does not always recognize symptoms as an injury, significant number of recreational runners might unknowingly be suffering an overuse injury while still participating (Lopes *et al.* 2009) [5].

## Methods

350 Recreational runners who participated in Valsad City Half Marathon held on 7th January, 2018 and those who participated in Run for New India, Surat marathon held on 25th February were included in the study. Both male and female recreational runners of age 18 or above with running experience of at least 6 months were included. Exclusion criteria were any congenital deformities and any history of trauma or surgeries in last one year. The data was taken by means of self-reported Questionnaire prepared by chief investigator for the screening of musculoskeletal pain prevalence.

## Procedure

A cross-sectional survey was conducted with recreational runners preparing to compete in 10 km running events. In total, approximately 350 recreational runners were invited to participate in the present study, out of 350 participants, 134 participants fulfilled all the inclusion and exclusion criteria and are ready to participate in the study. The study was conducted from December 2017 to February 2018.

For the purpose of data collection, two races were selected taking place in south Gujarat in 2018. For the participants recruitment, members of the research team were stationed where runners came to pick up their race packets one day prior to proceeding of the event.

Registered runners were invited to participate in the study and if interested to complete the informed consent processes. Risk factors data were collected from each participant through self-reported questionnaire. The questionnaire included demographic data of participants (Age, height, weight, BMI, Gender) and training parameters (years of running experience, weekly running distance type of training surface and training sessions). In addition, those runners reported current running related musculoskeletal pain were asked to describe the location of symptoms with a body chart and to rate intensity of their pain using a (Numerical Pain Rating Scale) from 0 (No pain) to 10 (most severe pain). This procedure of data collection took approximately 7-8 minutes.

Prior to data collection, usability of the initial self-reported

questionnaire was assessed using five recreational runners. These individuals completed the questionnaire and participated in a focus group to obtain information on ease of survey completion, question -clarity and question routing. Based on the individual's feedback, minor changes were made in the questionnaire.

Statistical analysis was carried out using SPSS Version 22.0 software. Pearson correlation coefficient test was used to find the correlation between prevalence of musculoskeletal pain with age, gender BMI, weekly running distance, frequency of training, (year) running experience and type to find its possible of training surface.

Confidence interval was set at 95% and any value, 0.05 was considered as significant and, 0.001 as highly significant.

## Results

As per inclusion and exclusion criteria and individual's willingness, a total of 134 recreational runners had participated in the study with the mean age of  $33.88 \pm 11.55$  years, mean height of  $171.88 \pm 7.51$  cm, mean weight of  $67.53 \pm 12.60$  kg and mean Body Mass Index (BMI)  $22.93 \pm 3.66$  kg/m<sup>2</sup>.

**Prevalence of musculoskeletal pain in recreational runners:**  
In the present cross-sectional observational study, prevalence of musculoskeletal pain was assessed through a self-reported questionnaire. Out of 134 recreational runners, 26 had complained of musculoskeletal pain which makes 19.40% of prevalence. As per gender also prevalence was calculated and analysis showed that there was no significant difference in terms of prevalence of musculoskeletal pain in male (19.44%) and female (19.23%) respectively.

Out of 26 symptomatic recreational runners, 2 reported pains after running, 19 reported that pain doesn't affect distance & speed, 2 reported pain affected distance & speed and 3 reported due to pain they have stop running.

**Running Parameters** All participants were analyzed for the running parameters (year of running experience, total running distance per week, no of training session per week and type of training surface). Data analysis showed that year of running experience was more in female ( $4.04 \pm 3.4$ ) than male ( $3.96 \pm 4.12$ ), total running distance per week was higher in male ( $38.86 \pm 31.76$ ) than female ( $34.30 \pm 21.17$ ), no. of training session per week was showing non-significant difference between male and female participants, ( $4.66 \pm 1.92$ ) and ( $4.92 \pm 2.41$ ) respectively. **Location of musculoskeletal pain:** Various location/site of pain have been reported by participants and listed in Table 1. The knee was most commonly reported location of musculoskeletal pain followed by shin pain, calf pain, foot pain, ankle pain, heel pain and Low Back Pain (LBP).

**Table 1:** Illustrate Percentage (%) of the location of the pain reported by all the participants and as per gender

Location of pain	Participants of Recreational Runner (n=134)	Male Recreational Runner (n=108)	Female Recreational Runner (n=26)
Knee	10	8	2
Low back pain	2	2	1
Ankle	2	1	1
Foot	4	3	1
Calf	4	4	0
Shin	4	3	1
Heel	3	2	1

## Correlation of musculoskeletal pain prevalence with Age, BMI, Weekly running distance and year of running experience

There was no correlation of musculoskeletal pain prevalence

with Age, BMI and years of running experience. Whereas there was some positive correlation found with Weekly running distance.

## Discussion

This present study was conducted to find the prevalence of musculoskeletal pain in recreational runners and its correlation between prevalence of musculoskeletal pain with age, BMI, weekly running distance and type of training surface.

This cross-sectional survey revealed that approximately one in five recreational runners is experiencing pain while running which makes a 19.40% prevalence of musculoskeletal pain. The finding of this study is similar to the study done by Alexandre Dias Lopes *et al.* in 2011 [8] with Brazil recreational runners. In addition to this, we have also calculated prevalence of musculoskeletal pain as per gender. Alexandre Dias Lopes *et al.* found higher prevalence in female (27%) than male (20%) with a possible reason of longer running experience, higher running distance per week, and higher body mass index. In our cross-sectional study, the prevalence is 19.44% in male and 19.23% in female which could be because of higher differences in reason of longer running experience, higher running distance per week, and higher body mass index [8].

Fredericson *et al.* (2017) [15]. and Alexandre Dias Lopes *et al.* (2011) [8] found knee as one of the most common site of pain in recreational runners which is similar to our results. For the present study, the median pain intensity of 2 points on a 0–10 numerical rating scale represents mild pain. These outcomes suggest chronic musculoskeletal conditions with mild pain intensity, which is typical of overuse injuries. Although these findings can be considered a concern for clinicians and sports-related professionals, the consequences for amateur athletes of participating in training sessions and races despite their pain is unknown as this research question remains poorly investigated. Therefore, prospective cohort studies recruiting a representative sample of runners in order to determine the consequences of our findings are needed urgently [8, 15].

Present study was carried out with secondary objective of finding a correlation between age, BMI, weekly running distance and running experience. There was no correlation of prevalence of musculoskeletal pain with age, BMI and running experience; but a positive correlation with weekly running distance between recreational runners. Any runner executes around 50 to 70 strides per minute and each ground contact generates loads ranging from 3 to 8 times the total body weight through the lower limbs (Macera *et al.* 1989) [16]. Hence, this could be the possible reason behind the positive correlation of prevalence and weekly running distance [16].

Out of 26 recreational runners with musculoskeletal pain; 19 found to had a training on asphalt surface; for training on grass, treadmill and clay, number of individuals are 2, 3 and 2 respectively.

Individual recreational runners with musculoskeletal pain were further investigated with Blazina scale to find the severity of their pain on running performance. Out of 26 recreational runners; 3 experience pain after running, 19 stated that pain doesn't affect distance and speed of running, 2 complained that pain affects distance and speed of running and lastly 2 had to stop running due to pain. So with relation to the results of the present study, recreational runners need to be educated regarding risk factors associated with running and preventive strategies.

The limitation of the study was that all information was collected from the respondents through self-report questionnaires, with no clinical assessment being performed

and smaller sample size was another drawback. So further study with elite runners could be done to assess and compare the prevalence and its correlation with age, gender, BMI and running parameters.

## Conclusion

The prevalence of musculoskeletal pain in recreational runners was 19.40% when surveyed in south Gujarat. It is possible that individual is not aware about their overuse injury, Hence, it's the role of a physiotherapist to provide education and preventive strategies for the same.

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