

<a>Does Running Increase the Risk for Hip and Knee Arthritis?: A Survey of 3,804 Chicago Marathon Runners

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INTRODUCTION:

Long-distance running is a popular form of cardiovascular exercise with many well-described health benefits, from improving heart health to the management of obesity, diabetes, and mental illness. The impact of long-distance running on joint health in recreational runners however remains inconclusive. The goal of this project was to examine the cumulative effect of long-distance running over a lifetime and the presence of hip and knee osteoarthritis.

METHODS:

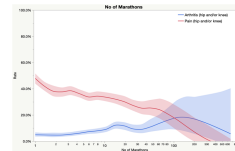
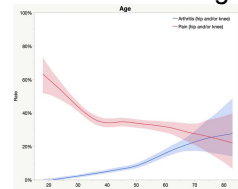
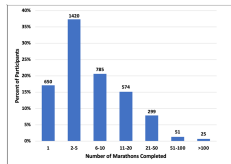
A survey was distributed to all participants registered for the 2019 or 2021 Chicago marathon (n=37,917). Surveys collected runner demographics and assessed for hip/knee pain, osteoarthritis, family history, surgical history, and running-related history. Running history included the number of marathons run, number of years running, average running pace, and average weekly mileage. The overall prevalence of osteoarthritis was identified, and a multivariable logistic regression model was used to identify variables associated with the presence of hip and/or knee osteoarthritis.

RESULTS:

Surveys were completed by 3,804 participants. The mean age was 43.9 (range, 18-83) and participants completed on average 9.5 marathons (median 5, range, 1-664), ran an average of 27.9 miles per week (median 25, range 0-180), and had been running for a mean of 14.7 years (range, 1-67) (Table 1, Figure 1). Hip and/or knee pain over the prior year was reported by 36.4% (n=1,383) of participants and the prevalence of hip and/or knee arthritis was 7.3% (n=277). A history of hip/knee injuries or surgery, advancing age (Figure 2), family history, and BMI were risk factors for arthritis (Table 2). Cumulative number of years running, number of marathons completed (Figure 3), weekly mileage, and mean running pace were not significant predictors for arthritis (Table 2). The majority (94.2%) of runners planned to run another marathon, despite 24.2% of all participants being recommended by a physician to reduce their running volume or stop running all together.

DISCUSSION AND CONCLUSION:

From this largest surveyed group of marathon runners, the most significant risk factors for developing hip or knee arthritis were age, BMI, previous injury or surgery, and family history. There was no identified association between cumulative running history and the risk for arthritis. Healthcare providers should consider these results before advising their patients reduce or eliminate running as a form of exercise to reduce arthritic risk.



Characteristic	All Runners (n=3804)	No Pain (n=2421)	With Pain (n=1383)
Age (mean)	43.9	43.8	44.0
Female (%)	85.2	85.1	85.3
White (%)	78.5	78.3	78.7
Black (%)	12.1	12.0	12.2
Hispanic (%)	6.8	6.7	6.9
Other (%)	3.8	3.7	3.9
Marathons completed (mean)	9.5	9.4	9.6
Years running (mean)	14.7	14.6	14.8
Weekly mileage (mean)	27.9	27.8	28.0
Running pace (min/mile)	18:30	18:35	18:25
Family history of arthritis (%)	15.2	14.8	15.6
History of hip/knee surgery (%)	8.5	8.2	8.8
History of hip/knee injury (%)	12.3	12.0	12.6
Participation in other sports (%)	25.1	24.9	25.3
Weekly mileage per mile	18.5	18.4	18.6
Duration of running per year	10.2	10.1	10.3
Physician recommendation to stop/reduce running (%)	24.2	23.8	24.6

Characteristic	OR (95% CI)	p-value
Age	1.02 (1.01, 1.03)	<0.001
Female	0.98 (0.95, 1.01)	0.15
White	1.01 (0.99, 1.03)	0.32
Black	1.05 (1.01, 1.09)	0.002
Hispanic	1.02 (0.98, 1.06)	0.21
Other	0.99 (0.94, 1.04)	0.68
Marathons completed	1.00 (0.99, 1.01)	0.85
Years running	1.00 (0.99, 1.01)	0.92
Weekly mileage	1.00 (0.99, 1.01)	0.98
Running pace	1.00 (0.99, 1.01)	0.95
Family history of arthritis	1.15 (1.08, 1.22)	<0.001
History of hip/knee surgery	1.35 (1.25, 1.45)	<0.001
History of hip/knee injury	1.25 (1.15, 1.35)	<0.001
Participation in other sports	0.99 (0.98, 1.00)	0.08
Weekly mileage per mile	1.00 (0.99, 1.01)	0.92
Duration of running per year	1.00 (0.99, 1.01)	0.95
Physician recommendation to stop/reduce running	1.15 (1.08, 1.22)	<0.001