International Journal of Physical Education, Exercise and Sports
www.physicaleducationjournal.com
ISSN: 2664-9896
Received: 19-09-2026, Accepted: 19-10-2026, Published: 03-11-2026
Volume 8, Issue 4, 2026, Page No. 53-55

Prevalence of musculoskeletal injuries among virtual fitness users: A survey study

Pushpak Santosh Chavhan[1], Sibi Joseph[2]
[1] TMV's Lokmanya Tilak College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India
[2] Professor and HOD, TMV's Lokmanya Tilak College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India
DOI: https://doi.org/10.66856/ijpees.2026.8.4.8077

Abstract
Background: Many people who go to the gym now follow unsupervised workouts from fitness apps or online videos instead of working with trainer .Without a trainer to correct posture and technique, these exercisers may be at higher risk of musculoskeletal symptoms among gym going adults who follow unsupervised, screen based exercise.
Method: The cross sectional survey was done in gyms in Navi Mumbai. A total of 162 adults aged 18 to 45 years were selected by convenience sampling. All of them had been following unsupervised exercise programs from fitness apps or online videos for at least 3 months. People with recent fractures, surgeries or neurological disorders were excluded. Data were collected by face to face interviews using a data collection sheet and the Nordic Musculoskeletal Questionnaire (NMQ). Pain intensity was measured with the Numeric Pain Rating Scale (NPRS). Data were analysed using IBM SPSS Statistics version 27.
Result: The mean age of participants was 27.17 ± 5.99 years, 64.8% were male. Musculoskeletal symptoms in last 12 months were reported by 51.2% (83 to 162) of participants, and in the last 7 days by 23.5% (38 of 162). The most commonly affected body regions were the shoulder (25.9%), lower back (16.7%), knee (6.8%), elbows (6.2%). The mean NPRS score was 1.08 ± 2.03for all participants with symptoms in the last 7 days , the mean score was 4.6 , and pain was moderate (score 4 to 6) in 78.9% of them .A diagnosed musculoskeletal deformity is reported by 1.9% , recent trauma by 8.0% , and medicine use by 6.2% of participants.
Conclusion: About half of the virtual of the virtual fitness users had musculoskeletal symptoms in last year, mainly shoulder, lower back and knees, and the pain was moderate. Trainers and physiotherapists should give a special attention to shoulder and lower back technique, and should advise proper warm up, cool down, regular posture and checks and some supervised sessions.

Keywords: Musculoskeletal symptoms, virtual fitness, screen based exercise, Nordic Musculoskeletal Questionnaire, prevalence, shoulder pain, low back pain

Introduction

Exercise habits have changed in recent years. Many people now use fitness apps, online sessions, videos and virtual reality to exercise, as an alternative or addition to traditional workouts. These options are easy to reach and convenient. Virtual exercise programs have been shown to improve health outcomes such as blood pressure, body mass index and waist circumference in working adults. A person's digital lifestyle also affects whether they choose to use fitness apps. Computer workers who followed an online workplace exercise program reported a good perception of their quality of life, and office workers found immersive virtual reality exercise acceptable and enjoyable. A virtual-run program also helped university employees keep up regular running and walking, and live online group training has been explored even in older adults.

Virtual exercise is not the same as supervised exercise. A systematic review found that virtual reality programs improved flexibility and motivation, but traditional exercise remained better for strength, endurance and heart and lung fitness. In a study of young healthy men, only the group that trained with a live instructor showed clear heart health improvements, while those who followed a recorded video or a written program did not. Other studies have looked at strength training done at home with online guidance and at virtual reality training in healthy older adults. These findings suggest that having a trainer is important.

Many gym members also follow workout plans from apps or online videos without a trainer. When no one checks posture, technique and equipment use, small mistakes may build up over time and lead to pain or injury. However, most earlier studies looked at health benefits, fitness or motivation. They did not measure musculoskeletal pain or injury. To the best of our knowledge, no data are available on musculoskeletal symptoms among gym-going adults who follow unsupervised app-based or video-based exercise. This study was done to fill this gap. Its aim was to find the prevalence of musculoskeletal symptoms among virtual fitness users using the Nordic Musculoskeletal Questionnaire (NMQ).

Methods

Study design and setting

This was a cross-sectional survey done in gyms in Navi Mumbai. Data were collected between [write start date] and [write end date].

Participants

A total of 162 adults were selected by convenience sampling. In this study, virtual fitness users were defined as people who follow exercise programs from fitness apps or online videos without a trainer.

Inclusion Criteria:

- Adults aged 18 to 45 years.
- Gym members who had been following unsupervised, screen-based exercise programs for at least 3 months.
- Willing to give informed consent.

Exclusion criteria:

- People with recent fractures, recent surgery or diagnosed neurological disorders.
- Sedentary people or beginners with less than 3 months of exercise.

Ethics

The study was approved by the Institutional Ethics Committee of TMV's Lokmanya Tilak College of Physiotherapy, Kharghar [add approval number or date]. Permission was also taken from the gym authorities. The purpose and procedure of the study were explained in simple language, and written informed consent was taken from every participant.

Outcome measures

1. **Nordic Musculoskeletal Questionnaire (NMQ):** This questionnaire records pain, ache or discomfort in different body regions during the last 12 months and the last 7 days. It is widely used to screen musculoskeletal symptoms [11].
2. **Numeric Pain Rating Scale (NPRS):** This was used to record pain intensity, where 0 means no pain and 10 means the worst pain.

Procedure

Eligible participants were approached in person in the gyms. Each participant was interviewed face to face using a data collection sheet and the NMQ. The interview took about 10 to 15 minutes. Details such as age, gender, height, weight, BMI, exercise history, current medicine use, diagnosed musculoskeletal deformity and recent trauma were recorded. Information was also collected about the type of workout, how often and how long participants exercised, and the body regions affected.

Statistical analysis

Data were analysed using IBM SPSS Statistics version 27. Results were shown as frequencies, percentages, means and standard deviations.

Results

Participant Details

A total of 162 participants were included. The mean age was 27.17 ± 5.99 years (range 18 to 45 years). Most participants were in their twenties. Of the 162 participants, 105 (64.8%) were male and 57 (35.2%) were female. A diagnosed musculoskeletal deformity was reported by 3 participants (1.9%), recent trauma by 13 (8.0%), and current medicine use by 10 (6.2%).

Prevalence of Symptoms

Musculoskeletal symptoms during the last 12 months were reported by 83 participants (51.2%), and 79 participants (48.8%) reported no symptoms. Symptoms during the last 7 days were reported by 38 participants (23.5%), and 124 participants (76.5%) reported no symptoms.

Table 1: Distribution of musculoskeletal symptoms by body region (N = 162)

Body Part	Frequency (%)
Shoulder	42 (25.9%)
Lower back	27 (16.7%)
Knees	11 (6.8%)
Elbow	10 (6.2%)
Neck	3 (1.9%)
Wrist or hand	2 (1.2%)
Ankle or foot	2 (1.2%)
Hip or thigh	1 (0.6%)

Note: Participants could report more than one body region. Percentages were calculated out of 162 participants.

The shoulder and lower back were the most commonly affected regions. The hip or thigh was the least affected.

Pain intensity

The mean NPRS score of all 162 participants was 1.08 ± 2.03 (range 0 to 7). This mean was low because 124 participants (76.5%) had a score of 0. Among the 38 participants who had symptoms in the last 7 days, the mean NPRS score was 4.6.

Table 2: NPRS scores among participants with symptoms in the last 7 days (n = 38)

Pain Severity	Participants (%)
Mild pain (score 1–3)	6 (15.8%)
Moderate pain (score 4–6)	30 (78.9%)
Severe pain (score 7 or more)	2 (5.3%)
Total	38 (100%)

Discussion

This study found that about half of the gym-going adults who followed unsupervised app-based or video-based exercise had musculoskeletal symptoms in the last 12 months (51.2%), and nearly one in four (23.5%) had symptoms in the last 7 days. The shoulder (25.9%) and lower back (16.7%) were the most affected regions, followed by the knees (6.8%) and elbow (6.2%). Among those with symptoms in the last week, most reported moderate pain, with a mean NPRS score of 4.6.

Earlier studies on virtual and app-based exercise mostly looked at health benefits, quality of life, flexibility or motivation [1, 5, 7]. We did not find any study that measured musculoskeletal symptoms in this group, so our results cannot be compared directly with earlier data. This study may be an early step in this area.

One possible reason for these symptoms is the lack of a trainer. A study showed that people who trained with a live instructor had better results than those who followed a recorded video or a written program [8]. When no one is present to correct posture and technique, small errors may build up over time and cause strain. The shoulder and lower back are used in many common strength and bodyweight exercises, so these regions may be more at risk. However, we did not observe exercise technique, so this is only a possible explanation. Other reasons are also possible. Some of the pain may be normal muscle soreness after exercise. Some participants may have had old injuries or other health problems that were not caused by their workouts.

It was expected that more participants would report symptoms over 12 months than over 7 days, because a

longer period allows more episodes to be remembered. This pattern is common in studies that use the Nordic questionnaire [11]. Only a few participants had a diagnosed deformity or used medicine, which suggests that most symptoms were not linked to a known long-term condition.

These findings have practical value. Trainers and physiotherapists who guide virtual fitness users should pay special attention to shoulder and lower back technique.

Proper warm-up and cool-down, regular posture checks and occasional supervised sessions may help prevent symptoms from getting worse. Since most participants had moderate pain, early advice and education may be useful.

This study has some limitations. The study was cross-sectional, so it cannot prove that unsupervised exercise caused the symptoms. There was no comparison group of people exercising under supervision, so we cannot say whether these symptoms are more or less common than in supervised exercisers. The data depended on the participants' memory, so recall bias is possible. Exercise technique was not directly checked. Convenience sampling was used, some gym owners did not allow the study, and some people refused to take part because they did not want to share personal information. The sample was taken from gyms in one city and most participants were male, so the results should not be applied to all populations, such as older adults, adolescents or people who exercise only at home.

Future studies should compare supervised and unsupervised exercisers, include more women and people from different places, and use direct methods such as posture or movement analysis to check exercise technique.

Conclusion

It can be concluded that significant number of virtual fitness users experience musculoskeletal injuries primarily in the shoulder , low back and knees 25.9%,16.7% and 6.8% respectively.

The study also found that 51.2% of participants reported musculoskeletal symptoms during previous 12 months, while 23.5% reported symptoms during previous 7 days.

References

1. Oginni J, Otinwa G, Gao Z. Physical impact of traditional and virtual physical exercise programs on health outcomes among corporate employees. Journal of Clinical Medicine,2024:13(3):694.
2. García-Fernández J, Gálvez-Ruiz P, Grimaldi-Puyana M, Angosto S, Fernández-Gavira J, Bohórquez MR. The promotion of physical activity from digital services: Influence of e-lifestyles on intention to use fitness apps. International Journal of Environmental Research and Public Health,2020:17(18):6839.
3. Moreira S, Criado MB, Ferreira MS, Machado J, Gonçalves C, Clemente FM, et al. Positive effects of an online workplace exercise intervention during the COVID-19 pandemic on quality of life perception in computer workers: a quasi-experimental study design. International journal of environmental research and public health,2022:19(5):3142.
4. Hajder Đ, Bjelica B, Bubanj S, Aksović N, Marković M, Arsenijević R, et al. A Systematic Review and Meta-Analysis of Virtual and Traditional Physical Activity Programs: Effects on Physical, Health, and Cognitive Outcomes. In Healthcare,2025:24(13):7-11.
5. Rappelt L, Held S, Leicht M, Wicker P, Donath L. Similar strength gains at lower perceived efforts via cluster set vs. traditional home-based online training: a 6 weeks randomized controlled trial. Frontiers in Sports and Active Living,2022:4:968258.
6. Touloudi E, Hassandra M, Galanis E, Goudas M, Theodorakis Y. Applicability of an immersive virtual reality exercise training system for office workers during working hours. Sports,2022:10(7):104.
7. Daveri M, Fusco A, Cortis C, Mascherini G. Effectiveness of Different Modalities of Remote Online Training in Young Healthy Males. Sports,2022:10:170.
8. Liu M, Zhou K, Chen Y, Zhou L, Bao D, Zhou J. Is virtual reality training more effective than traditional physical training on balance and functional mobility in healthy older adults? A systematic review and meta-analysis. Frontiers in Human Neuroscience,2022:16:843481.
9. Schwartz H, Har-Nir I, Wenhoda T, Halperin I. Staying physically active during the COVID-19 quarantine: exploring the feasibility of live, online, group training sessions among older adults. Translational behavioral medicine,2021:11(2):314-22.
10. Wattanapisit A, Amaek W, Promma W, Srirug P, Cheangsan U, Khwanchum S, et al. Effects of a workplace-based virtual-Run intervention among university employees. International Journal of Environmental Research and Public Health,2020:17(8):2745.
11. Choi WJ, Sung NJ, Kang YJ, Han SH. Validity of NIOSH-and Nordic-style questionnaires in the screening and surveillance of neck and upper extremity work related musculoskeletal disorders. Annals of Occupational and Environmental Medicine,2008:20(3):205-14.