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Prevalence of lateral epicondylitis among housewives in Lahore: a cross-sectional study

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Abstract

Background Lateral epicondylitis (LE) is characterized by pain, inflammation and local tenderness over the bony prominence of the lateral epicondyle and is exacerbated under stressful and repetitive movements such as prolonged supination and pronation movements, twisting (wringing, turning) and rolling activities (stirring and mixing). Lateral Epicondylitis ranks as the second most commonly diagnosed musculoskeletal condition. Females, especially housewives, are more affected by LE. It can lead to persistent elbow pain, reduced grip strength, limited arm movement, and difficulty performing daily tasks.

Results All of our 150 participants were women aged 25–50 + years. We found that 86% of housewives reported some level of pain (mild, moderate and severe) according to the PRTEE questionnaire but 39.33% (59/150) showed positive lateral epicondylitis cases assessed physically by special test (Cozen, Mills, Maudsley's test). Among the individuals diagnosed with lateral epicondylitis, a significant majority, 71.19% (42 out of 59), reported pain in their right arm while only 16.95% were experiencing pain in their left arm, however, 11.86% (7 out of 59) reported pain in both arms. The odds ratio estimates of age groups suggested that the 25–30 years group had higher odds of getting LE about 0.95 than the reference group. Among the individuals with lateral epicondylitis, 59.32% (35 out of 59) were experiencing chronic pain, while 40.67% (24 out of 59) were dealing with acute pain. 54.24% (32/59) of individuals with lateral epicondylitis experienced functional disability in specific activities, while 28.81% (17/59) reported functional disability in routine activities.

Conclusion We found a high prevalence of 39.33% lateral epicondylitis among housewives. There is a dire need to raise awareness among housewives for changing their lifestyle and activities regimen in order to avoid any such disorders like L.E. Robust studies with larger sample sizes are needed to establish conclusive evidence.

Keywords Cross-sectional study, Epicondylitis, Tennis elbow, Elbow pain, Repetitive stress

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Background

Lateral epicondylitis, which is also known as tennis elbow and lateral epicondylalgia, is an unpleasant painful condition caused by repetitive strain on the forearm extensor tendons, leading to pain and tenderness on the outer elbow [1]. Lateral epicondylitis (LE) is a quite prevalent condition affecting 1.6–23.1% of workers who engage in repetitive upper-limb activities. The prevalence of tennis elbow in tennis players ranges from 40 to 50%, although it is less common in general and only affects 1.3% of the population [2, 3].

Carpenters, teachers, housewives, shopkeepers, cooks, and painters are at risk of LE. Lack of rest, repetitive wrist and elbow movements, high handgrip force activities, vibrating tools, heavy lifting, diabetes, soft tissue diseases, and psychological factors like depression can increase the risk of tennis elbow [4]. Gripping activities exacerbate pain and significantly impair grip strength in individuals with lateral epicondylitis (LE). Research indicates that LE patients exhibit not only reduced maximal grip force but also a delayed rate of force development (RFD) during gripping tasks. This impaired RFD may hinder the ability to rapidly generate the requisite grip forces needed for activities of daily living. The combination of decreased grip strength and delayed RFD likely increases the risk of recurrent LE symptoms and adversely impacts overall functional performance [5, 6]. In housewives, it is mostly due to their work routine, which includes frequent pronation or supination movements, repetitive stress, workload, and pin-rolling activities. Washing clothes, dough making (as wheat tortillas are a staple food in Pakistan), sewing, cooking and baby care are also major causes of lateral epicondylitis due to the involvement of strenuous body movements. Moreover, housewives in Pakistan perform almost all the daily chores of the family which can make them indulge in various above-listed activities for long hours in their daily routine [7]. As compared to Western countries Pakistani housewives regardless of less job pressure are performing various activities at their houses [8].

Despite the high prevalence of lateral epicondylitis in the general population, there is limited research on its occurrence among housewives, particularly in the Pakistani context. A study conducted in Karachi, Pakistan, found that housewives are commonly affected by repetitive stress injuries, including lateral epicondylitis and showed 46% of housewives suffered from LE. Another study in a tertiary care center in Nepal reported on the diagnosis and management patterns of lateral epicondylitis, resulting in 31% of housewives diagnosed with LE highlighting the need for further research in this area [3].

Limited evidence backs a single effective treatment for LE patients. LE treatments range from NSAIDs, physiotherapy, corticosteroids, PRP, operative treatment, Mulligan and Cyriax techniques, and non-pharmacological options such as lifestyle changes, elbow bands, heating therapy etc [3, 8, 9]. Only 30% of all patients with LE refer to physiotherapy [10]. Physical therapy is essential for treating lateral epicondylitis in individuals who use their elbow, wrist, or hand extensively. It aids in muscle healing, and pain reduction, and enhances recovery for those with tennis elbow [1–3, 8, 9].

There was plenty of literature on pathology, risk factors, prevalence, and treatment, but there was little on tennis elbow awareness and prevalence in housewives. If it persists, it can significantly affect their daily activities. The continuous pain, limited arm mobility, and difficulty in performing tasks can lead to decreased quality of life. It may hinder work, household chores, and recreational activities, impacting overall well-being [11]. Timely treatment and proper management strategies are crucial to alleviate symptoms and prevent further complications. Persistent lateral epicondylitis can not only cause physical discomfort but also emotional distress due to the limitations it imposes on daily life [12].

This cross-sectional study will contribute to enriching the limited pool of data we have in Lahore, Pakistan concerning the prevalence of lateral epicondylitis in housewives.

Methods

Study design and setting

The sample size was determined using *Epitool* with a 95% confidence interval, resulting in a calculated sample size of 329. However, convenient sampling was employed to collect the 150 responses. Participants were selected from 3 different location i.e. *Kamahan*, and *Chungi Amar Saddu*, *Thokar* in Lahore, Pakistan. All participants were admitted only after signing an informed consent form linked to the questionnaire. In addition to the questionnaire, specialized physical tests, including Cozen's and Mill's tests, were performed to confirm diagnoses of lateral epicondylitis (LE). Furthermore, 5 participants, already diagnosed by physicians, provided their data online by completing the questionnaire. This comprehensive approach ensured ethical compliance and accurate data collection regarding participants' health conditions.

This study was approved by the Ethical Review Board of Government College University Faisalabad vide letter no. 41-2022 dated 25-02-2022.

Data measurement and variable

The Patient-Rated Tennis Elbow Evaluation (PTREE) questionnaire used for the evaluation of tennis elbow comprises 15 questions: the first five concerning the pain in the elbow, and the remaining 10 questions concerning the function of the elbow. The survey was filled out in person by reaching out to the housewives, and 5

were shared online using Google Forms (via WhatsApp) to gather maximum responses. The patient consent form and questionnaire are presented in Supplementary files.

Participants selection criteria

Inclusion criteria

- Only those housewives were selected who were aged 25–50+.
- Housewives experiencing lateral epicondylitis for less than 6 months were included.
- Housewives whose routine included a minimum working of 6 h or above.
- Only those women were selected who were involved only in household chores and not in any sports or work.
- The responses were gathered from March 2022 to August 2022.

Exclusion criteria

- Women less than 25 years and above 50 years of age were excluded to reduce health variables in older individuals. The high activity levels of younger housewives offer valuable insights for preventive strategies. Women aged 50 and above may decrease household activity due to retirement or physical changes, impacting their engagement compared to younger peers.
- Women suffering from elbow fractures, rheumatoid arthritis, cubital tunnel syndrome (CBTS), thoracic outlet syndrome, or a history of corticosteroid use were excluded.

Statistical methods

Data analysis was conducted using IBM SPSS Statistics version 25 and RStudio version 2024.04.0+735. Descriptive statistics such as percentages were calculated for age, hand dominance, pain duration, and pain in the arm (left, right, or both). Odds ratio was determined between various age groups to check the vulnerability to LE. Pearson's chi-square test was applied to determine the prevalence of tennis elbow among housewives. Correlation analysis was performed to check the relationship between various factors i.e., functional disability, pain duration, and pain ratings etc. A significance level of $p<0.05$ was considered statistically significant in the analysis.

Results

Participant demographics

This study involved 150 housewives aged 25–50+. On the basis of age, the participants were divided into 5 groups as illustrated in Table 1. The data reveals that the highest percentage of participants falls within the age range of 25–30, accounting for 36%, followed by the 45–50 age group at 22.6%. In contrast, the participation rates are lower in other age groups, with 30-35-year-olds making up 14%, 35-40-year-olds at 14.6%, and only 12% from the 40–45 age group in the entire population. Among the LE positive participants odds ratios were calculated for the groups while keeping the age group 40–45 years as a reference. The odds ratio suggested that the first group 25–30 years old was more likely to get the disease as it presented an odds ratio of 0.95 while the second group 30–35 years showed an odds ratio of 0.24 apprehending that this group has 74% lesser odds of getting LE (Table 1).

Outcomes

Prevalence of pain among housewives with lateral epicondylitis

We found that the majority of housewives participating in this study had pain in their right elbow 48% (72 out of 150). While 20% (30 of 150) housewives experienced pain in the left elbow, and only 26% (29 of 150) had pain in both elbows. This data highlights the high prevalence of right elbow pain among housewives with lateral epicondylitis (Fig. 1). However, the overall prevalence of Lateral epicondylitis in the housewives of Pakistan was estimated to be 39.33% (59/150), among these 71.19% (42/59) reported that they experienced pain in their right arm while 16.95% of the LE-positive population experienced pain in their left arm and only 11.86% (7/59) were experiencing pain in both of their arms.

Table 1 Demographic characteristic of participants along their odds ratio at a confidence interval of 95% with considering *p*-value < 0.05 as significant

Variable	Years	Frequency (N)	Percentage	LE positive cases Frequency (N)	Positive Percentage	Odds ratio	CI 95%	*p*-value
Age	25–30	55	36%	16	29.09%	0.95	0.26-3.0	0.91
	30–35	21	14%	13	61.90%	0.83	0.58–0.95	0.03
	35–40	22	14.6%	7	31.81	0.83	0.19–3.34	0.78
	40–45	18	12%	5	27.78%	Ref	Re	Ref
	45–50+	34	22.6%	18	52.94%	0.35	0.09–1.18	0.08
Gender	Female	150	100%					

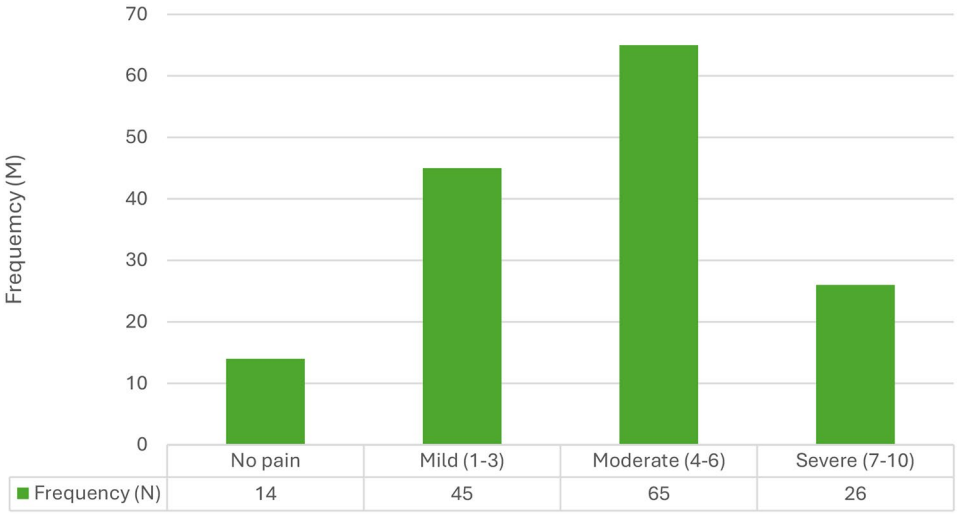

Fig. 1 Severity of self-reported pain assessed through PRTEE

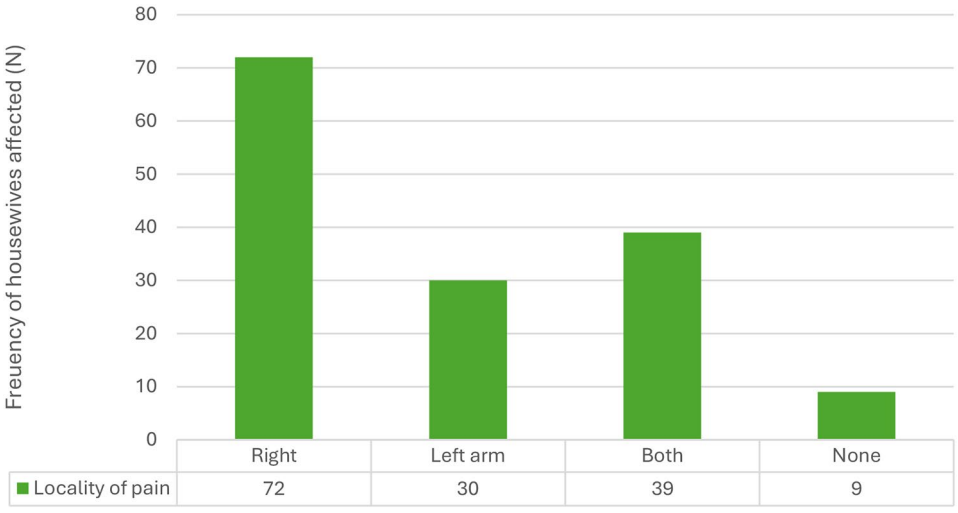

Fig. 2 Locality of lateral epicondylitis pain among housewives

Severity of lateral epicondylitis pain among housewives

We found that about 43% (65 of 150) housewives reported moderate pain, 30% (45 of 150) experienced mild pain, while 17.3% (26 of 150) reported severe pain, and only 14 pain-free. This data sheds light on the pain experiences of housewives, with a notable portion facing moderate pain levels (Fig. 2).

Most of the people found positive for lateral epicondylitis were right-hand dominant (righty) constituting a population of 89.83% (53/59) while 10.17% (6/59) were left-hand dominant (lefty). However, the percentage of total and positive participants presented that 54.54% (6/11) left-hand dominant participants were positive for LE while 38.13% (53/139) right-hand dominant participants were LE-positive.

According to the criteria set for the classification of acute and chronic pain, 59.32% (35/59) participants who were positive for LE were suffering from chronic pain (above 3 months) while 40.67% (24/59) LE-positive participants were suffering from acute pain (15 days or less than 3 month).

Functional disability with specific and usual activities

We found a high prevalence of pain and functional disability experienced by housewives in various activities like turning doorknobs, carrying bags, and more. We found that 30.7% (46 of 150) individuals faced challenges in specific tasks, 26% (39 of 150) encountered difficulties in usual activities, while 43.3% (65 of 150) reported no issues (Fig. 3).

Among the participants suffering from LE 54.24% (32/59) people were suffering from functional disability in specific activities including opening a doorknob, wringing out the washed clothes, pulling up their pants

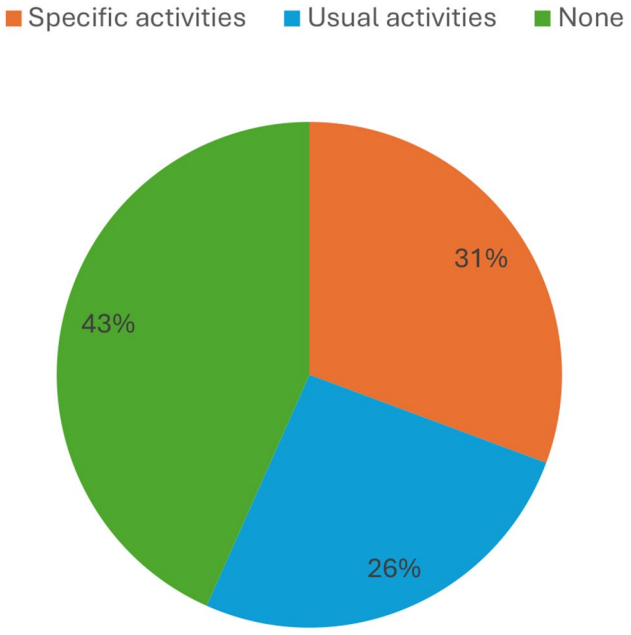

Fig. 3 Functional disability with specific and usual activities

etc., while 28.81% (17/59) of people reported functional disability in routine activities, however, 16.95% (10/59) people faced no functional disability in routine or specific tasks. The functional disability presented a weak positive correlation with pain rating, household work, carrying goods, lifting grocery bags, and usual activities while a highly non-significant negative correlation was exhibited by doorknob opening, lifting a coffee cup, jar opening, pulling up pants, normal working, and recreational activities. The pain rating shows a significantly weak positive correlation with all the activities except pulling up pants (Fig. 4).

Discussion

This study aimed to investigate the prevalence of lateral epicondylitis (LE) among housewives in Lahore, revealing a significant prevalence rate of 39.33%. This finding is particularly noteworthy, as it highlights the substantial burden of this condition within this demographic. Previous studies have reported varying prevalence rates, with some indicating that lateral epicondylitis affects approximately 1–3% of the general population and it affects 40–50% of tennis players [4]. The high prevalence

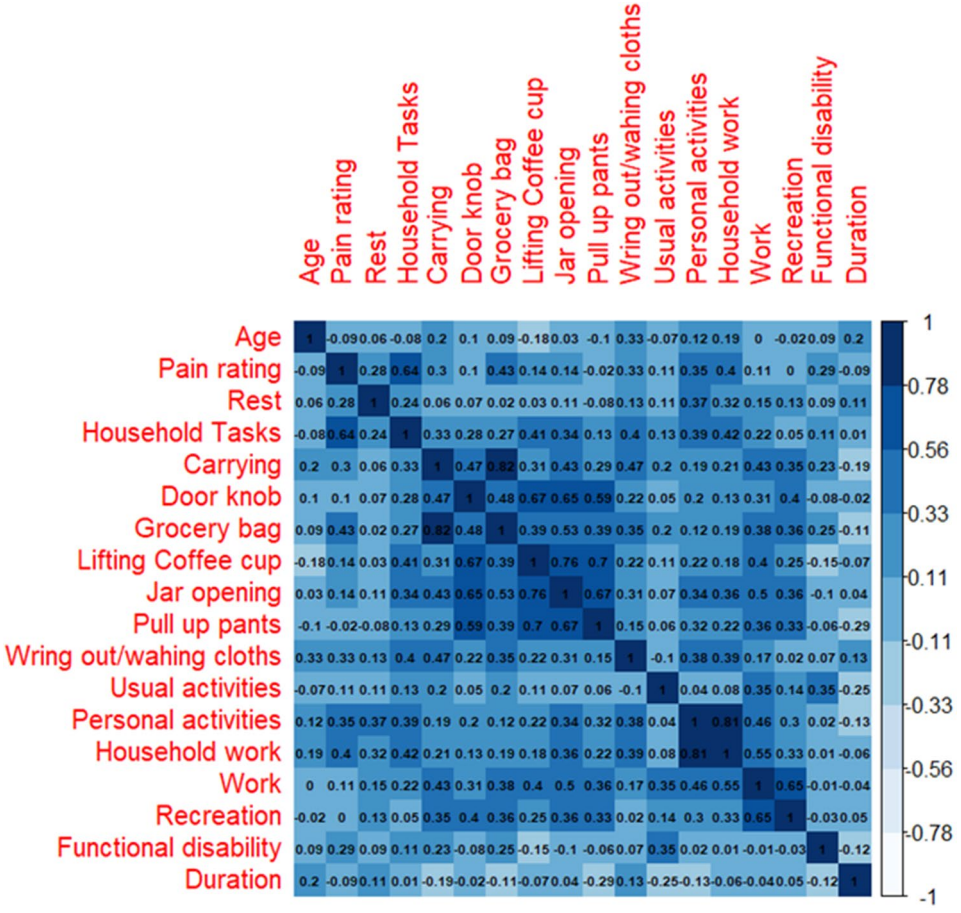

Fig. 4 Correlation graph showing the relationship among different activities, pain ratings, duration of pain, and functional disability

observed in our study suggests that housewives, who often engage in repetitive tasks, are at increased risk for developing LE. Moreover, a study conducted in Dhaka reported a prevalence of 31% among housewives, further supporting the notion that this population is at increased risk for developing LE due to their engagement in repetitive tasks [3].

This finding is consistent with the previous cross-sectional study which was conducted for the determination of most common repetitive stress injuries among housewives in Karachi which reported that tennis elbow is the major RSI that the housewife faces [1, 11].

Another study presented similar results to our study in which two groups were included. One of the men and the other of women. Incidence rates (IR) and rate ratios (RR) among various demographic groups were determined using multivariate Poisson regression. There were 2.98 and 0.82 cases of lateral and medial epicondylitis per 1,000 people per year, respectively. It was noticed that females were at great risk of getting lateral epicondylitis but not medial epicondylitis [13].

In our research, we found that the highest percentage of participants with lateral epicondylitis (LE) fell within the 25–30 age range (36%), followed by the 45–50 age group (22.6%). Participation rates were notably lower in the other age groups, with 30–35 years at 14%, 35–40 years at 14.6%, and 40–45 years at 12%. These findings are consistent with a cross-sectional study of Bazancir & Firat (2019) that explored the sociodemographic and clinical profiles of patients with lateral epicondylitis, which utilized the Patient-Rated Tennis Elbow Evaluation (PRTEE) questionnaire. In that study, the majority of participants were aged 20–40 years, indicating a similar trend of increased prevalence among younger individuals experiencing LE. The study found that all participants had positive results for lateral epicondylitis (LE), with common symptoms like pain, swelling (13.3%), increased joint temperature (8.3%), and tenderness (95%). The correlation between age and LE prevalence indicated that younger housewives may be more affected due to the repetitive nature of their daily tasks, potentially leading to the development of this condition [14].

In our study, the research findings align with a previous study conducted on work-related risk factors of lateral epicondylitis (LE) among chefs in Lahore. The data showed that LE is more prevalent in the dominant hand compared to the non-dominant hand. Our study revealed that 89.83% of individuals diagnosed with LE were right-hand dominant, consistent with the fact that 93% of participants in our study were right-handed. However, among the LE-positive participants, the ratio of LE was higher in left-hand dominant people which can be a limitation of the study as only 11 participants included in this study were left-handed. This highlights a correlation between the dominant hand and the occurrence of lateral epicondylitis. Additionally, the study's consistency is notable as the nature of chef work, predominantly associated with kitchen activities, is also common among housewives who engage in extensive kitchen work and other household chores [15].

The collected data from our study reveals that approximately 43% (65 out of 150) of housewives reported moderate pain, while 30% (45 out of 150) encountered mild pain. Furthermore, 17.3% (26 out of 150) reported severe pain, with only 14 individuals being pain-free. Similarly, among the LE-positive participants, 57.63% (34/59) were suffering from moderate pain, and 27.12% (16/59) were suffering from severe pain. While only 15.25% (9/54) were suffering from mild pain. These findings provide insight into the pain levels experienced by housewives, with a significant proportion facing moderate pain. This study's results are consistent with a study conducted in Nepal on the diagnosis and management of lateral epicondylitis, which also indicated a higher number of cases with moderate pain levels [3].

In the current study, it was observed that 54.24% (32 out of 59) of individuals with lateral epicondylitis (LE) encountered functional disability in specific activities like opening doorknobs, wringing out washed clothes, and pulling up pants. Additionally, 28.81% (17/59) of participants reported functional disability in routine activities, while 16.95% (10/59) did not face any functional disability in either routine or specific tasks. Additionally, it was noted that 59.32% (35/59) of individuals diagnosed with lateral epicondylitis (LE) exhibited chronic pain persisting for over 3 months, while 40.67% (24/59) of LE-positive participants reported acute pain lasting between 15 days and 3 months. These results lie in contrast with the previous study's data, indicating a distribution of 70% acute and 30% chronic pain cases although Dhaka shares many common social and cultural aspects with Pakistan where housewives have to undergo many activities [16].

The cause of tennis elbow is somehow clear with a multi-factorial nature and develops secondary to functional and structural malalignment of the elbow joint. It has been documented that a degenerative process is the underlying cause of the condition of LE, not inflammation. Nirschl and Pettrone pathologically demonstrated that LE is a chronic enthesopathy triggered by repetitive small injuries at the ECRB's origin [17]. Moreover, in cadaveric studies, it was observed that degeneration at the origin of the Extensor Carpi Radialis Brevis (ECRB) worsens with age. This finding suggests a possible explanation for the higher prevalence of Lateral Epicondylitis (tennis elbow) in middle-aged and elderly individuals compared to younger populations. This also aligns with our present study according to which the age group of 25–30 years is more likely to get the disease.

Management of tennis elbow is somehow clear with the multiple therapeutic effects but still challenging in some patients [18].

Limitations

The current investigation faced certain limitations. Firstly, it employed a cross-sectional design, which may not yield definitive insights into causal relationships. Secondly, although the diagnosis of lateral epicondylitis (LE) was based on a Patient-Rated Tennis Elbow Evaluation (PRTEE), other physiological and radiological assessments were omitted. Furthermore, the study did not explore the impact of workload on LE. Our results were limited by the age range of 25–50+years; different age groups may show varying tennis elbow pain patterns.

Conclusion

We found that a significant portion (86%) of participants reported some level of pain using the PRTEE questionnaire, with 17% experiencing severe pain. These findings suggest a high prevalence of lateral epicondylitis 39.33% among housewives in Lahore. Moreover, the study analysis presented that the dominant hand is more prone to developing LE, which is suggestive of the fact that strenuous movement and activity can be a cause of developing the disease. Keeping in view the status of lateral epicondylitis in housewives of Pakistan there is a need to raise awareness among them for changing their lifestyle and working routine. Moreover, lack of exercise and nutritional status may also have a significant impact on the aggravation of LE. However, that is the area which needs special undermining. Further research with larger sample sizes is required.

Abbreviations

PRTEE	Patient rated tennis elbow evaluation
TE	Tennis elbow
LE	Lateral epicondylitis
RSI	Repetitive stress injuries
CT	Computed tomography
MRI	Magnetic resonance imaging
ECRB	Extensor carpi radialis brevis
TENS	Transcutaneous electrical nerve stimulation
NSAID	Non-steroidal anti-inflammatory drug
ME	Medial epicondylitis

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12891-024-07889-x.

Supplementary Material 1

Supplementary Material 2

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Author contributions

H.A: Conceptualization, Data curation, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing. S.A: Data curation, Formal analysis, Writing – original draft, Writing – review & editing. M.N.S: Writing – original draft, Writing – review & editing. M.S.S: Formal analysis, Writing-original draft.

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Data availability

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Declarations

Ethics approval and consent to participate

The study protocol was approved by the Ethical Review Board of Govt. College University Faisalabad, Pakistan. The study was conducted in accordance with the principles of the Declaration of Helsinki. A written consent form was signed by each participant (Supplementary files).

Consent for publication

A written informed consent was obtained from each patient for publication of the data.

Guarantor

H.A.

Competing interests

The authors declare no competing interests.

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