Journal of Ergonomics
ISSN: 2165-7556

Samagh et al., J Ergonomics 2016, 6:3
DOI: 10.4172/2165-7556.1000169

Research Article Open Access

Lateral Epicondylitis: Impact on Demographic Variables

Pradeepika Samagh[1]*, Kavita Sudhakar[2] and Rohit Jindal[3]

[1]Department of Orthopedics, Mother Teresa Saket college of Physiotherapy, Panchkula, Chandi Mandir, Haryana, India
[2]Mother Teresa Saket college of Physiotherapy, Panchkula, Panchkula, Chandi Mandir, Haryana, India
[3]Government Medical College and Hospital, Chandigarh, India

Abstract

Background: Lateral epicondylitis is a repetitive trauma disorder which is caused due to over-use or over-stress of the wrist extensors of the forearm. The primarily complaint of the patient is that he suffers from pain and decreased function which affects the basic activities in daily life. The present study was conducted to assess the impact of Lateral epicondylitis on different demographic variables.

Methods: A total of 52 diagnosed cases of Lateral epicondylitis of elbow who fulfilled the inclusion and exclusion criteria were taken and included in the study. A detailed assessment of the patients was done which included the demographic and examination variables measurement.

Results: Unpaired t test was used to measure the difference in variable of two groups and Karl Pearson's correlation coefficient was used to determine the correlation between two entities. All of the subjects were in fourth and fifth decade of life with 96.15% subjects had the dominant side affected. There were 31 females (59.6%) and 21 males (40.4%) in the study signifying females were more affected than males and majority of the sample had normal BMI. There was no significant correlation between age of patients and physical and mental component of QOL ($p = 0.888$, $p = 0.507$). Majority of the patients had their dominant side affected and only 3.85% had their non-dominant side affected thereby making the 2 groups incomparable statistically. No statistically significant correlation was found between the BMI and physical and mental component of QOL of the patient. ($p = 0.977$, $p = 0.991$) There was no significant difference between the quality of life of males and females. ($p = 0.591$, $p = 0.782$) When comparing the quality of life of domestic population, working population and tennis player there was no statistical significant difference found between the groups. ($p = 0.993$, $p = 0.786$)

Conclusion: No significant difference between the demographic factors of gender, age, BMI and side affected was seen suggesting LE equally affects all the demographic variables. But, on comparison of mean scores it was seen that women had lower scores than men. In addition, people with affection of dominant hand were seen to be affected more with lateral epicondylitis.

Keywords: Lateral epicondylitis; Tennis elbow; Demographic variables; Quality of life

Introduction

A subjective sense of wellbeing termed as Quality of life encompasses physical, psychological, social and spiritual dimensions [1-5]. It is judgment of the individual's conscious cognitive satisfaction with one's life. It is important to examine the effects of various symptoms on patient's level of functioning because the functioning and life satisfaction of a patient are affected by a disease or treatment related symptoms, and helps exponentially to judge the overall functional status of the patients [3]. Therefore, by assessing multiple aspects of a patient's self-perceived wellbeing contributes in the quantification of the impact of a disease on an individual's functioning and wellbeing [3,4].

Lateral epicondylitis is the most common affliction of the elbow and a painful disabling condition [5,6]. It mainly occurs after minor and often unrecognized trauma of the extensor muscles of the forearm and is characterized by insidious pain typically attributed to repetition of one event or activity and also is considered to be an overload injury [6-9]. As the wrist extensors play an important role in maintaining wrist in extension which is primarily and chiefly required in carrying out the activities of daily living of the patient so in this disorder the activities of daily living are adversely hampered [10].

The clinical manifestation of the condition primarily constitutes pain over the lateral humeral epicondyle which may radiate to the forearm, provoked during excessive, quick, repetitive activities involving the hand in gripping or manipulating an object [7-11]. Pain and decreased function being the main complaints which further affects the activities in daily living (holding tools, shaking hands, lifting a cup of coffee, dressing and desk or household work, hitting a backhand stroke in tennis etc) [8,10].

Quality of life when assessed includes items related to self-care, usual activities, emotional problems, pain etc which are adversely affected in lateral epicondylitis thus leading to disability on the part of the patient [3]. There have been studies documented in literature that determined the prevalence, determinants, risk factors, work related risk factors and physical and psychosocial risk factors [12-18]. But there has been no relation established in literature between the different demographic variable which includes gender, age, body mass index, side affected and occupation. The present study was conducted to determine the impact of Lateral epicondylitis on the different demographic variables.

***Corresponding author:** Pradeepika Samagh, Master of Physiothereapy, Department of Orthopedics, Mother Teresa Saket college of Physiotherapy, Panchkula, Chandi Mandir, Haryana, India, Tel: +917837849737; E-mail: pradeepikasmgh@gmail.com

Received March 12, 2016; **Accepted** June 17, 2016; **Published** Juny 26, 2016

Citation: Samagh P, Sudhakar K, Jindal R (2016) Lateral Epicondylitis: Impact on Demographic Variables. J Ergonomics 6: 169. doi:10.4172/2165-7556.1000169

Materials and Methods

This validation study was approved by the ethics committee of Mother Teresa Saket College of Physiotherapy.

Study participants: All patients diagnosed with Lateral epicondylitis who met the inclusion and exclusion criteria were included in the study.

Subjects with lateral elbow pain, age group of 30 to 50 of both genders with a medical diagnosis of lateral epicondylitis/ tennis elbow, able to read and write English, who were willing to participate and with one test positive of Maudsley's, Cozen's and Mill's test were included in the study.

Subjects with diagnosed concomitant upper limb orthopedic condition, malignancy, polyarthritis or soft tissue inflammatory condition, upper quadrant neuro-musculoskeletal disorders that might affect grip strength, any concurrent treatment, history of surgery of elbow, rheumatoid or neurologic condition and symptoms suggestive of neurological compromise as in Carpal and radial tunnel syndrome were excluded.

Study design

Cross sectional survey design

Sample size: 52 patients diagnosed with lateral epicondylitis of elbow were recruited.

Instrumentation: Patient rated tennis elbow evaluation questionnaire (PRTEE) and Short Form – 36 questionnaires (SF-36).

Procedure: The subjects were explained the aim of the study and then a prior informed consent form was taken. All subjects underwent a physical examination of elbow by the principal investigator to confirm the diagnosis of Lateral epicondylitis. The subjects then were instructed how to fill the questionnaires and were thereafter handed over the questionnaires which were filled by the subjects themselves.

Outcome measures

Functional disability: It was rated by the patient on the PRTEE questionnaire. The subject rated his average symptoms in the past week on a scale of 0 to 10 where 0 was "you did not experience any difficulty" and 10 was "it was so difficult you were unable to do it at all" It had 2 categories i.e., pain and functional disability. Pain was rated by the patient at 5 different activities. Functional disability constituted specific activities and usual activities. A total of five questions were included in pain, six questions under specific activities and four under usual activities.

Health-related quality of life: It was rated by the patient on the SF-36 questionnaire. The subject rated his symptoms that best described his health that day. It had 8 due to physical health, role of limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain and general health, functioning, 2 under pain and 5 under general health.

Results

In this study, a total of 52 subjects (31 females and 21 males) aged 35 to 50 years with unilateral lateral epicondylitis were included and the impact of lateral epicondylitis on the different demographic variables. All of the subjects were in fourth and fifth decade of life of which 30.77% of the patients were in 35 to 40 years, 36.54% in 40 to 45 years and 32.69% in 45 to 50 years. There were 31 females (59.6%) and 21 males (40.4%) in the study signifying females were more affected than males. 96.15% subjects had the dominant side affected while only 3.85% had their non-dominant side affected. According to World Health Organization classification, in all 65.38% of the patients had normal BMI, 30.76% were pre-obese, 5.76% were under-weight and none of the patient was obese. (Figure 1-8)

There was no significant correlation between age of patients and physical and mental component of QOL ($p = 0.888$, $p = 0.507$) suggesting that all the age groups had an equal compromised QOL. Majority of the patients had their dominant side affected and only 3.85% had their non-dominant side affected thereby making the 2 groups incomparable statistically. No statistically significant correlation was found between the BMI and physical and mental component of QOL of the patient. ($p = 0.977$, $p = 0.991$) There was no significant difference between the quality of life of males and females. ($p = 0.591$, $p = 0.782$) But on comparison of their mean scores of QOL it was seen that both mental and physical component summary scores were lower in females than in males. When comparing the quality of life of domestic population, working population and tennis player there was no statistical significant difference found between the groups. ($p = 0.993$, $p = 0.786$).

Table 1 shows the division of subjects on the basis of age. Out of total sample of 52 subjects, 30.77% were in 35 to 40 years, 36.54% were in 41 to 45 years and 32.69% were in 46 to 50 years age group.

Table 2 shows the division of subjects into males and females. Out of total sample of 52 subjects, females (59.6%) were more than males (40.4%).

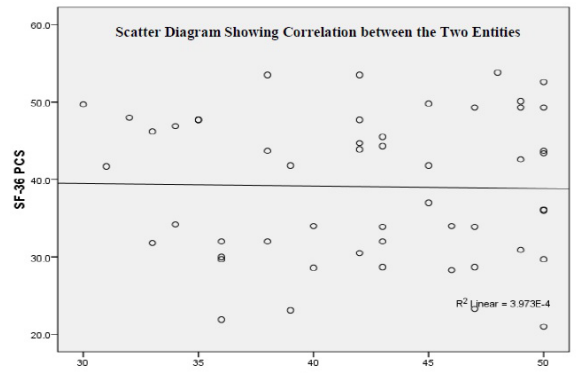

Figure 1: The correlation between age and quality of life (physical component summary score).

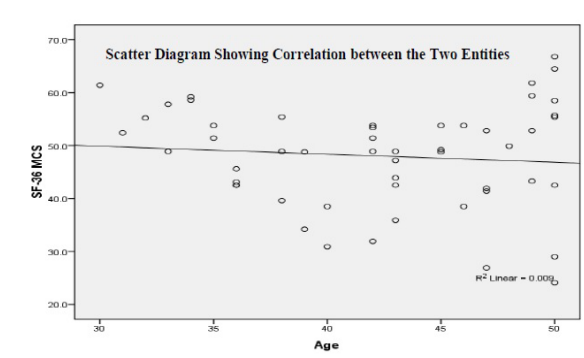

Figure 2: The correlation between age and quality of life (mental component summary score).

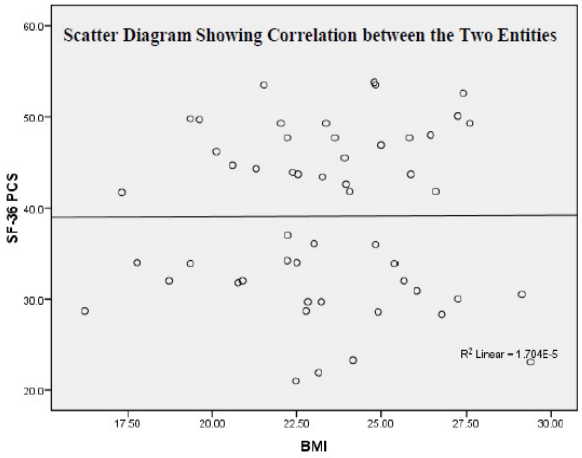

Figure 3: The correlation between BMI and quality of life (physical component summary score).

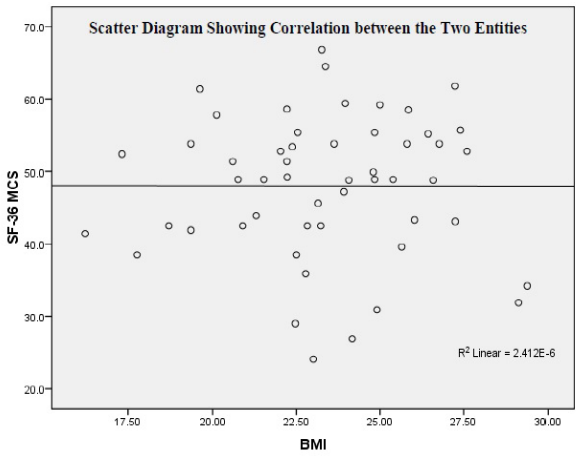

Figure 4: The correlation between BMI and quality of life (mental component summary score).

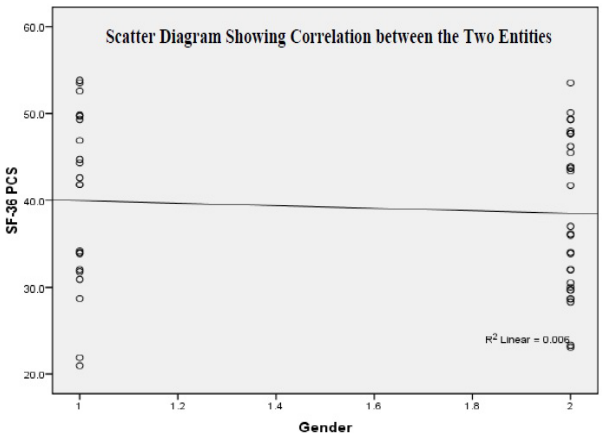

Figure 5: The correlation between gender and quality of life (physical component summary score).

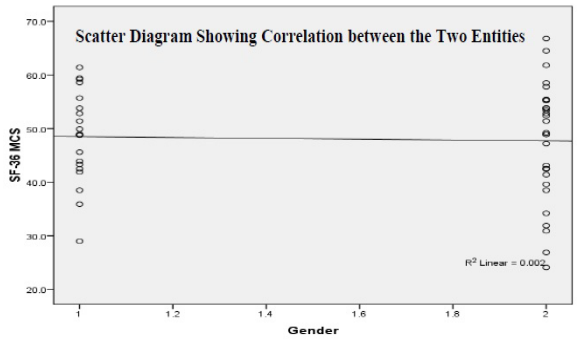

Figure 6: The correlation between gender and quality of life (mental component summary score).

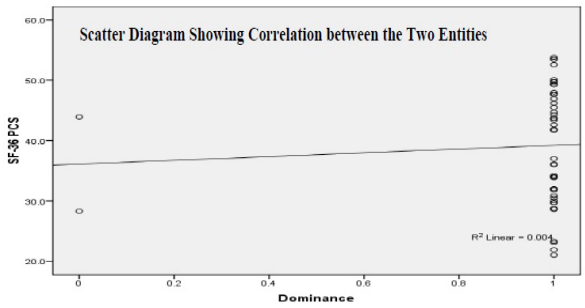

Figure 7: The correlation between dominance and quality of life (physical component summary score).

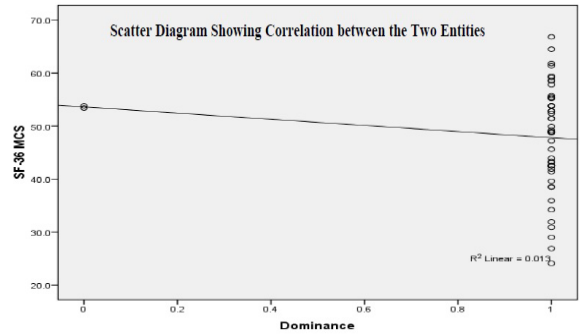

Figure 8: The correlation between dominance and quality of life (mental component summary score).

Table 3 shows the division of subjects on the basis of their side affected. Out of the total sample of 52 subjects, 96.15% had their dominant side affected and 3.85% had their non-dominant side affected.

Table 4 shows the division of total number of subjects based on BMI. Out of total sample of 52 subjects, 5.77% were underweight, 65.38% were normal, 28.84% were pre-obese. None of the patients was obese.

Table 5 shows the division of total number of subjects on the basis of occupation. Out of total sample of 52 subjects, 71.15% were working population, 26.92% housewife and 1.92% tennis players.

Table 6 shows the division of working population into teachers (27.02%), lawyer (5.41%), engineer (13.51%), banker (32.43%), carpenter (2.7%), electrician (5.41%), laundry man (5.41%) and gardener (8.11%).

Table 7 shows the correlation between AGE and SF-36 (PCS). The correlation coefficient for AGE and SF-36 (PCS) is - 0.020 and there is no significant correlation between the two entities. (p = 0.888).

Table 8 shows the correlation between AGE and SF-36 (MCS). The correlation coefficient for AGE and SF-36 (MCS) is -0.094 and there is no significant correlation between the two entities. (p = 0.507).

Table 9 shows the correlation between BMI and SF-36 (PCS). The correlation coefficient for BMI and SF-36 (PCS) is 0.004 and there is no significant correlation between the two entities. (p = 0.977).

Table 10 shows the correlation between BMI and SF-36 (MCS). The correlation coefficient for BMI and SF-36 (MCS) is -0.002 and there is no significant correlation between the two entities. (p = 0.991).

Table 11 shows the correlation between GENDER and SF-36 (PCS). The correlation coefficient for GENDER and SF-36 (PCS) is – 0.076 and there is no significant correlation between the two entities. (p = 0.591).

Table 12 shows the correlation between GENDER and SF-36 (MCS). The correlation coefficient for GENDER and SF-36 (MCS) is -0.039 and there is no significant correlation between the two entities. (p = 0.782).

Table 13 shows the correlation between DOMINANCE and SF-36 (PCS). The correlation coefficient for DOMINANCE and SF-36 (PCS) is 0.065 and there is no significant correlation between the two entities. (p = 0.647).

Table 14 shows the correlation between DOMINANCE and SF-36 (MCS). The correlation coefficient for DOMINANCE and SF-36 (MCS) is - 0.116 and there is no significant correlation between the two entities. (p = 0.415).

Discussion

In this study, a total of 52 subjects (31 females and 21 males) aged 35 to 50 years with unilateral lateral epicondylitis were included and the impact of lateral epicondylitis on the different demographic variables.

All of the subjects were in fourth and fifth decade of life of which 30.77% of the patients were in 35 to 40 years, 36.54% in 40 to 45 years and 32.69% in 45 to 50 years. The mean age of the patients included in the study was 42.25 ± 6.065 years. This is in consistent with many studies which suggests that lateral epicondylitis typically occurs in fourth and fifth decade of life [12]. In addition to this, Johnson et al. (2007) stated that patients with lateral epicondylitis are typically 40 years or older [19]. A suggested assumption for this would be that with advancing age there is reduced extensibility of the soft tissues and reduced muscle mass. So, with repeated movement as in LE these soft tissues are at an increased risk to get injured. In addition, the healing is delayed after repeated micro trauma owing to the degenerative changes occurring with increasing age causing pain [20-22].

There were 31 females (59.6%) and 21 males (40.4%) in the study signifying females were more affected than males. This is in accordance with the study done by Shri et al. (2006) who reported a greater prevalence of LE in females versus males. In a case-referent study, it was stated that, lateral epicondylitis is associated with female gender [16].

Age	Frequency	Percentage
35 to 40 years	16	30.77%
41 to 45 years	19	36.54%
46 to 50 years	17	32.69%
Total	52	100%

Table 1: Division of subjects on the basis of age.

Gender	Frequency	Percentage
Male	21	40.4 %
Female	31	59.6 %
Total	52	100%

Table 2: Division of subjects into males and females.

Side affected	Frequency	Percentage
Dominant	50	96.15
Non-dominant	2	3.85%
Total	52	100%

Table 3: Division of subjects on the basis of side affected.

Bmi values	Frequency	Percentage
Under weight (<18.50)	3	5.77%
Normal (18.50 – 24.99)	34	65.38%
Pre obese (25-29.99)	15	28.84%
Obese (>29.99)	0	0%
Total	52	100%

Table 4: Division of subjects on the basis of body mass index (bmi).

Occupation	Frequency	Percentage
Housewife	14	26.92%
Working population	37	71.15%
Tennis player	1	1.92%
Total	52	100%

Table 5: division of subjects on the basis of occupation.

Working population	Frequency	Percentage
Teacher	10	27.02%
Lawyer	2	5.41%
Engineer	5	13.51%
Banker	12	32.43%
Carpenter	1	2.7%
Electrician	2	5.41%
Laundry man	2	5.41%
Gardener	3	8.11%
Total	37	100%

Table 6: Division of subjects on the basis of working population.

Variable	Mean	Correlation coefficient	'p' value
Age	42.25	- 0.020	0.888
Sf-36 pcs	39.106		

Table 7: Correlation of age and sf-36 pcs.

Variable	Mean	Correlation coefficient	'p' value
Age	42.25	- 0.094	0.507
Sf-36 mcs	48.025		

Table 8: Correlation of age and sf-36 mcs.

Variable	Mean	Correlation coefficient	'p' value
Bmi	23.355	0.004	0.977
Sf-36 pcs	39.106		

Table 9: Correlation of bmi and sf-36 pcs.

Variable	Mean	Correlation coefficient	'p' value
Bmi	23.355	-0.002	0.991
Sf-36 mcs	48.025		

Table 10: Correlation of bmi and sf-36 mcs.

Variable	Correlation coefficient	'p' value
Gender	-0.076	0.591
Sf-36 pcs		

Table 11: Correlation of gender and sf 36 (pcs).

Variable	Correlation coefficient	'p' value
Gender	- 0.039	0.782
Sf-36 mcs		

Table 12: Correlation of gender and sf 36 (mcs).

Variable	Correlation coefficient	'p' value
Dominance	0.065	0.647
Sf-36 pcs		

Table 13: Correlation of dominance and sf-36 (pcs).

Variable	Correlation coefficient	'p' value
Dominance	- 0.116	0.415
Sf-36 mcs		

Table 14: Correlation of dominance and sf-36 (mcs).

A recommended assumption for this would be that females perform laborious tasks for prolonged periods of time involving lifting of heavy weights and repetitive movements of the elbow in both job-related and household activities. In addition, due to infrequent breaks the healing process is hindered thereby exuberantly exacerbating the symptoms. It was also noted that on comparison of the subjects having severe pain, 65.4% were females and 34.6% were males implying that females had more severe pain as compared to males.

96.15% subjects had the dominant side affected while only 3.85% had their non-dominant side affected. This implies that the dominant hand is affected more than the non-dominant hand in lateral epicondylitis which is corroborated by Samsoddini et al. (2010) who reported lateral epicondylitis mainly as episodes in the dominant arm of the patient [12]. Kaczmarek et al. (2008) stated LE occurs in the dominant arm in 75% of the population [22]. This might be because the dominant hand is always used extensively in all the occupational, household and activities of daily living leading to overuse, overstress and over-exertion of the wrist extensors of the forearm as seen in lateral epicondylitis. This makes the dominant hand more susceptible to degenerative changes occurring in lateral epicondylitis than the non-dominant hand [23].

The mean body mass index of the patients in the study was 23.355±2.94 kg/cm^2. According to World Health Organization classification, in all 65.38% of the patients had normal BMI, 30.76% were pre-obese, 5.76% were under-weight and none of the patient was obese. This depicts that majority of the patients had normal BMI. The result of our study corresponds with previous study by Tajika et al presenting that Lateral epicondylitis was not associated with BMI [10]. Franceschi et al. (2014) did a systematic study and concluded that upper limb tendinopathies were not associated with BMI. A suggested proposition being that increased adiposity in LE.

The effect on QOL by different demographic variables (age, gender, dominance, occupation and BMI) was also evaluated in our study. There was no significant correlation between age of patients and physical and mental component of QOL ($p = 0.888$, $p = 0.507$) suggesting that all the age groups had an equal compromised QOL. A probable reason might be that the age group included in our study was in the range (35 to 50 years) in which there is a maximum prevalence of LE. Majority of the patients had their dominant side affected and only 3.85% had their non-dominant side affected thereby making the 2 groups incomparable statistically.

No statistically significant correlation was found between the BMI and physical and mental component of QOL of the patient. ($p = 0.977$, $p = 0.991$) This implies that irrespective of the BMI the QOL of the patients was equally worsened. This might be because increased adiposity which occurs in obese individuals does not gets subjected to increased loading as there is no weight bearing in upper extremity unlike the lower extremities [23].

There was no significant difference between the quality of life of males and females. ($p = 0.591$, $p = 0.782$) But on comparison of their mean scores of QOL it was seen that both mental and physical component summary scores were lower in females than in males. This implies that females had a more compromised quality of life in comparison to males. In a systematic review, lateral epicondylitis was seen to be associated with handling heavy loads, repetitive hand/arm movements for prolonged hours, arms lifted in front of the body, hands bent or twisted and precision movements during work. These activities are extensively performed throughout the day by females as they have to do both occupational and domestic work [17]. This is supported by our study as in our study all the patients in the domestic category and 42% in the occupation category were females. This increased prevalence is associated with physical workplace factors and low social support at their work ultimately resulting in mechanical and metabolic overload over the wrist muscles leading to an increased predisposition of the female gender [16-18].

When comparing the quality of life of domestic population, working population and tennis player there was no statistical significant difference found between the groups. ($p = 0.993$, $p = 0.786$) The mean scores of QOL (physical and mental domains) between domestic population (PCS-36.721, MCS- 45.68), working population (PCS-40.141, MCS- 48.62) and tennis player (PCS- 34.2, MCS- 58.6) showed that domestic population (housewives) had more compromised physical and mental component of quality of life. Although, tennis player had more reduced physical component score, but since there was only a single tennis player out of 52 it was not statistically comparable.

A proposed conjecture would be that housewives mostly do household work for prolonged periods of time incorporating those activities which would precipitate the pain facilitating the injury at the probable site. This is supported by Walker-bone et al. (2010) who concluded that manual work and repetitive movements of the elbow carried for more than one hour a day was a significant risk factor for lateral epicondylitis [21]. Due to continued load while doing domestic work they continue the repetitive activities despite of pain which also leads to mental stress. In addition, work associated with micro trauma without proper rest results in failed healing precipitating functional disability. All these factors might cumulatively result in increased functional disability and reduced QOL both physically and mentally in domestic population.

Conclusion

This present study concluded that Lateral epicondylitis mostly

affects population in fourth and fifth decade of life. Female gender is more predisposed and also individuals with their dominant side affected. All age groups have and equally compromised QOL and individuals with all sub-categories of BMI have their QOL equally hampered. Also, females have more severed QOL both physically and mentally. Of all the three populations i.e., domestic, working and tennis players, domestic population had the most compromised QOL both physically and mentally.

References

1. Prigent A, Auraaen A, Tochokobou BK, Zaleski ID, Cheveul K (2014) Heath related quality of life and utility scores in people with mental disorders: a comparison with a non-mentally ill general populations. INT.I Environ. Res. Public Health 11: 2804-2817.
2. Roberts RA, Abrams H, Semback MK, Lister JJ, Gans RE, et al. (2009) Utility measures of health-related quality of life in patients treated for benign paroxysmal positional vertigo. Ear and hearing 30: 369-376.
3. Wang XS (1998). The effect of pain severity of health-related quality of life. A study of chinese cancer patients. Cancer 86: 1848-1855.
4. Blanchette MA, Normand MC (2011) Impairment assessment of lateral epicondylitis through electromyography and dynamometry. J.Can Chiropr Assoc 55: 96-106.
5. Guyatt GH, Feeny DH, Patrick DL (1993) Measuring health related quality of life. Ann Intern Med 118: 622-629.
6. Ward MM (1993) Heath-related quality of life in Ankylosing Spondylitis: A survey of 175 patients. ACR 12: 247-251.
7. Loude JE, Brigden A, Bennett E (2012) A comparative study to determine the effectiveness of the diamond and the mulligan taping techniques on grip strength in asymptomatic undergraduate students. The Plymonth student Journal of Health and social work 4: 15-27.
8. Kachanathu SJ, Miglani S, Grover D, Zakaria AR (2013) Forearm band versus elbow taping: as a management of lateral epicondylitis. J Musculoskelet Res 16: 1350003-1350011.
9. Cohen MS, Romeo AA (2001) Lateral Epicondylitis: Open and arthroscopic treatment. J Hand Surg 1: 172-179.
10. Barr S, Cerisola FL, Blanchard V (2009) Effectiveness of corticosteroid injections compared with physiotherapeutic interventions for lateral epicondylitis: A systematic review. Physiotherapy 95: 251-265.
11. Trivedi P, Sathivani, Nambi G, Khuman R, Shah K, et al. (2014) Comparison Of active release technique and myofascial release technique on pain, grip strength and functional performance in patients with chronic lateral epicondylitisis. Int J Physiother Res 2: 488-494.
12. Shiri R, Juntura EV, Varonen H, Helivaara M (2006) Prevalence and determinants of lateral and medial epicondylitis: A population study. Am J epidemiol 164: 1065-1074.
13. Buchbinder R, Green S, Struijs P (2008) Tennis elbow. Clinical evidence 05: 1117-1122.
14. Vicenzino B (2003) Lateral epicondylalgia: a musculoskeletal physiology perspective. Manual Therapy 8: 66-79.
15. Waugh EJ (2005) Lateral or epicondylalgia epicondylitis: What is a name? J Orthop Sports Phys Ther 35: 200-209.
16. Sansoddini A, Hollisag MT (2013) Effects of taping on pain, grip strength and wrist extension force in patientswith tennis elbow. Trauma Monthly 18: 71-74.
17. Bone KW, Palmer KT, Reading I, Coggon B, Cooper C (2011) Occupation and epicondylitis: a population based study. Rheumatology 2: 1-9.
18. Haahr JP, Andersen JH (2003) Physical and psychological risk factors for lateral epicondylitis: a population based case- referent study. Occup Environ Med 60: 322-329.
19. Andresen EM, Meyers AR (2008) Health-related quality of life outcome measures. Arch Phys Med Rehabil 81: 30-45.
20. Yaxley GA, Jull GA (1993) Adverse tension in the neural system. A preliminary study of tennis elbow. Australian J Physiother 39: 15-22.
21. Coombes B, Bisset L, Vincenzino B (2011) Elbow flexor and extensor muscle weakness in lateral epicondylalgia. Br J Sports Med 23: 1-5.
22. Kaczmarek CM (2008) Lateral elbow tendinosis: Implications for a weight training population. Strength and Conditioning Journal 30: 35-41.
23. Coombes BK, Bisset L, Vicenzino B (2009) A new integrative model of lateral epicondylalgia. BR J Sports Med 43: 252-258.