

Prevalence of De Quervain's Tenosynovitis among Restaurant Station and Junior Chef using Physical Assessment Test

Kashish Dinodia¹, Dr. Sushmita Singh², Dr. Ajay Kumar³

¹Physiotherapist, ²Assistant Professor, ³Principal,
DPO'S Nett College of Physiotherapy, Thane.

Corresponding Author: Kashish Dinodia

DOI: <https://doi.org/10.52403/ijhsr.20240535>

ABSTRACT

Aim: -To find the prevalence of De Quervain's Tenosynovitis among restaurant Station and Junior chef.

Objective: -To find presence of De Quervain's Tenosynovitis among Restaurant Station and Junior chef using Finkelstein test.

Methodology: -144 subjects were selected from the metropolitan cities according to the inclusion and exclusion criteria. A written informed consent was taken from the subjects in the language best understood by them. The study subjects were explained about the procedure. The test is performed on both the hands. A positive test is indicated by pain over the abductor pollicis longus and extensor pollicis brevis tendons at the wrist. The data was collected and was statistically analyzed.

Statistics and Results: -Total 144 chefs were included in the study out of which 20 chefs were indicated for the De Quervain's Tenosynovitis i.e. 13.9% of the total population was positive.

Conclusions: - The study concluded that De Quervain's Tenosynovitis is less prominent among Station and Junior Chef.

Clinical Implication: this study can be used to make people aware and prevent the occurrence or worsening of existing De Quervain's tenosynovitis. People can be given ergonomic advice like taking frequent breaks while working and resting the hand.

Keywords: De Quervain's Tenosynovitis, Chef, Finkelstein test, Musculoskeletal disorder.

INTRODUCTION

MUSCULOSKELETAL DISEASE

MSD are the most common occupational health issues affecting working individuals today MSDs are the world's second most prevalent cause of disability MSDs are also thought to be one of the leading causes of absenteeism and impairment when compared to other conditions⁽¹⁾

WORK RELATED

MUSCULOSKELETAL DISEASE

Work-related musculoskeletal disorders (WMSD's) are a range of inflammatory disorders resulting from injuries sustained while performing work duties. WMSDs are usually the result of regular exposure to work activities that contribute significantly to the development or exacerbation of painful symptoms and conditions that are worsened or that persist due to work conditions. It can be the result of repetitive and frequent work

activities resulting in overuse and strain to nerves, ligaments, muscles, tendons, joints, and spinal discs. These disorders are also commonly referred to as repetitive strain injuries, due to the emphasis on the upper extremity use in the occupational tasks, majority of musculoskeletal conditions related to the work have impact on neck, shoulder, elbows, arm, wrist, hand however conditions related to feet and spine are common. ⁽²⁾ Occupations such as chef, office worker, dentist, nurses, industrial workers and farmer are the example of occupation that are at high risk of getting MSDs (Due to arm and hand movements such as bending, holding, twisting, reaching, clenching. 8 to 11 among the workers in the catering industry the chef is reported to have the highest work related musculoskeletal disorders ⁽¹⁾

CHEF

A chef is a trained professional cook and tradesman who is proficient in all aspects of food preparation, often focusing on a particular cuisine. The word "chef" is derived from the term chef de cuisine. The hierarchy seen in them are as follows:- Head Chef, Deputy Chef, Station Chef, Junior Chef, Kitchen Porter and Purchasing Manager. Station and junior chef are assigned different roles in the kitchen depending on their experience and qualification. But station chef play a crucial role in the kitchen by cooking food that is being served to the customers. ⁽²⁾ However there are multiple positions that fall under the station chef title. Each chef is responsible for a different station depending on their expertise and managing the whole session of food different for example there is a chef in charge of only preparing sea food dish. Junior chef works with the station chef. They complete schooling or training and begin working in the culinary field by assisting the experienced chef and absorbing knowledge and techniques. ⁽³⁾

STATION AND JUNIOR CHEF

The type of work that is done by the station chef is, preparing specific food items and

meal components, delivering consistently high bulk orders and ensure that the food items are prepared adequately, responsible to supervise the junior chef, also the station chef is involved in correct handling of the utensils and assess the quality of the food and items used for the same. ⁽³⁾ Work that are assigned to the junior chef is ensuring consistent smooth running of the food preparation, always ensuring the working areas are clean, performs the tasks given by the station chef, prepare substitute items, ensure proper plating and garnishing of the dishes are done. ⁽⁴⁾

DE QUERVAIN'S TENOSYNOVITIS

Several studies are being done to check work-related musculoskeletal disorders them and found out that 26.2% are known to suffer from neck related disorders, 48.5% shoulder related disorders, 19.1% elbow disorders, 46.8% wrist disorders, 59.5% ankle or feet disorders. ⁽⁵⁾ De Quervain's Tenosynovitis is a painful, inflammatory condition caused by tendons on the side of the wrist at the base of the thumb. Pain gets worse with abduction of the thumb, a grasping action of the hand, and an ulnar deviation of the wrist. Thickening and swelling can also be present. It is a repetitive stress condition located at the first dorsal compartment of the wrist at the radial styloid. ⁽⁶⁾ Workers who perform repetitive activities of the wrist and hand and those who routinely use their thumbs in grasping and pinching motions in a repetitive manner are most susceptible. ⁽⁷⁾ Clinical features includes: Pain near the base of your thumb, swelling near the base of your thumb, difficulty moving your thumb and wrist when you're doing something that involves grasping or pinching. ⁽⁶⁾ The first dorsal compartment of the wrist contains the Abductor pollicis longus and Extensor pollicis brevis tendons lined by a synovial sheath which separates it from the five other dorsal wrist compartments. As these tendons pass through an approximately 2 cm long fibrous tunnel passing over the radial styloid and under the transverse fibers of the extensor retinaculum, they are at risk for

entrapment, particularly in the setting of acute trauma or repetitive motion. ⁽⁷⁾ Estimated prevalence is 0.5% in men and 1.3% in women. Peak prevalence is usually among individuals between the ages of 40 - 50 years. ⁽⁵⁾

NEED OF THE STUDY

- The job of station and junior chef involves a lot of monotonous repetitive tasks such as chopping, stirring, plating, doughing, kneading, tossing and various other activities that demands for long working hours in abnormal postures.
- It also involves working in bulk orders and making meals in large quantities, lifting heavy utensils and much more
- All these leads to chef's thumb in abducted and in opposition position for a longer period of time.
- Also flexion, extension, radial abduction and palmar adduction are involved in the daily activities of chefs for the extended period of time.
- Hence, it increases the risk of developing De Quervain's Tenosynovitis in Chefs.
- Thus, a need arose to find out the prevalence of De Quervain's Tenosynovitis among Restaurant Station and Junior Chef. Hence, this study has been carried out.

AIM AND OBJECTIVE

AIM: - To find the prevalence of De Quervain's Tenosynovitis among restaurant Station and Junior chef.

OBJECTIVE: - To find presence of De Quervain's Tenosynovitis among Restaurant Station and Junior chef using Finkelstein test.

MATERIALS & METHODS

MATERIALS

Consent form
Paper
Pen/ Pencil
Chair
Table

METHODOLOGY

Study Design

Type of study: - Cross sectional study

Duration of study: - 18 Months

Location of study: - Restaurants at Metropolitan city

Sample Design

Sample Size: - 144

Sample Population: - Participants who are Station and Junior Chef by profession

Sampling: - Convenient Sampling

SELECTION CRITERIA

Inclusion Criteria

- Individuals willing to participate.
- Both the genders are included.
- Participants between age group of 35 to 45 years.
- Participants who have been working as Station and Junior chef since last 5 years.
- Participants who have been working for at least 5 days in a week.
- Working hours of minimum 7 to 8 hours per day.

Exclusion Criteria

- Participants who have history of hand or wrist fractures.
- Participants who have history of Carpal Tunnel Syndrome.
- Participants who have undergone any recent surgery.
- Participants who are diagnosed with neurological disorders.
- Participants who are diagnosed with any musculoskeletal disorder
- Participants who are on any pain-relieving medications
- Participants who are working as part time.
- Female participants who are pregnant.

PROCEDURE

- 144 Subjects will be selected according to the inclusion and exclusion criteria
- A written consent form will be taken from the subjects in the language best understood by them
- The individual is explained about the test which will be performed on them.
- The test is performed as follows: -

- Patient position: - sitting on chair with forearm supported in mid prone.
- Therapist sitting on the lateral side of the patient.
- The patient makes a fist with the thumb inside the fingers.
- The examiner stabilizes the forearm and deviates the wrist towards the ulnar side.
- The test is performed bilaterally.
- A positive test is indicated by pain over the following tendons: -
- ABDUCTOR POLLICIS LONGUS
- EXTENSOR POLLICIS BREVIS

This is indicative of a paratenonitis of these two tendons.

RESULT

Table 1 : Age distribution chart

Range	No. of chef	Mean	Std. Deviation
<30 years	15	28.87	1.73
31-40 years	91	36.31	2.56
>40 years	38	43.82	2.20

It was found that 15 chef were <30 years of age, 91 chef were between 31-40 years of age and 38 chef were >40 years of age.

Table 2: Health status

BMI categories	Frequency	Mean	SD
Underweight	-	-	-
Normal	16	23.67	1.06
Obese	33	27.40	1.29
Overweight	95	32.02	1.70

It was found that 16 chef had normal BMI, 95 chef were overweight and 33 chef were obese.

Table 3: Work experience (in years)

Work experience (in years)	Frequency	Mean	SD
≤10 years	108	7.46	1.58
10-15 years	30	11.92	1.56
16-20 years	4	18.00	1.83
>20 years	2	20.50	4.95

Table 3 states that, 108 chefs had ≤10 years of work experience, 30 chefs had 10-15 years of experience, 4 chefs had 16-20 years of experience and 2 chefs had >20 years of experience.

Table 4 : Work duration (in hours)

Work duration (in hours)	Frequency	Mean	SD
≤8 hours	72	7.26	0.72
9-10 hours	65	8.85	1.51
>10 years	7	11.43	0.79

Table 4 states that, 72 chefs work for ≤8 hours, 65 chefs work for 9-10 hours and 7 chefs work for >10 hours.

Table 5: NPRS on activity

NPRS on activity	No. of chef	Mean	SD
NA	124	-	-
1-3	5	2.4	0.55
4-6	10	4.9	0.74
7-10	5	7.2	0.45

Table 5 states that, 5 chefs had 1-3 NPRS on activity. 10 chefs had 4-6 NPRS on activity, 5 chefs had 7-10 NPRS on activity

Table 6: NPRS on rest

NPRS on rest	No. of chef	Mean	SD
NA	124	-	-
0	4	-	-
1-3	13	2.08	0.64
4-6	3	5.00	1.00
7-10	0	-	-

Table 6 states that, 4 chefs had 0 NPRS on rest. 13 chefs had 1-3 NPRS on rest. 3 chefs had 4-6 NPRS on rest, 0 chefs had 7-10 NPRS on rest.

Table 7: Interpretation

Interpretation	No. of chef
Positive	20
Negative	124

Prevalence of De Quervain's Tenosynovitis among Restaurant Station and Junior chefs using Finkelstein test was found to be 13.9%.

DISCUSSION

This research aimed to assess the prevalence of De Quervain's Tenosynovitis among a sample of 144 restaurant chefs aged 35 to 45 years. The selection criteria included years of experience as a chef and the number of working hours. The Finkelstein Test, an active test commonly used to diagnose De Quervain's Tenosynovitis, was used as outcome measure for the prevalence study. In this test, subjects make a fist with the thumb inside the fingers and then deviate the wrist towards the ulnar side. A positive test is indicated by pain over the following tendons:- Abductor pollicis longus and extensor pollicis brevis

The mean age of the chefs was determined to be 37.51 years, with an average weight of 78.07 kg. Body Mass Index (BMI) analysis indicated that 11% of chefs had a normal BMI, 66% were classified as overweight, and 23% were deemed obese. One significant challenge stemming from the demanding nature of restaurant kitchen work is may be the limited opportunity for chefs to enjoy a leisurely, sit-down meal. Instead, they often find themselves grabbing quick bites

between tasks or while monitoring the line items. Additionally, a concerning habit among kitchen staff is might be the consumption of free sodas, which can contribute to weight gain. Another factor affecting the weight of chefs is the constant need to taste and adjust dishes on the line. This frequent tasting, especially of sauces and various ingredients, can lead to an increase in sodium intake. This rise in sodium levels may contribute to bloating and other weight-related concerns. It's important to note that while this study highlights challenges faced by chefs, not all individuals in the profession experience weight issues. Statistics show that 75% of professional chefs have a decade of work experience, with 20.8% having 10-15 years, 2.8% with 16-20 years, and 1.4% with 20 years of experience. However it takes approximately minimum 10 to 12 years of work experience to be promoted to the position of station and junior chef in India. Also it may vary according to different setups and countries

Among the surveyed chefs, 50% reported working for 8 hours, 45.1% worked for 9-10 hours, and 4.9% had a 10-hour work duration.

As a guide, by culinary school the standard chef position demands 50-plus hours a week, including nights, weekends and holidays. For a chef job in a restaurant, expect to work 7 days a week for 12 to 14 hours each shift. ⁽³⁾ However In a study by Ita Geyser, the optimal work shift for resilient millennial chefs was suggested to be 8 hours or less for efficient performance. ⁽⁵⁾

The Numeric Pain Rating Scale (NPRS) was employed to assess pain levels during activity and rest. Concerning activity, 3.5% of chefs reported 1-3 NPRS, 7% had 4-6 NPRS, and 3.5% experienced 7-10 NPRS. During rest, 2.8% had 0 NPRS, 9.1% reported 1-3 NPRS, and 2.1% indicated 4-6 NPRS.

The research has also revealed that the age groups most susceptible to de Quervain's tenosynovitis (DQT) among chefs are those within the 30 to 40 and 40 to 50 age brackets, rather than those within the 20 to 30 age

group. Consequently, it has been noted that individuals who have been working in the culinary industry for an extended period are at a higher risk of developing DQT. ⁽⁵⁾

The study also delved into the performance of a specific test, revealing that 13.9% of the total population exhibited positive results.

Specifically Tan D Balaraman T's study on working posture and musculoskeletal pain among restaurant chefs, indicates that chefs are less affected by such wrist issues. The study highlights that the more common challenges faced by chefs are related to standing for extended periods, resulting in a higher incidence of ankle and foot pain (59.5%), lower back pain (52.4%), and shoulder pain (48.5%). ⁽²⁾

This suggests that the nature of the job, which involves prolonged standing and handling heavy utensils, places greater stress on the lower back and shoulder joints. The study underscores the substantial impact of the profession on other areas, such as the lower back and shoulders, emphasizing the importance of addressing ergonomic concerns and promoting better working postures in the culinary industry

Previously mostly studies were conducted on the proximal joints as compared to the smaller joints among chefs. Hence De Quervain's Tenosynovitis in the wrist joint was taken for the studies among the urban population with the sample size of 144 which revealed 13.9% were affected with minimum to moderate intensity of pain ⁽²⁾

CONCLUSION

Based on the findings from the above-mentioned study, it has been determined that 13.9% of chefs suffer from De Quervain's Tenosynovitis as a result of the demands imposed by their work.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Lanfranchi JB, Duveau A. Explicative models of musculoskeletal disorders (MSD): From biomechanical and psychosocial factors to clinical analysis of ergonomics. *European Review of Applied Psychology*. 2008 Dec 1;58(4):201-13.
2. Tan D, Balaraman T. Working Posture and Musculoskeletal Pain among Restaurant Chef. *Indian Journal of Physiotherapy and Occupational Therapy*. 2020 Apr 1;14(02):255.
3. Pratten JD. What makes a great chef? *British Food Journal*. 2003 Aug 1.
4. Mason H. Chef. Gareth Stevens Publishing LLLP; 2014 Aug 1.
5. Esterhuyse N, Wakelin-Theron N, Geyser I. The optimal shift length for the resilient millennial chef. *Studia Periegetica*. 2022 Jul 14;38(2):63-79.
6. Stahl S, Vida D, Meisner C, Stahl AS, Schaller HE, Held M. Work related etiology of de Quervain's tenosynovitis: a case-control study with prospectively collected data. *BMC musculoskeletal disorders*. 2015 Dec;16(1):1-0.
7. Satteson E, Tannan SC. De Quervain Tenosynovitis. In *StatPearls* [Internet] 2022 Feb 22. StatPearls Publishing.
8. Ilyas, A. M., Ast, M., Schaffer, A. A., & Thoder, J. (2007). De quervain tenosynovitis of the wrist. *The Journal of the American Academy of Orthopaedic Surgeons*, 15(12), 757–764.
9. Melese H, Gebreyesus T, Alamer A, Berhe A. Prevalence and associated factors of musculoskeletal disorders among cleaners working at Mekelle University, Ethiopia. *Journal of Pain Research*. 2020 Sep 9:2239-46.
10. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. *Journal of electromyography and kinesiology*. 2004 Feb 1;14(1):13-23.
11. Alexopoulos EC, Stathi IC, Charizani F. Prevalence of musculoskeletal disorders in dentists. *BMC musculoskeletal disorders*. 2004 Dec;5(1):1-8.
12. Liu LW, Wang AH, Hwang SL, Lee YH, Chen CY. Prevalence and risk factors of subjective musculoskeletal symptoms among cooks in Taiwan. *Journal of the Chinese Institute of Industrial Engineers*. 2011 Jul 1;28(5):327-35.
13. Osborne A, Blake C, Fullen BM, Meredith D, Phelan J, McNamara J, Cunningham C. Prevalence of musculoskeletal disorders among farmers: a systematic review. *American journal of industrial medicine*. 2012 Feb;55(2):143-58.
14. Maurya P, Priyanka G, Palkar A. Prevalence of De-Quervain's tenosynovitis in tailors. *International Journal of Health Sciences and Research*. 2020 Feb;10(2):2249-957.
15. Fraser S, Lyon P. Chef perceptions of modernist equipment and techniques in the kitchen. *Journal of culinary science & technology*. 2018 Jan 2;16(1):88-105.
16. Wolf JM, Sturdivant RX, Owens BD. Incidence of de Quervain's tenosynovitis in a young, active population. *The Journal of hand surgery*. 2009 Jan 1;34(1):112-5.
17. Wu F, Rajpura A, Sandher D. Finkelstein's test is superior to Eichhoff's test in the investigation of de Quervain's disease. *Journal of hand and microsurgery*. 2018 Aug;10(02):116-8.
18. Pagonis, T., Ditsios, K., Toli, P., Givissis, P., & Christodoulou, A. (2011). Improved corticosteroid treatment of recalcitrant de Quervain tenosynovitis with a novel 4-point injection technique. *The American journal of sports medicine*, 39(2), 398–403.
19. Wu, F., Rajpura, A., & Sandher, D. (2018). Finkelstein's Test Is Superior to Eichhoff's Test in the Investigation of de Quervain's Disease. *Journal of hand and microsurgery*, 10(2), 116–118.
20. González-Iglesias, J., Huijbregts, P., Fernández-de-Las-Peñas, C., & Cleland, J. A. (2010). Differential diagnosis and physical therapy management of a patient with radial wrist pain of 6 months' duration: a case. *The Journal of orthopaedic and sports physical therapy*, 40(6), 361–368.
21. Allbrook V. (2019). 'The side of my wrist hurts': De Quervain's tenosynovitis. *Australian journal of general practice*, 48(11), 753–756.
22. Wu F, Rajpura A, Sandher D. Finkelstein's test is superior to Eichhoff's test in the investigation of de Quervain's disease. *Journal of hand and microsurgery*. 2018 Aug;10(02):116-8.
23. Goel, R., & Abzug, J. M. (2015). de Quervain's tenosynovitis: a review of the rehabilitative options. *Hand (New York, N.Y.)*, 10(1), 1–5.

24. Ilyas, A. M., Ast, M., Schaffer, A. A., & Thoder, J. (2007). De quervain tenosynovitis of the wrist. *The Journal of the American Academy of Orthopaedic Surgeons*, 15(12), 757–764.
25. Cheimonidou AZ, Lamnisos D, Lisacek-Kiosoglous A, Chimonas C, Stasinopoulos D. Validity and reliability of the Finkelstein test. *Trends in Medicine*. 2019;19(2):1-7.
26. Magee DJ. *Orthopaedic physical assessment - E- Book*. Elsevier Health Sciences; 2014 Mar 25.
- How to cite this article: Kashish Dinodia, Sushmita Singh, Ajay Kumar. Prevalence of De Quervain's tenosynovitis among restaurant station and junior chef using physical assessment test. *Int J Health Sci Res*. 2024; 14(5):268-274. DOI: <https://doi.org/10.52403/ijhsr.20240535>
