



TO STUDY UPPER LIMB MUSCULOSKELETAL PROBLEMS IN MALABAR PAROTTA MAKERS

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ABSTRACT

Background - Malabar Parotta is a Subcontinental layered flatbread made from Maida or Atta. Making it is indeed a task. Musculoskeletal disorders are common health problems throughout the world. Work-related Musculoskeletal disorders arise from arm and hand movements. What makes them risky in the working environment is their continual repetition. Although this comes under restaurant chefs, this specific technique is unique and skillful. Therefore, there is no research done on this difficult and skillful technique and is important to address it for the benefit of the makers. **Aim of the study** – To study musculoskeletal problems of Upper limb in Malabar Parotta makers. **Methodology And Study Tool** - A cross-sectional study with 100 individuals was included in the study. A self-made demographic questionnaire, Body map, Quick DASH (Disability of Arm, Shoulder, and Hand) scale, and Cornell hand discomfort questionnaire (CHDQ) were administered using the Direct Interview Method. **Results** – A total of 100 participants were analyzed in this study. 51.35% of Males have SHOULDER affection whereas 42.30% of Females show affection for SHOULDER. The affection for ARM is more recorded in Females with 30.68% and affection for FOREARM is more recorded in Males with 63.43%. The affection of HAND is Equal in both Males and Females with 62.6% respectively. **Conclusion** – The affection for Upper Limb was noticed to be severe in both males and females. As the number of parottas made increased disability and discomfort also increased. The people who worked in Home Based setups had maximum disability and discomfort. As the number of working years increased disability decreased but the discomfort was seen to be increased.

KEYWORDS : Malabar Parotta, Upper limb, Quick DASH, CHDQ

INTRODUCTION:

Malabar Parotta or Parotta is a Subcontinental layered flatbread made from Maida or Atta, alternatively known as flaky ribbon pancake. It is very common in Kerala, and Tamil Nadu and widely available in other states like Karnataka, Maharashtra, and countries like Malaysia, United Arab Emirates, and Sri Lanka.⁷

Parottas (Parathas) are often available as street food and in restaurants across.⁷

The process of making parotta consists of various steps which include – Sieve the ingredients, Knead the dough with hands, Divide the dough into balls, roll each ball as thinly as possible with a rolling pin, Brush oil on the rolled dough, Pleat the rolled dough, roll like a spiral and press the last edge on to the center, roll each spiral into parotta of 4-5 inches, Place parotta on a hot Tava and fry, Squish the parotta while serving between palms so that layers come up on the surface.⁸

Making Malabar parotta is indeed a task. It requires a good skill level. Even when you do know how to make it, pulling off this dish might be a bit too hard.⁶ It requires time and effort reinforcing the strength and effectiveness of hands.⁴

Musculoskeletal disorders are common health problems throughout the world. Work-related Musculoskeletal disorders arise from arm and hand movements such as bending, straightening, gripping, holding, twisting, clenching, and reaching. What makes them risky in the working environment is their continual repetition.¹

Work-related Musculoskeletal disorders are related to work designs that include: Fixed or static body postures, the continual repetition of movements, force concentrated on small parts of the body such as the hand and wrist, and a pace of work that does not allow sufficient recovery between movements. It usually occurs when there is a mismatch between the physical requirement of the job and the physical capacity of the human body.¹

The risk factors for musculoskeletal disorders include repetitive work, time on duty, vibration, awkward postures, tedious and painful actions, and prolonged standing.⁵

Several workplace conditions and tasks performed by workers might contribute to symptoms of WMSD, including dough handling, standing for prolonged periods next to a hot oven, lifting and moving heavy items and bags sometimes up and down a staircase, and working in cramped and heated spaces. They also work for long hours, during the night and early morning shifts, and they are under pressure to

complete certain tasks in a limited duration. These potentially harmful work practices may lead to musculoskeletal problems among workers. Although this comes under restaurant chefs, this particular parotta making is only done by specifically skilled people.

Therefore, as there are a lot of articles on various bread-making techniques, papad making, pizza making, and the musculoskeletal problems associated with it, there is no research done on this difficult and skillful technique of making Malabar Parotta which includes a lot of upper limb strength and effort. This being the major literature gap of not having single research done on Malabar Parotta making is an important issue to address worldwide as there can be various problems which the subjects face and can be brought into limelight and necessary advice and steps can be taken.

Thus, the main purpose of the study is to understand the musculoskeletal problems of the upper limb faced by the Malabar Parotta makers.

METHODOLOGY AND MATERIALS:

A cross-sectional study was carried out on 100 individuals who make Malabar Parotta for 6 months. Informed consent was taken from those who were willing to participate in the study. Subjects were selected based on inclusion and exclusion criteria. A self-made demographic questionnaire, Body map, Quick DASH (Disability of Arm, Shoulder, and Hand) scale, and Cornell hand discomfort questionnaire (CHDQ) were administered using the Direct Interview Method. The parameters studied using the scales were body part affected, Disability and Discomfort in Males and Females, Disability and Discomfort based on the number of parottas made, type of setup, and the number of working years.

Inclusion Criteria:

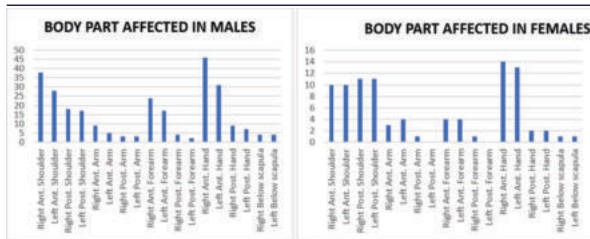
- Age group – 18 to 60 years.
- All genders.
- Having a work experience of 1 year.

Exclusion Criteria:

- Age group of less than 18 and more than 60 years.
- Subjects with a recent trauma.
- Subjects having any Neuro-musculoskeletal problems.
- Subjects having less than 1 year of experience.

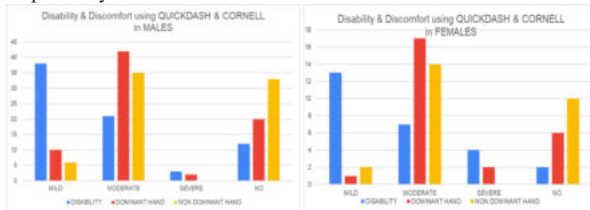
DATA PRESENTATION AND INTERPRETATION:

Graph 1 - Work-related Musculoskeletal Disorder Among Male And Female Respondents According To The Body Part Affected.



Graphs from above revealed that 51.35% of Males have SHOULDER affection whereas 42.30% of Females show affection for SHOULDER.

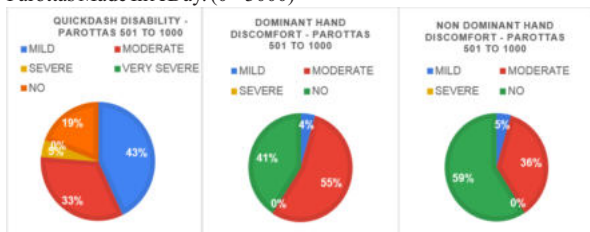
The affection for ARM is more recorded in Females with 30.68% and affection for FOREARM is more recorded in Males with 63.43%. The affection of HAND is Equal in both Males and Females with 62.6% respectively.



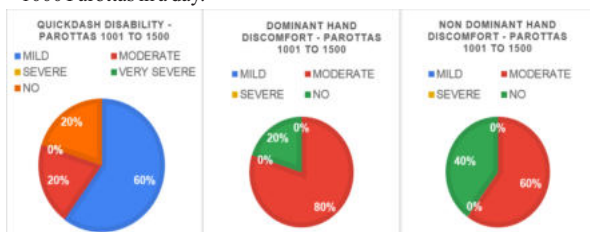
Graph 2 – Disability And Discomfort In Males And Females Using Quick Dash And Cornell Hand Discomfort Questionnaire

Graphs from above reveal that 51% of Males and 50% of Females have MILD DISABILITY, whereas 29% of Males and 27% of Females have MODERATE DISABILITY. SEVERE DISABILITY is seen in 4% of Males and 15% of Females. DOMINANT HAND Discomfort is MILD in 8% of Males and 4% of Females, MODERATE Discomfort is equally present in both, and SEVERE Discomfort is seen in 8% of Females only. NON-DOMINANT HAND Discomfort is MILD in 13% of Males and 8% of Females, MODERATE Discomfort is seen in 57% of Males and 54% of Females, and SEVERE Discomfort is seen in 3% of Males only. 38% of Females and 27% of Males have NO discomforts at all.

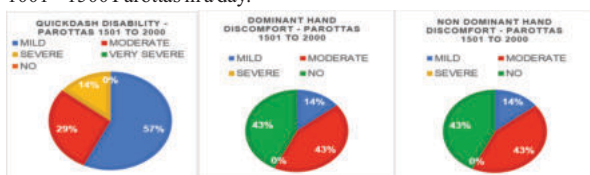
Graph 3: Disability And Discomfort Using Quick Dash And Cornell Hand Discomfort Questionnaire Depending On The Number Of Parottas Made In A Day. (0 – 3000)



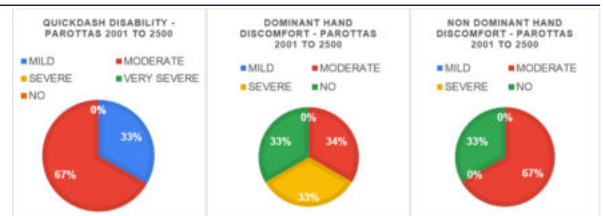
Graph 3A: Disability and Discomfort seen in respondents making 501 – 1000 Parottas in a day.



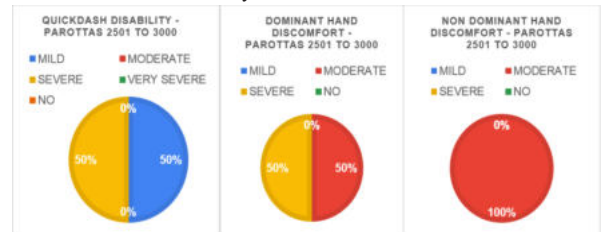
Graph 3B: Disability and Discomfort seen in respondents making 1001 – 1500 Parottas in a day.



Graph 3C: Disability and Discomfort seen in respondents making 1501 – 2000 Parottas in a day.



Graph 3D: Disability and Discomfort seen in respondents making 2001 – 2500 Parottas in a day.



Graph 3E: Disability and Discomfort seen in respondents making 2501 – 3000 Parottas in a day.

Graphs 3A to 3E above reveal that majority of MILD Disability is seen in 60% of respondents who make 1001 to 1500 parottas a day.

A majority of MODERATE Disability is seen in 67% of respondents who make 2001 to 2500 parottas a day.

A majority of SEVERE DISABILITY is seen in 50% of respondents who make 2501 to 3000 parottas a day.

20% of NO affection is seen in respondents who make 1001 to 1500 parottas a day.

Graphs 3A to 3E also reveal the DISCOMFORT of the DOMINANT HAND.

The majority of MILD Discomfort is seen in 33% of respondents who make 2001 to 2500 parottas a day.

MODERATE Discomfort is seen in 80% of respondents who make 1001 to 1500 parottas.

SEVERE Discomfort is seen in 50% of respondents who make 2501 to 3000 parottas a day.

NO Discomfort is experienced by 43% of respondents who make 1501 to 2000 parottas a day.

Graphs 3A to 3E also give a picture of the DISCOMFORT of the NON-DOMINANT HAND.

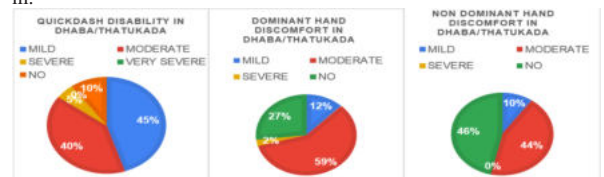
The majority of MILD Discomfort is seen in 14% of respondents who make 1501 to 2000 parottas a day.

MODERATE Discomfort is seen in 100% of respondents who make 2501 to 3000 parottas.

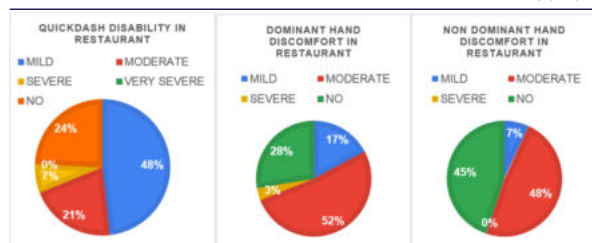
SEVERE Discomfort is seen in NONE of the respondents.

NO Discomfort is experienced by 59% of respondents who make 501 to 1000 parottas a day.

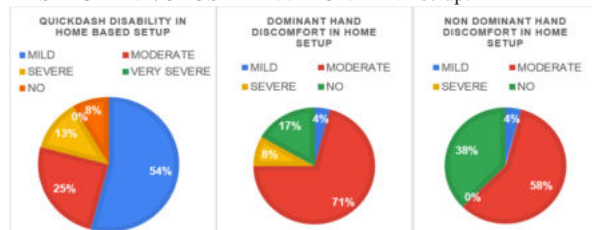
GRAPH 4: Disability and Discomfort using Quick DASH (Disability of Shoulder, Arm, and Hand) and CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) depending on the Type of Setup working in.



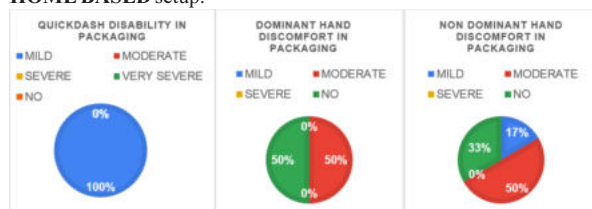
Graph 4A: Disability and Discomfort seen in respondents working in DHABA/THATUKADA/OPEN ENVIRONMENT setup.



Graph 4B: Disability and Discomfort seen in respondents working in RESTAURANT/CLOSED ENVIRONMENT setup.



Graph 4C: Disability and Discomfort seen in respondents working in HOME BASED setup.



Graph 4D: Disability and Discomfort seen in respondents working in PACKAGING/INDUSTRY setup.

Graphs 4A to 4D above reveal that majority of MILD Disability is seen in 100% of respondents who work in PACKAGING setup.

A majority of MODERATE Disability is seen in 40% of respondents who work in a DHABA/THATUKADA setup.

A majority of SEVERE DISABILITY is seen in 13% of respondents who work in HOME BASED setup.

24% of NO affection is seen in respondents who work in the RESTAURANT setup.

Graphs 4A to 4D also reveal the DISCOMFORT of the DOMINANT HAND.

The majority of MILD Discomfort is seen in 17% of respondents who work in RESTAURANT setups.

The majority of MODERATE Discomfort and SEVERE Discomfort is seen in 71% and 8% of respondents respectively who work in HOME BASED setup.

NO Discomfort is experienced by 27% of respondents who work in the DHABA setup.

Graphs 4A to 4D also give a picture of the DISCOMFORT of the NON-DOMINANT HAND.

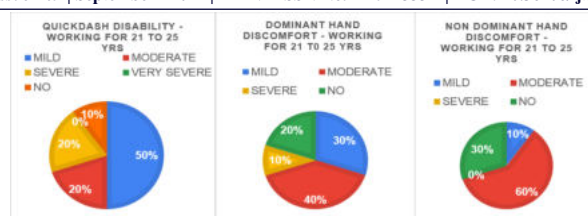
The majority of MILD Discomfort is seen in 17% of respondents who work in PACKAGING setup.

MODERATE Discomfort is seen in 58% of respondents who work in HOME BASED setup.

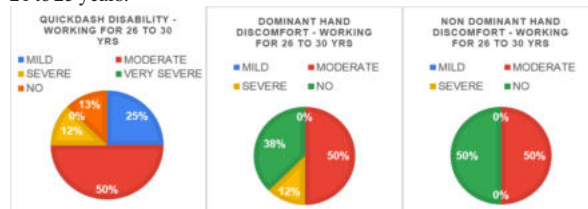
SEVERE Discomfort is seen in NONE of the respondents.

NO Discomfort is experienced by 46% of respondents who work in the DHABA/THATUKADA setup.

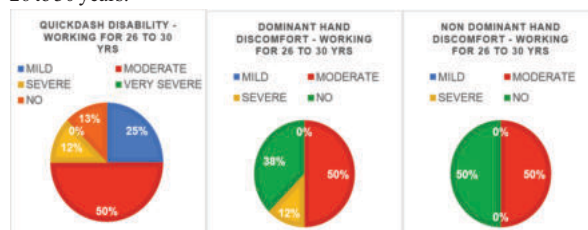
GRAPH 5: Disability and Discomfort using Quick DASH (Disability of Shoulder, Arm, and Hand) and CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) depending on the Number of Working Years.



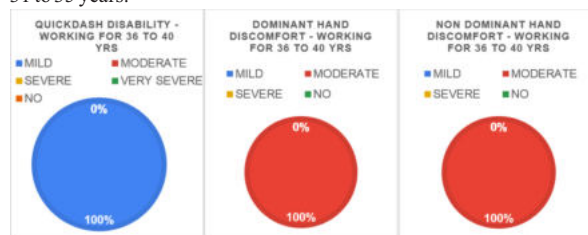
Graph 5A: Disability and Discomfort seen in respondents working for 21 to 25 years.



Graph 5B: Disability and Discomfort seen in respondents working for 26 to 30 years.



Graph 5C: Disability and Discomfort seen in respondents working for 31 to 35 years.



Graph 5D: Disability and Discomfort seen in respondents working for 36 to 40 years.

The Graphs above reveal that majority of MILD Disability in 100% & MODERATE Discomfort of the dominant and non-dominant hand in 100% of respondents who work for 36 to 40 years.

A majority of MODERATE Disability in 50%, MODERATE Discomfort of dominant hand in 100% & MILD Discomfort of the non-dominant hand in 50% of respondents who work for 31 to 35 years.

A majority of MODERATE Disability in 50% & SEVERE Discomfort of dominant hand in 12% of respondents who work for 26 to 30 years.

A majority of SEVERE DISABILITY in 20% & MILD Discomfort of dominant hand in 30% of respondents who work for 21 to 25 years.

The majority of NO affection is seen in respondents who work for 1 to 5 years and 11 to 15 years.

DISCUSSION:

To our knowledge, this is the first study on Malabar Parotta makers and there is no research done on this difficult and skill full technique which includes a lot of upper limb strength and effort.⁸ Thus, lack of evidence led to the execution of this study.

Women involved in Papad making activity on daily basis were found to assume different awkward postures among which rolling activity was found as a 'very heavy' activity and if continued for longer durations results in discomfort in different body parts.¹ When job demands repeatedly exceed the biomechanical capacity of the worker, the activities become trauma-inducing. Hence, traumatizers are workplace sources of biomechanical strain that contribute to the onset of injuries affecting the musculoskeletal system. It has been

conventional wisdom that "wear and tear" from at least some activities lead to reversible and irreversible damage to the musculoskeletal system.² A study on restaurant chefs reports that 3rd highest prevalence of work-related musculoskeletal disorders are shoulders due to the repetitive movement and prolonged static position of the shoulder for each position.³

Similarly, through the results of my study, a ranking was done based on the body part affected between males and females with the help of Body Map and it was clear that the majority of male respondents have Shoulder and Forearm affection and a majority of female respondents have Shoulder and Arm affection. The affection for hands is equally seen in both genders. As all the sub-activities were performed with continuous hand motion and lot of effort and force might be the reason for upper limb pain and discomfort.

The disability and discomfort according to Quick DASH (Disability of Shoulder, Arm, and Hand) and CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) in males and females show that Mild and Moderate disability is seen in the Majority of Males whereas Severe disability is seen in Majority of Females, similarly, Dominant hand discomfort is Mild in Males and Severe in Females, whereas the affection of Non – Dominant hand is majorly seen in Males which might be due the heavy and strenuous work demand and the various positions assumed by the individuals during the various steps of making parotta.

The disability and discomfort according to Quick DASH (Disability of Shoulder, Arm, and Hand) and CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) based on the number of parottas made give us a picture that as the number of parottas increases the disability and discomfort also increases which might be due to fatigue of muscles of the upper limb, or due to the heavy workload and force required in accomplishing the set target of parottas.

The disability and discomfort according to Quick DASH (Disability of Shoulder, Arm, and Hand) and CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) based on the type of setup the respondents work in show Mild affection for those who work in a packaging industry which might be due to more amount of rest breaks and work pattern which requires only some amount of effort. Moderate affection of discomfort in respondents working in a Dhaba/Thatukada/Open environment which might be due to open area of the workspace and better equipment. Severe affection for those who work in Home Based setup, which might be due to the association of various restrictions and demands of home as well as due to inappropriate work station and the various equipment needed to make the parotta.

The disability according to Quick DASH (Disability of Shoulder, Arm, and Hand) based on the number of working years shows that the more the work experience lesser the disability and this might be due to the various simpler techniques known to the respondent or due to known equipment for faster work.

The discomfort of the dominant hand according to CORNELL HAND DISCOMFORT QUESTIONNAIRE (CHDQ) based on the number of working years shows that discomfort in the hand increases depending on the increasing work years.

A study on bakers says that it should be noted that most of the respondents reported that symptoms slightly reduced their ability to work, but most of these symptoms were neglected or left untreated.

This may be attributed to their socioeconomic status because if they need to be at work to ensure financial support for their families, they neglect the work-related musculoskeletal symptoms and also the disorders.¹⁷ Therefore, there is a major literature gap which is a limitation of this and should be highlighted.

CONCLUSION:

Malabar Parotta Makers in this study were found to have maximum affection of SHOULDER and FOREARM in MALES whereas maximum affection of SHOULDER and ARM in FEMALES. The affection of HAND was noted to be equally affected in both genders.

The Disability and Discomfort in males and females show that Mild and Moderate disability is seen in majority of Males whereas Severe disability is seen in majority of Females, similarly, Dominant hand

discomfort is Mild in Males and Severe in Females, whereas the affection of Non – Dominant hand is majorly seen in Males.

The Disability and Discomfort based on the number of parottas made were found to be that as the number of parottas made increased (1 being the minimum and 3000 being the maximum) the disability and discomfort also increased among the respondents.

The Disability and Discomfort based on the type of setup show that Mild affection is seen in those who work in Packaging industry, Moderate affection in those who work in Dhaba/Thatukada /Open environment, and Severe affection is seen in those who work in a Home-based setup.

The Disability based on the number of working years (1yr being minimum and 40yrs being maximum) was found to be Mild and Moderate in those who work for many years and Severe in those who work for a smaller number of years.

The Discomfort based on the number of working years (1yr being minimum and 40yrs being maximum) was found to be Mild in those who work for a smaller number of years and Moderate and Severe in those who work for a greater number of years

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