

# The Profile Of Carpal Tunnel Syndrome (CTS) Patients at Dr. Soetomo Regional Public Hospital In Surabaya For The Years 2022–2023

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## Abstract

Carpal Tunnel Syndrome (CTS) stands out as the most prevalent entrapment neuropathy worldwide, affecting approximately 1% to 5% of the global population. This research explores the profile of 74 patients with Carpal Tunnel Syndrome (CTS) at Dr. Soetomo Surabaya Regional General Hospital in 2022–2023. With a global prevalence of CTS ranging from 1–5%, the pathophysiology is associated with compression and traction of the median nerve due to repetitive wrist flexion. This study is an observational analytical descriptive research with a retrospective approach. The study included a total of 74 carpal tunnel syndrome (CTS) patients, comprising a total of 114 affected hands, consisting of 29 Right CTS, 5 Left CTS, and 40 Bilateral CTS. Out of these, there were 32 cases of mild CTS, 32 cases of moderate CTS, and 50 cases of severe CTS. The variables described include comparing age and gender with the CTS location and severity level. The majority of patients fall within the early elderly category, specifically aged 45–55 years (39%), and the most prevalent gender is female (72%) overall and when considering CTS location (right, left, bilateral) and severity level (mild, moderate, severe). The prevalence of male to female patients 0,39:1 or two and a half times more women than men.

**Keywords:** Carpal Tunnel Syndrome; Age, Gender, Profile

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## 1. Introduction

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy worldwide, with a prevalence ranging from 1 to 5% of the entire population. The pathophysiology of this condition involves a combination of compression and traction mechanisms on the median nerve due to repetitive flexion movements of the wrist. Subandi et al. in 2021 said Carpal Tunnel Syndrome (CTS) is a clinical condition marked by sensations of tingling, numbness, pain, or weakness of the hand and wrist, extending into the arm.

According to the study conducted by Hidayati et al. in 2022, Carpal Tunnel Syndrome (CTS) has emerged as the primary contributor to chronic neuropathic pain in the upper extremities. CTS disproportionately affects women, with a prevalence 3.6 times higher than in men. This imbalance contributes to significant expenses in medical treatment, rehabilitation, compensation for lost work hours, initial pension costs, and the training of new workers, making CTS a substantial concern in the realm of employment. The onset of carpal tunnel

syndrome is linked to prolonged, repetitive, and forceful work, along with various risk factors such as gender, age, heredity, hormonal factors, and weight. A thorough understanding of CTS diagnosis and comprehensive management is crucial for healthcare professionals.

## 2. Methods and Material

This study is an observational analytical descriptive research with a retrospective approach. The study included a total of 74 carpal tunnel syndrome (CTS) patients.. The gathered data will undergo analysis, leading to the formulation of conclusions based on the findings. This is a descriptive study as the aim of this research is to interpret and compare the results of the profile patients with carpal tunnel syndrome at Dr. Soetomo Regional Public Hospital from 2022 to 2023. Additionally, the study is analytical as the discussion of the obtained readings is analyzed through quantitative comparisons. Furthermore, the research is conducted retrospectively because the data used are derived from past occurrences up to the present, and it is observational or non-experimental in nature due to the absence of interventions on the research subjects.

## 3. Result

### 3.1. Distribution of CTS patients based on bilaterality.

In this study, data were collected from 74 carpal tunnel syndrome (CTS) patients, and the distribution of CTS patients varied significantly. The most prevalent distribution was found in Bilateral CTS, with 40 patients out of 74, accounting for 54% or more than half of the total patients experiencing Bilateral CTS affecting both right and left hands.

Table 1. Distribution of CTS patients based on bilaterality

Diagnosis of CTS	N	%
Right CTS	29	39%
Left CTS	5	7%
Bilateral CTS	40	54%
<b>Total</b>	<b>74</b>	<b>100%</b>

### 3.2. Distribution of CTS patients based on severity.

The study also revealed the distribution of hands affected by carpal tunnel syndrome among the total of 74 patients and 148 hands. The highest distribution was observed in Severe CTS, with 50 hands out of the total 114 hands of CTS patients, representing 44%.

Table 2. Distribution of CTS patients based on severity

Severity of CTS	Total Hands	Hands	
		Right	Left
Mild	32	14	18
Moderate	32	22	10
Severe	50	33	17
Normal	34	5	29

<b>Total</b>	148	74	74
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### 3.3. Age distribution of CTS patients

The research indicates a diverse age distribution among carpal tunnel syndrome patients at Dr. Soetomo Regional Public Hospital from 2022 to 2023. The majority age group falls within the early elderly category, specifically in the 46–55 age range, comprising 29 out of 74 patients, accounting for 39%.

Table 3. Age distribution of CTS patients

Age (Permenkes 2019)	N	%
Late adolescence (17-25 years)	5	7%
Early adulthood (26-35 years)	6	8%
Late adulthood (36-45 years)	13	18%
Early elderly (46-55 years)	29	39%
Late elderly (56-65 years)	13	18%
After the Elderly (>65 years)	8	11%
<b>Total</b>	74	100%

### 3.4. Age distribution of CTS patients based on bilaterality

For each location type of CTS, the most common age distribution was found in the early elderly category (46–55 years), with 17 patients out of 40 having Bilateral CTS, 9 out of 29 having Right CTS, and 3 out of 5 having Left CTS.

Table 4. Age distribution of CTS patients based on bilaterality

Age (Permenkes 2019)	Bilateral CTS	Right CTS	Left CTS
Late adolescence (17-25 years)	1	4	0
Early adulthood (26-35 years)	4	2	0
Late adulthood (36-45 years)	8	5	0
Early elderly (46-55 years)	17	9	3
Late elderly (56-65 years)	7	4	2
After the Elderly (>65 years)	3	5	0
<b>Total</b>	40	29	5

### 3.5. Age distribution of CTS patients based on severity

Similarly, for each severity level of CTS, the highest age distribution was observed in the early elderly category (46–55 years), with 9 patients out of 32 experiencing mild CTS, 14 out of 32 experiencing moderate CTS, and 24 out of 50 experiencing severe CTS.

Table 5. Age distribution of CTS patients based on severity

Age (Permenkes 2019)	Mild	Moderate	Severe	Normal
Late adolescence (17-25 years)	2	1	3	4
Early adulthood (26-35 years)	5	1	3	1
Late adulthood (36-45 years)	5	10	6	5
Early elderly (46-55 years)	9	14	24	13
Late elderly (56-65 years)	7	4	9	6
After the Elderly (>65 years)	4	2	5	5
<b>Total</b>	32	32	50	34

### 3.6. Gender distribution of CTS patients

This study indicates the gender distribution of carpal tunnel syndrome (CTS) patients at Dr. Soetomo Regional Public Hospital in Surabaya from 2022 to 2023. The majority of patients were females, accounting for 53 out of 74 patients, with a percentage of 72%.

Table 6. Gender distribution of CTS patients

Gender	N	%
Male	21	28%
Female	53	72%
<b>Total</b>	74	100%

### 3.7. Gender distribution of CTS patients based on bilaterality

The most prevalent gender distribution based on the location types of CTS was found in all three categories (Right CTS, Left CTS, Bilateral CTS) among female patients. There were 19 female patients and 10 male patients with Right CTS, 3 female patients and 2 male patients with Left CTS, and 31 female patients and 9 male patients with Bilateral CTS.

Table 7. Gender distribution of CTS patients based on bilaterality

Diagnosis of CTS	N Male	%	N Female	%
Right CTS	10	48%	19	36%
Left CTS	2	9%	3	6%
Bilateral CTS	9	43%	31	58%
<b>Total</b>	21	100%	53	100%

### 3.8. Gender distribution of CTS patients based on severity

The most prevalent gender distribution based on the severity levels of CTS was observed across all severity levels (mild, moderate, and severe) and was predominant among female patients. Out of the total 74 patients and 148 hands, for mild CTS, there were 20 female patients and 12 male patients, for moderate CTS, there were 24 female patients and 8 male patients, and for severe CTS, there were 40 female patients and 10 male patients

Table 8. Gender distribution of CTS patients based on severity

Severity of CTS	N Male	%	N Female	%
Mild	12	29%	20	19%
Moderate	8	19%	24	23%
Severe	10	24%	40	38%
Normal	12	29%	22	21%
<b>Total</b>	<b>42</b>	<b>100%</b>	<b>106</b>	<b>100%</b>

## 4. Discussion

The distribution of carpal tunnel syndrome (CTS) patients at Dr. Soetomo Regional Public Hospital in Surabaya from 2022 to 2023 based on the location types indicates that the most prevalent distribution was found in Bilateral CTS, with 40 patients out of 74, accounting for 54% or more than half of the total patients experiencing Bilateral CTS. This is consistent with the research by Singjam et al (2021), who reported a prevalence of 80.7% for bilateral CTS. In their study of 327 patients, they found 143 cases of bilateral CTS, representing 43.7%. The prevalence of Bilateral CTS aligns with previous studies by Vicuna et al (2017) and Lewanska (2020), which reported figures of 68–74.3%. It is also consistent with a systematic review conducted by Pawel et al (2018), indicating that CTS symptoms on both sides were reported in 22%–87% of patients. Meanwhile, for Right CTS (CTS dextra), a prevalence of 39% was observed, and for Left CTS (CTS sinistra), it was 7%. This finding aligns with Lewanska's (2020) research, which reported a prevalence of 20.3% for Right CTS and 5% for Left CTS, indicating the prevalence order as Bilateral CTS, Right CTS, and then Left CTS.

The age distribution of carpal tunnel syndrome (CTS) patients at Dr. Soetomo Regional Public Hospital in Surabaya for the years 2022–2023, as depicted in the most prevalent age category is early elderly (46–55 years), comprising 29 out of 74 patients, accounting for 39%. This study also found a minimum age among late adolescents (17–25 years), with 5 patients, representing 7%, and a maximum in the elderly category (>65 years) with 8 patients, representing 11%. The graph obtained also shows a significant increase from late adolescence to peak at early elderly age, followed by a decline towards the elderly age. This aligns with a review by Sevy JO, et al (2023), stating that CTS rarely occurs in children and usually emerges in adults aged 40 to 60 years. It is also consistent with research by Malibary et al (2013), reporting the highest distribution of CTS at ages 45–55 years, with a prevalence increasing from 15–25 to 106 patients, representing 31.5%, and decreasing significantly to >75 years with 18 patients, representing 5.4%. This is in line with a review by Genova et al (2020), stating that although CTS can occur in all age groups, it is more common in adults aged 40 to 60 years.

The gender distribution of carpal tunnel syndrome (CTS) patients at Dr. Soetomo Regional Public Hospital in Surabaya for the years 2022–2023, as depicted in Table 5.9, shows that the most prevalent gender is female, with 53 out of 74 patients, accounting for 72%, which is 32 patients more than the male patients, totaling 21 out of 74 patients, representing 28%. This aligns with a literature review by Sevy JO, et al (2023), stating that the prevalence of CTS is higher in women than in men, with a female-to-male ratio of 3:1. It is also consistent with a review by Genova et al (2020), stating that the incidence rate of CTS is 9.2% in women and 6% in men. This is further in line with research by Melibary et al (2013), reporting a CTS prevalence of 86.3% in women and 13.7% in men.

## 5. Conclusions

The profile of carpal tunnel syndrome (CTS) patients at Dr. Soetomo Regional Public Hospital in Surabaya for the years 2022–2023 is predominantly characterized by bilateral CTS cases (54%) based on location, severe CTS cases (44%) based on severity, and a combination of severe bilateral CTS cases (19%) based on both criteria. The majority of patients fall within the early elderly category, specifically aged 45–55 years (39%), considering overall data and categorizing by CTS location (right, left, bilateral) and severity level (mild, moderate, severe). The most prevalent gender is female (72%) across all data and when considering CTS location (right, left, bilateral) and severity level (mild, moderate, severe).

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