AGE GROUP WITH SEVERITY SCALES AND FUNCTIONAL STATUS CARPAL TUNNEL SYNDROME ON ELDERLY AT NURSING HOME SANTO YOSEF SURABAYA

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ABSTRACT

Introduction : Carpal tunnel syndrome (CTS) is a condition which is known as one of the cumulative trauma disorder (CTD) that can happen to the wrist or arm with a symptoms like pain, loss of sensitivity, weakness and tingling that commonly occur to the thumb, index finger and middle finger. Prevalence of CTS that has been reported keep increasing each year, up to 276/100.000 cases each year.

Aim : The aim of this research is to know if there's a correlation between age group and carpal tunnel syndrome symptom on elderly at nursing home Santo Yosef Surabaya.

Methods : This research use observational study with analytic design and the method that's used in this research is cross sectional. Analysis in this research will be using spearman correlation test to know the correlation between variables. The population in this research is 154 elderly at the senior home facility Santo Yosef Surabaya. There is 70 elderly for this research sample.

Results : From the analytic result, it has been found that the symptom severity (SSS) and age group and functional status (FSS) and age group is significant with the p score of p =0.0017 and p= 0.049 respectively, from the data that's acquired from the result of spearman test it can be also concluded that from the coefficient correlation score of r=0.284 there's a weak correlation between severity symptom (SSS) and age group, the correlation score of r=0.236 from the functional status (FSS) and age group indicate that it also have a weak correlation power.

Conclusion : In conclusion, there was a significant correlation between age group and severity symptom in CTS (*SSS*). There is a significant correlation between age group and functional status in CTS (*FSS*).

Keyword: elderly, CTS symptoms, degree of severity, functional status.

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INTRODUCTION

Carpal Tunnel Syndrome (CTS) is a condition known as one of the cumulative trauma disorders (CTD) that can occur in the wrist or arm with symptoms such as pain, loss of sensitivity, weakness, and tingling that generally occurs in the thumb, index finger and middle finger. Such condition occurs when the median nerve (one of the large nerves from the upper arm to the wrist) is compressed or narrowed, caused by edema fascia, or as a result of a small bone abnormality resulting in pressure on the nerve or thickening of the tendon layer experiencing irritation. In most patients, complaints from CTS get worse over time so initial diagnosis and treatment are very important. Initial symptoms can generally be alleviated by a few simple measures such as using a splint, reducing the activities that cause them pain, or immobilizing. [1] [2]

Carpal Tunnel Syndrome is the most common condition in the form of Median Nerve Entrapment, and as many as 90% of cases of nerve entrapment are CTS. Other types of Median Nerve Entrapment Neuropathies are pronator syndrome and anterior interosseous nerve syndrome. In a study conducted in America by the National Health Interview Service (NHIS), there were 3.8% in the general population, and 1 in 5 patients who complained of symptoms such as pain, numbness, and tingling were thought to have CTS. The incidence of self-reported CTS continues to increase up to 276 / 100,000 per year, where women have increased by 9.2% and men as much as 6%. CTS itself is more common in women than men and more often found to be bilateral when compared to unilateral. [3] [4]

In Indonesia alone, the incidence of CTS is not yet known because the number of CTS diagnoses is limited due to the small number of patients reporting the condition. However, a research from Fatmawati et al. (2009) found 22.9% of welding section workers with non-ergonomic positions such as welding with squatting, bowing and positioning head looked up can affect the working position of the hand, and there are other studies conducted by Angelina (2014) on workers at PT. DOK and Surabaya shipping get 87.2% of respondents experiencing CTS complaints. [5]

Various factors can cause Carpal Tunnel Syndrome that can be divided into general conditions and health conditions of patients. Diseases such as diabetes, thyroid disease, connective tissue disorders, amyloidosis, acromegalia, and vitamin B deficiency are occurrence factors of CTS. Whereas in general conditions include age,

sex, use of oral contraceptives, wrist size, weight, body size, and Body Mass Index.

According to Law Number 13 of 1998, the age that can be said as the elderly is 60 years and above. The increase in the elderly is expected to continue to increase both on a global and Indonesian scale where it is predicted that in 2100 the number of elderly Indonesians will increase higher than the world's elderly population. This is because since 2004 there has been an increase in life expectancy in Indonesia from 68.6 years to 70.8 years; where the provinces with the highest number of elderly were DI Yogyakarta (13.4%), then Central Java (11.8%) and East Java (11.5%) while the provinces with the lowest number of elderly were Papua (2.8%). Older women are higher in number than older men. [6]

According to some existing studies, the elderly have a higher chance of getting CTS when compared to people under the age of 50, where the symptoms of CTS itself can manifest from the age of 30 years. The increase in the incidence of CTS in the elderly can be attributed to an increase in thenar muscle wasting and loss of both sensory and motor axons and an increase in the regeneration ability of the axons themselves. [7] [8].

Based on existing data, researchers want to find out whether there is a correlation between a person's age and the incidence of CTS symptoms.

Based on the data that has been obtained and some related studies, the researcher seeks out to find the correlation of the age group with the degree of severity and functional status of carpal tunnel syndrome in the elderly at the St. Joseph Nursing Home.

METHODS

The research design used in this study was observational analytic design. The study used a cross-sectional approach. In this study, the relationship between age groups and CTS symptoms will be analyzed.

The dependent variable of this study is the severity of CTS symptoms and the functional status of CTS symptoms. The independent variable in this study is the elderly age group. The population of this study is the elderly who reside in St. Joseph Nursing Home, as many as 154 people. The sample of this research is the elderly in St. Joseph Nursing Home, the total population in the study area, is 154 people. The sampling technique used in this study is a purposive sampling technique, which is a technique in which the data to be taken is data that meets the requirements and inclusions following this study. The inclusion criteria of this study were willing to participate, be cooperative

in answering questionnaires, reside in the St. Joseph Nursing Home Surabaya, and respondents aged over 60 years old. While the exclusion criteria from this study were that the respondent had an accident that affected the wrist, the respondent had a history of stroke, the respondent had a history of arthritis, and the respondent had a history of gout.

Data were collected at the St. Joseph Nursing Home, Surabaya. This research was conducted from July to September 2017.

RESULT

This research was carried out at the St. Joseph Nursing Home, located at Jl. Jelidro II / 33, Lontar, Sambikerep, Surabaya, East Java. The St. Joseph Nursing Home is inhabited by 154 elderly, consisting of 67 men and 87 women. St. Joseph Nursing Home began operating on 19 March 2008.

St. Joseph Nursing Home has two floors, has 35 bedrooms with different capacities: 12 rooms with a capacity of 12 people, 11 rooms for four people, and 12 rooms for two people. St. Joseph Nursing Home has some routine activities for the elderly to fill their daily time, including praying, singing, morning gymnastics, watching, and there are some elderly who also play halma, chess, dominoes. The elderly in St. Joseph Nursing Home does

not have an obligation to follow a strict rule, so they have the freedom to spend their own time. They can do their hobbies freely; some elderly choose to read books, gardening, play with friends, or chat. The place is maintained as tidy as it provides comfort, a calm situation far from the center of the crowd, and nurses who are ready to assist the elderly. The St. Joseph Nursing Home also has a regular weekly program on Wednesday and Saturday, where the elderly gathered by the hall to attend morning exercises, pray, and sing together. These activities are carried out until lunchtime, to strengthen the sense of togetherness with each other.

This research was conducted for six days, starting from Wednesday 19 July 2017, where we researched the hall where the elderly gather. The study began at 10:00 to 12:00, then continued on Thursday the 20th, Friday the 21st, Monday the 24th, where we continue collecting data by room visit because several older people did not participate in the event in the hall. Then, on Wednesday, 26 July 2017, we conducted data collection in the hall and continued on the last day, Thursday, 27 July 2017. On 20, 21, 24, 26, 27 July 2017 the study began earlier, at 08.00-12.00

The researcher conducted the primary data collection process by collecting data directly, where the

researchers measured the severity of carpal tunnel syndrome (SSS) and functional status scale (FSS) of the elderly. The population of the elderly in St. Joseph Nursing Home is as many as 154 people, and there are as many as 70 respondents who meet the inclusion criteria as research subjects.

Data collected in this study will be tabulated based on distribution according to age group, gender, SSS degree, FSS degree. The correlation analysis between age groups and degrees of SSS and age groups and degrees of FSS will be carried out. The analysis will be carried out using the Spearman correlation analysis technique. The α value has been set at 0.05 so that the relationship between variables can be considered significant if the significance value or p-value <0.05. Here are the results of the study:

Table 5.1 Respondent Distribution by Age Group

Age Group	Frequency (n)	Percentage (%)
Early Elderly Period (60 - 74 y/o)	19	27.1%
Late Elderly Period (75 - 90 y/o)	48	68.6%
Later Elderly Period (90+ y/o)	3	4.3%
Total	70	100%

Based on Table 5.1, the age group of Late Elderly Period (75-90 years) has the most significant percentage of 68.6%,

and the Later Elderly Period group has the lowest percentage of 4.3%.
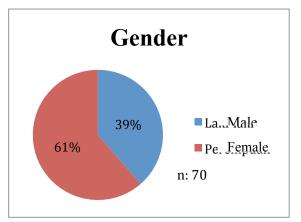

Figure 5.1 Respondent Distribution based on Gender

Based on Figure 5.1, there are 27 male respondents (39%) and as many as 43 female respondents (61%) of the total number of respondents as many as 70.
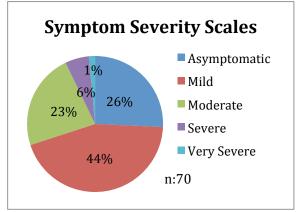

Figure 5.2 Respondent Distribution based on Symtoms Severity Scale

Based on Figure 5.2, of 70 respondents there were 18 respondents were Asymptomatic (26%), 31 respondents were Mild category (44%), 16 respondents were in the Moderate category (23%), four respondents were in a Severe category (6%) and one respondent in the Very Severe category (1%).
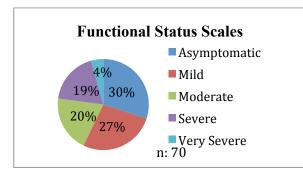
Functional Status Scales

- Asymptomatic
- Mild
- Moderate
- Severe
- Very Severe

4%, 30%, 27%, 20%, 19%

n: 70

Figure 5.3 Respondent Distribution based on Functional Status Sales

Based on Figure 5.3, of the total 70 respondents, there were 21 respondents classified as Asymptomatic (30%),19 respondents classified as Mild (27%),14 respondents classified as Moderate (20%), 13 respondents classified as Severe (19%), and three respondents classified as Very Severe (4%).

Table 5.2 Respondent Distribution based on Age Group and Gender

Age Group	Gender				Total	
	Male		Female			
	(n)	(%)	(n)	(%)	(n)	(%)
Early Elderly Period (60 - 74 tahun)	11	15.7%	8	11.4%	19	27.1%
Late Elderly Period (75 - 90 tahun)	16	22.9%	32	45.7%	48	68.6%
Later Elderly Period (90+ tahun)	0	0%	3	4.3%	3	4.3%
Total	**27**	**38.6%**	**43**	**61.4%**	**70**	**100%**

Based on Table 5.2, the Late Elderly Period (75 - 90 years) had the highest percentage for both men and women, amounting to 22.9% and 45.7%. In the Early Elderly Period, the lowest percentage obtained for men is 15.7%. In contrast, for women, the age group that has the lowest percentage is the Later Elderly Period (90+ years), which is 4.3%

Table 5.3 Respondent Distribution based on Age Group and Symptoms Severity Scale

Degree of SSS	Age Group							
	Early Elderly Period (60 - 74 y/o)		Late Elderly Period (75 - 90 y/o)		Later Elderly Group (90+ y/o)		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Asymtopmatic	7	10%	11	15.7%	0	0%	18	25.7%
Mild	10	14,3%	20	28.6%	1	1.4%	31	44.3%
Moderate	1	1.4%	14	20%	1	1.4%	16	22.9%
Severe	1	1.4%	3	4.3%	0	0%	4	5.7%
Very Severe	0	0%	0	0%	1	1.4%	1	1.4%
Total	**19**	**27.1%**	**48**	**68.6%**	**3**	**4.3%**	**70**	**100%**

Based on Table 5.3, the Early Elderly Period (60 - 74 years) in Mild degree has the highest percentage, which is 15.7%, while the moderate and severe degrees have the lowest percentage, which is equal to 1.4%. Late Elderly Period (75 - 90 years) with SSS Mild degree has the highest percentage, which is 28.6% and the lowest percentage is in Severe degree of 4.3%. Later Elderly Period has the same percentage for mild, moderate, and very severe degrees, which is 1.4%. In the Later Elderly Period age group, no asymptomatic degrees were found, and in the Early Elderly Period and Late Elderly Period age groups, there were no very severe degrees.

Table 5.4 Respondent Distribution based on Age group and Functional Status Scales

Degree FSS	Early Elderly Period (60 - 74 y/o)		Late Elderly Period (75 - 90 y/o)		Later Elderly Group (90+ y/o)		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Asymtopmatic	8	11.4%	13	18.6%	0	0%	21	30%
Mild	4	5.7%	14	20%	1	1.4%	19	27.2%
Moderate	6	8.6%	8	11.4%	0	0	14	20%
Severe	1	1.4%	11	15.7%	1	1.4%	13	18.6%
Very Severe	0	0%	2	2.9%	1	1.4%	3	4.3%
Total	**6**	**8.6%**	**61**	**87.1%**	**3**	**4.3%**	**70**	**100%**

Based on Table 5.4, in the Early Elderly Period (60 - 74 years), Asymptomatic degrees are found to have the highest percentage, which is 11.4%, while severe has the lowest percentage, which is 1.4%. Late Elderly Period (75 - 90 years) with SSS Mild degrees has the highest percentage of 20% and the lowest is Very Severe, which is 2.9%. The Later Elderly Period has the same percentage for mild, severe, and very severe degrees, which is 1.4%.

Table 5.5 Respondent Distribution based on Gender and Symptoms Severity Scale

Degree of SSS	Male		Female		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Asymtopmatic	13	18.6%	5	7.1%	18	25.7%
Mild	8	11.4%	23	32.6%	31	44.3%
Moderate	5	7.1%	11	15.7%	16	22.9%
Severe	1	1.4%	3	4.3%	4	5.7%
Very Severe	0	0%	1	1.4%	1	1.4%
Total	**27**	**38.6%**	**43**	**61.4%**	**70**	**100%**

Based on Table 5.5, found the degree of Asymptomatic in men with the highest percentage of 18.6% and Severe is the lowest of 1.4%. The female

respondents with mild degrees had the highest percentage of 32.6%, while those with the lowest percentage were very severe degrees of 1.4%.

Table 5.6 Respondent Distribution based on Gender and Functional Status Scale

Degree of FSS	Gender					
	Male		Female		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Asymtopmatic	13	18.6%	8	11.4%	21	30%
Mild	6	8.6%	13	18.6%	19	27.2%
Moderate	3	4.3%	11	15.7%	14	20%
Severe	4	5.7%	9	12.9%	13	18.6%
Very Severe	1	1.4%	2	2.8%	3	4.3%
Total	**27**	**38.6%**	**43**	**61.4%**	**70**	**100%**

Based on Table 5.6, men with Asymptomatic degrees had the highest percentage of 18.6% and very severe was the lowest of 1.4%. In female respondents, moderate degrees were obtained with the highest percentage being 18.6%, while for the degrees that had the lowest percentage was very severe degrees of 2.8%.

Table 5.7 Correlation Analysis Between Age Groups with SSS Degrees

			Age Group	Degree of SSS
Spearman's Rho	Age Group	Correlation Coefficient	1.000	.284[*]
		Sig. (2-tailed)	.	.017
		N	70	70
	Degree of SSS	Correlation Coefficient	.284[*]	1.000
		Sig. (2-tailed)	.017	.
		N	70	70

From the results of the analysis between age group correlations with SSS degrees using the Spearman rho statistical test, we get a p-value = 0.017, which is smaller than $\propto$ = 0.05, which means there is a significant relationship between age groups with SSS degrees. With a correlation coefficient = 0.284, which means it has a weak correlation strength.

Table 5.8 Correlation Analysis Between Age Groups and FSS Degrees

			Age Group	Degree of FSS
Spearman's Rho	Age Group	Correlation Coefficient	1.000	.236[*]
		Sig. (2-tailed)	.	.049
		N	70	70
	Degree of FSS	Correlation Coefficient	.236[*]	1.000
		Sig. (2-tailed)	.049	.
		N	70	70

From the results of the analysis between age group correlations with FSS degrees using the Spearman rho statistical test, we get a p-value = 0.049, which is smaller than $\propto$ = 0.05, which means there is a significant correlation between age groups with SSS degrees. The value of the correlation coefficient = 0.236, which means it has a weak relationship strength.

DISCUSSION

In this study, from 70 respondents, there were more women than men, with 39% male respondents (27 respondents) and 61% female respondents (43 respondents). This is in accordance with research conducted by Febriyanti in 2017, which found more women living in nursing homes than men [12]. This may be influenced by the higher life expectancy of women compared to men in Indonesia where the life expectancy of men, according to the Indonesian Statistics Agency is 68 years and women 72 years. [13].

In this study, it was found that almost all degrees except for Asymptomatic equivalents are dominated by women (also applies to both SSS and FSS). In SSS, we found a ratio of the percentage of men and women of 18.6%: 7.1% for Asymptomatic, wherein this degree, there were more men. For other degrees, the percentage is 11.4%: 32.6% for Mild, 7.1%: 15.7% for Moderate, 1.3%: 4.3% for Severe, and 0%: 1.4% for Very Severe . Whereas the FSS found the same thing where women were more dominant except in the degree of Asymptomatic which was more dominated by men in the amount of 18.6%: 11.4%, while for other degrees, such as Mild which was dominated by women in amount of 8.6 %: 15.7%, 4.3%: 18.6% for Moderate, 5.7%: 11.4% for Severe, and 1.4%: 4.3% for Very Severe. This is consistent with the research conducted by Ibrahim et al. in 2012 and Werner in 1994, which found that women had a risk of getting CTS more than two times that of

men. This is thought to be caused by hormonal and menopausal changes that occur in women. [3] [4]

In this study, it was found that the older we get, the higher the possibility of experiencing symptoms of CTS. This can be seen from the results of SSS and FSS for all degrees more commonly found in the age group Late Elderly Period (75-90 years), found in SSS results for Asymptomatic degrees of 15.7%, Mild 28.6%, Moderate 20%, Severe 4.3%, except in the Very Severe degree which is only found in the Later Elderly Period (90+ years) age group which is equal to 1.4%.

Whereas the FSS results found a similar picture where the Late Elderly Period (75-90 years) age group had the highest percentage, for Asymptomatic degrees of 18.6%, Mild 20%, Moderate 11.4%, Severe 15.7%, while for the Very Severe degree of 2.9%. The above statement is supported by research conducted by Bettina in 2015 and Blumenthal in 2006 in which CTS conditions have increased in later life. Age 75 years is the culmination of the emergence of CTS symptoms. The onset of symptoms of CTS in this elderly group can be influenced by decreased body function, increased muscle wasting, decreased axons, and duration of exposure are also factors in increasing CTS

symptoms in the older age group. [8] [9] [10] [11]

In this study, the instrument used was the Boston Carpal Tunnel Syndrome Questionnaire (BCTSQ) questionnaire consisting of 2 parts, the Symptoms Severity Scale (SSS) and the Functional Status Scale (FSS). Based on the data obtained in this study, with the increasing age of a person, CTS complaints also increased; this can be seen from the results of SSS and FSS, which have increased severity in the older age groups. This statement is in accordance with research conducted by Lilisantosa et al. in 2017, which found an increase in the diagnosis of CTS in older respondents. [14]

From the results of correlation analysis between age groups with SSS degrees using the Spearman rho correlation statistical test method, we get the results of $r = 0.284$. Thus, it can be concluded that there is a weak correlation between age groups and SSS degrees. The same thing was also found in the results of the correlation analysis between age groups with the degree of FSS, which obtained $r = 0.236$. Thus, the correlation obtained between age groups and degrees of FSS has weak strength.

In a study conducted by Ferhan in 2014, in 547 patients found an increase of 4.17 times in someone in the age group over 65 years when compared with

someone in the age group of 35 years or younger. In the age group above 65 years old, it has the highest percentage for both medium and severe conditions that are linked by researchers to an increase in thenar muscle atrophy, which is more visible in the older age group. [15]

According to Bland, in 2005, it was found that fewer symptoms of CTS were found in someone under the age of 63 years. In this study also found that the number of patients experiencing CTS was more experienced by women than men where there was a high increase in the incidence in the age group 50-54 years and a similar increase occurred in both women and men at the age of 75 -85 years. [16]

CONCLUSION

In research on the correlation of age groups with the degree of severity and functional status of symptoms of carpal tunnel syndrome in old age in St. Joseph Nursing Home, which is held from 19 to 27 July 2017, can be concluded as follows:

1. The most common age group found in St. Joseph Nursing Home Surabaya is a group of late older people (74 - 90 years).

2. The incidence of CTS symptoms is higher in women than men in the elderly group.

3. The severity of CTS (SSS), which has the most number, is the Mild degree of 31 (44%) respondents.

4. The highest number of functional status CTS (SSS) is the Asymptomatic degree of 21 (30%) of respondents.

5. There is a relationship between age groups and the severity of CTS (SSS) in the elderly at St. Joseph Nursing Home.

6. There is a relationship between age groups and the functional status of CTS (FSS) in old age in St. Joseph Nursing Home.

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