The Relationship Between Work Posture and the Risk of Carpal Tunnel Syndrome in Openwork Craftsmen in the Village Mongolian

Nurzihan Adam 1, Rona Febriyona 2, Andi Nur Aina Sudirman 3
Fakultas Ilmu Kesehatan, Program Studi Keperawatan
Universitas Muhammadiyah Gorontalo

ABSTRACT

Work posture is the posture of the body at the time of work. Different work attitudes will produce different strengths. When working, postures are designed to occur naturally, thereby reducing musculoskeletal injuries. The purpose of this study was to determine the relationship between work posture and the risk of carpal tunnel syndrome in openwork craftsmen in Mongolato Village, the type of research is quantitative with a cross-sectional approach, a population of 84 openwork craftsmen in Mongolato Village, a sample of 45 openwork craftsmen, which was determined by purposive sampling techniques, the statistical test used was Chi-Square. The research instrument is a questionnaire. The results showed that the work posture of the craftsmen could trigger the risk of carpal tunnel syndrome events and the results of chi-square analysis obtained p-value = 0.007>0.05. Based on the results of the analysis of 45 filigree craftsmen, it is known that craftsmen who have a work posture in the medium risk category totaled 27 respondents, with 20 respondents experiencing moderate carpal tunnel syndrome and 7 respondents experiencing high carpal tunnel syndrome. For craftsmen who have a high-risk work posture, there are 18 respondents, namely 6 respondents with moderate carpal tunnel syndrome and 12 respondents with high carpal tunnel syndrome. This study concludes that there is a relationship between work posture and the risk of carpal tunnel syndrome in filigree craftsmen. Advice for craftsmen to pay more attention to good work posture for work so that they can avoid the risk of carpal tunnel syndrome.

Keywords: Carpal Tunnel Syndrome, Openwork Craftsman, Work Posture

This is an open access article under the CC BY-SA license.

INTRODUCTION

Craftsmen are people whose job is to make crafts or people who have skills related to making certain crafts, these craft items are usually made by hand rather than by machine. One of the craftsmen who uses their hands to make crafts is an openwork craftsman.

Openwork craftsmen are a person or group who work to make handicrafts in the form of openwork. Openwork or karawo is one of the handicrafts owned by the people of Gorontalo, karawo crafts, or karawo embroidery made on fabrics that have vertical and horizontal fibers and must be made very carefully. This affects the work posture of the craftsmen.
In research (Mason et al.) it is estimated that by 2030 cases of carpal tunnel syndrome will double to around 105,000 per year. Carpal tunnel syndrome is the most common chronic hand condition that requires surgery, with increasing cases of carpal tunnel syndrome hence the incidence of surgery for carpal tunnel syndrome also increased worldwide, in the UK the number of decompression operations for carpal tunnel syndrome increased by 34%. while for patients with carpal tunnel syndrome mildness may improve clinically and neurophysiologically.

According to the data World Health Organization (WHO) 2010 Carpal Tunnel Syndrome often occurs in everyday practice, especially in developed countries. It is estimated that 55-56% of all people in developed countries have experienced CTS in their lifetime. (Permatasari and Ariffin 2021) According to the American Academy of Orthopedic Surgeons in the United States, the incidence rate of carpal tunnel syndrome cases ranges from 1-3 cases per 1,000 people per year, more than 50% of all occupational diseases in the United States are Carpal Tunnel Syndrome. Epidemiology, CTS is the second most common occupational injury after low back pain, the incidence of CTS can reach 276:100,000 population per year. Based on the results of the study, the prevalence of CTS is around 2.7% in Sweden and around 7-16% in the UK. (Queen Karel Lina, Abdurahman Berbudi B.L. 2022)

Incorrect hand posture can cause fatigue and discomfort. Awkward work posture in the long term can cause injuries and complaints in skeletal muscle tissue and peripheral nerves. (Sulaiman and Sari 2018)

Work posture is an action taken by craftsmen in doing work. The work posture of craftsmen involves several muscle forces, so the application of poor work posture will cause health problems, one of which is carpal tunnel syndrome

Carpal tunnel syndrome is one of the most frequent disorders of the median nerve. In the wrist, the median nerve passes through the carpal tunnel and innervates the skin of the palm and back of the hand in the area of the thumb men. When walking through this tunnel, the median nerve most often experiences pressure, which causes a pressure neuropathy called carpal tunnel syndrome or carpal tunnel syndrome. Carpal tunnel syndrome is the most common source of numbness and hand pain, it is more common in women than men. (Unny Yeyen, Ika Rahman 2021)

In Indonesia, the prevalence of Carpal Tunnel Syndrome is not yet known for certain because the reported cases are still very few. Studies on high-risk wrist occupations have been reported with a prevalence between 5.6%-15%. In Bangka Belitung, the prevalence of CTS cases was 2.8% in 2014 based on data from the Occupational Health and Safety (K3) survey of the Bangka Belitung Health Office, and increased to 3.4% in 2015. (Queen Karel Lina, Abdurahman Berbudi B.L. 2022)

One of the risk factors for Carpal Tunnel Syndrome is the use of inappropriate hand work postures and repetitive or repetitive movements when working using the hands. Carpal tunnel syndrome affects 0.6% to 3.4% of the general population and up to 5% of workers who often perform daily chores with their hands, especially wrists with repetitive movements. (Aswin, Reskiaddin, and Halim 2022)

METHOD
This study uses quantitative research methods, which intend to examine how much the relationship between two or more variables. The research design used was a cross-sectional approach carried out by filling out questionnaires on work posture variables and carpal tunnel syndrome. This study aims to determine the relationship between work posture and the risk of carpal tunnel syndrome. In this study, the independent variable was work posture and the dependent variable was carpal tunnel syndrome. The research will be conducted in August 2023 in Mongolato Village.

The sampling technique used in this study is Non-Probability Sampling with a type of Purposive Sampling. The population in this study is 84 filigree craftsmen in Mongolato Village, the sample of this study is 45 people determined by the calculation of the Slovin formula. Data collection techniques in this study use primary data, namely data obtained by conducting interviews or direct observations with respondents, and secondary data, namely data that has been obtained directly from Mongolato Village that supports this study.

RESULT
Univariate Analysis
In this study, respondents were selected from as many as 45 craftsmen in Mongolato Village. From all existing respondents, an overview of univariate analysis was obtained including work posture and carpal tunnel syndrome. Based on the results of the study, it is known that work posture with moderate risk amounted to 27 respondents (60.0%), and high risk with 18 respondents (40.0%). So it can be seen that the highest work posture is at medium risk with 27 respondents (60.0%). As for carpal tunnel syndrome, the medium category with 26
respondents (57.8%) and the high category with 19 respondents (42.2%). So it can be seen that carpal tunnel syndrome is highest in the medium category with 26 respondents (57.8%).

Bivariate Analysis

<table>
<thead>
<tr>
<th>Work Posture</th>
<th>Carpal Tunnel Syndrome</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Keep</td>
<td>Tall</td>
</tr>
<tr>
<td>Medium Risk</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>20</td>
<td>44.4%</td>
<td>7</td>
</tr>
<tr>
<td>High Risk</td>
<td>6</td>
<td>13.3%</td>
</tr>
<tr>
<td>Sum</td>
<td>26</td>
<td>57.8%</td>
</tr>
</tbody>
</table>

Based on the results of the study, 27 respondents were found craftsmen with medium-risk work posture, of which 20 respondents with carpal tunnel syndrome medium category, and 7 respondents with carpal tunnel syndrome The high category is thought to be caused by the use of the wrong hand work posture for a long time, too long working with repetitive movements. Furthermore, craftsmen with a high-risk work posture were 18 respondents, of which 6 respondents with carpal tunnel syndrome medium category, and 12 respondents with carpal tunnel syndrome The high category is thought to be because working craftsmen use excess strength and focus which results in muscle muscles becoming stiff and tense, working with hands for a long time without support.

Based on the results of the chi-square test analysis, it was found that the p-value = 0.007 < 0.05 which means that there is a relationship between work posture and the risk of carpal tunnel syndrome in openwork craftsmen in Mongolato Village.

**DISCUSSION**

**The Relationship of Work Posture with the Risk of Carpal Tunnel Syndrome in Openwork Craftsmen in Mongolato Village**

Based on the results of bivariate analysis on 45 filigree craftsmen in Table 4.1, it is known that craftsmen who have a work posture in the medium risk category amounted to 27 respondents (60.0%), of which 20 respondents (44.4%) with carpal tunnel syndrome in the medium category and 7 respondents (15.6%) with carpal tunnel syndrome in the high category. Then craftsmen who have a high-risk category work posture amounted to 18 (40.0%), of which 6 respondents (13.3%) with medium carpal tunnel syndrome and 12 respondents (26.7%) with high category carpal tunnel syndrome.

The relationship between work posture and carpal tunnel syndrome based on the chi-square test obtained p value = 0.007 > 0.05 which means there is a relationship between work posture and carpal tunnel syndrome.

In 20 respondents (44.4%) with a moderate risk category work posture with carpal tunnel syndrome which is suspected because craftsmen often work in static positions or work in one position for a long time. For 7 respondents (15.6%) who have a work posture in the medium risk category with high carpal tunnel syndrome, it can be seen from the way openwork craftsmen work in doing their daily work always do repetitive movements, craftsmen also rarely use support on the hands while working and in doing work craftsmen do not stretch or relax, as a result of the above craftsmen often feel pain in the fingers and wrists, and find it difficult to grip needles and cloth.

Furthermore, in 6 respondents (13.3%) with high-risk category work postures with carpal tunnel syndrome which is a significant problem, namely when working craftsmen do not relax muscles in the hands, craftsmen also often use the wrong hand work posture, causing pain, numbness and tingling in the fingers to wrists. For 12 respondents (26.7%) who had a high category work posture with high carpal tunnel syndrome, there were problems, namely when working craftsmen use excessive force on the hands, perform repetitive movements for a long time, bend the hands for too long, as a result of the craftsmen often complain of pain in the wrist, besides that craftsmen also often wake up at night because of the pain felt, Not only that. The craftsmen also often experience tingling and numbness at the same time.

Many factors can cause carpal tunnel syndrome to occur, one of which is wrist work posture. Movements with repetitive flexion-money extension postures on the wrist result in trauma that can cause complaints of carpal tunnel syndrome. Wrong wrist posture with static work positions on the hands, arms, and shoulders for a long time will have an impact on muscle tissue or nerves or both can cause inflammation, and
hand posture that is always bent too lam can trigger carpal tunnel syndrome. (Sandra Amalia,Yuliani Setyaningsih 2023)

Work posture is an attitude that is needed when the body does work. Work attitude at work must be carried out normally to prevent complaints or disorders in the musculoskeletal especially carpal tunnel syndrome. (Hidjrawan and Sobari 2018).

Carpal tunnel syndrome is a disease caused by occupational factors and factors that are not related to work. In this study, the carpal tunnel syndrome in question is related to work as an openwork craftsman who works involving the hands. Carpal tunnel syndrome arises because the median nerve is compressed in the carpal tunnel in the wrist. Carpal tunnel syndrome, a combination of finger, hand, and arm disorders with symptoms reflecting sensory or motor compression, is most common in adults over 30.

Openwork craftsmen who have a risk of carpal tunnel syndrome are craftsmen who do not pay attention to work posture, perform repetitive movements for a long time, work with excessive focus and strength on the hands resulting in muscle strain, and do not stretch while working.

This study can provide information and advice to filigree craftsmen to reduce carpal tunnel syndrome complaints suffered, including doing simple hand and wrist exercises for 4-5 minutes every hour. This exercise can help reduce the risk of developing or preventing carpal tunnel syndrome. Stretching and exercises can strengthen the wrist and hand muscles, thereby improving blood flow to the area. Exercise should begin with a short warm-up period accompanied by a rest period and if possible avoid overstretching of the hand muscles and fingers.

This research is in line with research (Sekarsari, Pratiwi, and Farzan 2017), it is known that the results of statistical tests using the exact Fisher test at a confidence level of 95% or α = 0.05 obtained sig (0.014) < α (0.05) which means there is a relationship between awkward posture on the hands and complaints carpal tunnel syndrome on stone-breaking workers in North Moramo District, South Konawe Regency. Based on the results of research obtained most workers complain of pain and tingling in their wrists after work, and at night often feel numbness in the hands, complaints of carpal tunnel syndrome It is also felt when doing daily activities, such as difficulty grasping an object. Of the 60 respondents who performed awkward postures on their hands, there were 41 respondents (64.1%) experienced Carpal Tunnel Syndrome was in as many and 19 respondents (29.7%) experienced Carpal Tunnel Syndrome. Of the 4 respondents who did not do awkward postures on their hands when breaking stones, there were no respondents (0%) who had positive carpal tunnel syndrome and 4 respondents (6.2%) who had negative carpal tunnel syndrome.

Other similar studies were conducted by (Fanny S. Farhan 2018) which show p-value = 0.001 which means that there is a meaningful relationship between wrist work posture and complaints of carpal tunnel syndrome. The dominant factor causing complaints of carpal tunnel syndrome is the posture of the wrist. In this study, most respondents experienced complaints of tingling then accompanied by stiffness and pain in the wrists and fingers caused by the use of wrong work postures, especially on the hands. Carpal tunnel syndrome What happens is related to the use of hands because work is a result of swelling tenosinovial Inside the carpal tunnel. The study concludes that the results of statistical tests show that wrist posture affects complaints of carpal tunnel syndrome at ojek drivers in Kramat Jati District, East Jakarta. To avoid the occurrence of carpal tunnel syndrome, It is recommended that motorcycle taxi drivers do warm-up movements on the wrist to reduce the risk of the appearance of carpal tunnel syndrome.

Based on the description and theory above, researchers assume that the use of inappropriate work postures such as bending fingers and wrists for too long, and letting the hands work without support is very risky to cause carpal tunnel syndrome complaints. In addition to working too focused, working without stretching and relaxing the hand muscles can also pose a risk of carpal tunnel syndrome. A sense of comfort can be felt when craftsmen do work with good and correct work posture. Good work posture to do work, especially making openwork crafts, must use a banger on the hands and arms when embroidery, do not let fingers and wrists bend for a long time, and must stretch or rest every 1 working hour to prevent the risk of carpal tunnel syndrome.

CONCLUSION

1. It is known that the highest work posture is found at medium risk with 27 respondents (60.0%), and work posture with high risk with 18 respondents (40.0%).
2. It is known that the highest carpal tunnel syndrome is in the medium category with 26 respondents (57.8%), and carpal tunnel syndrome is in the high category with 19 respondents (42.2%).
3. There is a relationship between work posture and carpal tunnel syndrome based on the chi-square test obtained p value = 0.007 > 0.05 which means there is a relationship between work posture and carpal tunnel syndrome.
REFERENCES


