



Description of Work Related Neck Pain Among Employees in State Electricity Company (PLN Indonesia)

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Abstract

Introduction: The use of electronic devices without proper usage techniques can result in a variety of health problems, including neck pain. This study aimed to describe neck pain problems among office workers who use the electronic devices.

Method: This study was a quantitative research in which descriptive, observational, cross-sectional methods were used. This study was conducted from July to December 2022 at the State Electricity Company at Semarang office, Indonesia. Total 57 participants were chosen using a purposive sampling technique. A Google Form-based questionnaire was designed to collect the study data. Univariate analysis and cross-tabulation table were used.

Result: Total 60% participants reported to experience neck pain. The proportion of neck pain was higher among men and among older age (<35 years old). A more significant proportion of participants who reported neck pain were those who used their devices for ≥ four hours (94.4%) compared to user < 4 hours. In addition, people with more than five years of employment length were more likely to report neck pain (75%) compared to employment with <5 years.

Conclusion: This research concluded that work related neck pain in the State Electricity company was due to improper use of electronic devices.

Keywords: neck pain, gadget use, electricity office

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Introduction

Nowadays, gadget use is inextricably linked to human life in terms of entertainment and other activities. Gadgets, in general terms, are considered electronic devices with a particular function on each device, such as computers, smartphones, games, and others.¹ Data from the Central Statistics Agency (BPS) in 2021 found that household internet use had increased by 3.89% from the previous year, (78.18% in 2020 to 82,07% in 2021). This growth in household internet use was also followed by the growth of population that owns cellular phones in 2017-2021, reaching 65.87%. The population using the

internet has increased during the period of 2017 – 2021, as shown by the increasing percentage of the population accessing the internet in 2017 around 32.34% to 62.10% in 2022.² In 2020 - 2021, Java Island had Indonesia's third-highest percentage of households owning/operating computers (20.74%).²

Computers and smartphones are commonly used in offices.³ The State Electricity Office Company is a state-owned enterprise that uses gadgets in administrative and works support related activities. Those workers spend more time in the office than in the field.

The use of gadgets without a proper posture can cause various kinds of problems for the health of its users.^{4,5} This problem includes both physical, such as musculoskeletal pain, eyes, headaches, and mental, such as anxiety and difficulty of sleeping.⁶⁻⁸ Baseline Health Research (Risksedas) in 2018 found that the prevalence of musculoskeletal problems in Indonesia was 7.9%, which occurred in the muscles of the neck, shoulders, arms, hands, back, waist, and lower muscles.⁹ Until now, no global data has found the prevalence of musculoskeletal problem due to the use of gadgets. However, several studies in various countries have been conducted to prove this. The prevalence of musculoskeletal pain due to computer use was 87.3% in Saudi Arabia in 2021.¹⁰

It is known that one form of musculoskeletal problems experienced by a person due to the use of gadgets is a neck pain. Neck pain is caused by an increase in the neck angle, which increases the burden on the head and presses on the neck bones.¹¹ The incidence of neck pain among gadget users is relatively high. A study by Nadhifah et al. (2021) discovered that some gadget users in Java island experienced neck pain, particularly in women under 30, and that the average time spent using a smartphone is more than 7 hours. In another study, 42.90% of participants stated that they had neck pain due to computer use while working.¹²

This study was also supported by a study conducted in 2016 that discovered a relationship between complaints of neck pain and the use of gadgets in daily life.^{7,13}

It is known that the work performed by employees in the State Electricity Company has the possibility of causing risk of neck pain. Therefore, this study aimed to describe neck pain cause by improper gadget use among employees in one of State Electricity Company office in Semarang.

Methods

This quantitative research uses a descriptive observational approach using a cross-sectional study design. This research was conducted from July to December 2022 at the State Electricity Company office Semarang City. The population participating in this study were all employees (n=115). Of those, only 57 participants were recruited using a purposive sampling technique. The data in the study were collected using a Google Form-based questionnaire. Data analysis was performed using univariate analysis and cross-tabulation using the SPSS computer program. Data were visualised in the frequency distribution.

Results

This study found that 60% of the employees had neck pain and 40% reported no pain in their necks (Figure 1).

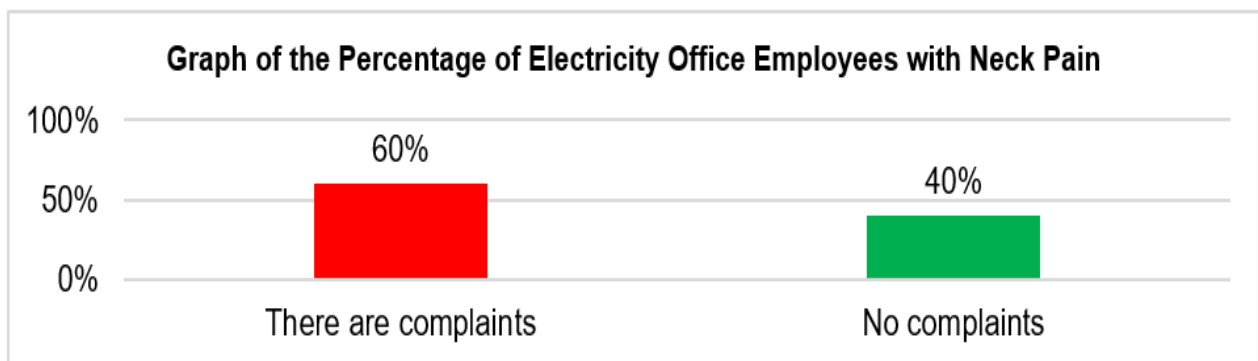


Figure 1. Graph of the Percentage of Electricity Office Employees with Neck Pain

Of those with neck pain, 63.9% (n=23) were men and 36.1% (n=13) were women (Table 1). People with age \geq 25 were experiencing more neck pain (23/36, 63.9%) than people <35 years old (13/36, 36.1%) (Table 1). People with neck pain

experience reported to use gadget for \geq 4 hours (34/2, 94.4%) compared to only 2/36 (5.6%) gadgets users reported neck pain (Table 1).

The gadget users with neck pain reported using gadget whilst sitting and standing (improper posture) (94.4%) compare to 5.4% using gadget whilst sitting (Table 1).

Employees with length of work more ≥ 5 years reported more neck pain experience (27/36, 75%) than employees with length of work < 5 years (9/36, 25%) (Table 1).

Table 1. Neck Pain experiences based on

Characteristics of Respondents	Neck Pain			
	Yes			
	n	%	n	%
Gender				
Man	23	63.9	18	75.0
Woman	13	36.1	6	25.0
Total	36	100	24	100
Age				
< 35 years	13	36.1	5	20.8
≥ 35 years	23	63.9	19	79.2
Total	36	100	24	100
Gadget Usage Duration				
≥ 4 hours	34	94.4	20	83.3
< 4 hours	2	5.6	4	16.7
Total	36	100	24	100
Posture whilst using gadget				
Sit and stand	34	94.4	19	79.2
Just sitting	2	5.6	5	20.8
Total	36	100	24	100
Length of work				
≥ 5 years	27	75.0	20	83.3
< 5 years	9	25.0	4	16.7
Total	36	100	24	100

Discussion

Rahayu et al. (2020) in his research found that the proportion of neck pain problems was also higher in women compared to men.¹⁴ This is in line with the results of research conducted by Balaputra & Sutomo (2017).¹⁵ This study does not follow the results of research conducted by S. Y. Lee, Lee, & Han in 2016.¹⁶ In their research, S. Y. Lee et al. (2016) stated that neck flexion was caused by the duration of gadget use ($p < 0.05$) and, over time, will cause an increase in the next flexion angle, which causes complaints of pain in the neck.¹⁶ Previously conducted studies also found a relationship between using gadgets and the duration of neck pain felt by a person.¹⁷ Most students experience neck pain after 7-9 hours of online lectures a day.¹⁸ The longer the duration of exposure, the greater the risk of injury.¹⁹

The results of the study in the form of a higher proportion of respondents with a sitting and standing body position when using gadgets, are not in accordance with

the results of the study, which stated that office employees who work in a sitting position with a bent neck are associated with the incidence of neck pain.²⁰ Body positions that are carried out for a long time and done repeatedly will make it easier for a person to experience musculoskeletal problems.²¹ The sitting position is different from good postures, such as excessive flexion of the cervical or too bent, tilted position, and so on.²² This sitting position can affect the body's posture when using the gadget. Research on college students found that posture during online learning was the main risk factor influencing the incidence of Neck Arm Pain during study at home in the COVID-19 pandemic situation (OR= -2.441, p-value 0.007 and 95% CI = lower -4.170, upper -0.713).²³

The position when using the gadget varies, such as standing, lying down, and sitting. A study found that using gadgets in a sitting position will increase the angle of the neck compared to a standing position.²⁴

Research in South Korea shows that the sitting position suffers more neck pain by 38,6% than the standing position by 9,2%, lying down 37,1%, and the prone position 14%.²⁵ There is no relationship between body position and the use of gadgets with complaints of neck pain that can occur due to other factors such as excellent physical condition, ergonomic work devices, and a healthy lifestyle.

That participants with a working period of ≥ 5 years (75%) had a higher experience of neck pain than participants with a working period of < 5 years (25%). Otherwise, participants with a working period of ≥ 5 years (83.3%) had a higher proportion of no neck pain complaints than respondents with a working period of < 5 years (16.7%). The results of this study are not in line with research conducted by Rahayu et al. (2020), which states that there is a relationship between the working period and the incidence of musculoskeletal complaints.¹⁴ It was also known that respondents with more than ten years of service had a 3,261 times greater risk possibility than respondents with ≤ 10 years of service (OR = 3,261, 95% CI 1,281–8,303).¹⁴

In general, a person's working period will affect the occurrence of complaints and neck pain. This happens because the same work activity carried out for a long time will raise the risk of complaints.²⁶ However, tenure can also reduce the incidence of neck pain complaints because the longer a person works in the same field, a way to deal with problems at work will appear, one of which is overcoming neck pain complaints.

Conclusion

This study found that as many as 57 State Electricity Company participated in this study, and of those, more than half of the participants claimed to have neck pain (60%). The proportion of complaints of neck pain is more in men with 35 years of age. Based on the participants practice in using gadgets, more respondents who had neck pain were participants who used gadgets with a duration of ≥ 4 hours (63%) and used gadgets in sitting and standing (64.20%). Meanwhile, employees with neck pain were employees with a working period of ≥ 5 years (75%) compared to employees with

< 5 years of length of work. This study does not analyze the relationship between variables. Therefore, further analysis is needed to see the relationship between each variable further to strengthen the research results.

Ethics approval

The respondent's personal data is kept confidential. Data reporting is done anonymously. In addition, all respondents knew the purpose of the study and agreed to be the research subject.

Availability of data and materials

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Author Contribution

AU, LM and FDR designed the research, prepare the instrument, analyzed the data, and composed a manuscript. M collected the data. All authors approved the final manuscript.

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