



## WORK POSTURE ANALYSIS USING THE RAPID OFFICE STRAIN ASSESSMENT (ROSA) METHOD AT PERUMDA TIRTANADI

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Received: October 20<sup>th</sup> 2025, Revised: November 13<sup>th</sup> 2025, Accepted: November 25<sup>th</sup> 2025

### Abstrack

*Perusahaan Umum Daerah (Perumda) Tirtanadi, as one of the agencies providing clean water and wastewater management services in North Sumatra, has a fairly high administrative and operational workload, especially for employees who work in a sitting position for a long time in front of the computer. This research aims to analyze the work posture of office workers in the Tirtanadi Regional Public Company (Perumda) using the Rapid Office Strain Assessment (ROSA) method to identify the level of ergonomic risk and the potential for musculoskeletal complaints. The type of research used is descriptive qualitative with an observational approach. Data was obtained through direct observation and a Nordic Body Map (NBM) questionnaire that was distributed to 10 respondents from 10 different divisions who routinely work using computers. Research results show that some workers experience complaints on the waist, back, neck, and shoulders, which indicates a less than ideal work posture. Based on the results of the ROSA assessment, there are two divisions that obtained a score of >5 (Marketing and Assets), which means that they need immediate improvement in the workstation to prevent further musculoskeletal disorders. Meanwhile, the other eight divisions showed a score below 5 which is still classified as safe but still needs routine monitoring. This research recommends the application of ergonomic work chair adjustments, monitor position settings, and periodic stretching to increase employee comfort and productivity.*

**Keywords:** *Ergonomics, Work Posture, Rapid Office Strain Assessment (ROSA), Nordic Body Map, Musculoskeletal Disorder (MSDs).*

## INTRODUCTION

The use of computers and laptops as work tools has increased rapidly (Perceka & Sutrisno, 2020a). This is because computers and laptops can help workers complete their tasks quickly (Perceka & Sutrisno, 2020b). However, frequent use of computers without considering ergonomics in the workplace poses risks to users (Theofany Simanjuntak & Susanto, 2022).

Perumda Tirtanadi, as one of the institutions providing clean water and wastewater management services in North Sumatra, has a fairly high administrative and operational workload, especially for employees who work in positions that require them to sit for long periods of time in front of a computer. Activities such as data entry, information processing, and digital customer service are often carried out without considering ergonomic aspects, potentially causing health problems due to poor posture. Computer usage at Perumda Tirtanadi averages 8 hours per day. Working days at Perumda Tirtanadi are Monday to Friday, with working hours from 08:00 to 16:30 every day. This causes ergonomic risks for employees.

This study on the posture of workers using computers at Perumda Tirtanadi used the Rapid Office Strain Assessment (ROSA) method. The Rapid Office Strain Assessment (ROSA) method is a method

for assessing ergonomic risks in office work related to the use of computers, seating, telephones, and other work environments. In the ROSA method, there are several aspects that are the focus of assessment, including: the chairs used by workers, computers (monitors), use of telephones, keyboards, and mice. Other aspects observed in the use of the ROSA method are the duration of interaction with work equipment and the body position of workers during work. There are three parts to the ROSA method assessment: Section A focuses on chairs, Section B focuses on monitors, and Section C focuses on mice and keyboards (Pramono et al., 2022).

Based on the above introduction, this study aims to analyze work posture using the ROSA method among employees at Perumda Tirtanadi, particularly those working in an office environment. The results of this study are expected to provide an overview of the level of ergonomic risk in the workplace and provide recommendations for improvements to support the comfort and occupational health of employees at Perumda Tirtanadi.

## RESEARCH METHODS

The research was conducted using descriptive qualitative methods at the Regional Public Company (Perumda) Tirtanadi. The objects observed were

employees who worked in front of computers. The research was observational in nature, conducting observations in the office work area (Office Work Station). Data collection in this study was carried out through interviews and observations aimed at obtaining information from workers regarding their work posture (Pramono et al., 2022)

There are several tools used in data collection and processing in this study. The research instruments used in this study are as follows:

1. Nordic Body Map (NBM) Questionnaire

The Nordic Body Map is the most commonly used questionnaire to identify discomfort among workers because it is standardized and well-organized. The NBM is intended to identify in more detail the parts of the body that experience discomfort or pain during work (Dewi, 2020).

2. Rapid Body Assessment (ROSA) Questionnaire

Rapid Office Strain Assessment (ROSA) is an ergonomic assessment method for offices and jobs related to computers/administration. ROSA is

one of the methods in office ergonomics, where the assessment is designed to measure the risks associated with computer use and to determine the level of change required based on reports of worker discomfort (Cut Ita Erliana & Munadya ZaphiraMunadya Zaphira, 2019).

3. Camera

Cameras are used to document workers' posture when using office facilities. The work postures documented are sitting posture, monitor posture, telephone posture, keyboard posture, and mouse posture.

## RESULTS AND DISSCUSSION

### 1. Result

- a. Nordic Body Map Questionnaire Results

The Nordic Body Map questionnaire was distributed on October 1-2, 2025. The Nordic Body Map questionnaire was given to 10 worker samples from 10 different divisions, namely Management Information Systems, Management Systems, Drinking Water Treatment, Executive Supervisory Staff, Finance, Marketing, Customer Service, Customer Relations, General Affairs, and Assets. Based on the

questionnaire results, it was found that most workers experienced musculoskeletal complaints. Some of the body parts that were often felt to be painful included the upper neck (4 people), lower neck (3 people), left shoulder (3 people), right shoulder (5 people), left upper arm (4 people), and right upper arm (4 people). Complaints were also frequently found in the back (6 people), waist (7 people), buttocks (5 people), and hips (4 people). Some workers also reported pain in the left elbow (1 person), right elbow (none), left forearm (1 person), and right forearm (none). Other body parts that were also complained about included the left wrist (1 person), right hand (1 person), pain in the left hand (1 person), right hand (1 person), left thigh (2 people), right thigh (2 people), left knee (6 people), and right knee (6 people), left calf (4 people), right calf (4 people), left ankle (2 people), right ankle (3 people), pain in the left foot (3 people), and right foot (4 people).

The results show that the body part with the highest level of complaints is the waist, where 1 worker reported feeling slight pain, 3 workers reported feeling pain, and 3 other workers reported feeling severe pain in that area. This condition indicates a tendency for muscle fatigue due to an unfavorable working position

and the use of work facilities that do not support the physical comfort of workers.

#### b. Work Measurement Results

The final results of this work measurement were obtained from the Nordic Body Map assessment sheet, which was then processed using the ROSA calculation. A final score of >5 indicates that improvements are needed. The following are the results of the work measurement using ROSA for office workers at Perumda Tirtanadi.

**Table 1.** Work Measurement Results

NO	Division	Score	Description
1.	General	3	No repairs needed
2.	Management Information System	4	No repairs needed
3.	Magement System	3	No repairs needed
4.	Board of Directors Supervisory Staff	3	No repairs needed
5.	PAM	3	No repairs needed
6.	Finance	4	No repairs needed
7.	Customer Service	1	No repairs needed
8.	Public Relations	3	No repairs needed
9.	Marketing	6	No repairs needed
10.	Assets	6	No repairs needed

Source: Primary Data

From the work measurement table above, we can see that out of 10 workers, there are 2 workers with scores >5, which means that the workstation needs to be improved as soon as possible because this indicates symptoms of Musculoskeletal Disorder.

#### c. Causes of Musculoskeletal Disorders

Musculoskeletal Disorders (MSDs) are complaints felt by a person in the muscles and skeleton. The complaints are felt gradually, ranging from very mild to very painful. Complaints in the form of damage to ligaments, joints, and tendons can occur if the muscles receive static loads repeatedly over a long period of time. Musculoskeletal disorders in workers are influenced by risk factors that contribute to their occurrence. These include biomechanical factors, individual factors, and psychosocial factors. Biomechanical factors encompass force/load, body position during work, duration, frequency, and exposure to vibration. Individual factors include gender, age, length of service, body mass index, exercise habits, and smoking habits (Rahmah & Herbawani, 2021).

Musculoskeletal disorders are common among workers, accounting for about half of all occupational diseases. Of the total 1,200,000 cases of occupational diseases, more than 500,000 are MSDs.

Construction workers, delivery personnel, and healthcare workers are the most commonly affected (Istighfaniar, 2016).

## CONCLUSSION AND SUGGESTION

### 1. Conclusion

Based on the results of research conducted at Perumda Tirtanadi using the Rapid Office Strain Assessment (ROSA) method and the Nordic Body Map (NBM) questionnaire, it can be concluded that a small number of workers experience musculoskeletal complaints, especially in the waist, back, neck, and shoulders. This indicates that there are ergonomic risks due to non-ideal work postures and the use of work facilities that are not fully in accordance with ergonomic principles. The ROSA assessment results show that of the ten divisions observed, two divisions scored >5, namely the Marketing and Assets divisions. This score indicates the need for immediate improvements to workstations in order to prevent further musculoskeletal disorders. Meanwhile, the other eight divisions scored below 5, indicating relatively safe working conditions but still requiring periodic monitoring.

Therefore, improvements are needed, such as adjusting ergonomic work chairs, positioning monitors at eye level, and arranging keyboards and mice appropriately. Additionally, employees are

advised to perform regular stretches and schedule breaks to reduce muscle tension caused by prolonged sitting. The implementation of good ergonomic principles is expected to enhance employee comfort, productivity, and workplace health at Perumda Tirtanadi.

## 2. Suggetion

To create an ergonomic work environment that supports the long-term health of office workers, attention must be paid to the workstation. One key aspect is the use of ergonomic chairs equipped with lumbar support and adjustable height features, so that feet can rest comfortably on the floor and sitting position is more stable. Monitor position should also be considered, which should be level with the eyes and placed at a distance of about 50–70 cm to avoid strain on the neck and eyes.

Next, the keyboard and mouse should be positioned parallel to the elbows in a neutral position, without bending the wrists. The use of wrist rests can also help reduce the risk of injuries such as carpal tunnel syndrome. In addition, room lighting needs to be adjusted so that it does not cause glare or reflections on the screen. Natural lighting is highly recommended, but if this is not possible, a desk lamp with non-glare lighting can be a solution.

To prevent muscle tension due to prolonged sitting, workers are advised to

do light stretching every 1–2 hours, apply the 20-20-20 principle (look at an object 20 feet away for 20 seconds every 20 minutes), and, if possible, use a flexible work desk or standing desk so they can switch between sitting and standing positions. The layout of the work desk should also be arranged so that important items are within arm's reach, and the desk remains tidy to avoid inefficient repetitive movements.

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