

The Relationship Between Working Duration and Forward Head Posture

Ni Nyoman Melani Karang¹, Kadek Dwi Pradnya Lestari²

¹ Sport Physiology Department, Medical Faculty, Udayana University, Indonesia

² RSUD Sanjiwani Kabupaten Gianyar, Indonesia

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Corresponding Author:

Ni Nyoman Melani Karang
Sport Physiology Department,
Medical Faculty, Udayana
University, Indonesia

Email:

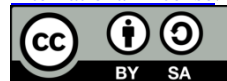
melanikarang9e27@gmail.com

ABSTRACT

Forward head posture refers to the anatomical alignment of the head positioned anteriorly to the shoulders. An imbalance in the muscles of the cervical region characterizes this disorder. This phenomenon can be attributed to multiple variables, one of which pertains to the length of the work period. This investigation seeks to establish the relationship between working duration and forward head posture. This research method uses a cross-sectional analytic observational study design that was carried out from February to March 2023 in Gianyar. The study employed a sample size of 60 individuals, selected by the utilisation of a basic random sampling methodology. The CVA measurement uses the MB Ruler, and the duration of work is measured with a self-report questionnaire. Data analysis in this study used the SPSS version 24 application with bivariate tests using Chi Square and Spearman's rank tests. The findings of this study revealed a statistically significant association between work duration and forward head posture, as indicated by a p-value of 0.012 ($p < 0.05$). The findings of this study indicate a statistically significant correlation between the duration of employment and the occurrence of forward head posture.

Keywords: Forward head posture, Duration of work, CVA

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1. INTRODUCTION

Currently, the use of technology is growing rapidly to help with jobs or access information. One technology that is often used is the computer. A computer is a system consisting of software and hardware devices. The computer is touted as the starting point of the digital technology revolution [1]. Around 45 million workers in the world stare and sit in front of computers for hours continuously, and 75% of all daily activities involve using computers. [2]. At present, the increased role of computers, accompanied by being able to access the internet, causes workers to spend time in front of computers for around 4-6 hours and even > 6 hours per day [3]. Based on data and statistics from Indonesia in 2017, the percentage of computer use in offices was 42.08%. Approximately 17.89 office workers in Bali use computers to complete their work [4]. Increased intensity of computer use can cause health problems, such as posture disorders. The phenomenon of computer users maintaining a static seated position, with their gaze directed slightly downward and their head positioned forward for extended periods, results in the muscles experiencing varying strains in order to maintain balance. This condition is commonly referred to as forward head posture [5].

Forward head posture (FHP) is a prevalent kind of postural deformity characterized by the anterior displacement of the head relative to the vertical axis of the body's center of gravity. One of the factors that can affect forward head posture is the duration of work [6],[7],[8]. About 85% of workers complain of musculoskeletal disorders in the neck area [9]. Approximately 63% of those employed in occupations requiring computer usage exhibit symptoms of forward head position [10]. An additional investigation revealed that the incidence of forward head position disorder among computer-using workers aged 20-30 years is approximately 66.3% [11]. In forward head posture, there will be muscle weakness in the deep neck flexor and tightness in the upper trapezius, sternocleidomastoid (SCM) muscles, and levator scapulae [12],[13],[14]. The occurrence of forward head posture results in heightened compressive stresses on the apophyseal cervical and posterior spinal joints, as well as alterations in the length of connective tissue [15], [16]. Postural changes that occur in the forward head posture in the long term can cause chronic pain in the cervical region, cervical muscle tension such as the upper trapezius muscle, Stern Cleido Mastoideus (SCM) muscle, levator scapulae muscle, disc herniation, arthritis, and ligament instability in the cervical joint. [17],[18]. This can interfere with worker activity.

The occurrence of issues among workers might detrimentally affect the overall quality of job completion. Consequently, it is imperative to proactively address and effectively manage these grievances in order to mitigate any disruptions to work-related tasks. Hence, the author seeks to conduct a more comprehensive analysis of the correlation between the duration of work and the occurrence of forward head posture.

2. METHODS

The study was carried out on the premises of an office located in Gianyar. The present study employs a cross-sectional analytic observational study design to examine the association between job duration and forward head posture among employed individuals. The process of selecting study subjects through the utilisation of simple random sampling techniques, facilitated by computerization, The eligibility criteria for participants in the study, ranging from 20 to 30 years of age, required them to be office employees who primarily used computers and expressed their willingness to provide informed consent. Subjects with a history of trauma or surgery in the cervical or thoracic area, neurological disorders including cervical root syndrome, and infectious diseases such as rheumatoid arthritis or osteoarthritis were excluded based on the predetermined criteria. In this study, 60 people participated as research subjects. CVA angle measurement in forward head posture needed a tool to measure the degree of inclination of the neck using the method of photogrammetry. Photogrammetry is an analytical method for measuring an object that has been photographed, and then the analysis process is carried out digitally on a computer. A The application used on the computer is MB Ruler, which already has validity and reliability (ICC > 0.972) [19]. Measuring the duration of computer use using a questionnaire self-report questionnaire [20]. Data analysis in this study used the SPSS version 24 application with a bivariate test using Chi Squared and Spearman's rank.

3. RESULTS AND DISCUSSION

Table 1. Subject Characteristics

Variable	N	%
Gender	60	100
Man	45	75,00
Woman	15	25,00
Working Duration		
≥4 hours	40	60,00
≤ 4 hours	20	40,00
CVA Angle		
CVA < 49 ⁰	50	83,33
CVA > 49 ⁰	10	16,67

According to Table 1, men made up as much as 70% of the research subjects, with women making up as much as 25%. The table shows the frequency distribution of work duration. Research subjects work more with a duration of more than 4 hours per day, with a percentage of 60%, compared to less than 4 hours, with a percentage of 40%.

Table 2. Relationship Between Work Duration and Forward Neck Posture

Working Duration	Forward Head Posture		r	p
	CVA <49 ⁰	CVA >49 ⁰		
	n (%)	n (%)		
≥ 4 jam	25 (62,5)	15 (37,5)	0,572	0,012
≤ 4 jam	8 (40)	12 (60)		

Based on table 2, research subjects with a work duration of 4 hours had a CVA angle of 490 by 25 people (62.5%), followed by a CVA angle of >49⁰ by 15 people (37.5%). The CVA was 49⁰ by 8 people (40%) and >49⁰ by 12 people (60%), in research subjects with a duration of 4 hours. Based on these data, there is a strong, significant, and unidirectional relationship between duration of work and the incidence of forward head posture, i.e., the longer the duration of a person's work, the greater the incidence of forward head posture, with p = 0,012 and r = 0.572.

Unergonomic work postures, which occur repeatedly and for a long time, will cause prolonged mechanical stress. Based on research on the use of computers by workers for around 4-6 hours and even > 6 hours per day, individuals will tend to lean their heads forward [21]. When using a computer in an uncomfortable position for an extended period of time, such as when the screen is too low or the computer doesn't know the time, poor posture is one of the factors that contribute to postural tension. Postural tension is considered one of the factors that cause musculoskeletal disorders [22], [23]. A study shows that when a person sits operating a laptop, computer, or smartphone with a natural neck position, it reduces the activity of the muscles around the neck, namely the sternocleidomastoid, upper trapezius, cervical vertebral spinae, and thoracic vertebrae spinae muscles. The opposite happens if the position of a person's head is tilted forward, and if a person is used to leaning his head forward, it will

lead to forward head posture, where the load on these muscles increases when going on for a long time [24]. In addition, the development of forward head posture in workers who use computers for more than 40 hours per week [25]. The time constraint imposed on the subject serves as a contributing factor to the subject's prolonged computer usage. Prolonged periods of work can result in the development of musculoskeletal issues, particularly in individuals who maintain improper posture and fail to engage in stretching exercises. This can subsequently increase the likelihood of a forward head posture [26].

4. CONCLUSION

In this study, it was concluded that there was a significant relationship between work duration and forward head posture. In this study, it is necessary to study further the factors that influence forward head posture, such as work position. The findings of this study revealed a statistically significant association between work duration and forward head posture, as indicated by a p-value of 0.012 ($p < 0.05$). The findings of this study indicate a statistically significant correlation between the duration of employment and the occurrence of forward head posture.

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BIOGRAPHIES OF AUTHORS

	<p>Ni Nyoman Melani Karang is a physiotherapist working on private physiotherapy clinic especially orthopaedic and sport physiotherapy in Bali, Indonesia. Now still ongoing Master of Sport Physiology. Here the contact: melanikarang9e27@gmail.com</p>
	<p>Kadek Dwi Pradnya Lestari is a physiotherapist working on RSUD Sanjiwani Kabupaten Gianyar in Bali, Indonesia. I am interested to learning of all branch of physio. Here the contact: dwilestari2397@gmail.com</p>