

# Ergonomic Model Dental Chair Side Assistant “Edisi” to Reduce the Risk of Working Posture due to Musculoskeletal Disorders in Dental Therapist

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**Abstract:-** Dental assistants in maintaining dental and oral health are required to work quickly and precisely because they are very responsible for activities before, during and after dental treatment takes place, musculoskeletal disorders are disorders that can cause muscles to not function properly due to activities that are too heavy which can cause posture unnatural body. One strategy to overcome this problem is through the ergonomic model of the dental chair side assistant "Edition" this model consists of working positions and work place stretching. The purpose of the study was to analyze the effectiveness of the ergonomic model of the Dental Chair Side Assistant "Edition" on the risk of working posture in dental and oral therapists "Edition". The method used is a quasi- experimental pre-test and post-test with control group design. Sampling using the Lemeshow formula. The research sample was divided into 2 groups, namely the intervention group and the control group which consisted of 32 people, based on the inclusion criteria. This study used a questionnaire instrument and an observation sheet. Statistical test using Intraclass correlation coefficient, Mann Whitney, and Wilcoxon. The results obtained are the ergonomic model of the chair side assistant "Edition" effectively reduces the risk of work posture ( $p = 0.000$ ) so it can be concluded that the ergonomic model in the chair side assistant "Edition" is effective as a model used in reducing complaints of musculoskeletal disorders, namely the risk of work posture in dental and oral therapist. **Keywords:** Ergonomics, Chair Side Assistant, Musculoskeletal, Dental and Oral Therapist.

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## I. INTRODUCTION

Dental and Oral Therapist is one of the recognized professions in Indonesia, according to the legislation - the dental therapist has the authority to carry out dental and oral therapist work in accordance with the field of expertise possessed [1]. As a health worker, the dental and oral

therapist profession is very vulnerable against risk factors that may result in the occurrence of disease in this case a hazard to occupational health and work safety which results in disability or death. Law Number 13 of 2003 concerning Manpower, Article 86 paragraph 2 which states that in every workplace it is obligatory to carry out Occupational Health and Safety Efforts to protect the safety and health of workers in order to realize optimal work productivity.

Occupational diseases caused by dental therapists originate from physiological factors which are generally the duties of a dental therapist which in outline consists of [2] main tasks, namely promotive, preventive and limited curative implementation, one of which is as a dental assistant who works as a dentist's companion in this is preparing tools, controlling saliva, preparing materials, preventing cross-infection by sterilizing tools and rooms, adjusting the light when the dentist performs a treatment procedure, as a dental hygienist also fills out medical records [3]. One of the occupational risks of the therapist teeth and mouth are affected by occupational diseases (PAK) consisting of musculoskeletal disorders, lower back pain, hernia nucleus pulposus (HNP), and Carpal Turner Syndrome caused by ergonomic errors so that this also has an impact on increasing costs for workers compensation.

## II. METHODOLOGY

The design of this study was a quasi-experimental Pretest and Post-test Design (Non Equivalent Control Group). Respondents consisted of 64 dental and oral therapists. The minimum sample size required is 64 people. The sample was divided into two, namely 32 people for the intervention and control groups. Dental and oral therapist is a member of PTGMI Semarang, Central Java.

The instrument for assessing the risk of a work posture uses a REBA (Rapid Entire Body Assessment) assessment sheet, while the feasibility of the model is measured by a questionnaire. The research data uses an interval scale, statistical tests use the intraclass correlation coefficient to determine the feasibility of the module. While the normality

test uses the Shapiro Wilk test because the number of respondents is less than 50. The effectiveness test on normal data in the paired group uses a dependent sample test and for the unpaired group, an independent sample test is used.

**III. RESULTS AND DISCUSSION**

**A. Data Collection**

The results of data collection were carried out through interviews and systematic reviews. It can be concluded that in general the problems faced by dental and oral therapists in working as chair side assistants are work positions that are not appropriate because they work according to the work position of dentists without regard to their work position, which is good and true. *Design and Build.*

**B. Model Test**

**Table I. Normality Data for Rapid Antire Body Assessment (REBA)**

Variables	p-value*	
	Intervensi	Kontrol
REBA pre-test	0,149	0,051*
REBA post-test	0,000*	0,008*

Table 1 shows the normality test of the data. REBA is mostly normally distributed with p-value < 0.05 and there are data that are not normally distributed, it can be concluded that the data test is continued with the non-parametric test, namely the Wilcoxon and Mann-Whitney test.

**Table II Paired t-Test Results**

Paired t-test*				
Group	N	Mean±SD Pre-Test	Mean±SD Post-Test	p-value
Intervention	32	11,72±2,020	5,66±1,310	0,000*
Control	32	11,91±2,100	10,22±1,809	0,000*

\*Wilcoxon

Table 2 shows that the results of the paired test effectiveness test have a p-value of the intervention group which is 0.000 (p < 0.05), meaning that the ergonomic model in the chair side assistant is effective in reducing the risk of working posture for dental and oral therapists. The p-value of the control group was 0.000 (p < 0.05), meaning that there was also a reduction in the risk of working posture in the dental and oral therapists in the control group.

**Table III Independent t-Test Results**

Independent t-Test **				
Group	N	Mean	SD	p-value
Intervention	32	5,78	3,545	0,000*
Control	32	8,59		

\*\*Mann Whitney

Table 3. The results of the independent t test effectiveness test showed that the p-value between the intervention and control groups was 0.000 (p < 0.05)

meaning that the ergonomic model of the dental chair side assistant "Edition" was more effective in reducing the risk of working posture in dental and oral therapists compared to control group,

**C. Discussion**

Dental assistants have ergonomic principles which consist of selecting the required instruments, simplifying all tools and materials, preparing tools and materials quickly at work, and also being able to transfer tools quickly [3]. In addition, dental and oral therapists also in their competence have competence in care services, which consist of promotive, preventive and limited curative implementation, in this case increasing knowledge, attitudes and actions with limited cases. One of the right ways that can be done in reducing complaints of musculoskeletal disorders in dental chair side assistants in dental and oral therapists is the ergonomic model work and management engineering aims to prevent unnatural working hours and can help adjust work and rest hours [4]. The ergonomic model of the dental chair side assistant "Edition" consists of giving media posters as well as job position training and work place stretching where the training provided has several stages, namely: the preparation stage, the opening stage, the content stage, the closing stage and the evaluation stage.

This assessment consists of 2 groups, 15 Group A, namely: Neck, Back and Legs and Group B, namely: Upper Arm, Forearm and Wrist[5] then the results obtained are the results of the effectiveness test of paired variable data Rapid Entire Body Assessment (REBA) shows that the p value the value of the intervention group was 0.000 (p < 0.05) meaning that the ergonomic model in the chair side assistant "Edition" was effective in reducing the risk of working posture. The results obtained are in line with research conducted by Komang Ayu Cintia Dewi et al that a more ergonomic work attitude can reduce the compression force of musculoskeletal complaints and increase work productivity.

Work posture is a determining point in analyzing the effectiveness of a job. If the work posture is good and ergonomic, it is certain that the results obtained will be good. But if the work posture is not ergonomic, it will be easy to feel tired so that it can cause a decrease in performance at work [6].

Musculoskeletal disorders are also caused by incorrect work postures in carrying out work activities, the complaints experienced vary from mild complaints to very sick complaints, in assessing the position or work posture this is done using the Rapid Entire Body Assessment (REBA) sheet where REBA is a method used developed in the field of ergonomics and can be used quickly in assessing the position or work posture of a worker [7].

The results of the unpaired effectiveness test showed that the p-value of the control was 0.000, the risk of working posture in the intervention and control groups so that the p-value was 0.05, meaning that the ergonomic model in the chair side assistant was effective in reducing complaints of musculoskeletal disorders in dental and oral therapists in the

intervention group in compared with the control group who were only given poster media. This is in line with research conducted by Luh Niah Agusdianti et al that ergonomic education can reduce musculoskeletal complaints and can improve posture consistency [8]. In addition, it is also supported by research from Sumihardin, namely the installation of safety posters and operational procedures can reduce the number of work accidents by 11 cases.

#### IV. CONCLUSION AND RECOMMENDATIONS

As one of the health workers, the dental and oral therapist profession is very vulnerable to risk factors that may result in the occurrence of diseases in this case hazards to occupational health and work safety resulting in disability or death. The ergonomic model in the chair side assistant "Edition" is effective as a model used in reducing complaints of musculoskeletal disorders, namely the risk of working postures for dental and oral therapists.

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