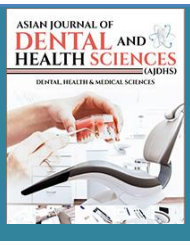

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Portable Dental Chair Innovation in Improving Operator Comfort

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Abstract

Objective: to produce a suitable portable dental chair innovation and its effective application in improving operator comfort.

Materials and Methods: This study was an R&D type with a pre-experimental design. Sampling was done using purposive sampling with a total of 30 Dental Therapists across all primary health centers in the Banjarbaru City. The independent variable was the Portable Dental Chair innovation, and the dependent variable was operator comfort.

Results: The use of portable dental chair innovation provides convenience in dental health services regarding operator comfort, which is sometimes suboptimal, as well as limitations in features for complex dental care. Technical and logistical issues such as equipment damage and lack of resource availability can also be challenging. Therefore, innovation in the production of portable dental chairs is crucial. Technological advancements can improve ergonomics, efficiency, and equipment quality, addressing the increasing market demand for mobile and flexible dental care. Thus, this innovation not only provides solutions to existing problems but also expands access to quality dental care for more people, resulting in a positive impact on overall dental health sector.

Conclusion: Portable Dental Chair Innovation is suitable and effectively applied to improve operator comfort.

Keywords: Dental Therapists, Portable Dental Chair, operator comfort

INTRODUCTION

Oral health services are efforts aimed at improving oral health, preventing and treating diseases, and restoring oral health for individuals, families, groups, or communities comprehensively, integrative, and qualitatively. Optimal oral health services require adequate equipment, one of which is a portable dental chair. A portable dental chair is a type of dental unit that can be moved, easily stored, folded, and carried according to needs, suitable for providing dental health services in remote areas or areas that are difficult to reach by health facilities. Dental health services using portable dental chairs are mainly chosen because of the mobility and flexibility they offer, allowing dental health service providers to easily carry and use this equipment in various locations, such as primary care in remote areas. Another advantage is the more affordable cost of obtaining and maintaining portable dental chairs compared to larger and more advanced fixed dental chairs. Portable dental chairs may not provide all the comfort features offered by fixed dental chairs but still serve as an efficient solution in situations where mobility, flexibility, and the ability to provide dental care in different locations are priorities.

The use of portable dental chairs provides convenience in dental health services, one of which is the sometimes suboptimal comfort for operators, as well as limitations in features for complex dental care. Technical and logistical issues such as equipment damage and resource availability can also be challenging. Therefore, innovation in the production of portable dental chairs is crucial. Technological advancements can improve ergonomics, efficiency, and equipment quality, addressing the increasing market demand for mobile and flexible dental care. Thus, this innovation not only provides solutions to existing problems but also expands access to quality dental care for more people, resulting in a positive impact on the overall dental health sector.

MATERIALS AND METHODS

In this study, the participants were 30 dental therapists from all primary health centers in Banjarbaru City. Data collection duration was one month. Questionnaires were printed and distributed directly to dental therapists and summarized using tables with ratings using a Likert scale. The questionnaire was created by researchers considering the purpose of this study. The main focus of this research is the innovation of making portable dental chairs that can improve comfort for operators. The questionnaire includes operator comfort, ergonomic support, ease of equipment accessibility, and the strength of materials of the portable dental chair innovation. Data collected from respondents through completed questionnaires were kept confidential and anonymous.

PRODUCT RESULTS

Researchers innovated the production of portable dental chairs that are easily transportable, equipped with adjustable headrests, footrests, and body rests, as well as tables and lamps, while still focusing on operator comfort to support the effective and efficient provision of dental health services.

1. Equipment Specifications

a. Overall chair height = 93 cm

b. Chair height from the bottom = 47 cm

c. Chair width = 39 cm

d. Length of chair to footrest = 85 cm

e. Backrest height = 43 cm

f. Headrest designed to be soft and adjustable

g. Table length = 48 cm

h. Table width = 30 cm

2. Attributes of portable dental chairs are as follows:

a. Frame made of round iron pipe material

b. Portable/foldable

c. Cushioned with foam on the head, back, seat, and footrest

d. Foam covered with synthetic leather fabric

e. Additional small table on the left side

f. Lightweight yet sturdy and easy to carry

RESULTS:

This study is an innovation study of making portable dental chairs with equipment testing using expert validation questionnaires. Expert validation was conducted to obtain data used as the basis for testing the feasibility of using portable dental chair innovations. Expert validation was carried out by experts consisting of 4 individuals, namely dentists, dental nurses, psychologists, and electromedical experts. Expert validation was conducted to obtain data used as the basis for testing the feasibility of using portable dental chair models. The feasibility test results by experts can be seen in the following table:

Table of Results of Expert Validation Test on the use of Portable Dental Chair Model

Number	Respondent	*Score	Criteria
1	Expert 1	95%	
2	Expert 2	77,5%	**Very**
3	Expert 3	80%	**Suitable**
4	Expert 4	87,5%	
	Mean	85%	

The table above shows that the assessment results through the Likert scale show an average score of 85% with the criteria Very Suitable, indicating that the portable dental chair model can be tested as a product.

Table of Interclass Correlation Coefficient Test Results by Experts on the use of Portable Dental Chair Model Variable Average Category p-value Portable Dental Chair 0.904 High 0.001.

Variable	Mean	Category	*p-value*
Dental Chair Portable	0,904	High	0,001

**Interclass Correlation Coefficient Test*

The table above shows that the test results of the equipment feasibility by expert validators averaged 0.904, indicating a high category with a p-value of 0.001, indicating that the Portable Dental Chair is highly suitable in supporting dental health service activities. The study was conducted on 30 dental therapists working in all primary health centers in Banjarbaru City. Research results:

Table of Equipment Use Test on Operator Comfort Aspect Variable Statistics Conventional school chair Portable Dental Chair p-value Operator Comfort.

Variable	Statistic		
	Conventional school chair	**Dental Chair Portable**	***p-value***
Operator Comfort			
a. Mean±SD	5,90±1,561	13,77±1,736	**0,000**
b. Delta Δ	7,87		

**Mann Whitney test*

The table above shows that the operator comfort aspect towards the use of conventional school chairs in dental health services was 5.90, whereas in the use of portable dental chairs, it was 13.7 with a delta Δ value of 7.87. The statistical test results show that the p-value is 0.000 (< 0.05), meaning that the use of Portable Dental Chairs has a more effective compared to conventional school chairs.

DISCUSSION:

Discomfort in healthcare services, including discomfort experienced by healthcare professionals during examinations or treatments without comfortable chairs, is indeed an important issue. The physical health and comfort of healthcare professionals not only affect the quality of care provided to patients but also impact their mental and physical well-being. Comfortable chairs not only allow healthcare professionals to work more efficiently and with better concentration but also can help prevent injuries or fatigue caused by non-ergonomic positions over long periods. Furthermore, the physical comfort of healthcare professionals can also affect their job satisfaction, which in turn can influence staff retention and the quality of service provided.

Based on the information gathered and field interviews conducted, it was found that one of the obstacles in dental healthcare services is the lack of dental chairs that provide comfort for operators. To date, there have been no innovations from health centers or schools in creating healthcare tools that support operator comfort. The desired solution is a portable dental chair equipped with a headrest, table, light, and adjustable footrest to make operators feel comfortable. Innovative tools in the form of portable dental chairs are highly necessary to support healthcare activities, given the importance of comfort in preventing back injuries in operators performing counselling, examinations, and procedures. Therefore, the researchers developed a tool innovation to improve operator comfort in the form of a portable dental chair

Data collection through expert validation conducted by several experts in the fields of health and technology revealed that the average tool feasibility test result from expert validators was 0.904, indicating a high category with a p-value of 0.001,

showing that the Portable Dental Chair is highly feasible in supporting dental healthcare activities. Validation by experts was carried out to determine the level of suitability of a tool effectively. Tool assessment can be reviewed and evaluated by experts in their respective fields according to predetermined indicators. The statistical test results show that the p-value is 0.000 (<0.05), meaning that the use of the Portable Dental Chair provides a more effective level of operator comfort compared to conventional school chairs in dental healthcare services.

In dental healthcare services, operator comfort is crucial to maintaining optimal service quality. Portable dental chairs that support operator comfort play a crucial role in ensuring that service procedures can be performed with high efficiency and accuracy. Operators often have to work in awkward positions and require high focus for extended periods. Therefore, in this study, portable dental chairs have provided ergonomic support, such as soft cushions and proper supports for the back, arms, and head, to help reduce fatigue and tension that may occur during service procedures. According to a study by Al Wazni et al. (2015) [8], ergonomic chair designs can minimize the risk of injury and improve operator comfort

The lightweight and easily movable mobility of portable dental chairs can assist operators in providing dental care in various locations or different environments. This can reduce physical and mental fatigue on operators. According to a study conducted by Monametsi et al. (2019) [9], high mobility in portable dental chairs can improve the efficiency and comfort of operator work in dental healthcare services in remote areas.

CONCLUSION:

Based on the research findings, it can be concluded that the innovation of portable dental chairs is feasible and its application effectively improves operator comfort. This is evidenced by the average result of expert validation tests of 0.904, indicating tool feasibility in the high category with a p-value of 0.001. The innovation of portable dental chairs is more effective in improving operator comfort compared to conventional school chairs, as evidenced by a p-value of 0.000 (<0.05).

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