

CHAPTER I

INTRODUCTION

In this chapter, the writer focuses on explaining background of the research, formulation of the research, purposes of the research, limitation of research problem and the system of research writing.

1.1 Background of Problem

The development of technology, knowledge, social and culture have triggered the widespread of diseases which suffered by human as example spinal diseases. Spinal disease is a disease which attacks and damages the spine, both regarding hard bone structure and soft tissue around the spine. It can be caused by various causes such as infections, degenerations, vascular abnormalities, congenital spine abnormalities, tumour growths, or spinal cord injury, which results in compression or suppression of nerve structure that runs around the spine. As the result, disorder of nerve functions from minimal to fatal, will appear either slowly or progressively, as nerve damage occurs. According to Hari, et al., (2018) today, number of spinal diseases are increasing as well as life expectancy. One of them known as scoliosis.

Scoliosis is a case of three-dimensional spine deformity, with the main diagnostic criteria are being more than 10 degrees of coronal curvature and having an anteroposterior position on x-ray (Handy, 2015). From several scoliosis cases were found, 80-85% cause of scoliosis is idiopathic (meaning the cause is unknown), then mostly it found in puberty, more often in females compared to males, and it can be determined from hereditary factors (Mujianto, 2013). Scoliosis sufferer are among students, entrepreneurs, civil servants with different causes without regardless of gender. Based on data from the World Health Organization (WHO) shows the incidence of scoliosis to reach 3 percent in the world. Meanwhile, in Indonesia it reaches 4-5 percent of population based on the 2015 health census data.

As cited in Akhmad (2016) people with scoliosis are including the category of people with disabilities. Republic of Indonesia Law Number 8 Year 2016 states that disability people are “any person who has long-term physical, mental, intellectual and/or sensory impairments who may face various challenges and barriers in their interaction with their surroundings to be able to fully and effectively participate together with other citizens on the basis of equal rights”.

People with disabilities such as scoliosis sufferers also have the right to be healthy. Republic of Indonesia Law Number 36 year 2009 states that "health is a health condition physically, mentally and spiritually so that enabling any person to live a productive life socially and economically". Healthy means that a person must be given many opportunities to develop his/her genetic potential into phenotypic realities. The preceded definition gives an understanding that health must be seen as a complete unity of the physical, mental and social elements. This rule also should be applied to scoliosis sufferers, by giving them opportunity to develop their abilities.

However, not all activities can be carried out optimally by scoliosis sufferers to support their abilities. They mostly get tired faster when sitting too long compared to normal people in general. As many as 20.01% of young people with disabilities in Indonesia complain about their health (BPS Data, Susenas 2018). ‘Disabled young people’s here, include the scoliosis sufferers who experience health problems because they cannot sit too long. This thing happens because their body’s unpreparedness carries the burden, consequently work of their muscles will never be balanced. Then, it will impact in a mechanism of protection of the muscles of spine to maintain balance until there is overuse of one side of the muscle in a continuous time. If this thing still continues in the musculoskeletal system of the spine, there will be a variety of pains that suffered by sufferer including muscle pain, range of motion from the spine or back pain, muscle contraction, and problematic accumulation will result in disruption of their daily life or their day activities (Adillani, 2015). Therefore, sitting too long is a problem for people with scoliosis in their daily activities.

Students are one of the people who easily suffer the scoliosis, due to their long-sitting habit, especially during the class. Scoliosis sufferer students must study for 1.5 to 2 hours for one course. However, in one day they can have five courses maximally. The number of courses that must be attended by scoliosis students can be various per day. In fact, one course actually has caused fatigue for scoliosis sufferer students because they are required to sit around 1.5 to 2 hours. It cannot be imagined if scoliosis sufferer students take for 3 to 5 courses in a day with their non-normal physics.

In learning process, scoliosis sufferer students also use public facilities which are provided by the university where they study. Article 5 paragraph 3 of Law number 39 year 1999 states that "All members of disadvantaged groups in society, such as children, the poor, and the disabled, are entitled to greater protection of human rights." The article emphasizes what is meant by disadvantaged groups are elder, children, the poor, pregnant women and people with disabilities. This can refer to special facilities that are entitled to be received by people with disabilities such as scoliosis sufferer students.

Furthermore, provision of special facilities for students with disabilities has been mentioned in article 5 Permenristekdikti number 46 year 2017. Then, this regulation also has been applied at Universitas Andalas. Moreover, Universitas Andalas already provide public facilities which are easy to access, especially for people with disabilities such as ramp, handrail and pedestrian lanes in several areas which aims to support the improvement of the quality of education. Unfortunately, Universitas Andalas has not been yet to provide special facilities for scoliosis students in the classroom. Even though, current chairs are available in the classroom but the backrests cannot support the scoliosis sufferer's coccyx. In addition, the material of those chairs are uncomfortable for scoliosis sufferer students. In consideration that the classrooms are used by students for academic activities and non-academic activities, the chairs in the classrooms at Universitas Andalas should be designed properly with considering disabilities users. So, it will help students with disabilities like scoliosis sufferers to be maximal in their daily activities.

The absence of special facilities for people with scoliosis at Universitas Andalas, then scoliosis students who are not able to sit for 1.5 to 2 hours, raise a problem which is should be solved. So, a preliminary interview was conducted to find out how comfortable students of scoliosis in using current chairs. The results of initial interview which is conducted on six scoliosis students at Universitas Andalas on May 2019 showed that five of respondents felt uncomfortable with the chairs that provided in the classroom.

The four respondents felt uncomfortable because of facilities such as the backrest did not support their coccyx and also because of the materials are hard. As many as 50% of respondents stated that they were uncomfortable with the material of chairs which are hard, in Universitas Andalas classrooms. The results of interview on evaluation of seats can be seen in **Figure 1.1**.

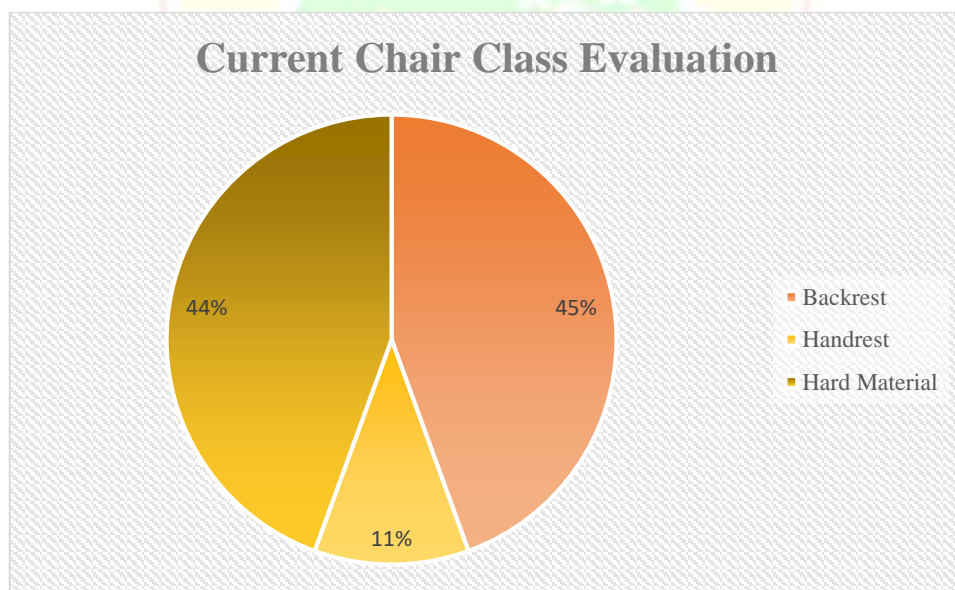


Figure 1.1 Interview Results: Evaluation of Seats in Classrooms at Universitas Andalas

The result above shows the importance of special facilities for people with disabilities such as scoliosis, in achieving convenient facilities both scoliosis sufferer students or non-disable students. This thing actually can be realized by the provision of special chair design for scoliosis students in the classroom. The results of the initial interview also showed that the six respondent's hopes special chair design for scoliosis students can be provided in the classroom.

Special chair design for scoliosis students can be a good solution to help them in developing abilities and doing academic activities. By facilitating the classrooms with special chair design for scoliosis students, the writer expects this effort can help scoliosis students at Universitas Andalas feel healthy to sit in the classroom. Thus, it is necessary to design a special chair for scoliosis students in Universitas Andalas's classrooms, of course with specifications which fill convenience of the users (scoliosis sufferer students).

1.2 Problem Formulation

The formulation of the research problem is:

How to design a special chair which help scoliosis sufferer students feel more comfortable and not get tired easily when sitting in a classroom?

1.3 Research Objective

The purpose of this research are as follows:

1. To evaluate the condition of classroom's chairs at Universitas Andalas which not make scoliosis sufferer students feel comfortable to sit.
2. To design special chairs for helping scoliosis sufferer students feel more comfortable to sit.

1.4 Research Scopes

The limitation of the problems in this research are as follow:

1. The functions of this special chairs designed only to make scoliosis sufferer students feel more comfortable while sitting in the classroom, so it is cannot relieve pain that is suffered by the students.
2. This special designed chair can only be used by scoliosis sufferer students with a degree of curvature of the spine maximum of 40 degrees.

1.5 Outline of Report

This final project is divided into several chapters which are arranged systematically in order to facilitate the reading and understanding. As for the outline of the report are:

CHAPTER I INTRODUCTION

This chapter discuss about background of the research, problem formulation, research objective, scope of research, and outline of report.

CHAPTER II LITERATURE REVIEW

Literature review describes the supporting theory of research, previous research and other things related to this research.

CHAPTER III RESEARCH METHODOLOGY

The research methodology consists of steps that include the stages in designing special chair for scoliosis sufferer students in Universitas Andalas classroom until the prototype production also for the evaluation of prototype.

CHAPTER IV DATA COLLECTION AND DATA PROCESSING

Consists of data that have been collected and data that have been processing for the research. This chapter also consists of selecting design steps among the alternative designs.

CHAPTER V PROTOTYPE PRODUCTION AND EVALUATION

Consists of steps for making prototype, production cost, evaluation of the prototype and part analysis.

CHAPTER VI CONCLUSION AND SUGGESTION

Consists of conclusions of the research and suggestions for the next research.