CHAPTER 1 INTRODUCTION

I.1 Background

The spread of the Covid-19 virus, according to the WHO, can be transmitted through the nose and mouth of an infected person who emits particles when they talk, cough, or breathe hard. These virus particles can be large (droplets) or very small (aerosols). This virus can also be transmitted when droplets from an infected person stick to the surface of surrounding objects and are touched by other people who touch their eyes, nose and mouth without washing their hands first (World Health Organization, 2020).



Figure I. 1 Covid Cases Graph in Indonesia Per July 15th

In Indonesia, the first Covid-19 case was announced since March 2020. Based on the graph above, the number of confirmed cases of Covid-19 per day is in the range of 5,000 to 20,000 cases per day. However, as of June 2021, the number continues to increase so that positive confirmed cases rise to the range of 30,000 to 50,000 per day (Gugus Tugas Covid-19 Indonesia,2021).

In Indonesia, the birth rate was at 2.3 in 2018 (Worldbank, 2018). With marriage at two million new couples per year, and 80 percent of pregnancies, 1.6 million babies will be born that year (BKKBN, 2020). When compared to other countries, the Fertility Rate in Indonesia can be said to be quite high.

Source (Covid.go.id,2021)

Birth to women with Covid-19 can cause babies born to be born prematurely (Bonet M et al., 2020). Several countries categorize groups of pregnant women as groups who can be exposed to acute COVID-19 respiratory disease (World Health Organization (WHO), 2020). With a good age of pregnant women in the range of 30-35 (Purnama I, 2014). Based on data from covid.jakarta.co.id, the age group exposed to Covid-19 is the age group of 20-29 years and 30-39 years, this makes women at optimal pregnant age vulnerable to Covid-19.

In Indonesia itself, especially in big cities, many people still choose a hospital or a health center as a place of delivery. Meanwhile, the hospital occupancy rate in big cities including DKI Jakarta, West Java, Central Java, and East Java is an average of 70%, with a range of 63%-73% (CNBC Indonesia, 2020). With this, the role of Puskesmas as a community facility emerged by providing public health efforts (West Java Health Office, 2020), in addition to this the role of Puskesmas is very important in areas far from hospitals as primary service providers. Therefore, an innovation is needed so that deliveries carried out at the puskesmas are safe in accordance with strict health procedures to reduce the impact of the spread of the Covid-19 virus on mothers, babies, and medical personnel working at the puskesmas.



Figure I. 2 Plot of healthcare service from bottom to top

Source (Dinkes Jawa Timur)

Based on Figure I.2 there is not only one type of Puskesmas, but there are several types based on its level, besides offering free general health services some of them also provides special type of service including birth delivery and other mom and baby services. Puskesmas PONED (Pelayanan Obstetri Neonatal Emergensi Dasar) located between general Puskesmas and RS PONEK (Pelayanan Obstetri Neonatal Emergensi Komprehensif), with the current active positive cases of Covid-19 in Indonesia Puskesmas PONED a less concentrated rather than hospital so it's the more favourable for women in the suburban area to deliver their child. Based on the interview done with the head of midwives Puskesmas PONED Salawu, there are around 10-18 child's delivery conducted every month in Puskesmas PONED Salawu, also there are already 2 cases of Covid-19 infected mother delivery that successfully conducted.

With the responsibility of puskesmas PONED has, the maternity facilities are far behind compared to RS PONEK in accordance with Covid-19 prevention facilities based on observation held in May 2021. This requires a solution to fill the gap between maternity facilities of puskesmas PONED and RS PONEK. Previously, a solution is already made in the form of a delivery bed chamber, but it still has some flaws in several aspect including dimension, features, and ventilation. A better design needed to further improve the function of the chamber to prevent covid-19 spread between mother, midwives, and also the babies.

To get a good delivery bed chamber design and in accordance with the relevant needs of current issues, a good design approach is needed so that it can produce a product that is better than the existing birthing aids during the pandemic, so that it can be a solution to the problems that occur. Descriptive models of a design process usually identify the importance of conceptualizing a solution in the initial processes (Cross, 2005). One of the descriptive models that is often used is the French Model Design Process. This method consists of 4 main activities, namely: (1) Problem Analysis, (2) Conceptual design, (3) Embodiment of Schemes, and (4) Detailing Process. By using the French Model Design Process, the process of getting more feedback and this model is a product development model design that focuses on the innovation aspect of the product to be made (van Zyl, 2006). Therefore, in making

the bed chamber model, it will be carried out using the French Model Design Process method. The research will be continued because a new birthing bed chamber design is believed to be a solution to the current problems.

I.2 Problem Definition

Based on the background that has been described previously, the formulation of the problem on the topic of this research is how to design a product design for a delivery bed chamber in accordance with existing needs using the product development method using the French Design Process method.

I.3 Research Purpose

Based on the formulation of the existing problems, the purpose of this study was to obtain a product design for the delivery bed chamber that was in accordance with existing needs using the French Design Process product development method.

I.4 Research Benefit

By using the results of this study, it is hoped that this research will have the benefit of producing a product design for a delivery bed chamber that is in accordance with existing needs.

I.5 Research Limitation

Based on the existing problems, the limitation of the problem in this study focuses on the design in the form of a 3D model that does not discuss electrical components.

I.6 Writing Systematic

In writing this research, following the systematics as follows:

CHAPTER I Introduction

This chapter explains the introduction of the research that consists of background of research, problem formulation, objective of research, limitations of research, and benefits of research.

CHAPTER II Literature Review

This chapter consists of relevant literature for helping the research for solving the underlying problems.

CHAPTER III Problem Solving Methodology

This chapter explained the detailed steps of the research including the problem definitions, then the problem solving systematic that will lead a conclusion for current research.

CHAPTER IV Integrated System Design

This chapter contains the data obtained from the research objective function. Data processing will be carried out in accordance with the French's Design Process research method. So that the data is processed in accordance with alternative concepts that are good and appropriate.

CHAPTER V Analysis and Evaluation of Design Results

This chapter will explain the processing of the data that has been carried out in CHAPTER IV.

CHAPTER VI Conclusion and Suggestion

This chapter will contain conclusions from the results of research that has been carried out and also contain suggestions for researchers who will conduct further research on similar topics in order to get better solutions.