

CHAPTER 1

PRELIMINARY

1.1 Background

Stunting has been identified as a major public health priority (Prendergast, 2014). According to the World Health Organization's (WHO) public health importance cut-off values for stunting, Indonesia has a high prevalence of stunting (Titaley et al., 2019). The country is even ranked fifth among countries with the highest burden of stunted children (Beal, T., et al, 2018). The stunting rate for children in Indonesia based on Riskesdas is 30.8 percent in 2018 (Riskesdas, 2018).

Stunting is caused by chronic malnutrition, and childhood malnutrition has been linked to an increased risk of adult obesity. Malnutrition has been linked to increased morbidity and mortality, impaired physical, neurodevelopmental, and economic ability, and an increased risk of metabolic disorders in adulthood, specifically increased metabolic fat, according to certain research (Grillo et al, 2016).

In Indonesia from 1999 to 2004 the prevalence of overweight and obesity increased from 4.2 and 1.9% in childhood to 8.8 and 3.2% in adolescence (Julia et al., 2008). A growing number of studies have found that nutritional stunting leads to a slew of long-term changes, including lower energy expenditure, increased susceptibility to the effects of high-fat diets, lower fat oxidation, and impaired food intake regulation, all of which increase the likelihood of becoming obese in the future (Sawaya, A.L., and Roberts, S., 2003).

The increase in the incidence of obesity is in line with the increase in the incidence of metabolic diseases. Prevalence of metabolic syndrome in adolescents is increasing, in parallel with the increasing trends in obesity rates. As the proportion of the population with

obesity continues to rise, the prevalence of metabolic syndrome is increasing in adolescents. Children with metabolic syndrome have an increased risk of metabolic syndrome as adults, and possibly an increased risk of type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD) (Al Hamad, 2017).

According to the prevalence data listed above, it can be seen that the increasing prevalence of stunted adolescents who are obese is accompanied by an increase in the prevalence of adolescents with metabolic syndrome. This is caused by the nutrition transition, this transition can change in diet composition from conventional diets that are predominantly drawn from plant-based food sources that are low in fat and high in fibre. Obesity has raised the public health importance of noncommunicable diseases caused by nutrition, such as cardiovascular disease and diabetes (Kimani-Murage et al., 2010).

The definition of metabolic syndrome has been recommended by various organizations, including the World Health Organization (WHO), NCEP III, the International Diabetes Federation (IDF) and The National Heart, Lung and Blood Institute (NHLBI). However, for adolescents, the standard used is from the International Diabetes Federation, namely the IDF Criteria. With many consequences of nutritional deficiencies and complications of obesity, it can meet the criteria for the metabolic syndrome listed by the IDF criteria (IDF, 2006).

Similar study was conducted and included 59 obese adolescent between the ages of 13 and 16. Around 27 people (45.8%) had metabolic syndrome (Widjaja, et al., 2020) . From this research, it can be seen that the number of obese children with metabolic syndrome is quite high, so we would like to know more about the association between obese children who experience stunting with metabolic syndrome. Because to study the

relationship between adolescent obesity and metabolic syndrome is very useful to prevent the risk of similar diseases that will occur in the future. With the unprocessed data from previous studies, it will be easier to find out how likely it is that adolescents who are obese are stunted adolescents with the risk of metabolic syndrome. In addition, this research aims to provide opportunities for further research on stunted, obesity in adolescent, and metabolic syndrome.

1.2 Formulation of the Problem

Is there an association of stunted in obese adolescents and the risk of metabolic syndrome?

1.3 Research Purposes

Based on the formulation of the problem that has been described above, the objective of this research are:

1.3.1 General Purpose

To analyze the association of stunted in obese adolescents and the risk of metabolic syndrome.

1.3.2 Specific Purpose

1. To know the amount of stunted in obese adolescent
2. To know the amount of stunted in obese adolescent and metabolic syndrome
3. To analyze the association of obese adolescent in stunted and metabolic syndrome

4. To know the risk of hypertension in stunted and non stunted obese adolescent
5. To know the risk of triglycerides in stunted and non stunted obese adolescent
6. To know the risk of high density lipoprotein in stunted and non stunted obese adolescent
7. To know the risk of fasting plasma glucose in stunted and non stunted obese adolescent

1.4 Benefit of Research

1.4.1 Academic Benefits

This research is expected to increase understanding of the association between stunted and metabolic syndrome risk in adolescent obesity. This can also be useful in the application of the medical field to determine the possibility of children who can experience the risk of syndrome in obese adolescents who are stunted or not.

1.4.2 Practical Benefits

This research is expected to find out the prevalence of early detection of obese adolescents with short stature who experience stunted and metabolic syndrome by being able to provide knowledge to the public as parents to be careful and always take care of their children's health so that the risk of obesity and metabolic syndrome in stunted adolescents can be avoided. This research can also

be a reference to provide further research opportunities in stunting children, obesity in adolescents and metabolic syndrome.