

CHAPTER 1

INTRODUCTION

1.1. Project Background

Ballet is a type of dance performance categorized as an athletic art that makes dancers have a unique set of nutritional requirements to maintain their optimal performance. Aside from perfect technique and discipline, the optimal body composition and the aesthetic goal of thinness are known to maximize the dancers' on-stage performance and physiological needs (Wright & Collin, 2020; Gammone & D'Orazio; 2020). However, the physiological demands or requirements of body shape among ballerinas were different in each ballet school. Usually, with the increase of difficulty technique level, the ballerina physical demands increased as well. These requirements have made the ballerinas also need a combination of balanced strength, flexibility, and high fitness level to support their movement and avoid injuries. On the other hand, ballet is an "*en pointe*" ("on the toes") dance where these ballerinas require a complete plantarflexion of their foot-ankle (Reid, 1988; Lai & Kruse, 2016). Hence, the physical demands towards the ballerinas have become the beginning of nutritional problems among ballet dancers.

With high demands towards the ideal body shape, the ballerinas' perception of being "acceptable" or "competent" by their environment might change their perspective from their subjective views. These changes might be the beginning of body dissatisfaction among ballerinas, where the eagerness to have lean and thin body shape is increased. The perspective from the ballet dancers with a lean physique and low body fat (BF) levels were helpful in regards to their ballet movement efficacy as well as the execution of ballet's finesse (Sundgot-Borgen & Garthe, 2011). Therefore, various ways, such as restricting their food intake and increasing training volume, were done to build their ideal body shape as their perception.

During the development of ideal body shape, ballerinas are mostly associated with the prevalence of low body weight, low body mass index (BMI), and eating disorder, where those cases

have known as the major nutritional problems among female dancers compared to non-dancer females. Stokic and team (2005) stated that 30 ballet dancers, with a mean age of 17.4 years, had significantly lower body weight, body height, and BMI, which at $18.56 \pm 1.53 \text{ kg/m}^2$ compared to the average score from 30 non-athletic girls with BMI of $19.96 \pm 2.12 \text{ kg/m}^2$ (mean age of 18.01 ± 1.3 years). Sousa *et al.* (2013) also found that >70-80% of dancers had lower than recommended intake, including macronutrients and micronutrients. These nutritional problems are known as a contrary problem among the dancers itself since they want to have an aesthetic demand and motivation to be thin and to optimize their performance. Moreover, this condition will affect their “acceptable” body image and increase the risk of eating disorder behaviors confounded by their psychosocial stressors (Byrne & McLean, 2002; Nordin-Bates, Walker, & Redding, 2011). Thus, body composition demands, as well as psychological aspects, are the factors behind that affect how the ballerinas control their nutritional intake.

On the other hand, ballet as an exercise is known to not effectively for dancers to burning their calorie; thus, the prevalence of dietary restriction habits among the dancers getting increased since they want to maintain their lean physique and weight control (Twitchett *et al.*, 2010). Also, many aesthetic athletes or weight-dependent sports like ballet were unable to compensate for their high energy output demands with adequate energy intake. Most of these athletes were at risk of numerous health and performance impairments related to their energy imbalance (Loucks, 2004). In regards to this condition, several nutritional problems related to the imbalance of energy input-output might be correlated with the short- and long-term consequences. These consequences can include menstrual irregularity, prone to injury, and longer recovery time, which will occur more among the ballerinas and getting worse with a lean physique and low percentage of BF, in compared to their healthier counterparts (Carlberg *et al.*, 1983; Twitchett, 2008).

Aside from nutrition inadequacy, nutritional knowledge deficits also persisted among the dancers (Dotti *et al.*, 2002). These problems have resulted in multiple nutritional issues, such as nutritional deficiencies, low body weight, low energy intake, and delayed puberty, which getting

worse among the very young ballet dancers and affected their growth and development progress (Grochowska-Niedworok *et al.* 2018). Therefore, nutritional education among the ballerinas, such as good dietary practices and psychological aspects towards their body satisfaction, is needed to improve ballerinas' nutritional knowledge as an athlete.

As the adequate nutritional intake among the ballerinas known as the main determinant of their athletic performance; however, the evidence of nutritional knowledge and body image perception that affect the dancers' nutritional intake are still unclear, especially in Indonesia. With little to few ballerina research studies in Indonesia, it was still quite challenging for researchers to map the nutritional status of the ballerinas, since the latest studies were conducted from one ballet school only. For example, from Dienasar (n.d.) study, it was found that more than half (56.1%) of the adolescent ballerinas (15-21 years old) had unhealthy eating habits. However, their body image perception and body composition status were found in good condition. In contrast results, Khoirunnisa & Setiarini (n.d.) found that 44% from total participants (108 ballerinas with aged 11 – 17 years old) had a negative body image perception. The negative body image perception among these ballerinas was found significantly associated with their nutritional status, diet history, and coach influence. However, from both of the studies, the nutritional status of ballerinas was only measured based on BMI, waist and hip circumference, which all these data cannot differentiate between the fat, muscle, and bone mass of an individual. Also, the studies on nutritional knowledge and eating habits measurement from both studies only categorized their participants into two main groups: good/healthy or not good/unhealthy. These categorizations cannot determine more detail in which area of nutritional knowledge the ballerinas were good or not good and how diverse and how much food intake amount that these ballerinas had. Thus, further body composition assessment, body image perception, food diversity and their amount of intake, and nutritional knowledge were needed to define more about the nutritional status of ballerinas in Indonesia.

With the development of technology, the use of new machines might help the researcher better to understand the nutritional status among the ballerinas. One example is bioelectrical

impedance analysis or bioimpedentiometry (BIA), which provides many advantages over other methods in assessing the individual body composition, such as less prone to human error problems. This measurement can include total body water (TBW), fat mass (FM), fat-free mass (FFM), muscle mass (MM), and BF. With the broad assessment results, the determination of the nutritional status will not only based on body height and body weight, but the muscle, range of fatness levels, especially among the very lean dancers, as well as hydration status can be included to understand the current nutritional status of ballerinas (Gammone & D’Orazio; 2020). Hence, the usage of BIA and other assessments, such as body image perception, nutritional knowledge, and dietary intake from several ballet schools across Jakarta, were needed as preliminary data to understand the nutritional status of ballerinas in Jakarta.

1.2. Hypothesis

Ballerina with low FFQ scores, low stunkard figure rating scale, and low nutritional knowledge score will have low range of BMI level and body composition.

1.3. Objective

The aim of this study was to assess the nutritional status among ballerinas in Jakarta from their body composition in relation to their body image, food intake, and nutritional knowledge.

1.4. Benefit of the Study

The findings from this study could be beneficial as follows;

- Provide information about the relationship between dietary intake, body composition, body image and nutritional knowledge among ballerinas, especially in Jakarta.
- As preliminary data and supplementary literature for future research, on nutrition among ballerina in Indonesia.

- Contribute to the nutritional policy development to increase the body fitness and nutritional balance among ballerinas in Indonesia.