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## Prevalence of overweight and obesity among students with intellectual disabilities in Taiwan: A secondary analysis



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### ABSTRACT

**Purpose:** The study aims to investigate the prevalence and likelihood of overweight and obesity in a large sample of students with intellectual disabilities (ID) from Taiwan.

**Method:** A secondary analysis of a cross sectional study was employed to examine the body weight status among 7 to 18 year-old students with ID enrolled in public special education schools in 2013. The students were divided into three age groups (7–12 yrs, 13–15 yrs, and 16–18 yrs), four ID levels (mild, moderate, severe, and profound) and six comorbidities of ID (ID only, ID caused by genetic disorders, ID with physical disability, ID with multiple disabilities without physical disabilities, ID with autism spectrum disorders, and others with rare diseases).

**Results:** The sample represented 34.8% of students with ID attending public special education schools in Taiwan. Within this sample, 35.2% were identified as being overweight or obese. The 16 to 18 year-old age group were approximately two times (AOR = 2.02, more likely to be obese than the 7–12 year-old group. Students with ID caused by genetic disorders such as Down syndrome (AOR = 2.00) appeared to be more overweight or obese in comparison to those with ID only. Students with moderate (AOR = 1.64) and severe ID (AOR = 1.49) were more overweight/obese compared to those with profound ID.

**Conclusion:** The findings not only highlight the high prevalence of overweight/obesity but also stress the need for health promotion initiatives to address issues of overweight/obesity within this population.

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## 1. Introduction

The threat of overweight and obesity has spread around the world (World Health Organization [WHO], 2011). Concerns on the high prevalence of childhood obesity in the public health have been highlighted in the past (e.g., Lobstein, Baur, & Uauy, 2004). Obesity is considered a “non-communicable disease” by WHO, and the epidemic disease is a high risk factor for a variety of chronic diseases such as cardiovascular diseases and Type II diabetes (WHO, 2000). In comparison with Asian

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countries, the United States has continually developed national health guidance through initiatives like Healthy People 2010 and Healthy People 2020 to monitor the epidemic of childhood obesity (e.g., Nutrition and Weight Status: Reduce the prevalence of children and adolescents aged 2 to 19 years who are considered obese (United States Department of Health and Human Services, Healthy People 2020, 2011). Compared to the Americas region (e.g., United States, Mexico, and Brazil), people in the South and East Asia regions (e.g., Taiwan, Philippines, Singapore) have lower body mass index (BMI; WHO, 2000). Despite such findings, the rapid rise of childhood obesity in Asia appears to be leading to metabolic syndromes at a younger age when compared to other regions such as the Americas (Yoon et al., 2006).

Individuals with intellectual disability (ID), including children and adolescents, have been reported to be more obese than the general population (Melville et al., 2008; Rimmer, Yamaki, Lowry, Wang, & Vogel, 2010; Slevin, Truesdale-Kennedy, McConkey, Livingstone, & Fleming, 2014; Stedman & Leland, 2010), live with other health conditions (e.g., high blood cholesterol; hypertension, depression, low self-esteem; Lin, Lin, & Lin, 2010a; Rimmer et al., 2010), and have poor living habits (e.g., dietary intake, medication use, physical inactivity; Bhaumik, Watson, Thorp, Tyrer, & McGrother, 2008; Maïano, 2011). In Asia, the health consequence of the children and adolescents tends to be exacerbated due to epidemic obesity (Yoon et al., 2006). Several researchers have stated that these patterns of obesity in children with ID are more likely to continue into adulthood (Maïano, 2011; Mikulovic et al., 2014; Stedman & Leland, 2010). This suggests that children with ID are a vulnerable population facing more daily challenges than their peers without ID, and the challenges may persist into adulthood.

Accordingly, the issue of preventing childhood obesity needs to be addressed in public health (Daniels, Jacobson, Mccrindle, Eckel, & Sanner, 2009; Stedman & Leland, 2010; Yoon et al., 2006). Several large-scale investigations on obesity issues in people with ID were made to report the epidemic results (e.g., Choi, Park, Ha, & Hwang, 2012; Foley, Lloyd, Vogl, & Temple, 2014). There is little specific and comprehensive guidance for obesity among children and adolescents with ID in Taiwan, as studies of health issues (e.g., obesity) have reported only on small samples (Lin, Yen, Li, & Wu, 2005; Lin, 2008). Thus, it is particularly critical for Taiwan to square up with the reality of obesity threat. The lack of large-scale epidemiological studies of childhood obesity in persons with ID may hamper preventive health initiatives and immediate recourse support (Jeevanandam, 2009).

In Taiwan, appropriate authorities face the dilemma that the lack of nationwide health databases for school-aged students with disabilities across age groups may hinder the creation of initiatives to launch meaningful public health services and education (Liao et al., 2013; Lin et al., 2005). Despite the School Physical Fitness Database (SPFD) developed by the Taiwan Ministry of Education (MOE) in 2006, the national database is more likely to focus on the physical fitness profiles of typically developed students. There is very limited literature published in Taiwan and other countries using a large sample size across age groups to report on the prevalence of overweight and obesity in children and adolescents with ID (Barnes, Howie, McDermott, & Mann, 2013; Bégarie, Maïano, Leconte, & Ninot, 2013; Lin et al., 2005; Lin et al., 2010a; Lin, 2008; Salaun & Berthouze-Aranda, 2011). For example, Lin et al. (2010a,b) recruited a study of 350 Taiwanese high-school aged students (all aged 16 to 18 years) with ID. Results indicated that 20% of the participants with mild to profound ID who were obese, were concentrated in three special education schools. The results resembled the findings in Lin's (2008) study on 239 participants (aged 15 to 20 years) of whom 21.7% were obese. Compared with the findings of Liao et al. (2013) measuring the BMI of general Taiwanese students by using nationally representative samples, the severity of obesity in Taiwanese adolescents with ID appears to be much worse than their peers without ID. While there is a strong hypothesis about the potential relationship between obesity and ID populations, more studies across various age groups with a representative sample need to be conducted to investigate the weight problem of children and adolescents with ID in Taiwan. Therefore, the purpose of this study was to investigate the prevalence and likelihood of overweight and obesity among children and adolescents with ID aged 7 to 18 years in Taiwan.

## 2. Method

### 2.1. Study design and sampling

The present investigation was a cross sectional study using secondary data analysis in children and adolescents aged 7 to 18 years with ID who were enrolled in public special education schools in Taiwan between September 2013 and June 2014. The diagnosis of ID and the classification of ID levels in Taiwan are typically identified by general psychological-evaluation teachers or physicians with two major criteria: (a) Wechsler IQ scores below 70 (mild,  $55 < ID < 69$ , moderate,  $40 < ID < 54$ , severe,  $25 < IQ < 39$ , and profound,  $IQ \leq 24$ ), and (b) substantial limitation of aspects of adaptive behaviors such as daily living skills, communication, social, emotional skills, and subject learning (MOE, 2013).

The Taiwan Special Education Transmit Net statistics (MOE, 2014), an initial existing database of enrollment in special education schools, contained an estimated 5561 students with ID. This proportion represented 18% of the total Taiwanese student population (i.e., elementary to high school level in special education schools or mainstream schools) and identified ID from all disability categories in the August 2013 academic year through July 2014 (MOE, 2014). In the study, the initial 2318 (41.7%) of 5561 students with ID were collectively retrieved from student health center records in the nation's 10 special education schools once agency approval letters were obtained. The refusal of participation by other schools was due to clerical limitations and time constraints.

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