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# Research in Developmental Disabilities



## The risk of metabolic syndrome among institutionalized adults with intellectual disabilities

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### ABSTRACT

People with metabolic syndrome (MS) are at increased risk of coronary heart disease and other health problems, such as diabetes and stroke. However, there is little previous information on the prevalence and determinants of MS among people with intellectual disabilities (IDs). The present study aimed to examine the prevalence of MS risk factors among institutionalized adults with IDs. We analyzed the annual health check data of 164 institutionalized adults with IDs whose age was  $\geq 20$  years in 2009. The measure of MS in the study was the presence of three or more of the following five components: central obesity, elevated blood pressure (BP), elevated fasting glucose (FG), elevated triglycerides (TG), and reduced high-density lipoprotein (HDL-C). The prevalence of MS was 11.6% in the study participants (8% in males and 17.2% in females), which is lower than that in the general population of Taiwan. In the logistic regression analysis of the occurrence of MS, we found that gender, TG and HDL-C were variables that could significantly predict MS after controlling for other potential factors. Adults with IDs who were female (OR = 38.354, 95% CI = 1.985–741.029) and who had higher TG levels (OR = 1.043, 95% CI = 1.008–1.079) and reduced HDL-C levels (OR = 0.696, 95% CI = 0.549–0.883) had a statistically higher risk of MS. This study was one of the first to provide information on the prevalence of MS and its risk factors among institutionalized adults with IDs. We suggest that further study should focus on the specifics of MS, such as incidence, age-specific risk factors and further prevention or treatment in people with ID.

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### 1. Introduction

Many studies have shown that persons with intellectual disabilities (IDs) are more likely than the rest of the population to have physical disabilities, mental health problems, hearing impairments, vision impairments and communication disorders (Lin, Yen, Li, & Wu, 2005; Lin, Loh, Choi, et al., 2007; Lin, Loh, Yen, et al., 2007; Ouellette-Kuntz et al., 2005; van Schroyen Lantman-De Valk, Metsemakers, Haveman, & Crebolder, 2000). Individuals with IDs are also more likely to have ill-health risk factors than the general population and to require more attention in health care systems (Hsu et al., 2009; Lin, Wu, & Lee, 2004;

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Lin, Lee, Loh, et al., 2009; Lin, Lin, Yen, Loh, & Chwo, 2009; Lin, Lin, Chen, et al., 2010; Lin, Lin, Lin, Chang, et al., 2010; Lin, Lin, Lin, Hsu, et al., 2010; Yen & Lin, 2010; Yen, Lin, Loh, Shi, & Shu, 2009). However, due to long-term neglect in the health care policy for persons with IDs, the quality of care available to them is low (Lin, Chwo, Yen, Wu, & Chu, 2004; Lin, Wu, & Yen, 2004).

Metabolic syndrome (MS) is a group of conditions that place people at risk for chronic diseases. The occurrence of MS is defined by the presence of three or more of the following abnormalities: abdominal obesity (waist circumference: men > 102 cm, women > 88 cm); serum triglycerides level of at least 150 mg/dL; high-density lipoprotein cholesterol level (men < 40 mg/dL, women < 50 mg/dL); blood pressure of  $\geq 130/85$  mmHg and fasting glucose  $\geq 110$  mg/dL (National Institutes of Health, 2002). Ford, Giles, and Dietz's (2002) estimation of the prevalence of the MS in a representative sample of US adults showed that MS is highly prevalent. The unadjusted and age-adjusted prevalence of metabolic syndrome was 21.8% and 23.7%, respectively. The prevalence increased from 6.7% among participants aged 20 through 29 years to 43.5% and 42.0% for participants aged 60–69 years and at least 70 years, respectively.

Sivakumar (2007) pointed out the relationship between metabolic syndrome and ID and recommended screening and management of metabolic syndrome in this population. However, there is little information to present the prevalence and determinants of MS among people with IDs in the previous studies. The present study aims to examine the prevalence and risk factors of MS among institutionalized adults with IDs.

## 2. Methods

We conducted a cross-sectional study in a Taiwanese private disability welfare institution that cared for people with IDs. We analyzed the 2009 annual health examination chart of adult people with IDs. The study population included all adults with an ID in the institution. Ethical approval for this research was obtained from the study institution.

The study sample included 164 adults with IDs, aged  $\geq 20$  years. The analyzed information included demographic characteristics (gender, age, disability type and level) and body mass index (BMI: kg/m<sup>2</sup>). MS was defined as the presence of three or more of the following five components: central obesity (waist circumference, WC:  $\geq 90$  cm in males,  $\geq 80$  cm in females), elevated blood pressure (BP; systolic BP  $\geq 130$  mmHg or diastolic BP  $\geq 85$  mmHg), elevated fasting glucose (FG;  $\geq 100$  mg/dL), elevated triglycerides (TG;  $\geq 150$  mg/dL), and reduced high-density lipoprotein ("good") cholesterol (HDL-C; <40 mg/dL in males, <50 mg/dL in females).

Data were analyzed with the statistical software SPSS 18.0. We used number, percentage, chi-square and independent *t*-test methods to analyze the sample's characteristics and their relationship with the components of MS. A multiple logistic regression method was used to evaluate the potential risk factors associated with the occurrence of MS.

## 3. Results

Table 1 presents the demographic characteristics of people with IDs by gender. One hundred participants were male, and 64 were female; their average age was 33 years. Of the study subjects, 92.7% had an ID only, and 7.3% were affected with multiple disabilities (ID accompanied by other disabilities). In our samples, 47% of people with an ID had a mild or moderate level of disability, and 53% had severe or profound disabilities. With regard to the BMI of the subjects, the results indicated that 42.1% of participants were overweight or obese.

Table 2 and Fig. 1 illustrate the distribution of MS characteristics in people with ID. Biochemical analyses showed that the elevated or abnormal rates of each component of MS were as follows (female vs. male): TG (12.5% vs. 18%), HDL-C (29.7 vs. 13%), FG (3.1 vs. 4%), BP (38.8% vs. 29.1%), and WC (59.4% vs. 21%). The elevated rates of HDL-C ( $p < 0.05$ ) and WC ( $p < 0.001$ ) differed significantly by gender among the study subjects.

Table 3 presents the prevalence of MS among people with ID. These cases of MS were defined by the presence of three or more of the five MS components. The results show that the prevalence of MS was 11.6% in the study

**Table 1**  
Demographic characteristics of people with ID by gender.

Characteristics	Male ( <i>n</i> = 100) <i>n</i> (%)	Female ( <i>n</i> = 64) <i>n</i> (%)	Total ( <i>n</i> = 164) <i>n</i> (%)
Age (mean $\pm$ SD)	33.2 $\pm$ 9.4	32.6 $\pm$ 8.5	33.0 $\pm$ 9.0
20–29	41 (41.0)	29 (45.3)	70 (42.7)
$\geq 30$	59 (59.0)	35 (54.7)	94 (57.3)
Disability type			
ID	91 (91.0)	61 (95.3)	152 (92.7)
ID + other	9 (9.0)	3 (4.7)	12 (7.3)
Disability level			
Mild or moderate	41 (41.0)	36 (56.3)	77 (47.0)
Severe or profound	59 (59.0)	28 (43.8)	87 (53.0)
BMI (mean $\pm$ SD) <sup>a</sup>	23.0 $\pm$ 4.7	25.6 $\pm$ 5.6	24.0 $\pm$ 5.2
<24	66 (66.0)	29 (45.3)	95 (57.9)
$\geq 24$	34 (34.0)	35 (54.7)	69 (42.1)

<sup>a</sup>  $p < 0.05$ .

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