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Comparison of obesity among Chinese and U.S. Special Olympic athletes with intellectual disabilities

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ABSTRACT

Background/objectives: Obesity is a health problem in China, but there are no reports on the obesity status of Chinese citizens with intellectual disabilities (ID). Research has shown that adults with ID have higher body mass index (BMI) than adults without ID, but this information is primarily based on populations residing in North American and European countries. The purpose of this study was to compare BMI and obesity status of Chinese and U.S. Special Olympic athletes with ID.

Subjects/methods: Height, weight, BMI and self-reported physical activity (SRPA) data from the Special Olympics 2006 U.S. National Games and 2007 Shanghai World Games databases were analyzed. Linear and logistic analyses were conducted for continuous data and dichotomous variables, respectively. Predictor variables were age, gender, country, SRPA, and obesity status according to country specific criteria. Significance was set at $p < 0.05$.

Results: The U.S. group had significantly higher BMI values than their Chinese counterparts. Age ($p = 0.001$) and country ($p = <0.001$) were the main predictors of BMI and obesity status, even when country-specific standards of obesity classifications were used. Holding all other factors constant, each unit increase of age was associated with increased odds for obesity by a factor of 1.04 and the odds of obesity occurring in U.S. athletes was 2.47 times greater than in Chinese athletes.

Conclusion: Obesity is an emerging health problem for Chinese adults with ID. Participation in Special Olympics does not offset obesity in people with ID and other methods of intervention are needed to address obesity in this population segment. This is a global health concern that requires immediate attention.

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1. Introduction

There exist no data on obesity rates in Chinese adults with intellectual disabilities (ID) despite the fact that obesity is a global health problem that also impacts China (Bouchard & Katzmarzyk, 2010; Wang et al., 2012). The majority of evidence indicates that individuals with ID are more overweight than their counterparts without ID (Melville et al., 2008; Rimmer & Yamaki, 2006; Stancliffe et al., 2011), but this knowledge is based mostly on western samples from North America and Europe (Bhaumik, Watson, & Thorp, 2008; Emerson, 2005; Frey & Temple, 2008). To date, there are only five papers on the topic of obesity and ID in East Asian countries/territories, specifically Korea (Choi, Park, Ha, & Hwang, 2012), Japan (Ito, 2006), Hong Kong (Frey & Chow, 2006), Taiwan (Lin, Yen, Li, & Wu, 2005), and the "East Asia" region (Temple, Foley, & Lloyd, 2014). Three of the papers focused on children and adolescents with ID and found high rates of obesity (Choi et al., 2012; Frey & Chow, 2006; Lin et al., 2005). Ito (2006) found a higher prevalence of obesity among older women with ID living in community settings in Japan. Temple et al. (2014) examined body mass index (BMI) in adult Special Olympic athletes and found higher obesity prevalence rates among females and North American participants, but no cross-country comparisons were made. To date, there exist no published reports on the obesity status of adults with ID in China and it is of interest to assess if obesity is a health concern in the world's largest population of people with ID (1% of approximately 1.2 billion people (Maulik, Mascarenhas, Mathers, Dua, & Saxena, 2011).

Special Olympics International is currently the largest health service provider to people with ID in the world and presents an opportune mechanism to assess health data on this population segment (Special Olympics, 2005). Special Olympics International currently serves over 4 million people with ID in over 180 countries (Special Olympics, 2011) by organizing recreational and competitive sports programs. Special Olympics China was established in 1985 and has grown over 20-fold to approximately 760,000 athletes in 2011 (Harada, Parker, & Siperstein, 2008), surpassing the number of U.S. athletes by 200,000. (Siperstein, Harada, Parker, Hardman, & McGuire, 2008; Special Olympics, 2011). In 1997 Special Olympics International implemented the "Healthy Athletes" free health screening program and data collected from these screenings have resulted in a large health database that includes BMI as a measure of obesity. Three studies have utilized this database to examine BMI in Special Olympic athletes with ID across different countries (Harris, Rosenberg, Jangda, O'Brien, & Gallagher, 2003; Lloyd, Temple, & Foley, 2012; Temple et al., 2014), however, none reported BMI in Chinese adult athletes as a separate group. China was included as part of the East Asia (Temple et al., 2014) and non-U.S. (Harris et al., 2003) regions, but cultural norms and service provisions to adults with ID vary across countries (Jeevanandam, 2009; Kwok, Cui, & Li, 2011). In addition, neither study utilized country-specific obesity standards recommended by the World Health Organization to assess obesity rates (W.H.O. Expert Consultation, 2004). As a result, there exists no information specifically on obesity in Chinese Special Olympians with ID.

The purpose of this study was twofold. First, to report BMI and obesity status in Chinese and U.S. Special Olympics International athletes using country-specific obesity standards. Obesity rates are reportedly higher among adult North American compared to East Asian Special Olympic athletes (Lloyd et al., 2012; Temple et al., 2014), but since country-specific obesity standards were not used, these findings are suspect and further study is warranted using country-specific obesity standards. Second, to examine country, age, gender and self-reported physical activity as predictors of BMI and obesity in Chinese Special Olympic athletes as these have been reported as BMI and obesity determinants in adults with ID from other countries (Hsieh, Rimmer, & Heller, 2014; Temple et al., 2014).

2. Methods

2.1. Subjects

The Indiana University Institutional Review Board and Special Olympics approved all procedures. The Special Olympics Healthy Athletes office provided access to de-identified data from Chinese and U.S. athletes who competed in the Special Olympics 2007 World Summer Games in Shanghai. After data cleaning, it was found that the number of U.S. athlete data sets was insufficient for analysis, thus U.S. athlete data from the 2006 U.S. National Games were used for analysis.

Special Olympics eligibility requires either a diagnosed intellectual disability, cognitive delay or a closely related developmental disability (SpecialOlympics.org, 2004, 2006). The age range for participation is 8 years and older. To qualify for the World Games, which are held every four years, an athlete must have placed first, second, or third at the annual National Games within the four-year period. To advance to the annual National Games, an athlete must have trained in a formal program for a particular sport and placed first, second, or third in the same sport at all levels (i.e. local, area, sectional, and state competitions) prior to competing at the national level (Winnick, 2005).

2.2. Data collection

All data were collected onsite at the aforementioned games using Special Olympics Healthy Athletes materials in participant native language (Chinese or English). Healthy Athletes is a health screening and education program that is available at most Special Olympics International competitions. It offers health screening in seven areas: vision, hearing, oral health, healthy lifestyles, general fitness, podiatry, and sports physicals. Healthy Athletes also provides items such as eyewear, hearing aids, and mouth guards free of charge to athletes in more than 100 countries (Special Olympics, 2005).