Comparison of Body Mass Index and Physical Activity between Adult Chinese and U.S. Special Olympic Athletes

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HIGHLIGHTS

Our secondary data analyses show:

- Similar physical activity behavior among adult Special Olympic (SO) athletes from China and the United States, but
- Significantly higher obesity rates (as indicated by Body Mass Index) among athletes from the U.S. despite controlling for age, gender, and physical activity.
- This suggests that there might exist other major factors that contribute to obesity among adults with ID. Further investigations are warranted.

BACKGROUND

Latest estimates show between 7 and 8 million Americans have intellectual disability (ID) (AIDD, 2012). Previous research has shown that adults with ID are more obese and less active than their counterparts without ID (Stancliffe et al., 2011). However, a gap exists in the literature between the current knowledge, which is heavily based on populations living in North American and European countries, and a better understanding of people with ID residing in other countries. For instance, China has the largest population in the world, but very little is known about Chinese citizens with ID.

Obesity is an emerging as a major health concern in many developing countries, and China is no exception. The obesity rates has been rising among Chinese adults, yet nobody has looked at the prevalence of obesity among people with ID.

Physical activity has been recognized by many countries to be the main strategy to tackle obesity. However, it is unclear if the impact and effectiveness is universal.

The largest service provider to people with ID in the world –Special Olympics, provides an opportunity to investigate these issues with their Healthy Athletes screening program data. China and the U.S. are the biggest groups in our dataset (over 1,200 cases combined). These two chosen countries perfectly represent the developing countries that are improving disability awareness and support, and the developed countries with already-established awareness and knowledge base concerning disability.

METHODS

Special Olympic Athletes were being screened by health care professionals.
Photo by Adam Nurkiewicz. Specialolympics.org

All data were previously collected by volunteering health professionals through the Special Olympics Healthy Athletes screenings during the 2006 USA National Games and 2007 Shanghai World Games. Records in two areas were examined: FUNfitness (physical activity), and Health Promotion (better health and well-being). We are mainly interested in two variables:

1. **Body Mass Index (BMI)**: a commonly used simple index of weight-for-height classifying overweight and obesity. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m2).
2. **Self-Reported Physical Activity (SRPA)**: The question asked was: "ON AVERAGE, how many days a week do you do some physical activity"? The choices are "3-7 days a week" and "1-2 days a week". The answer "no regular activity program" can also be made.

The initial data received from Special Olympics contain:

- 621 cases from the U.S.
- 600 cases from China

After data cleaning:

- 44 athletes were excluded because they did not participate in one of the 21 competitive events;
- 361 were excluded for being under or over the age limits; and
- another 551 were excluded due to completely missing at least one of the screenings.

The final sample contains a total of 501 cases (220 from the U.S. and 281 from China).

RESULTS

- The Chinese group (n=220) consisted of 129 males and 91 females, making up 43.9% of the total sample.
- The gender compositions were not significantly different.
- The Chinese group (mean age 21.5 ± 5.2 years) was significantly younger on average and had less variance within the group compared to the US group (mean age 28.5 ± 8.0 years).
- The Chinese group had an age distribution that is skewed toward being younger, with the youngest group (18-24 years) having more participants than all of the other groups combined, whereas the US group was more evenly distributed across age categories.
- More than ninety percent of participants from both countries were in the age range of 18 to 39 years.

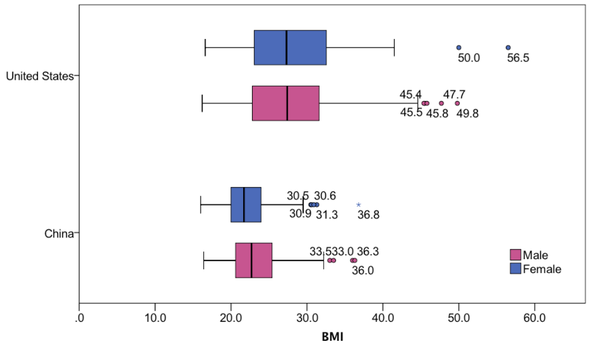

Figure 1. Boxplot: BMI by Country and Gender (Pink = Female)

- The mean raw BMIs of participants from the two groups were significantly different (mean BMI 23.0 vs. 28.1).
- The Chinese group had less in-group variance than the US group (4.0 vs. 6.9, SD)
- The majority of participants from both groups are physically active according to their self-report (77.3% vs. 69.3%, exercise 3 or more days a week).

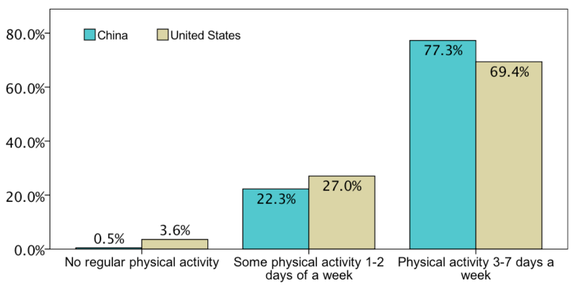

Figure 2. Self Reported Physical Activity By Country

Outcome variable= Obesity (0 or 1)			
Predictor variables	**Odds ratios**	**p value**	**95% CI[c]**
Age	1.04	.006	(1.011,1.068)
Gender (Male =0, Female =1)	1.35	.163	(.886, 2.047)
Country (China=0, U.S.=1)	2.47	<.001	(1.517, 4.052)
Physical activity			
No leisure time physical activity=0	Ref		
Some physical activity =1	.568	.328	(.154, 1.869)
Regular physical activity=2	.537	.389	(.157, 2.055)

Model Chi-square = 40.44, p<.001
[c] CI: Confidence Interval (Lower bound, upper bound).

Table: Linear Regression Results

In the regression model:

- Age is a significant predictor of BMI (P<.01).
- Gender (female) and self-reported physical activity were not significantly different.
- Country is a significant predictor (p<.001). The odds of being obese is 2.47 times greater among U.S. Special Olympic Athletes compared with their Chinese counterparts.

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