

# 論文要旨

論文題目 Associations of physical characteristics with socioeconomic status and lifestyles among migrant peasant workers' children in China

## 1. Introduction

### 1.1 Background

Rapid urbanization in China has made it extremely obvious that there is a shortage of labor in southeast coastal cities. Since the economic reform and Opening-Up Policy (1978) in China, the spare labor force has been transferring from rural areas to cities, and the population of laborers has consistently increased. The term “migrant peasant worker” (MPW) refers to those who migrate from rural areas to urban areas seeking employment opportunities. Most MPWs' children accompany their parents to the cities. In China, the government has classified every Chinese citizen as either “rural register” or “urban register” as a means of categorizing household registration. This system is known as “Hukou”. Citizens registered under the urban Hukou enjoy access to state subsidies such as food allowance, lifetime employment, medical insurance, housing, social security and pensions. Those registered under the rural Hukou are not entitled to these state subsidies. MPWs have no access to services from local governments because of their rural Hukou status, and their children are unable to attend state schools in cities. Hence, the MPWs' children are at a higher risk of suffering from poor health than children registered under the urban Hukou. In contrast, since the migration from rural area to urban area has increased the MPWs' family income, parents are in a better position to provide for their children. Their increased income enables more MPWs to purchase medical insurance for their children, which ensures adequate medical care. From this aspect, migration has a favorable impact on their children's health (Hu XP, 2004; Hu X et al., 2008).

### 1.2 Previous studies on growth of MPWs' children

A few studies have reported the growth status of MPWs' children. Zhang ZS (2005) reported that MPWs' children are more likely to be under weight, and have anemia and dental caries than children of citizens in Shanghai. Yin XJ (2010) showed that MPWs' children weighed less than children of citizens in Shanghai. Li H (2011) reported that the growth and development parameters (height, body weight, chest circumference, vital capacity, BMI) of MPWs' children were much lower than those of urban children. There are many studies on the health problems of immigrant children in other countries. Immigrant children with low socioeconomic status (Bogin B et al., 2002; Hernandez DJ, 2004) and limited access to health care (Yu SM et al., 2004; Ortega A et al., 2007) are at higher risk of having poor health than native-born children. Immigrant children have also been identified as having an array of poor health issues, including growth retardation (Geltman PL et al., 2001; Huang ZJ et al., 2006), obesity and mental health problems (Mirza NM et al., 2004; Will B., et al., 2005). Some studies have shown that internal migrant children were stunted and underweight due to their unhealthy lifestyles (Slesinger DP et al., 1986; Glew RH et al., 2003).

### 1.3 Relationships between growth and socioeconomic status and lifestyles behaviors in MPWs' children

Yan Z (2010) showed that, after adjusting for family income, the curves of four physical indices of height, weight, BMI and chest circumference for either boys or girls were higher for MPWs' children than those for children still living in the rural areas from where the MPWs' children had migrated. This study also reported that the differences in

the rates of being overweight in the two groups regardless of age and sex were highly significant, except for female children 7–9 years old. Moreover, comparing children of similar age and sex, the prevalence rates of obesity, dental caries and poor vision in MPWs' children were significantly higher than in rural children.

#### **1.4 Study aims**

Previous studies have reported that physical indices of height and weight for MPWs' children were lower than children who have “urban Hukou”. There is only one paper that compares the physiques between MPWs' and rural children, and there is no evidence for association between physiques and socioeconomic factors in MPWs' children. Furthermore, there is no studies that simultaneously compare physiques among MPWs', rural and urban children. The purpose of the present study was to examine associations of physical characteristics with socioeconomic status and lifestyles by comparing rural and urban children among MPWs' children in China.

## **2. Methods**

### **2.1 Study design**

A cross-sectional survey of children 7–12 years old was adopted, the study design was approved by the Ethics Committee of the Graduate School of Health and Sport Sciences at Chukyo University.

#### **2.1.1 Study areas**

The study areas were located in Shanghai city and Wuhu city in Anhui province, China.

#### **2.1.2 Study population**

Subjects for the analysis included 748 children in rural residents, 914 in MPWs and 795 in citizens in Shanghai City.

### **2.2 Body measurements**

The physical characteristics measured in this study were height, weight, sitting height and body fat percentage.

### **2.3 Questionnaire investigation**

We designed the questionnaire based on the Chinese National Nutrition and Health Survey, and National Health Interview Survey in the USA. The questionnaire included questions concerning the occupation of the child's parents, the level of parental education, the guardian's cognition of health, the child's living environment and family status, the child's learning and living condition, the child's health status, the child's diet and the child's food intake frequency.

### **2.4 Statistical analyses**

#### **2.4.1 Associations between physiques and socioeconomic factors among the three groups**

We examined the differences in physiques among the three groups by ANOVA. The dependent variables included height, weight, sitting height and body fat percentage. Then ANCOVA was applied to analyze the associations between children's physiques and socioeconomic factors by taking height, weight, sitting height and body fat percentage as dependent variables, socioeconomic factors (parental occupation, parental education, family monthly income) as independent variables and age as a covariant. Finally, ANCOVA was used to assess differences in physiques among the three groups by adjusting for socioeconomic factors (parental occupation, parental education, family monthly income). The analyses were conducted by taking physiques as a dependent variable, the group and socioeconomic factors as independent variables, and age as a covariant.

#### **2.4.2 Associations between physiques and socioeconomic status and lifestyles in MPWs' children**

Firstly, we derived sex- and age- specific physical indices (height, weight, BMI) cut-offs for 7- to 12-year-old

MPWs' children with 914 subjects, using the less than 15th percentiles and greater than 85th percentiles to define poor growth ( $<P_{15}$ ) and good growth ( $P_{85}<$ ), respectively, and others to define normal growth ( $P_{15}$ – $P_{85}$ ). Secondly, the chi-square test was used to examine the differences in the proportion of socioeconomic and lifestyle behavior factors among the categorized indices (height, weight, BMI). Finally, simple logistic regression analyses were applied to analyze socioeconomic and lifestyle behavior factors associated with growth status among MPWs' children.

### **3. Results**

#### **3.1 General characteristics of subjects**

For parental occupation, a high proportion of parents of children in rural residents were agriculture and water conservancy laborer, with 31% for fathers and 38% for mothers. In MPWs, 56% of fathers were production of transport equipment operator and 47% of mothers were unemployed. In citizens in Shanghai City, there was a high percentage of production of transport equipment operator, with 23% for fathers. Twenty-nine percent of mothers in citizens in Shanghai City were employed in business service. Regarding parental education, more than half of the fathers and mothers in rural residents had a primary school education level or lower (51% for fathers, 52% for mothers). A high proportion of those in MPWs had a primary school education level or lower (45% for fathers, 42% for mothers). A high proportion of those in citizens in Shanghai City had an education level of senior high school (39% for fathers) or junior high school (35% for mothers). The education level was high in ascending order of group 1, group 2 and group 3 for both fathers and mothers. The father's education level was higher than the mother's level in all groups. Family monthly income was high in ascending order of rural residents, MPWs and citizens in Shanghai City. Among the three groups, family monthly income (yuan) ranged from 1001 to 2000 for a high proportion in rural residents (26%) and in MPWs (22%), and ranged from 5001 to 6000 for 14% in citizens in Shanghai City.

#### **3.2 Comparisons of physiques among rural children, MPWs' children and urban children**

There were significant differences in all physical indices, regardless of sex ( $p < 0.001$ ). For boys and girls, both height and sitting height were lower for MPWs' children than for urban children, except for 7-year-old boys and 12-year-old girls. MPWs' children weighed less than urban children, and had a lower body fat percentage than urban children, except for 7-year-old boys and 7- to 9-year-old girls. For all age groups, regardless of sex, MPWs' children had bigger physiques than rural children.

#### **3.3 Relationships between physiques and socioeconomic factors**

For both boys and girls, all indices displayed statistically significant associations with parental occupations ( $p < 0.001$ ). Among the fathers' occupations, both boys and girls whose fathers were agriculture and water conservancy labors and unemployed had relatively small physiques, and those whose fathers were office clerk personnel, professional and production of transport equipment operator had big physiques. For the mothers' occupations, boys whose mothers were agriculture and water conservancy labors had relatively small physiques. Similarly, girls whose mothers were agriculture and water conservancy labors had relatively small physiques, while those whose mothers were office clerk personnel, professional, business service and production of transport equipment operator had big physiques. Regarding parental education, there were strong associations between parental education and all physical indices ( $p < 0.001$ ). Boys and girls whose fathers had higher education levels were bigger than those whose fathers had lower education level. The results with regard to mothers' education level were similar. Similarly, family monthly income was significantly associated with children's physiques ( $p < 0.001$ ). For both sexes, a higher family monthly income was associated with bigger physiques of children in all indices.

### **3.4 Comparisons of physiques adjusted by socioeconomic factors among rural children, MPWs' children and urban children**

There were strong associations between physiques and group in all indices for both boys and girls ( $p < 0.001$ ), but physiques hardly had any associations with socioeconomic factors. After adjusting for socioeconomic factors, the sizes of physiques were big in descending order of citizens in Shanghai City, MPWs and rural residents.

### **3.5 Relationships between physiques and socioeconomic status and lifestyles in MPWs' children**

Children with a smaller physique were more likely to be from families with lower monthly income and lower parental education, and have fathers that were unemployed. Conversely, subjects with a bigger physique were more likely to have mothers that were unemployed, and were less likely to have lived in Shanghai <60 months, watch TV, play video games or use computers  $\geq 3$ h/day, not have their own bedroom, be a picky eaters and have an unemployed father. Socioeconomic status and lifestyle behaviors in Shanghai City may associate with both poor and good growth status in MPWs' children.

## **4. Discussion**

Firstly, we explain why MPWs' children had smaller physiques than children of citizens living in Shanghai City, but bigger physiques than rural children. In this study, we examined parental occupation, parental education level and family monthly income as the socioeconomic factors by taking into account. Parents with occupations involving non-manual labor can provide their children an array of services, and goods such as proper clothing, housing and food, which are beneficial to children, because non-manual work have higher wages than manual work. Many children of parents with occupations involving manual labor lack access to those same resources and benefits, thus putting them at risk for being underweight (Rona RJ et al., 1991; Halldorsson M et al., 2000). In our data, occupations such as office clerk personnel and professional are regarded as occupations involving non-manual labor, and they had a tendency to offer a high wage. With respect to education, the education level of a parent has a definite association with children's physiques; that is, children in families with higher parental education level have a tendency towards bigger physiques. Many studies have shown that parental education has a profound influence on a child's physical growth (Bornstein MH et al., 2003; Parke RD et al., 2004). In the present study, the education level was high in ascending order of rural residents, MPWs and citizens in Shanghai City for both fathers and mothers, and children's physiques correlated with their parent's education level. As for family monthly income, family income influences the ability to purchase healthy items that affect a child's growth. A poor family is much more likely to buy a large amount of cheap, unhealthy food to feed their family, rather than a small amount of nutritious food that will leave them hungry. This inadequate dietary habit stunts a child's growth. Furthermore, many poor families cannot purchase necessary health care services (Dittus KL et al., 1995; Casey PH et al., 2001). Family monthly income was high in ascending order of rural residents, MPWs and citizens in Shanghai City. Therefore, similar mechanisms from previous reports are assumed to be at work in the research populations of the present study. The education level was high in ascending order of rural residents, MPWs and citizens in Shanghai City for both fathers and mothers. Family monthly income was high in ascending order of rural residents, MPWs and citizens in Shanghai City. Moreover, the occupations with high wages were high in ascending order of rural residents, MPWs and citizens in Shanghai City. In contrast, the occupations with low wages were low in descending order of rural residents, MPWs and citizens in Shanghai City. These results mean that the factor of group has the same tendency as the three socioeconomic factors. This is the main reason why there were strong associations between physiques and group, but there are hardly any

associations between physiques and socioeconomic factors in the ANCOVA.

Secondly, we discussed the association between physiques and socioeconomic and lifestyle behavior factors in MPWs' children. Many studies have shown that immigrants are likely to have an earlier onset of puberty, improved physical status and a lower prevalence of stunting (Yu SM et al., 2004, Garnier NT et al., 2003). Since the migration from rural area to urban area has increased MPWs' family income, migration has a favorable impact on their children's health (Hu XP et al., 2004). They are in a better position to provide for their children. Their increased income enables more MPWs to purchase medical insurance for their children, which ensures adequate medical care. From this aspect, living in Shanghai <60 months was a risk factor for poor growth status among MPWs' children. Several studies have shown an association between a child's growth and family income (Duan CR et al., 2005; Mcloyd V, 1998). Similarly, family income influences the ability to purchase healthy food and, adequate living space, which affects a child's growth. A poor family is much more likely to have poor dietary habits, which can stunt a child's growth (Dittus KL et al., 1995; Casey PH et al., 2001). Furthermore, many poor families cannot afford necessary health care services (Btsflry RH et al., 1992; Dubay L et al., 2001). A substantial amount of evidence exists regarding the link between the amount of time spent watching TV, playing video games or using computers and growth retardation, likely because children who spend a lot of time watching TV, playing video games or using computers do not get sufficient exercise. Physical activity is beneficial to the growth of human bones and muscles. It strengthens the heart and lungs, and improves the circulatory, respiratory and digestive systems, which is conducive to the growth and development of the human body, and improves disease resistance (Waldman M et al., 2012; Wickrama KS et al., 1997).

## **5. Conclusion**

1. MPWs' children had smaller physiques than children of citizens in Shanghai City, and bigger physiques than children of rural residents. There are strong associations between physiques and socioeconomic factors. Among the fathers' occupations, both boys and girls whose fathers were agriculture and water conservancy laborers and unemployed had relatively small physiques, and those whose fathers were office clerk personnel, professional and production of transport equipment operators had big physiques. For the mothers' occupations, boys whose mothers were agriculture and water conservancy laborers had relatively small physiques. Similarly, girls whose mothers were agriculture and water conservancy laborers had relatively small physiques, while those whose mothers were office clerk personnel, professional, business service and production of transport equipment operators had big physiques. Conversely, children whose parents had a higher education had relatively big physiques. Children of families with higher monthly income had bigger physiques in all indices. Whereas, when both socioeconomic factors and group were taken as independent variables, for both sexes, there were strong associations between physiques and group in all indices, and there were hardly any associations between physiques and socioeconomic factors.

2. Among MPWs' children, subjects with smaller physiques were more likely to be from families with a lower monthly income, have an unemployed father and have parents with lower education level. Conversely, subjects with a bigger physiques were more likely to have an unemployed mothers, and were less likely to have lived in Shanghai City <60 months, watch TV, play video games or use computers≥3h/day, not have their own bedroom, be picky eaters and have an unemployed father. Socioeconomic status and lifestyle behaviors in Shanghai City may be associated with both poor and good growth status in MPWs' children.