

# Comparisons and Countermeasures of Physical Status among 40-49 Different Groups in Weifang

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## Abstract

In order to properly evaluate physical health status of adults in Weifang city, shape, physique, physical function and physical quality indicators of adults and the differences between urban people and rural people were probed by means of random sampling, measurement and comparative analysis. The results show that: urban non-manual adults were higher and heavier than urban manual ones and rural ones, while urban manual adults were higher and heavier than rural ones; urban manual adults had higher lung capacity and rest pulse rate than urban non-manual ones and rural ones; urban manual male adults had greater grip strength than urban non-manual ones and rural ones, while rural female adults had greater grip strength than urban manual and non-manual female ones; seated forward bends of urban non-manual adults were better than urban manual ones and rural ones. In general, there are not significant differences between physical quality of rural adults and urban ones.

**Keywords:** adult, physique, physical function, physical quality.

## 1. Introduction

In order to enrich and improve Chinese physique monitoring system and database, to learn the status and change of Chinese physique, to provide scientific basis for the national fitness program, according to "Sports Law of People's Republic of China", "National Program of Action for Fitness in China" and the "National Physical Fitness Monitoring Provisions", the 2nd national physical fitness monitoring was decided to carry out in 2005. Fitness was the basis of the overall quality of workers. The physical quality of the people was related to the socialist modernization, so studying the physical condition of the people of Weifang was important practical significant for national program of action for fitness.

To learn about the characteristics and conditions of adults' physical quality in Weifang city, in 2005, the city sports bureau organized and launched a large-scale monitoring of the adult physical quality. Reliable data were obtained; based on those data, the results were analyzed and compared; recommendations were given for the existing problems, what provided scientific basis for adults' fitness

program, and serviced economic construction and social development.

## 2. Research Object and Methods

### 2.1 Research Object

Adults aged 40-49 in Weifang city were randomly selected for the study, every 5 years span was divided into an age group. 1,230 adults were measured, while the effective samples were 1200, which included 600 male and 600 female. For convenience, we assumed that the symbol A denoted urban non-manual adults, the symbol B denoted urban manual adults and the symbol C denoted rural adults.

### 2.2 Research Methods

Based on "national physical quality monitoring data entry card in 2005", the adults' physique, physical function and physical quality were monitored. We have used two physique indexes height (cm) and weight (kg), two physical function indexes lung capacity (ml) and rest pulse rate (times), two physical quality indexes grip strength (kg) and sit and reach (cm) to analyze and to compare the different of each groups' physical quality.

Literature data, questionnaire, the actual measurement and other methods were used. SPSS11.0 for Windows statistical package was used to process data.

## 3. Results

Test results of adults aged 40-49 in different groups and different stages (Table 1-4)

Table 1 The comparison of male adults aged 40-44 in different groups of Weifang city

Index	A		B		C	
	X	SD	X	SD	X	SD
Height(cm)	171.	6.07	169.	5.94	168.	5.48

	6		6		9	
Weight(kg)	74.5	11.3 1	75.1	10.3 4	70.7	11.6 1
Lung Capacity(ml)	404 5	824	373 5	703	368 9	651
Rest Pulse Rate (times)	77.9	9.35	75.2	9.61	74.8	8.13
Grip strength (kg)	51.3	6.57	50.9	7.60	49.9	6.79
Seated forward bends (cm)	8.5	8.36	9.9	8.51	9.8	7.59

Index	t <sub>AB</sub>	t <sub>AC</sub>	t <sub>BC</sub>
Height(cm)	0.24	0.13	0.25
Weight(kg)	1.12	2.15*	2.13*
Lung Capacity(ml)	0.26	2.66**	2.20*
Rest Pulse Rate (times)	0.23	0.24	0.33
Grip strength (kg)	3.10*	0.26	0.27
Seated forward bends (cm)	3.09**	3.04**	0.24

\*p<0.05, \*\* p<0.01

Table 2 The comparison of male adults aged 45-49 in different groups of Weifang city

Index	A		B		C	
	X	SD	X	SD	X	SD
Height(cm)	170.8	5.91	170.1	5.42	167.7	4.74
Weight(kg)	74.9	10.97	71.1	10.34	69.1	11.11
Lung Capacity(ml)	3700	668	3568	605.7	3545	630
Rest Pulse Rate (times)	78.7	8.76	75.4	7.86	76.5	8.72
Grip strength (kg)	49.6	7.25	48.0	7.02	47.5	6.97
Seated forward bends (cm)	6.7	8.91	8.1	8.44	8.4	8.02

Index	t <sub>AB</sub>	t <sub>AC</sub>	t <sub>BC</sub>
Height(cm)	0.13	2.11*	2.02*
Weight(kg)	0.45	1.23*	2.12*
Lung Capacity(ml)	0.13	0.16	0.12

Rest Pulse Rate (times)	0.09	2.15*	2.13*
Grip strength (kg)	3.12*	3.43**	0.12
Seated forward bends (cm)	3.01*	3.11*	0.22

\*p<0.05, \*\* p<0.0

Table 3 The comparison of female adults aged 40-44 in different groups of Weifang city

Index	A		B		C	
	X	SD	X	SD	X	SD
Height(cm)	159.3	4.68	159.5	5.67	158.5	5.20
Weight(kg)	62.6	8.60	62.5	8.72	64.5	9.66
Lung Capacity(ml)	2895	402.1	2867	470.1	2694	441.2
Rest Pulse Rate (times)	75.7	7.33	76.1	8.59	74.9	7.54
Grip strength (kg)	31.2	4.59	31.2	5.12	31.8	6.33
Seated forward bends (cm)	11.9	5.81	10.6	7.76	12.6	6.90

Index	t <sub>AB</sub>	t <sub>AC</sub>	t <sub>BC</sub>
Height(cm)	1.21	1.26	2.23*
Weight(kg)	0.12	0.25	0.35
Lung Capacity(ml)	0.12	2.23*	0.39
Rest Pulse Rate (times)	0.23	2.45*	0.13
Grip strength (kg)	2.26*	0.34	0.11
Seated forward bends (cm)	0.67	0.27	2.34*

\*p<0.05, \*\* p<0.01

Table 4 The comparison of female adults aged 45-49 in different groups of Weifang city

Index	A		B		C	
	X	SD	X	SD	X	SD
Height(cm)	159.9	4.68	158.8	4.74	158.3	4.52
Weight(kg)	64.8	8.05	65.7	8.73	64.2	10.80
Lung Capacity(ml)	2806	533.1	2675	451	2589	453

Rest Pulse Rate (times)	75.7	7.85	74.8	9.06	74.7	9.08
Grip strength (kg)	30.6	4.44	29.8	4.69	30.4	6.01
Seated forward bends (cm)	10.9	7.36	11.9	7.67	10.7	6.15

Index	t <sub>AB</sub>	t <sub>AC</sub>	t <sub>BC</sub>
Height(cm)	0.23	0.33	0.25
Weight(kg)	2.13*	2.11*	3.23**
Lung Capacity(ml)	2.11	2.18*	0.34
Rest Pulse Rate (times)	0.23	2.26*	0.12
Grip strength (kg)	2.12*	2.16*	0.23
Seated forward bends (cm)	0.12	0.34	0.55

\*p<0.05 , \*\* p<0.01

## 4. Results and Discussion

### 4.1 Analysis and comparisons of adults' morphology in different groups in Weifang City

Height levels reflect the longitudinal growth of human bones which are influenced by age, environment, living standards, physical exercise and other factors.

It can be seen from Table 1 and 2 that different groups of men aged from 40 to 44 do not have significant differences. However, height levels of men in other age groups do have significant differences except the urban men and urban non-manual laborers. Tables 3 and 4 show that height levels of women aged 45-49 do have significant differences except height levels of the urban female laborers and farmers aged 40-44. This demonstrates that the nutritional status is good in the city. However, because urban non-manual laborers aged from 45 to 49 suffer relatively great pressure and their exercise time is relatively small. Height levels between them and farmers do not have significant difference.

The living conditions of urban manual workers are good, their pressure is small, and so they have higher heights when compared with farmers. Weight is an important indicator of changes which reflects the human skeleton, muscle, fat, the weight gain that muscle, in general cases

the growth of weight demonstrates muscle growth and improved nutritional status. It can be seen from Table 1 and 2 that in the two stages male adults in urban and urban non-manual laborers do not have significant differences, while each of them do have significant differences with farmers respectively. Table 3 and 4 show different groups of adult women aged 40-44 do not have significant differences. In the 45-49 periods significant differences can be found and urban laborers are heavier than both farmers and urban non-manual which indicates that women in the urban non-manual workers pay more attention to exercise, but the urban manual workers pay no attention. According to some materials, body weight of adults increases with the increases of fat weight components of muscle in a certain age, but up to a certain age, fat body weight is relatively stable or even decrease, and these increases of body weight are mainly the increases in fat.

The increase of body weight of adult female aged after 40 should be considered as the growth of fat. This situation may increase the risk of diabetes, heart disease and stroke and other diseases, so due attention should be paid to the phenomenon which the weight of adult females increases with increasing age.

### 4.2 Analysis of functional indexes between different groups adults in Weifang City

Vital capacity can reflect the size of the chest, lung elasticity and respiratory muscle strength and physical activity level. During the decline of the body's natural process of breathing both the respiratory function declines and the increases of diseases can be reflected by changes in vital capacity.

According to data analysis of Table 1 and 2 adult males in the 40-44 years old and urban non-manual laborers do not have significant differences, urban laborers and farmers have a significant difference and the urban non-manual workers and farmers have a very significant difference. All urban non-manual workers, urban laborers and farmers aged from 45-49 do not have a statistically significant difference. From the view of mean statics constitutions of both urban non-manual men and women are better than manual workers. These shows that manual labor is not a substitute for physical activity, manual labor can only exercise a part of the function which can not improve the full body, so continuous and comprehensive exercises should be adopted to improve physical condition.

The purpose of measuring the pulse is to understand the quiet resting heart rate which is one of the important

physiological indicators used for prevention and treatment of cardiovascular disease. Heart rate reflects the person's cardiovascular reserve and is also an important early performance in the common cardiovascular disease. From Table 1 to 4 it can be seen that 40 to 44 year-old males of different groups do not have significant difference; while in the 45-49 years old urban non-manual workers and urban laborers and farmers respectively have a significant difference.

In the two phases in this urban non-manual women and female farmers have significant differences and others have non-significant difference which demonstrates manual work influence health. From the view of mean values point urban workers' mean values were higher than those of farmers, but with the increase of age, the mean pulse of adult men and women decline due to the development of the cardiovascular system tend to stability and maturation. Along with the gradually reduce in the level of metabolism, basal metabolic rate begins to decline, the body's physiological function starts to decline from the peak, which results in the decreased resting pulse.

#### 4.3 Analysis of adults' physical indicators in different groups in Weifang City

Grip strength reflects the strength of forearm and hand muscles, data from Table 1 to 4 shows that both men and women of urban and urban non-manual laborers aged 40-44 years old have significant differences, the others have no significant difference. In the 45-49 year-old stage urban non-manual laborers have significant differences with urban laborers and a very significant difference with farmers, yet there are no significant differences between manual workers.

From the view of mean value, followed from high in the end are urban manual workers, farmers and urban non-manual workers which overall shows manual labor is conducive to the growth of upper body strength, but the upper body strength of farmers is weak due to the poor living conditions in rural areas. Sit and Reach reflect the torso, waist, hip and other parts of the joints, muscles, ligaments, flexibility and stretching targets, which have a close relationship people's daily life and movement.

Table 1-4 show that in the stage of male adults aged 40-44 urban non-manual laborers and farmers have very significant differences respectively, and urban non-manual workers have significant difference with farmers and urban laborers. Female adults in stage of 45-49 do not have significant difference, but in the phase of 40-44 urban laborers and farmers have a significant difference,

which indicates that urban women pay more attention to physical exercise and nutritional health than men.

## 5. Conclusions and Suggestions

### 5.1 Conclusions

(1) Targets based on the analysis of morphological, functional indicators and physical indicators it shows that physical conditions of urban people is better than farmers due to the differences of the social environment, living, productive labor, nutrition and physical activity between urban and rural areas.

(2) Both urban and rural areas of the body shape, physical function and physical aspects, there is a lack of physical exercise is not scientific and reasonable. Both the urban and rural people have defects in the body shape, physical function and physical aspects, which can be contributed to unscientific and unreasonable exercise.

### 5.2 Suggestions

Sub-health has caused close attention as a hot issue by the whole society now. The results above objectively reflect that middle-aged people among 40-49 years old should focus on disease prevention and fitness and positively control sub-health. According to the above results, recommendations for the existing differences between different groups in Weifang City are put forward:

- (1) Physical exercise should be determined by the results of physical and then scientific understand of your physical condition and carry out physical exercise. According to the relevant data scientific and reasonable activities can adjust the sub-health status, restoring health, cheer spirit. Therefore sub-health people need exercise prescription.
- (2) In the development of social economy and improving people's living standards publicity fitness guide should also be strengthened, the government should be organized and planned to carry out the National Fitness, and effectively improve the national physique.
- (3) The government should strengthen the construction of venues, provide protection for people's exercise, take great advantage of existing venues, and organize more high level competition to enrich the cultural life, put enhancing people's health first, and focus on social benefits.

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