



# The Relationship Between Physical Growth Indices and Maternal Employment in Children Aged 7 to 11 Years

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## Abstract

**Background:** It has been reported that differences in the level of education and employment status of the parents can affect the children's growth index.

**Objectives:** Given the importance of children's optimal growth rate on society's health and since parental employment can alter children's growth index, we decided to conduct a comparative study of the growth indices of children aged 7 to 11 years with working mothers and stay-at-home mothers.

**Methods:** A sample of 300 male students aged 7 to 11 years was selected using convenience sampling. The children's height, weight, and BMI were measured by a trained individual twice to reduce error. After collecting the required information from 300 students, data analysis was performed in SPSS 24 and Microsoft Excel using the analysis of independent t-test at the significance level of 0.05.

**Results:** Of the 300 students examined, 21.7% (n = 65) were 7 years old, 20.7% (n = 62) were 8 years old, 21% (n = 63) were 9 years old, 20% (n = 60) were 10 years old, and 16.7% (n = 50) were 11 years old. Moreover, 225 mothers stayed at home, and 75 worked. Based on the independent t-test to compare the BMI of the children whose mothers stayed at home and those whose mothers worked, a significant difference was observed only in children aged 7 years, whose BMI was lower in the working mothers' group (P = 0.02).

**Conclusions:** It seems that children who have stay-at-home mothers tend to have better growth than those whose mothers work at certain ages.

**Keywords:** Physical Growth Indices, Maternal Employment, Children

## 1. Background

Childhood is a critical period in human life because it encompasses major health events (1). Many diseases are rooted in childhood (2). Child mortality rates in a society indicate that society's health status is also associated with various factors, such as socioeconomic status, mothers' health, and access to health services (3). Anthropometric measurement services, including height and weight measurement, are among the most important sources of information for assessing children's physical growth and nutritional status (4). Recently, regular measurements of height, weight, head circumference, and body mass index (BMI) and their comparison with existing standards have become a common practice in healthcare systems and pediatric clinics (5, 6). This monitoring aims to discover the child's physical growth pattern and interpret it using existing growth charts to

identify inappropriate and pathological growth patterns early on and start prevention and treatment measures on time (7, 8). Still, the existing curves, which are based on the information gathered from children in developed Western countries, cannot be considered valid for all countries. Comparing the growth pattern of the local population with the growth pattern of children in Western countries is problematic because climatic, genetic, ethnic, economic, and cultural differences and diverse traditions and customs all affect people's growth (9,10). It has also been reported that differences in the level of education and employment status of the parents can affect the children's growth index (11). Some studies have reported the negative impact of maternal employment on children's health (12, 13). Given the importance of children's optimal growth rate on society's health and since parental employment can alter children's growth

index, we decided to conduct a comparative study of the growth indices of children aged 7 to 11 years with working mothers and stay-at-home.

## 2. Objectives

Given the importance of children's optimal growth rate on society's health and since parental employment can alter children's growth index, we decided to conduct a comparative study of the growth indices of children aged 7 to 11 years with working mothers and stay-at-home mothers.

## 3. Methods

This was a cross-sectional, descriptive-analytical, observational study conducted in the academic year 2019-2020 in the all-boys elementary schools of District 2 of Tehran, Iran. A sample of 300 male students aged 7 to 11 was selected using convenience sampling. A trained individual measured the children's height, weight, and BMI twice to reduce error, and the average of the measurements and their position in the percentile of weight and height were taken as the criteria for entering the child's information. To ensure the validity of the data, all the measurements were performed by one person using a scale and tape measure with confirmed measurement accuracy. All the information was immediately recorded on the checklists. All children who were interested in participating in the study were enrolled in that school and were present at their school on the day of data collection were included. Children who were not interested in participating in the study or who had lost 2-3 kg of weight due to acute illnesses during the recent months or those who performed sports professionally were excluded. Finally, based on the determined criteria, 22 students were excluded from the study, and 300 students remained to be examined. After collecting the required information from 300 students, data analysis was performed in SPSS 24 and Microsoft Excel using independent t-test analysis at the significance level of 0.05.

## 4. Results

Of the 300 students examined, 21.7% (n = 65) were 7 years old, 20.7% (n = 62) were 8 years old, 21% (n = 63) were 9 years old, 20% (n = 60) were 10 years old, and 16.7% (n = 50) were 11 years old. Moreover, 225 mothers stayed at home, and 75 worked.

Based on the independent t-test to compare the BMI of the children whose mothers stayed at home and

those whose mothers worked, a significant difference was observed only in children aged 7 years, whose BMI was lower in the working mothers' group ( $P = 0.02$ ) (Table 1).

## 5. Discussion

The literature shows that maternal employment may affect children's health through different mechanisms. Positive influential factors include the mother's income, health insurance, and self-esteem. Even so, the mother's employment may prevent her from supervising or participating in time-consuming health-promoting activities (13). Aurelius et al. (11) examined the height, weight, and BMI of school-aged 7-11-year-old children in Vietnam about parental education and employment. They found no significant relationship between the children's growth and maternal employment, except for girls whose mothers were manual laborers and farmers; these girls were shorter and thinner than children whose mothers had governmental employment. The prevalence of low birth weight was 11%, and this factor was also not related to the mother's occupation. In the present study, a significant difference was observed between the mother's employment status and a decrease in the child's mean height and weight only at the age of 7 years; however, at the age of 8-11 years, no significant difference was observed between the group with working mothers and the group with stay-at-home mothers. Meanwhile, the present study did not examine girls; therefore, its results cannot be compared with the findings of the study conducted in Vietnam. Taghva et al. (14) examined the height and weight of children aged 7-11 years in Shahrood, Iran, and compared the data with international standards. A sample of 2224 male and female students was examined in terms of height and weight. In boys, the mean height at 7 years of age was 119.32 cm, and the mean weight was 21.50 kg, which increased to 139.36 cm and 31.98 kg by the age of 11; compared to the data reported by the National Center for Health Statistics (NCHS), the mean height and weight in Taghavi's study were lower than the international standards. The boys' mean height and weight were higher in the present study than in Taghavi's study but lower than the NCHS standards, as consistent with the cited study. Shahraki et al. (15) reported different results in Tehran. They concluded that mothers' employment harms children's health - that is, maternal employment increases the probability of children's underweight due to malnutrition. Morril (13) noted that employment can prevent the mother from participating in or monitoring activities that promote the child's health and believed that maternal employment harms children's health.

**Table 1.** Mean Height, Weight, and BMI of Children Based on Their Mother's Employment Status <sup>a</sup>

Variables	Stay-at-Home Mothers	Working Mothers	P-Value
<b>7 years</b>			
Height	121.00 ± 2.07	121.7 ± 2.08	0.21
Weight	21.6 ± 1.79	20.5 ± 2.19	0.03 <sup>b</sup>
BMI	14.7 ± 1.37	13.1 ± 8.62	0.02 <sup>b</sup>
<b>8 years</b>			
Height	125.0 ± 2.06	125.2 ± 2.03	0.72
Weight	24.4 ± 2.03	24.9 ± 3.35	0.62
BMI	15.4 ± 1.29	15.7 ± 2.14	0.58
<b>9 years</b>			
Height	130.8 ± 2.44	129.2 ± 2.19	0.08
Weight	27.4 ± 2.32	27.2 ± 4.32	0.53
BMI	16.0 ± 1.50	16.7 ± 1.61	0.22
<b>10 years</b>			
Height	136.7 ± 2.6	136.2 ± 7.34	0.98
Weight	28.6 ± 2.31	29.2 ± 4.31	0.19
BMI	15.3 ± 1.11	15.7 ± 1.37	0.25

<sup>a</sup> Data are expressed as mean and analyzed by unpaired Student's *t*-test.

<sup>b</sup> Indicates *P* < 0.05.

It seems that children who have stay-at-home mothers tend to have better growth than those whose mothers work at certain ages. This could be attributed to the increased amount of time that stay-at-home mothers spend with their children. However, when it comes to children, the difference is less likely to be attributed to their increased ability to independently nourish themselves. Due to the vastness of this country and the existing cultural diversity, future studies should consider cultural differences and examine them as influential factors concerning this subject.

### 5.1. Conclusions

It seems that children who have stay-at-home mothers tend to have better growth than those whose mothers work at certain ages.

### Footnotes

**Authors' Contribution:** All authors have contributed equally in this manuscript.

**Conflict of Interests:** All authors declared that there is no conflict of interest.

**Data Reproducibility:** The dataset presented in the study is available on request from the corresponding author during submission or after publication.

**Ethical Approval:** This study was performed according to the principles of the Health Research Committee of the Shahroud University of Medical Sciences (IR.AJAUMS.REC.1398.266).

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