

# Child labour and its relationship to Body Mass Index (BMI), school attendance and academic marks

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## Abstract

To determine the relationship between work and the BMI, average attendance and marks obtained by school children in rural and urban areas of Pondicherry. A cross-sectional study was carried out in the schools situated in the service areas of Jawaharlal Institute Rural Health Center (JIRHC) and Jawaharlal Institute Urban Health Center (JIUHC) of JIPMER, Pondicherry. In all the classes studied, working children in the urban area scored slightly lower marks. In the urban area the average attendance at school among the working children was found to be slightly, but not significantly, lower compared to the non-working children. In rural areas compared to the non-working children, the average BMI of the working children was slightly lower in classes VIII and IX. The average BMI of the working children in the urban area was slightly lower in all the classes compared to the not working children.

Key words: Child labour, Body mass index, school attendance, Academic marks, Pondicherry

## Introduction

Child labour is broadly defined as any form of economic activity for at least 1 hour per week and / or domestic chores for at least 7 hours per week and / or school labour for at least 5 hours per week (ILO-SIMPOC, 2000). According to ILO estimates, in developing countries alone there are 250 million children in the age group of 5-17 years who were toiling in economic activity. Asia, excluding

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Japan has the most child workers approximately 61% of the world's total (ILO-SIMPOC 2000). One-half of these children combined work with the school or were engaged in non-economic activity (ILO 1999).

The prevalence and exploitation of child labourers in India ranges from the official estimate of 17 million to unofficial estimate of 44 million. India is becoming the leading contributor to this social evil (Kulshreshtha 1994).

The findings indicate that, although better early childhood nutrition leads to higher chances of attending school, it may also put the child at additional pressure to participate in family labor activities which may be reflected in poor performance in schooling (Solomon 2010).

It was strongly felt that children who work and attend school may have some disadvantage compared to school children who are not engaged in work. The present study compares the BMI, attendance at school and average marks scored by working and non-working children who attend school.

## Materials and methods

A cross sectional study was carried out in the schools situated in the service areas of Jawaharlal Institute Rural Health Center (JIRHC) and Jawaharlal Institute Urban Health Center (JIUHC) of JIPMER, Pondicherry.

### *Working definition of child labour*

For the purpose of the study, child labour was defined as any kind of work done by a school-going child for remuneration in cash or kind.

### *Participants*

759 school children from classes VI - X were selected from three schools in rural area and two schools from the urban area. The marks and the attendance of the working and the non-working children for the academic year were collected from the annual school records. The height and the weight taken for

that academic year (June 2003 - April 2004) was obtained from the record maintained for the nutritional program (Rajiv Gandhi Breakfast Scheme and the Mid-day Meal Program) or from the health record maintained in some schools. Body mass Index (BMI) was calculated by using Quetelet's formula i.e.

$$\text{BMI} = \text{Weight (kg)} / \text{Height}^2 \text{ (mts)} \text{ (Park 2009)}$$

**Statistical analysis:** Student t-test was done using Statistica Version -7.0 (Statsoft, USA).

## Results

The average marks obtained by working students were found to be slightly higher in class VI, IX and X compared to those not working. The average marks obtained by the working children in classes VII and VIII were less than those of the non-working children. In all the classes studied, working children in the urban area scored slightly but not significantly lower marks than those children who did not work.

Nivedita et al in Pondicherry, found that except in class VIII, the ratio of the below average students among the working students was only slightly higher than among the non-working students (Nivedita and Roy 2005). Work would also understandably make the child tired to be attentive and follow the lessons in the class. A study from Sri Lanka showed that working more than 12-15 hours per week had a negative impact on a child's learning (Lancaster and Ray 2004). In Guatemala it was found that among working children, 41% scored lower grades. Absenteeism was reported among 25.3% and tardiness in 26% of the children who worked (Marschatz 2004).

Except in class IX the average attendance of the working children was slightly higher than the rest of the classes when compared to non-working children. In all the classes studied, the average attendance among the working children was found to be slightly lower compared to the non-working children.

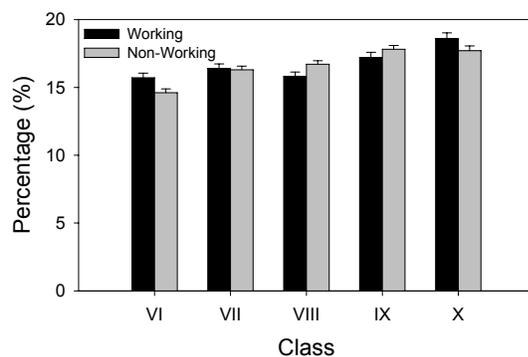


Figure 1: Average body mass index of the working and non-working children in rural area.

In spite, of the mid-day meal scheme and the Rajiv Gandhi Breakfast Scheme (provided up to class VIII), one of the aims of which is to attract students to school, working children tend to have a low attendance in school. (Rajiv Gandhi Breakfast scheme is implemented by Government of Pondicherry to provide breakfast consisting of 35gm of sweet biscuits and 150ml of standardized hot milk to every student. Many of the school children come to the school without taking any breakfast due to poverty there was a "felt need" to supply breakfast for students. It will be served when the school is starting and will mitigate the issuance of "An eager mind

with empty stomach" a scheme named "Shri Rajiv Gandhi Breakfast Scheme")

Nivethida et al in Pondicherry found that there was a drastic fall in the percentage of attendance among the working students in class IX. In other classes the average attendance was slightly more or same compared to the non-working students.

Working at a job may make it just that much more difficult for these children to have an attendance equal with the non-working children. While working does not appear to seriously hamper a child's attendance at school or the grades, it definitely imposes a strain on the little bodies and minds that could have lasting effects.

Figure 1 shows the average Body Mass Index (BMI) of the working and non-working children in rural area. In class VII, the average BMI was the same (16Kg/m<sup>2</sup>) for both the groups of children. Compared to the non-working children, the average BMI of the working children was slightly lower in classes VIII and IX. These differences were not statistically significant (p-value=0.8831 at 0.05 level of significance) when applied t-test (Statistica v7.0, Statsoft, USA). The standard deviation for working group is 1.199166 and for non-working group is 1.298846. Figure 2 shows the average BMI of the working and non-working children in urban area. The average BMI of the working children was slightly but not significantly lower in all the classes compared to the not working children. The standard deviation for working group is 0.0971082 and for non-working group is 1.088577. The p-value is 0.118697 at 0.05 level of significance.

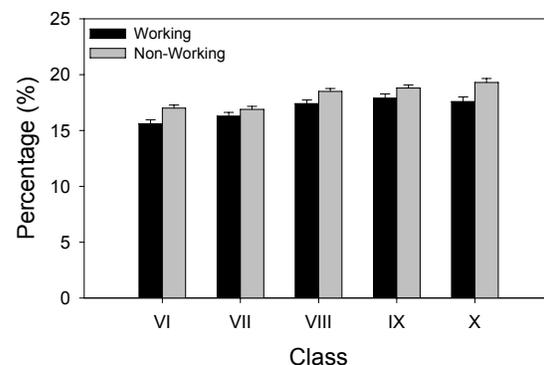


Figure 2: Average body mass index of the working and non-working children in urban area.

The relationship between work and the BMI of children is not very clear. Ambadekar et al (1996) found that the proportion of a BMI below the normal value was more among the working children (80.7%) than among the children who do not go to work (71%) in the age group of 8-15 years (Ambadekar et al 1996). On the other hand a case-control study done in Calcutta among the children who work in the leather workshop reported no difference in the height and weight between two groups of working and non-working children (Sampa 1993). In the present study, work does seem to be related to the nutritional status of the working children; this was obvious in higher classes where the children are not covered under the breakfast schemes and mid-day meal schemes. It should also be borne in mind that all the schools in the study area have implemented the Rajiv Gandhi Breakfast Scheme and the Mid-day Meal

Program. To what extent these nutritional programs for children is effective cannot be commented upon, but it is clear that despite going to work outside of school and the consequent rigors of a job children seem none the worse, at least physically.

### **Conclusion**

Overall working children scored lesser marks compared to non working children. The average attendance at school among the working children was found to be slightly lower compared to the non-working children. Similarly the average BMI of the working children was slightly but not significantly lower compared to the not working children. The benefits of the Rajiv Gandhi Breakfast Scheme and the Mid-Day Meal Scheme must continue in schools. It is also strongly felt that these schemes need not be restricted to the lower classes, as is the practice at present.

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