Inverse Association between Body Mass and Frequency of Milk Consumption in Children


OBJECTIVE
To evaluate the relationship between milk consumption and body mass in school children in Southern Italy.

STUDY DETAILS
– Cross-sectional study of 1087 children from 3 primary schools in Southern Italy
– Average age 7.7 years (range 3 to 11 years); body mass index (BMI) 19.01 kg/m² (range 11.1 to 36.7 kg/m²)
– The data from 884 children who consumed only whole milk (451 boys, 433 girls) were analyzed separately from the larger cohort (n=975), which included children who consumed skimmed milk
– A self-reported food-frequency questionnaire was used to evaluate the frequency of consumption of specific foods
– Food items were grouped into milk, dairy foods, fish, cereals (including pasta), meat, fruit, vegetables, sweet beverages and snacks
– Milk consumption was pooled into 4 frequency categories: poor (≤1/week); moderate (>1/week and ≤5 to 6/week); regular (1/day); high (≥2/day), and further divided into whole milk and skimmed milk
– The other food groups were pooled into 4 main categories (rare, moderate, frequent and high)
– Energy intake was not measured
– Exclusions: those whose data was incomplete, those following a specific dietary regimen for any reason, and those consuming only skimmed or partly skimmed milk, which was considered unusual in this population unless prescribed for medical reasons

KEY FINDING
The prevalence of overweight is significantly lower in children consuming whole milk daily than in those consuming milk less frequently.

The inverse association is independent of other variables such as age, birth weight, parental overweight, education of parents, physical activity and other dietary habits.

This association was no longer significant when children consuming skimmed milk were included in the analysis.

RESULTS
– In the whole milk only group, multiple regression analysis show that frequency of milk consumption was significantly and inversely associated with age- and sex-specific BMI z-scores after controlling for other variables such as age, birth weight, parental overweight, education of parents, physical activity and frequency of consumption of other foods (p=0.005)
– In the larger cohort, that included children consuming skimmed milk, the inverse association was no longer significant when other groups of food were included in the analysis
– Children consuming skimmed milk were older and heavier than those consuming whole milk. The lack of a significant association when including children consuming skimmed milk may be explained by overall changes in dietary habits in these children due to medical reasons
– Logistic regression analysis confirmed that the risk of overweight was twice as high in those who consumed ≤1 serving per week of whole milk (relative risk: 2.18 [95% CI: 1.30-3.66]). This association was no longer apparent in the larger cohort including children consuming skimmed milk
Barba et al. 2005

### Association between milk consumption and BMI z-scores

<table>
<thead>
<tr>
<th>Category of whole milk consumption</th>
<th>Number of servings</th>
<th>Prevalence of overweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>≤1 serving/week</td>
<td>60.5%</td>
</tr>
<tr>
<td>Moderate</td>
<td>More than 1 and ≤5 to 6 servings/week</td>
<td>51.2%</td>
</tr>
<tr>
<td>Regular</td>
<td>1 serving/day</td>
<td>45.9%</td>
</tr>
<tr>
<td>High</td>
<td>≥2 servings/day</td>
<td>40.7%*</td>
</tr>
</tbody>
</table>

*p < 0.004

- Controlled for age, sex, birth weight, parental overweight, education of parents, physical activity, frequency of milk consumption
- Controlled for same + frequency of consumption of dairy foods, fish, cereals, meat, fruit, vegetables, sweet beverages, snacks