Mother’s Working Status and Nutritional Status of Children Under the Age of 5 in Urban Low-income Community, Surabaya, Indonesia

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Summary
A cross-sectional anthropometrics survey was carried out in a low-income community of Surabaya, Indonesia, to examine the association between mother’s employment and the child’s nutritional status for identifying a group at risk of having malnourished children. Subjects were 274 children under the age of 5. The children of non-working mothers had significantly higher height-for-age z-score (HAZ) ($p < 0.05$) than those of working mothers. When mother’s work was divided into ‘formal’ and ‘informal’, HAZ and weight-for-age z-score (WAZ) of children of the informal worker’s group were significantly lower than those of the non-working mother and the formal worker’s group ($p < 0.05$). Mother’s education and income of the formal worker’s group were significantly higher than those of the informal worker’s group ($p < 0.01$). Our study identified a group at risk of malnutrition, i.e., children of mothers working in informal sectors. The programs to provide childcare for working mothers should target this particular group of poor households.

Introduction
As the economic situation in many parts of developing countries becomes more difficult, the number of women engaged in wage earning has increased. In developing countries, the effects of mother’s work on their children’s health are not well understood. Previous studies have shown conflicting results: positive and also negative effects on children’s nutritional status have been reported. This study was thus conducted to explore the association between mother’s employment and the child’s nutritional status in taking several confounding factors into account and to find a group at risk of having malnourished children.

Methods
Surabaya city, the capital of east Java province, was selected as a study area being a typical urban area in Indonesia with a population of approximately 2.8 million in 1997. There are some low-income villages in the city. The government defined the low-income villages according to the socioeconomic and environmental status of the inhabitants. Of these low-income villages, Kalijudan village was chosen for this study. Six of the nine Posyandus (Integrated health post) were selected randomly in this village. The total population of these six study areas was 5599. The subjects were children under the age of 5 and their families. All children living in the area were invited to participate in the study. Of the 342 children, 274 (80 per cent) participated. The data were collected between mid-September and October 1999. Structured interviews were performed in local language by eight health center staff, including a medical doctor, one nurse, two midwives and three nutritionists under supervision of two researchers. Three sets of data were collected.

1. Weight-for-age z-score (WAZ), height-for-age z-score (HAZ), and weight-for-height z-score (WHZ) based on the growth reference curves developed by National Center for Health Statistics (NCHS) and Center for Disease Control and Prevention (CDC).
2. Socioeconomic characteristics of the respondents, including child’s and mother’s age, mother’s education, working status of mothers, monthly household income, food shortage during the last 1 month in the household, and living with extended family.

3. Working status of mothers: non-working and working. Working mothers were further categorized into working in formal and informal sectors.

SPSS software (Version 9.0) was used for statistical analysis.

**Results**

The three indicators of 274 children’s growth were as follows: HAZ was \(-0.38 (SD \pm 1.81)\), WAZ was \(-1.01 (SD \pm 1.32)\), and WHZ was \(-0.95 (SD \pm 1.38)\). Nearly one-quarter of the children (24 per cent) were below \(-2.0 SD\) of HAZ, 16 per cent were below \(-2.0 SD\) of WAZ, and 18 per cent were below \(-2.0 SD\) of WHZ.

Multiple linear regression analysis revealed that HAZ of working mother’s children was significantly lower than that of non-working mother’s children when the child’s age and the mother’s education and income, and the likelihood of living with extended family were controlled \((p < 0.05, R^2 = 0.15)\). Sixty-four (23 per cent) children’s mothers carried out paid work. The children of non-working mothers had significantly higher HAZ than those of working mothers \((p < 0.05)\). There was no significant difference in education or likelihood of living in an extended family. The mean income of working mother’s household was significantly higher than those of non-working mothers \((p < 0.01)\). Food shortage in the working mother’s group, however, was significantly higher than that of the non-working mother’s group \((p < 0.05)\). Among 64 children of working mothers, 35 (55 per cent) had formal work as a government employee or factory worker, while 29 (44 per cent) had informal work such as a tailor, maid, street vendor or other.

As Table 1 shows, all nutritional indicators were the best in the formal worker’s group. Both HAZ and WAZ of children of the informal worker’s group were significantly lower than those of the non-working mother’s and the formal worker’s groups \((p < 0.05)\). Mother’s education and income of the formal worker’s group were significantly higher than those

| Table 1: Association between socioeconomic and nutritional status of 274 children by mother’s working status |
|---|---|---|
| Nutritional indicators | Non-working mother \((n = 210)\) | Working mother |
| | | Formal work \((n = 35)\) | Informal work \((n = 29)\) |
| Mean (SD) | Mean (SD) | Mean (SD) |
| Height-for-age z-score (HAZ) | \(-0.26 (1.79)\) | ** | \(-1.56 (1.83)\) |
| Weight-for-age z-score (WAZ) | \(-0.96 (1.24)\) | ** | \(-1.75 (1.09)\) |
| Weight-for-height z-score (WHZ) | \(-0.97 (1.40)\) | ** | \(-1.10 (0.75)\) |
| Child’s age (months) | 25 (16.6) | 29 (17.5) | 37 (16.4) |
| Mother’s age (years) | 28 (5.0) | ** | 29 (5.5) |
| Mother’s education (years) | 8.9 (3.3) | ** | 10.9 (2.6) |
| Income per month per household (1000Rp) | 319 (139) | ** | 545 (318) |
| Food shortage\(a\) | 0.15 (0.36) | ** | 0.20 (0.41) |
| Living with extended family\(b\) | 0.27 (0.45) | ** | 0.46 (0.51) |

\(a p < 0.05, \quad b p < 0.01\) (Bonferroni was used as post-hoc analysis).

*0 = household which suffered from food shortage, 1 = household which did not suffer from food shortage

**0 = household which did not live with extended family, 1 = household which lived with extended family.

US$ 1 = 7300Rp
of the non-working mother’s group and the informal worker’s group ($p < 0.01$). Mother’s education and income were not significantly different between the non-working mothers and the informal worker’s group.

**Discussion**

This study revealed that children of working mothers had significantly lower HAZ than that of non-working mothers. There are several studies in other countries supporting our findings. Previous studies showed four main factors related to mother’s work and children’s nutritional status: food intake, care arrangement, mother’s working condition, and income. Our study identified a group at risk of malnutrition: children of mothers who had informal work. Our findings and those of others on the relationship between mother’s work and children’s nutritional status, indicate that the type of work should be considered in predicting the association of mother’s work and children’s nutritional status to clarify conflicting findings among differently designed studies.

In our study the households of working mothers were, in general, not poorer than those of non-working mothers, but food shortage was higher in the working mother’s group. A study in Latin America reported that in families with both husband and wife present, women’s work was associated with a higher standard of living. Informal workers are likely to be ‘poverty-avoiders’, and formal workers to be ‘income-enhancers’. We thus divided our subjects into two groups according to socioeconomic conditions: formal and informal workers. Workers of informal sectors lived in significantly poorer households than workers of formal sectors. The amount of income was less than the poverty line, they were less educated, they suffered from shortage of food and lived in a nuclear family. Policy makers should focus more on these ‘poverty-avoiders’ to improve children’s health and welfare.

**References**


**Evaluation of Serum Cholesterol and Triglyceride Levels in 1–6-year-old Saudi Children**

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**Summary**

Estimations of cholesterol and triglyceride in serum are frequently requested tests due to the close association between elevated levels of these parameters and the risk of arteriosclerosis later leading to cardiovascular disease. Since lipid levels in children show considerable variations in different populations, this study was conducted with the aim of investigating levels of cholesterol and triglycerides in Saudi children less than 6 years old. The study group comprised 582 children with ages ranging from 1 to 6 years, randomly selected during a household screening programme. Fasting blood was used for the estimation of cholesterol and triglyceride using an autoanalyzer. The overall