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Maternal nutrition knowledge and child nutritional outcomes in urban Kenya

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ABSTRACT

We examine the link between maternal nutrition knowledge and nutritional outcomes of children and adolescents (5–18 years) measured in terms of height-for-age Z-scores (HAZ). One particular focus is on the role of different types of nutrition knowledge. The analysis builds on household-level and individual-level data collected in urban Kenya in 2012 and 2015. Various regression models are developed and estimated. Results show that maternal nutrition knowledge – measured through an aggregate knowledge score – is positively associated with child HAZ, even after controlling for other influencing factors such as household living standard and general maternal education. However, disaggregation by type of knowledge reveals important differences. Maternal knowledge about food ingredients only has a weak positive association with child HAZ. For maternal knowledge about specific dietary recommendations, no significant association is detected. The strongest positive association with child HAZ is found for maternal knowledge about the health consequences of not following recommended dietary practices. These findings have direct relevance for nutrition and health policies, especially for designing the contents of educational campaigns and training programs.

1. Introduction

This study analyzes the link between maternal nutrition knowledge and child nutritional outcomes in urban households in Kenya. Malnutrition in all its forms affects one out of three individuals worldwide (IFPRI, 2016). While overnutrition rates are rising, undernutrition remains a major concern in many countries. It is estimated that 25% of all children in developing countries are stunted, an indication of sustained episodes of energy and micronutrient deficiencies. In spite of the progress made elsewhere, in Africa the number of stunted children continues to increase (IFPRI, 2016; UNICEF, WHO, & World Bank Group, 2015).

Various interventions are commonly implemented to improve child nutrition and promote healthy living environments for poor households. Among others, these interventions include food and cash transfers, supplementary feeding programs, and nutrition education campaigns (Hirvonen, Hoddinott, Minten, & Stifel, 2016; Tabbakh & Freeland-Graves, 2016; World Bank, 2010). While the evidence for the effect of transfer programs on child health outcomes is mixed (Burchi, Scarlato, & d'Agostino, 2016; de Groot, Palermo, Handa, Ragno, & Peterman, 2017), there is a potential for an increased impact on child nutrition if conditional cash transfer programs are combined with nutrition education programs (Burchi et al., 2016). Positive associations between maternal nutrition knowledge and child nutritional outcomes are well documented for young children (Appoh & Krekling, 2005; Burchi, 2010; Webb & Block, 2004). For older children and adolescents, the effects have hardly been analyzed. Moreover, existing studies typically do not differentiate by type of nutrition knowledge, which would be useful to better understand how nutrition education programs should be designed to make them most effective.

Studies on the effects of maternal nutrition knowledge in developing countries are mainly restricted to children under five years of age (e.g. Appoh & Krekling, 2005; Burchi, 2010; Webb & Block, 2004). It is assumed that nutritional improvements are most beneficial for young children (Black et al., 2013; Leroy, Ruel, Habicht, & Frongillo, 2014; Ruel et al., 2008). Appoh and Krekling (2005), for instance, used data from Ghana to illustrate positive

Abbreviation: HAZ, Height-for-age Z-score.

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associations between mothers' nutritional knowledge and the nutritional status of children under three. In that study on Ghana, maternal nutrition knowledge was measured with a composite knowledge score, calculated using answers to questions on breastfeeding, complementary feeding, and causes of Kwashiorkor. Burchi (2010) found positive effects of maternal knowledge on preschool children based on nationally representative data from Mozambique. Burchi (2010) constructed a nutrition and health knowledge variable by considering respondents' awareness of vitamin A, HIV/AIDS, oral rehydration, and family planning.

A few studies identified positive links between maternal nutrition knowledge and child nutrition also for older children, but this evidence is limited to developed countries. Variyam, Blaylock, Lin, Ralston, and Smallwood (1999) used data from the US and showed that maternal health awareness and knowledge about nutrient contents of foods had positive effects on dietary quality of children between 2 and 17 years of age. Also using data from households in the US, Tabbakh and Freeland-Graves (2016) measured maternal nutrition knowledge based on awareness of nutrient contents and dietary recommendations, finding a positive association with adolescents' dietary quality and a negative association with adolescents' body mass index.

Here, we contribute to this literature by analyzing associations between different types of maternal nutrition knowledge and older children's nutritional status in a developing country. We use primary survey data collected in urban Kenya in 2012 and 2015. Specifically, we aim to answer the following two research questions: (1) Is maternal nutrition knowledge positively associated with height-for-age Z-score (HAZ) of children and adolescents? (2) Do different types of maternal nutrition knowledge produce dissimilar results?

Kenya is an interesting example for this type of research because malnutrition in all its forms is prevalent. Especially in urban areas, traditional diets are increasingly shifting towards more processed foods, which was shown to contribute to overweight and obesity among adults (Kimenju, Rischke, Klasen, & Qaim, 2015; Rischke, Kimenju, Klasen, & Qaim, 2015). At the same time, rates of stunting remain relatively high among children and adolescents. The coexistence of different forms of malnutrition in the same setting and the same households is common also in other parts of Africa. In such situations, it is especially important to better understand the role of nutrition knowledge. This can help to design more effective food and nutrition policies.

2. Materials and methods

2.1. Conceptual framework

Theoretical and empirical research suggests that maternal nutrition knowledge is necessary but not sufficient for healthy child nutrition and for inducing related behavioral change (e.g. Contento, 2008; Hawkes et al., 2015). Mothers are particularly important for nutritional outcomes of children and other household members, because in most situations mothers are primarily responsible for dietary choices and food preparation.

There are two main pathways how children can be affected by the nutrition knowledge of their mother. First, the quantity, quality, and diversity of the food prepared in the household, as well as the sanitary practices, influence child nutritional outcomes directly (Campbell et al., 2013; Variyam et al., 1999). Second, the dietary and sanitary practices observed and experienced during childhood can also have an indirect effect through forming attitudes towards nutrition and health (Hoddinott, Karachiwalla, Ledlie, & Roy, 2016; Vereecken & Maes, 2010; Yabancı, Kısaç, & Karakuş, 2014). Attitudes developed during childhood are known to affect own dietary practices in later life (Kigaru, Loechl, Moleah, Macharia-Mutie, & Ndungu, 2015). This already starts with older children and adolescents making their own choices for food consumed away from home. Against this background it is very plausible that different types of maternal nutrition knowledge can have different effects on child nutrition.

Household and contextual variables – such as living standard and food environment – can influence maternal nutrition knowledge and also child nutritional outcomes (Hawkes et al., 2015). In our empirical analysis, we control for such factors through including appropriate covariates in regression models. The main nutritional outcome of interest is child HAZ, which measures long-term nutritional outcomes. Maternal nutrition knowledge is expected to influence the nutrition of children and adolescents in the long run.

2.2. Study context and data

The data for this study were collected in two rounds of a household survey conducted in Kenya in 2012 and 2015. Kenya's child undernutrition rates are high, with 35% of all children being stunted, 7% wasted, and 16% underweight (Matanda, Mittelmark, & Kigaru, 2014; Ministry of Public Health and Sanitation, 2012). Our research was conducted in Central Kenya, where child undernutrition has seen only moderate improvement over the last two decades (Matanda et al., 2014).

We concentrated on urban and peri-urban areas and used a two-stage sampling procedure. At the first stage, we purposively selected three towns in Central Kenya, namely Ol Kalou, Njabini, and Mwea. These three towns have similar characteristics in terms of the size of the urban center, infrastructure conditions, and availability of social institutions (hospitals etc.). Yet some variation in terms of the type of available food retail outlets was observed (Kimenju et al., 2015; Rischke et al., 2015). At the second stage, around 150 households were randomly selected in each of the three towns. In 2012, the total sample comprised 453 households. In 2015, the sample included 450 households. For the 2015 survey round, about half of the 2012 households were revisited, the other half were newly selected, again using random sampling.

In both survey rounds, a structured questionnaire was used to collect data on various socioeconomic characteristics, including household composition, income sources, food and non-food consumption expenditures, the health of household members, and access to various types of services. In addition to the household-level data we took anthropometric measures from one randomly selected child (aged 5–18) in each household and his/her mother or caretaker.[1] Body measurements were taken according to international standards (Centers for Disease Control and Prevention, 2007) with an accuracy of 0.1 kg for body weight and 0.7 cm for height (de Onis, Onyango, Van den Broeck, Chumlea, & Martorell, 2004). Maternal nutrition knowledge was captured through a series of diet and nutrition related questions, as explained in more detail below.

Not all sample households had children between 5 and 18 years of age. In a few cases, there were children in the households but we were unable to trace them, even after repeated visits. For the analysis, we pool the sample from the two survey rounds and construct a child-level data set. Sixty-four children were observed during both survey rounds (128 observations), while 298 children were observed only in 2012 or in 2015. In total, we have 426 observations from children and adolescents (aged 5–18) with

[1] In cases where the child's mother was unavailable, data from another female caretaker in the same household were taken. This happened in 12% of the sample households.