



Can prolonged breastfeeding duration impair child growth? Evidence from rural Ethiopia[☆]



Daniel Muluwork Atsbeha^{a,*}, Rodolfo M. Nayga Jr.^{b,1}, Kyrre Rickertsen^a

^a School of Economics and Business, Norwegian University of Life Sciences (NMBU), P.O. Box 5003, Aas 1432, Norway

^b Department of Agricultural Economics and Agribusiness, University of Arkansas, 217 Agriculture Building, Fayetteville 72701, USA

ARTICLE INFO

Article history:

Received 9 October 2013

Received in revised form 21 January 2015

Accepted 30 March 2015

Keywords:

Breastfeeding duration

Child growth

Complementary food

Health production

Omitted variable bias

Stunting

ABSTRACT

Many studies in developing countries have found a negative association between breastfeeding duration and child growth. This finding creates a public policy dilemma given the widely accepted benefits of breastfeeding. Plausible causes for the negative association include reverse causality and omitted variables. Using the 2005 Demographic and Health Survey from rural Ethiopia, we find a downward bias in the estimated growth effect of breastfeeding duration before we control for the nutritional adequacy of complementary foods. Once the omitted variable problem is addressed, we find no evidence of adverse growth effects from prolonged breastfeeding. Instead, we find that the effect of inadequate supplementation on child growth is stronger for children that are breast-fed for shorter duration. These results support policies aimed at promoting breastfeeding beyond the first six months of life.

© 2015 Elsevier Ltd. All rights reserved.

Introduction

Besides its nutritional value, breastfeeding imparts preventive and therapeutic benefits to infants and mothers (American Academy of Pediatrics, 2005). It also generates indirect benefits for households and society in the form of lower feeding costs and reduced medical care expenditures (e.g., Weimer, 2001). However, many studies (e.g., Ng'andua and Watts, 1990; Caulfield et al., 1996; Asenso-Okyere et al., 1997; Brennan et al., 2004; Foraita et al., 2008) have found a negative association between breastfeeding duration and child growth in developing countries. These findings imply that children who are breast-fed for prolonged durations are likely to be stunted, a commonly-used indicator of cumulative malnutrition (O'Donnell et al., 2008). Studies show that stunted children experience poorer psychomotor development, interact less frequently with their environment (Grantham-McGregor et al., 2001) and tend to score lower than other children on cognitive tests (Martorell, 1997). Therefore, the reported negative association between breastfeeding duration and child growth has important public policy implications with

respect to the duration for which breastfeeding should be encouraged.

Critics question a causal interpretation of the negative association by pointing out several specification problems (e.g., Grummer-Strawn, 1993; Martin, 2001). The two most commonly cited sources of misspecification are reverse causality, i.e., malnourished children may be breast-fed longer than other children, and omission of confounding variables. With respect to the former, Marquis et al. (1997) examined the link between breastfeeding duration and length at the age of 15 months among Peruvian toddlers. They found that breastfeeding duration was negatively correlated to length. However, further analysis on the risk of weaning by the end of month 14 showed that the risk of weaning was decreased when the toddlers' recent health indicators such as weight-for-age and dietary intake were low. The authors concluded that the negative association between breastfeeding duration and length may have been caused by the tendency of mothers to breastfeed malnourished children longer. Simondon et al. (2001a) found similar evidence of reverse causality among Senegalese toddlers. The authors initially found a negative association between height-for-age of 3-year-olds and their age at weaning. However, children who were weaned late also had poor early growth performance. Accordingly, when the children's initial growth status at the age of 2–3 months was controlled for, the negative association disappeared. Simondon et al. (2001b) also investigated the reasons behind weaning decisions of mothers in

[☆] This work was partly supported by the National Research Foundation of Korea (NRF 2014 S1A3 A2044459).

* Corresponding author. Tel.: +47 9481 1811; fax: +47 6496 5701.

E-mail address: daniel.atsbeha@nmbu.no (D.M. Atsbeha).

¹ Adjunct professor at Norwegian Agricultural Economics Research Institute and Korea University.

rural Senegal. In support of the reverse causality hypothesis, they found that the three most cited reasons for late weaning were mothers' beliefs that their children were 'small and weak', child sickness, and food shortage. In addition, they reported that incidence of moderate and severe stunting was extremely high among children who were weaned late because their mothers believed they were 'small and weak' relative to other children who had been weaned late for other reasons.

Though less explored empirically, the omission of confounding variables is also cited (e.g., Ng'andua and Watts, 1990; Grummer-Strawn, 1993) as a potential explanation for the negative association between breastfeeding and child growth. Often the omission claim is related to controlling for the adequacy of complementary foods.² In such cases, the estimated growth effect of breastfeeding duration is likely to confound the growth effects of complementary food intake for two reasons. First, breast milk is a readily available alternative when a mother cannot access nutritionally adequate complementary foods (e.g., Simondon et al., 2001b). Second, even when access to complementary foods is not a problem, there is a tradeoff between breast milk and complementary food intake in the daily diet of the child because of satiation (e.g., Bajaj et al., 2005; Singh et al., 2005; Islam et al., 2008).

This article offers two contributions. First, we provide econometric support to the argument that the health benefits from breastfeeding duration are likely to be underestimated when the adequacy of complementary foods is not allowed for.

Second, the nutritional adequacy of complementary foods is likely to be influenced by their quantity, quality and provision time. However, data from developing countries often lack information to control for all these dimensions. This explains the relatively limited attention given to the empirical investigation of omitted variable bias as an explanation to the negative growth effect of breastfeeding duration. In the absence of data about complementary food intake, we argue that duration of postpartum amenorrhea³ can be used as a proxy variable. The choice is motivated by the observation that postpartum amenorrhea is mainly determined by breastfeeding frequency and duration (Dewey et al., 1997), while complementary food intake is likely to influence breastfeeding patterns both in the short and long run. In the short run, self-regulation in daily food intake leads to a negative correlation between breastfeeding frequency and complementary food intake (Dewey et al., 1997; Bajaj et al., 2005; Singh et al., 2005; Islam et al., 2008). Moreover, suckling stimulation from frequent breastfeeding is an important determinant of prolactin levels, which is a hormone responsible for lactation initiation (Tay et al., 1996). Therefore, the intake of complementary foods has implications for breastfeeding patterns in the long run also. For example, Díaz et al. (1995) found that the probability of a child remaining exclusively breast-fed during the first year of life was 30.6% higher among children with more frequent suckling episodes per day than other children with less frequent episodes.

In many African countries, postpartum amenorrhea is the major birth spacing factor (Thapa et al., 1989; Simondon et al., 2003). If this is the case for a specific country, succeeding birth interval can also serve as a proxy variable. In rural Ethiopia, where our data comes from, nearly 90% of the surveyed rural women do not use any modern method of birth control. In addition, about the same percentage of parents exhibit very poor knowledge of the ovulation cycle, ruling out traditional methods of birth control such as the rhythm method. Furthermore, succeeding birth interval is likely to be directly correlated with adequacy of complementary foods.

Once subsequent pregnancy occurs, feeding patterns for a child are likely to move towards complementary foods for many reasons. For example, maternal perceptions about breast milk quality may change unfavorably (e.g., Simondon et al., 2001b; Woldegebriel, 2002). There could also be cultural taboos against breastfeeding while pregnant (e.g., Woldegebriel, 2002). In addition, breastfeeding while pregnant may prove nutritionally burdensome.

We have chosen to use succeeding birth interval as our proxy variable for two reasons. First, it is harder to recall the return of menstrual cycle after a childbirth than a child's birthday. Second, the occurrence of subsequent pregnancy is more likely to initiate weaning and subsequent changes in feeding pattern than the return of menstrual cycle.⁴

We use data from the 2005 Demographic and Health Survey (DHS) conducted in Ethiopia. Our sample contains 445 children below 5 years of age living in rural areas. The focus on Ethiopia is motivated by its preschool-age child stunting rates, which are among the highest in the world and have persisted at approximately 60% since the early 1980s (Christiaensen and Alderman, 2004). Stunting is also widespread in other regions of sub-Saharan Africa, South Asia, China and Central America (Hoddinott, 2009).

We find a negative association between breastfeeding duration and child growth before we control for adequacy of complementary foods. There is no evidence to support reverse causality as the reason for the negative association in our sample. However, the negative association disappears once we control for adequacy of complementary foods. Furthermore, we find that the effect of inadequate complementary foods on child growth is stronger for children breast-fed for shorter durations.

Empirical model

We estimate a household child health production function (Rosenzweig and Schultz, 1983)⁵:

$$H = g(\mathbf{X}, \mathbf{Z}), \quad (1)$$

where H is a vector of child health indicator, $\mathbf{X}$ is a matrix of child-specific health inputs such as breastfeeding duration, and $\mathbf{Z}$ is a matrix of household-specific health inputs such as parents' education. Because many of the health inputs may be endogenous, our results must be interpreted as robust correlations rather than causal relationships (Voors et al., 2011).

Assuming a linear and stochastic relationship between the health indicator and the right-hand-side variables of Eq. (1), the child health production function can be written as:

$$H = \mathbf{X}\beta + \mathbf{Z}\theta + \varepsilon, \quad (2)$$

where β and θ are vectors of parameters to be estimated and ε is a vector of error terms.

⁴ The direction of correlation with our health indicator is the same for postpartum amenorrhea and succeeding birth interval. However, the degree of linear correlation between postpartum amenorrhea and our health indicator is weaker, which is about a third of the correlation of the health indicator with succeeding birth interval. This supports our expectation that succeeding birth interval is more likely to affect feeding patterns, and hence health outcomes, than postpartum amenorrhea. Most of the results in this paper are, however, insensitive to which of the two variables are used as proxy for adequacy of complementary foods.

⁵ Ideally, we would like to estimate a reduced-form household child health production function that is derived from a constrained utility maximization problem with child health entering directly into the utility function. However, no price and income data are available. Such data limitations often force estimation of econometric models with less desirable statistical properties such as hybrid health production functions (Rosenzweig and Schultz, 1983).

² By adequacy of complementary foods, we refer to the ability of complementary foods to provide the necessary nutrients required for child growth.

³ Postpartum amenorrhea is the period of temporary infertility following child birth.

Download English Version:

<https://daneshyari.com/en/article/5070363>

Download Persian Version:

<https://daneshyari.com/article/5070363>

[Daneshyari.com](https://daneshyari.com)