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Extended Abstract

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**Impact of Nutrition Supply on academic achievements of adolescent Girls?
Some Empirical Evidence**

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Does Nutrition Provisioning Impact Educational and Learning Outcomes of Adolescent Girls? Empirical Evidence from India

ABSTRACT: The Rajiv Gandhi Scheme for Empowerment of Adolescent Girls was introduced by the Indian government in the later part of 2010. This scheme targeted girls between the ages of 11 and 18, and it was implemented in phases. To assess the causal effect of this program on the education of the girls it benefited, we employed the difference-in-differences methodology. Our findings indicate that the program has a significant positive impact on enrollment rates. However, the improvement in learning outcomes is limited to basic levels. We propose that these changes can be attributed to the notable enhancement in the health status of the program's recipients and an increase in education-related expenses specifically allocated for children. Additionally, our research suggests that early access to the program is crucial for experiencing its beneficial effects. This implies that the government should prioritize providing nutritious food during early childhood for the overall development of children, rather than at a later stage. Importantly, our results remain consistent across various datasets, withstand tests against potential confounding factors, and are robust when alternative specifications are considered.

Keywords: Education, Health, Human Capital, Difference-in-Differences

INTRODUCTION

Optimal development of school children relies on their access to nourishing meals during early childhood. Healthy food provides the necessary macronutrients and micronutrients that are crucial for their growth and well-being. However, it is disheartening to note that approximately 66 million schoolchildren in developing countries experience food deprivation, as reported by Bundy et al. in 2018. The United Nations' 2021 report indicates that a staggering 828 million people still suffer from hunger globally. Given these distressing figures, goal 2 of the United Nations' Sustainable Development Goals (UN SDGs), which focuses on eradicating hunger and ensuring food security, appears to face significant challenges.

A wealth of literature exists regarding the direct impact of early childhood access to nutrition on children's health outcomes. Studies conducted by Afridi (2010), Luo et al. (2012), Rossin-Slater (2013), Sylvia et al. (2013), and Todd & Winters (2011) consistently demonstrate the positive effects of early childhood nutrition programs on various anthropometric health measures such as Body Mass Index (BMI), anemia levels, obesity, height, and weight for age.

Furthermore, an increasing body of research examines the indirect effects of early nutrition access on the educational and learning outcomes of school and college students. Scholars such as Glewwe et al. (2001), Glewwe & Jacoby (1995), Millán et al. (2020), Todd & Winters (2011), Wisniewski (2010), and Yamauchi (2008) contribute to this field. Providing nutritious food during early childhood yields multiple benefits, including improved cognitive skills, test scores, school attendance, increased enrollment, and reduced truancy rates, as highlighted by Lundborg et al. (2022) and Wisniewski (2010).

Educational outcomes and health status are interconnected, as emphasized by Gomes-neto et al. (1997) and Variyam et al. (1999). The health status of children significantly influences their academic achievements, as discussed by Alderman & Headey (2017) and Frisvold (2015). These studies suggest that children who receive adequate nutrition (measured as height for age Z score) experience substantial improvements in their test scores and exhibit reduced truancy rates. In contrast, malnourished children face delays in school entry and attain lower levels of education. Glewwe et al. (2001) find that better-nourished children in the Philippines enter school earlier, perform better academically, and repeat fewer grades.

Nevertheless, there is a dearth of evidence regarding the impact of providing nutrition to adolescents on their health and educational outcomes, particularly the latter. This gap in knowledge has served as the impetus for our research. As a result, our study is the pioneering endeavor to examine the causal effects of nutrition provisioning to adolescents on their educational outcomes.

DATA, MODELING, ESTIMATION

We have used ASER data (rounds 2008, 2009, and 2016) for learning outcomes. We used NSSO 64 and 71 Round for enrollment. We used NFHS Round 4 (2015-16) for the health outcomes and Young Lives (Round 3, 4, and 5) for the sub-sample analysis.

To get the clean estimate, we rely on the difference in difference technique. As it takes care of the issues of the selection bias and the unobserved time invariant heterogeneity. For robustness per se, we used propensity score matching, entropy balancing, and test of exact randomization.

FINDINGS

Our results reveal that the SABLA program has a positive and statistically significant impact on the enrollment of adolescent girls. However, we observe the improvement in reading ability

and math skills only at a basic level. Also, the effect gets stronger with the increase in the years of exposure to the program.

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