Nutrition 47 (2018) 90–96

Contents lists available at ScienceDirect

Nutrition

journal homepage: www.nutritionjrnl.com

Applied nutritional investigation

Does planning of births affect childhood undernutrition? Evidence from demographic and health surveys of selected South Asian countries

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ARTICLE INFO

Article history:
Received 14 June 2017
Accepted 5 October 2017

Keywords:
Planning of births
Interval between marriage and first birth
Birth interval
Birth order
Undernutrition
South Asia

ABSTRACT

Objective: The prevalence of child undernutrition in South Asia is as high as in Sub-Saharan African countries. The unmet need for family planning also is quite high. In previous literature, the biodemographic relationship of family planning, particularly birth order and birth spacing, and nutritional status of children have been assessed separately. The aim of this study was to work on the hypothesis that the planning of births comprising timing, spacing, and number of births improves child undernutrition, especially in the areas with high prevalence of stunting and underweight.

Methods: We used recent Demographic and Health Survey data from four selected South Asian countries. Binary logistic regression models were applied to estimate the adjusted percentage of stunting and underweight by identified independent factors.

Results: Findings suggested that after controlling for other socioeconomic factors, children in the first birth order with >24 mo of interval between marriage and first birth have a lower risk for stunting (20%; $p < 0.01$) and underweight (14%; $p < 0.05$), respectively, than other scenarios of the planning of births. The probability of child undernutrition is lower among children born with >24 mo of birth spacing than its counterpart in all birth orders, but the significance of birth spacing reduces with increasing birth orders.

Conclusion: Appropriate planning of births using family planning methods in countries with high birth rates has the potential to reduce childhood undernutrition. Thus, the planning of births emerges as an important biodemographic approach to eradicate childhood undernutrition especially in developing regions like South Asia and thereby to achieve sustainable development goals by 2030.

Introduction

Childhood undernutrition is a major public health issue in South Asian countries. It triggers much of the morbidity and mortality in the developing world [1,2]. Undernutrition was recognized as the cause of about one-third of all deaths among children <5 y of age [3]. It also restricts the intellectual and neurologic development and economic productivity [4]. Undernourished children are more prone to the infections that lead to losing energy and immunity [5]. Therefore, many international institutions are committed to reducing the pervasiveness of childhood undernutrition. For instance, the 65th World Health Assembly (WHA) is aiming to reduce maternal and child undernutrition by 2025 [6], whereas the recently adopted goal 2 of the Sustainable Development Goals is aiming for eradication of undernutrition by 2030 [7].

In the process of developing innovative strategies for improving maternal and childhood nutrition, some of the studies from international agencies have advocated for empowering women to plan their families, which can improve maternal, infant, and young child nutrition (MIYCN) [7–10]. In particular, Allison et al. advocated for the integration of family planning (FP) services and MIYCN programs that can be equally beneficial for mothers and their children [8]. Furthermore, the MIYCN and FP Working Group is viewing the integration of FP into the nutrition eradication programs as a biodemographic approach for eradicating undernutrition [8,9]. In the past, studies have documented the natural synergies between FP and MIYCN: FP helps women plan the timing, spacing, and number of births; furthermore, planning of births (PoB) ensures improving not only the nutritional status of women but their children as well. For instance, childbearing during the adolescent

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https://doi.org/10.1016/j.nut.2017.10.006
0899-9007/

period is simply a lack of planning for the timing of births [11,12]. Adolescent childbearing restricts the postmenarcheal linear and ponderal growth among teenagers during the window of opportunity to grow up [13,14]. As a result, motherhood during adolescence leads to undernourishment of children [15]. Furthermore, it triggers the chance of experiencing poor pregnancy and delivery outcomes such as intrauterine growth restriction, premature births, and low birthweight.

Globally, an estimated 162 million children <5 y of age were stunted and 99 million were underweight. By region, the prevalence of underweight in South Asia was the highest in the world. The prevalence of stunting in South Asia was as high as in Sub-Saharan African countries [16]. In 2011, around 39% and 23% children were at the risk for stunting and underweight, respectively, in South Asia [17]. Although other developing regions like Southeast Asia have achieved goal 1 of the Millennium Development Goals regarding the reduction of half of childhood undernutrition by 2015, South Asian countries lagged behind [18]. On the other hand, the prevalence of contraceptive use among married or in-union women in the reproductive age group increased worldwide from 55% to 63% between 1990 and 2011. In South Asia, it was still ~54% in 2011 [19]. The World Health Organization (WHO) estimated that ~222 million women in developing countries are not using any method of FP, but they want to postpone or stop their childbearing; South Asian countries contribute a significant share of those women [20]. The percentage of women with unmet needs for FP in South Asia (21%) is higher than the global average (17%). Among the users of FP, a majority use sterilization to complete their family size. Thus, in this study, we selected South Asian countries, as it is at the disadvantageous position in both childhood undernutrition and use of FP and consequent PoB.

The effects of birth order and birth spacing on physical growth during childhood are independently well documented. For instance, evidence from many developing countries suggests that the nutritional status among children becomes worse in higher-order births than in lower-order births [11,21,22]. Similarly, Rutstein found a nearly linear inverse relationship between the length of the birth interval and childhood undernutrition [23]. Evidence from Demographic and Health Surveys (DHS) from 17 countries and a survey from Brazil demonstrated that children born with shorter birth intervals had more risk for stunting and underweight than those born with longer birth spacing [24]. Specifically, the risk for undernutrition was higher among children who had <3 y of birth spacing [25], whereas another study identified that the same was greater among the children who had <2 y of birth spacing [26].

In the past, the association among childhood undernutrition and early childbearing, birth interval, and birth order was examined separately [11,22,23,25–27]. These studies, however, did not consider all three components of the PoB together and did not acknowledge their intersectional axes (interval between marriage and first birth, birth spacing, and birth order). Therefore, the present study aimed to find the association between PoB comprising timing, spacing, and limiting the number of births and childhood undernutrition, in the process of highlighting FP as a biodemographic strategy to reduce childhood undernutrition in the highly vulnerable region of South Asia.

Materials and methods

Theoretical linkage

Based on the introduction and background, we constructed a conceptual framework showing the direct and indirect pathways through which the PoB is affecting the nutritional status of children (Fig. 1). Figure 1 presents the continuum process of planning of timing, spacing, and number of births directly affecting childhood undernutrition via biodemographic factors such as intrauterine growth restriction, low birthweight, premature birth, and ultimately the nutritional outcomes of children. Furthermore, the planning of timing, spacing, and number of births directly affects socioeconomic factors such as educational level, economic status, and autonomy because inappropriate timing, lack of spacing, and undesirable births both independently and together create a hindrance in educational attainment, economic status, and personal autonomy of mothers. We used these conceptual inputs in planning our statistical models to establish the association between the PoB and childhood nutritional status.

Data sources

DHS are nationally representative cross-sectional household surveys conducted in developing and less-developed countries. The surveys collect a broad range of socioeconomic, demographic, and health data using a well-structured and standardized questionnaire. Careful sample design, cautious structuring of the questionnaire, well-trained and supervised interviewers in the field, and quality

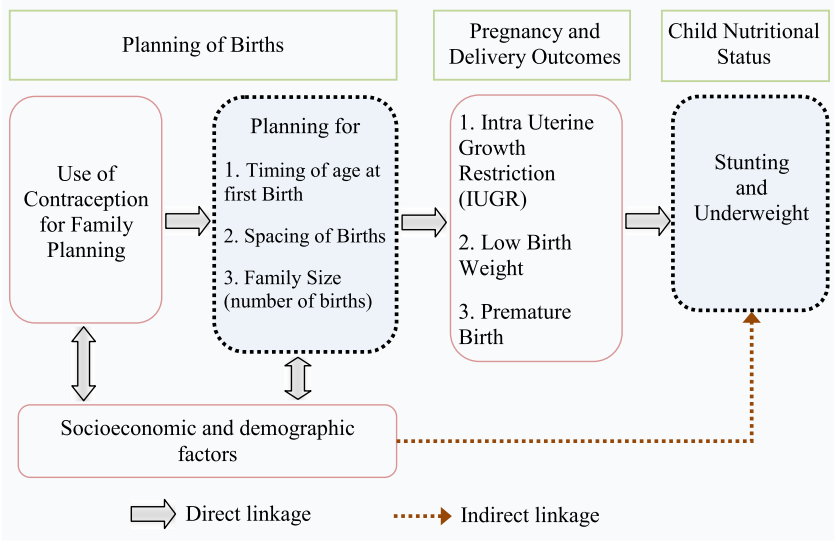

Fig. 1. Theoretical linkages modified from Rana and Goli (2017) [28]. The components in the box highlighted with dotted lines are considered in the statistical analyses of this study. Child nutritional statuses are the dependent while planning of births is the independent variable.