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## MATERNAL HEALTH AND NUTRITIONAL STATUS OF CHILDREN: EVIDENCES FROM INDIA'S NATIONAL FAMILY HEALTH SURVEYS

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### Abstract

Introduction: It is a well-established fact that an educated woman who undergo full antenatal care check-ups, takes iron folic acid (IFA) during pregnancy, having institutional birth and whose delivery is assisted by a skilled health person, promotes maternal health and improve child nutritional status. In the light of the above, an attempt is made in this paper to relate the maternal health and education in determining the nutritional status of the children in Jammu & Kashmir. Material & Methods: We used data from the National Family Health Survey conducted in 2005-06 (NFHS-3), 2015-16 (NFHS-4) & 2019-20 (NFHS-5). We have chosen some selected maternal health factors and maternal education to determine their trends viz-a-viz nutritional status of the children. Results: Results show that an improvement in maternal health factors and maternal education lead to improve the nutritional status of the children in Jammu & Kashmir. Conclusion: Maternal factors (antenatal and postnatal visits, iron folic acid, institutional and home births, births attended by skilled health personnel etc.) are important to determine the health status of the mothers and maternal health (body mass index, anaemia level in mothers) is a pre-condition to determine the nutritional status of the children.

Key words: maternal health, nutritional status, stunting, wasting, underweight

### 抽象的

简介：接受过全面产前保健检查的受过教育的妇女在怀孕期间服用叶酸铁 (IFA)，在机构分娩并由熟练的卫生人员协助分娩，促进孕产妇健康和改善儿童营养状况。鉴于上述情况，本文试图将孕产妇健康和教育与查谟和克什米尔儿童的营养状况联系起来。材料和方法：我们使用了 2005-06 (NFHS-3)、2015-16 (NFHS-4) 和 2019-20 (NFHS-5) 进行的全国家庭健康调查的数据。我们选择了一些选定的孕产妇健康因素和孕产妇教育来确定它们的趋势，即儿童的营养状况。结果：结果表明，母亲健康因素和母亲教育的改善可改善查谟和克什米尔儿童的营养状况。结论：孕产妇因素（产前和产后检查、铁叶酸、机构和家庭分娩、由熟练卫生人员接生等）对于确定母亲的健康状况和孕产妇健康（体重指数、母亲的贫血水平）很重要）是确定儿童营养状况的先决条件。

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关键词: 孕产妇健康, 营养状况, 发育迟缓, 消瘦, 体重不足

## 1. Introduction

Undernutrition among children is increasingly recognized as a major prevalent and important public health problem in many developing countries including India, which has a long-term consequence for the human and economic development [1]. Income is the most important and influential determinants of child undernutrition [2], as greater incomes at household level make it easy to invest more in food consumption, access to clean drinking water, good hygiene and adequate health and child care arrangements [3]. After seventy years of independence in India with healthy economic growth, good progress in the agricultural sector, remarkable increases in food availability, the problem of undernutrition remained formidable. It is a serious problem in India. The prevalence of malnutrition among children is higher among underweight mothers [4].

The reduction in the prevalence of undernutrition was slow in the past years. According to a joint report of UNICEF, WHO and World Bank [5] the prevalence of stunting among under five in India fell from 62.7 percent in the early 1990s to below 54.2 percent in the late 1990s. The prevalence of underweight also declined over this period from 55.50 percent to 46.3 percent while that of wasting declined from 20.3 percent to 17.1 percent. A mother's health at each stage of life affects health at other stages and also can have cumulative effects on the nutritional status of their children. Poor maternal nutritional status is associated with low child nutritional status[6]. Women who remain healthy during pregnancy and after birth are more likely to stay healthy later in life and have better birth outcomes and childhood [7]. Therefore, the

health and well-being of women matter to every person, society and country [8] and are essential to determine the nutritional status of children [9], [10].

All women/expected mothers need access to antenatal care in pregnancy. Antenatal Care (ANC) is an important entry point for pregnant women to receive a broad range of health promotion counselling and prevention services. The studies have shown that women attending regular ANC exhibit better knowledge, attitudes and antenatal practices which influence the nutritional status of their children[11], [12][12], [13]. The institutional births assisted by skilled health professionals can make the difference between life and death for both the mother and the baby [6]. Place of birth is a very important determinant of nutritional status of the children [14]. A study based on low-income countries established that infants delivered at residential homes have two-to-three-fold odds of being severely underweight, severely stunted, and severely wasted [15]. Research found that undernutrition is highly prevalent among the children whose mothers' body mass index (BMI) is below the normal level [16], [17] maternal anaemia[18] [19], and place of delivery [11] are associated strongly with child nutritional status. It was also claimed that intake of iron-folic acid supplements during pregnancy increased birth weight by 6.46 g per month[20].

Education of the mother is important to give an adequate care to the children. Attending some years of primary school is fundamental for mothers aiming at improving their children's long-term and short-term anthropometric status [21]. It was found that children with illiterate mothers were 2 times more likely to be

moderately and severely stunted compared with their counterparts with secondary education [22]. It was found that on an average, one year of a mother's formal education increases their children's height-for-age and weight-for-age z-scores by nearly 0.025 and 0.015 respectively [21]. The importance of mothers' education also well documented by Schultz T P [23], where he argues that mothers' education can influence child health in a number of ways: a) education may lead to a more efficient production of child health, b) better educated mothers may be more effective at producing child health for a given amount of health goods; c) educated mothers tend to opt for fewer but healthier children, and d) more schooling raise family incomes which in turn improve child health status. It was also revealed that mother's education is strongly and inversely associated with stunting [24] [25] and Protein Energy Malnutrition [26]. Thus, there is a significant association between child's nutritional status with mothers' nutritional knowledge. It was found that majority of the mothers with adequate level of literacy and having good knowledge of nutrition had children with normal nutritional status whereas the children whose mothers had poor nutritional knowledge were found with stunting [27].

Births attended by skilled health personnel is a measure of a health system's ability to provide adequate care for pregnant women. All women should have access to skilled care during pregnancy and childbirth to ensure prevention, detection and management of complications. Assistance by competent health personnel working within an enabling environment is key to lowering maternal and newborn deaths [28]. The Government of India has been focusing on initiatives to improve maternal health indicators.

Much progress has been made in ending preventable maternal deaths in the past two decades. Maternal Mortality Rate (MMR) - the number of women and girls who die each year due to issues related to pregnancy and childbirth has declined considerably to 113 in 2016-18 from 122 in 2015-17 and 130 in 2014-2016.

In terms of institutional births 92 percent births are taking place at delivery care and 95 percent of these births are assisted by skilled health personnel. As per the data from NFHS conducted in India, there is also seen improvements in Body Mass Index (BMI) of women below normal (BMI < 18.5 kg/m<sup>2</sup>) from 12.2 percent in 2015-16 to 5.2 percent in 2019-20. The picture of anaemic women is improving slowly from 46.9 percent in 2015-16 to 44.1 percent in 2019-20.

## **2. Objectives**

- a) To know the trends in maternal health indicators, maternal literacy and nutritional status of children in Jammu & Kashmir.
- b) To investigate the linkages between maternal health, maternal education and nutritional status of children in Jammu & Kashmir.

## **3. Material & Methods**

This study is based on data from India's National Family Health Surveys (NFHS-5, NFHS-4 NFHS-3). To know the trends in the status of maternal health and education, we examined certain selected maternal health indicators like mothers who had at least 4 antenatal care visits, consumed iron folic acid for 100 days or more when they were pregnant, received postnatal care from a

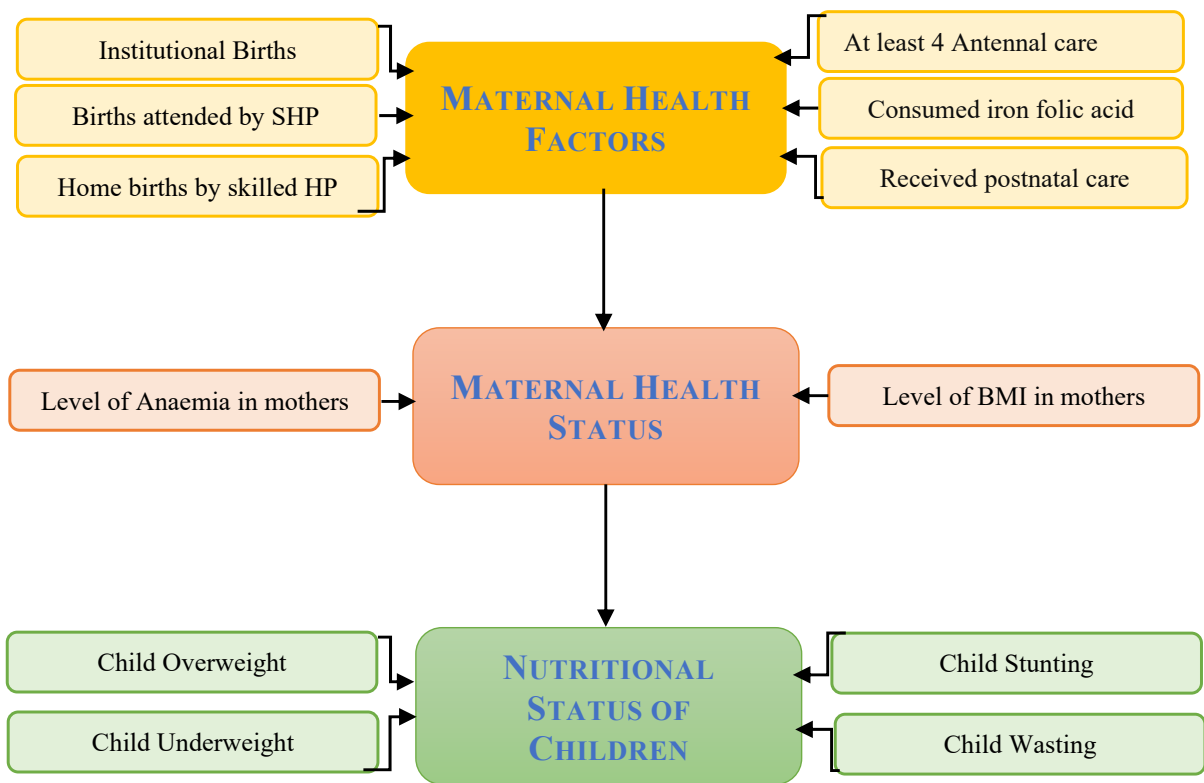
doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery, institutional births, births assisted by skilled health personnel, home births that were conducted by skilled health personnel, all pregnant women age 15-49 years who are anaemic (<11.0 g/dl), and women literacy rate. The data from different surveys were compared to draw the analysis.

### 3.1 Conceptual Framework

It is believed that the immediate maternal health factors – a) mothers who had at least 4 antenatal care visits, b) consumed iron folic acid for 100 days or more when they were pregnant, c)

received postnatal care from a doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery, d) institutional births, e) births assisted by skilled health personnel, f) home births that were conducted by skilled health personnel and g) women literacy level – are responsible for maternal health status – a) women age 15- 49 years who are anaemic (<11.0 g/dl), b) body mass index (BMI) of women below normal (BMI <18.5 kg/m<sup>2</sup>) – and maternal health has a significant effects on the child nutritional status – stunting (height-for-age), wasting (weight -for-height) and underweight (weight for age).

**Fig. 1: Conceptual Framework-Linkages between maternal health & child nutritional status**



SHP = Skilled Health Personnel

Therefore, the conceptual framework below shows that maternal factors responsible for maternal health status on the one hand and on the

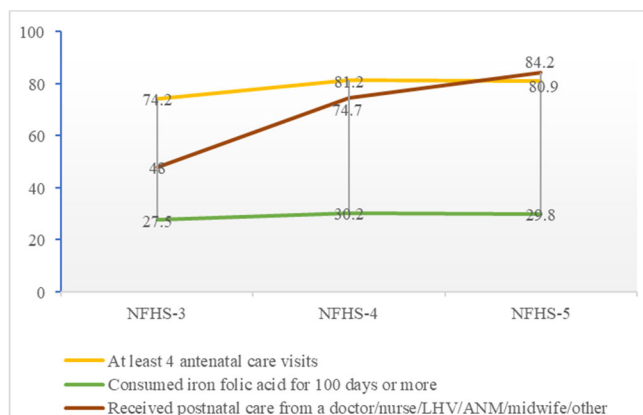
other hand maternal health status is an important pre-condition for determining the nutritional status of the children.

#### 4. Results & Discussion

The maternal mortality rate remains a useful and easily available indicator of the health of any population. Any changes in maternal mortality rates reflect a clear change in the health status of the entire population. As per the Sample Registration System (SRS) report by Registrar General of India (RGI) for the last three years, Maternal Mortality Ratio (MMR) of India has reduced from 130 per 100,000 live births in SRS 2014-16 to 122 in SRS 2015-17 and to 113 per 100,000 live births in SRS 2016-18. The MMR depends on various factors including antenatal and postnatal cares, mothers who consumed iron folic acid when they were pregnant, institutional births, births assisted by skilled health personnel, home births that were conducted by skilled health personnel, anaemic status of the expected mothers etc.

The trends in selected indicators related to maternal health (assessed from NFHS-5, NFHS-4, NFHS-3) in the above graphs revealed that the antenatal visits have increased from 74.2 percent in NFHS-3 to 80.9 percent in NFHS-5. The postnatal visits have increased from 48 percent to 84.2 percent for the same period. The consumption of iron folic acid (27.5 percent to 29.8 percent) is also continuously increasing from NFHS-3 to NFHS-5 (Fig.-2).

**Fig. 2. Antenatal, postnatal visits & consumption of IFA during pregnancy**



**Fig. 3. Institutional births & births attended by skill health personnel**

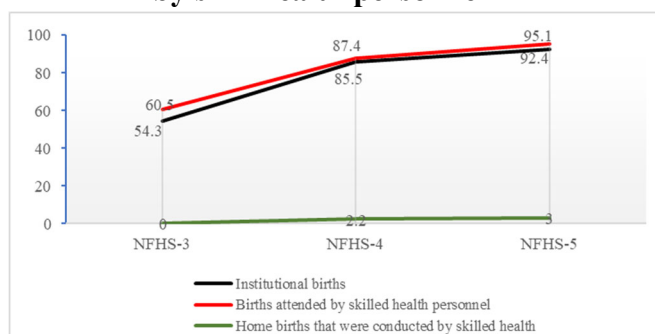


Fig.-3 depicted the improvement in respect of institutional births (from 54.3 percent in NFHS-3 to 92.4 percent in NFHS-5) along with births assisted by skilled health personnel (from 60.5 percent in NFHS-3 to 95.1 percent in NFHS-5). Fig.-4 shows that women with low body mass index (BMI <18.5 kg/m<sup>2</sup>) (22.7 percent to 5.2 percent) and low anaemic level (<11.0 g/dl) (55.7 percent to 44.1 percent) are decreasing continuously for the period from 2005-06 to 2019-20, reflecting an improvement in maternal health status in Jammu & Kashmir.

**Fig. 4. Women whose BMI <18.5kg, BMI >18.5kg & who are anaemia (<11.0g/dl)**

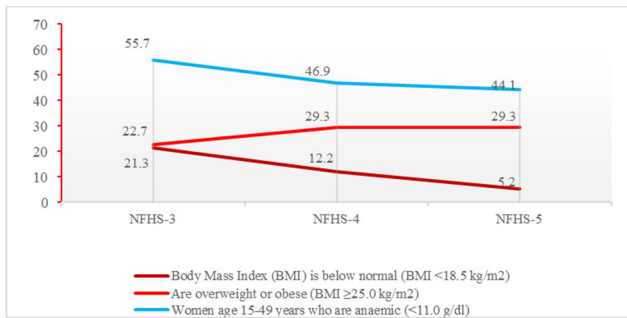
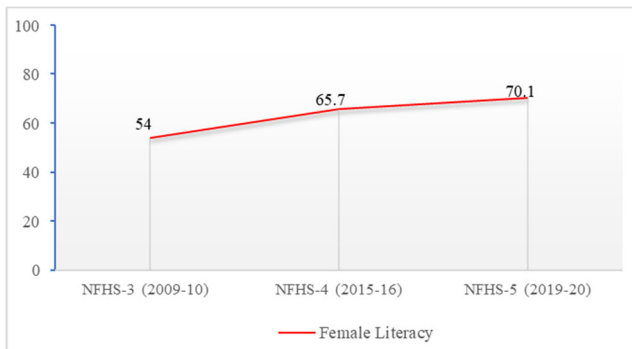


Fig. 5. Women literacy level in Jammu & Kashmir

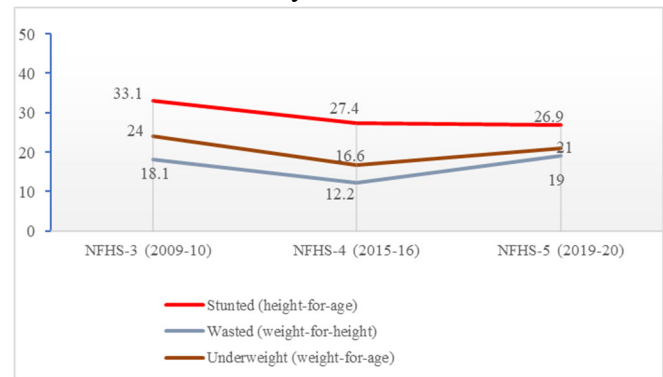


The female literacy in Jammu & Kashmir is continuously increasing from 54 percent in NFHS-3 to 70.1 percent in NFHS-5 (Fig-5). The level of literacy enables the women to participate fully in the development programmes which led to better maternal health, nutrition, income generation and family planning interventions [29].

All these improvement in maternal health indicators may have an important linkage with child nutritional status. The analysis from three round of data (NFHS-3, NFHS-4 NFHS- 5) in Fig.-6 shows that in Jammu & Kashmir, as the improvements in maternal health factors and maternal education takes place, the prevalence of underweight - low weight for age – among children < 5 years has also come down from 24 percent in 3rd round (2009-10) to 21 percent in 5th round (2019-20).

The stunting - low height for age – also register a decline from 33.1 percent in 2009-10 to 26.9 percent in 2019-20. The wasting -low-weight-for-height- has remained the same for the said period. The decrease in all the indicators of nutritional status of children was observed in same line as the improvements in antenatal and postnatal cares, institutional births, births attended by skilled health personnel, consumption of iron folic acid, and mother's BMI level were observed.

Fig. 6. Nutritional Status of Children less than 5 years



The findings of the study are in line with studies conducted in Bolivia [30], Bangladesh [32] and India [31] where it was found that maternal education have a strong effect on nutritional status of the children.

## 5. Conclusion

In conclusion, we say that the maternal factors (antenatal and postnatal visits, iron folic acid, institutional and home births, births attended by skilled health personnel etc.) are important to determine the health status of the mothers and maternal health (body mass index, anaemia level in mothers) is a pre-condition to determine the nutritional status of the children. It was observed

in three rounds of data that as maternal health improves; the nutritional status of the children is also improving continuously in different rounds. The findings of the present study are in line with the study conducted in Ethiopia by using data from 2016, Ethiopia demographic and health survey and the study conducted in Gampaha District, Sri Lanka on primary school children (Grade 1–5). In these studies, it was found that mother's educational status, body mass index (BMI) and other maternal characteristics had a significant association with stunting and wasting among children under age 5 years [33], [34]. Similar findings were also observed in a study conducted in India by using data from women aged 15–49 years and their children of age 6–59 months for the study in two rounds of National Family Health Survey (NFHS-3 & NFHS-4). The study found that the risk of anaemia and malnutrition in children was higher among anaemic and underweight mothers[4]. Thus, besides poverty and other socioeconomic factors, maternal health is an important factor which directly affect the nutritional status of the children. The present study supports the trends. There is a great need to focus the attention of the leaders and policy-makers for intervening to improve the nutritional status of the children, as nutritional status of children is a main indicator of development and a pre-condition for the society to progress.

As the present study supports that there is a relationship between maternal health and nutritional status of children. Therefore, there is a need to address this problem on priority basis. To achieve this, the present study recommends that:

a) A great thrust must be given on increasing the frequency of antenatal and postnatal care visits, raising the

proportion of institutional delivery, eradicating the problem of anaemia and taking care of body mass index of the expected mothers.

b) Health and Nutrition education should be provided to the community member particularly targeting the lactating and expecting mothers of so as to improve their hygiene levels and help them to adopt better dietary patterns.

## 7. Conflict of Interest

There is no conflict of interest.

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