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Can Children's Health be Improved by Raising Healthcare Spending and Medical Specialization? A Prospective Study

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Abstract:- In India, medical advancement has taken on a life of its own and is essential toconcern the rise in disease prevalence and other issues affecting people. Increased medical investment and medical specialization are two components of a multifaceted medical expansion that should be involved both in health care systems.

We discover that financial investments in healthcare and the specialization of the medical field greatly improve a number of outcomes, such as life expectancy and a decline in child mortality but additionally, we found that socioeconomic conditions are positively connected with children's health whereas medical expansion is negatively associated with childhood obesity.

Keywords:- *Child care, Obesity, medical expansion, Child health.*

I. INTRODUCTION

In order to reduce the prevalence of health problems caused by illness and disease, medical expansion encompasses the health care system, i.e. growing medical investment and increasing medical specialisation [1](Conrad et al 2005). According to the biological model of health and illness, failures in biology, hygiene, behaviour, and biomedical treatment provided to patients by doctors cause health issues[1] (Conrad et al 2002).. This scientific approach discussed above has contributed to the growth of medicine over the past 50 years. Numerous state medical colleges were founded in India during the past six to seven years with the recruitment of medical specialists to give the best primary to tertiary healthcare to patients, leading to a large development of the medical field.

In the United States, total health spending as a percentage of GDP increased from 5.1 percent in 1960 to 17.1 percent in 2014; in Australia, job growth in the healthcare profession increased from 12.5 per 1,000 people in 1960 to 36.7 per 1,000 people in 2006; in the United Kingdom, where the number of doctors increased from 0.8 per 1,000 people in 1960 to 2.7 per 1,000 people in 2009; and in Switzerland [2](Wang et al 2015).

But the real concern here is how much better human health has become in poor nations like India as a result of this huge medical advancement in last six to seven years. The socioeconomic growth of people has a significant impact on children's health, independent of whether this immense medical advancement has improved neonatal life expectancy or child care through educating parents[3] (Crowley et al 2009). In order to learn more about how medical expansion (increasing healthcare spending and medical specialization) affects children's health, the current prospective study was designed with this goal in mind. Numerous research have been done on the relationship between socioeconomic development and medical advancement with children health, but to our knowledge, this is the first study to look at how these two factors relate to childcare for children between the ages of 0 and 4 years.

II. MATERIALS AND PROCEDURES

The 42 childcare professionals—well-trained nurses, MBBS doctors, and MBBS plus MD doctors—of the paediatric department at Rajshree Medical Research Institute (a private medical college) in the Bareilly region of Uttar Pradesh, India conducted a prospective study for one-year (2020–2021) . From five child care centers , 124 kids (from 106 families)were chosen for this trial (public health care centres) located in Bareilly region.

The protocol has been evaluated and approved by the Rajshree Medical Research Institute's Institutional Ethics Review Board on Human Subject Research in Bareilly, Uttar Pradesh, India.The local ethical committee approved the parental and child care provider consent forms on Dec 2019, and in accordance with the study's design, online and offline workshops were held from 15th Jan, 2020, to 31st Dec, 2021, at five public health care centres, with the appropriate centre directors being properly informed. Parents who are willing to participate have signed a written, informed consent form, and they have required to attend all of the regular online and in-person workshops. The parents were notified three days in advance of the online and in-person workshops by phone or SMS. They had to be there or

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they wouldn't be permitted to participate in the study (Erinosho et al 2011).

An on-site kitchen, racial and ethnic variety among the children, and a population of children in care predominantly made up of low-income children between the ages of zero and four years old are among the inclusive criteria for the public health care centres (Hanna et al 2012). Children with severe food allergies, gastrointestinal problems, chronic illnesses or conditions that impaired nutritional status, or mobility issues were not allowed to enrol. Each centre earned 250 rupees for each child it participated in the study with (Hanna et al 2012). The directors of the intervention centres were instructed to purchase the necessary stationery and workshop setups, as well as the supplies needed to support the physical activity that will be taught to parents during the offline workshop by the child care providers. This was carried out in accordance with American Academy of Pediatrics recommendations.

The entire group of chosen kids has been split into two categories or groups. The first group is a member of the placebo group, whereas the second group is a member of the intervention group. Using a computer-based random selection technique, the groups of chosen understudies were assigned. The accident also led to the selection of the disabled youngsters. Children with primary immunodeficiency or inborn metabolic abnormalities were not included in the study (Isbell et al 2013).

At each of the intervention centres, the child care providers held workshops on five different topics: childhood obesity, healthy food for young children, physical exercise for young children, personal health and wellness, and working with families to encourage healthy behaviours. The child care professionals also collaborated with the centre directors to create or revise the center's nutrition and exercise policy (Isbell et al 2013). They also distributed posters and fact sheets on nutrition and exercise, offered at least monthly on-site consultations, and additional phone or email consultations. The information papers were distributed to parents and child care providers, and the posters were exhibited in the child care facilities. With the centre directors of the public health care centre, certain prevalent concerns with mild serving and proposals for scheduled physical exercise were explored.

The questionnaires and parental consent papers were filled out by child care professionals with assistance from the centre director. At all centres, data were collected at baseline and a year after the intervention. A second research assistant was trained to assess dietary intake and physical activity based on individual child observations across all centres (Benjamin et al 2012 & Brown et al 2006). 52 workshops on topics like childhood illnesses, obesity, healthy eating, physical activity, vaccine programme, sukanya yojna, and raising healthy children were held over the course of a year by childcare providers (i.e., newly recruited, well-trained nurses, MBBS and MS/MD doctors) in order to increase the knowledge of parents. These 52 workshops were held in government-approved public health care facilities of Bareilly, Uttar Pradesh area. Over the course of a year, childcare providers provided parent workshops in addition to six site visits and five office consultations each centre.

Statistical analysis T-tests or chi-square tests were performed between the intervention and control centres to compare the baseline demographic traits. Independent sample T-tests were performed to compare observations between the intervention and placebo groups. For categorical variables, chi-square tests were used, and T-tests were used for continuous variables. Some demographic variables lacked the necessary data. Significant results were found to be *p 0.05.

III. RESULTS

In all, 124 infants(children) between the ages of 0 and 4 were enrolled in the study.

39 percent of male children with a mean age of 2.731 years were chosen for the placebo group, whereas 37 percent of male children with a mean age of 2.547 years were chosen for the interventional group. In the intervention andplacebo groups, three and two disabled children, respectively, were chosen. As shown in tables 1, there were significant differences between the interventional and placebo groups' demographics with regard to the study's chosen children and families in terms of religion (chi-square (df) = 244.54(4), p 0.0001), parent education (chi-square (df) = 26.85(1), p 0.0001), and family income (chi-square (df) = 23.54(2), p 0.0001). At the centre level, there were significant differences between the intervention and placebo centres in parent education (t statistic (df) = 2.41(15), p = 0.03) and family income (t statistic (df) = 2.48(15), p = 0.03).

The education levels of childcare providers did not differ significantly between the groups, but there was a significant difference in the religious affiliations of childcare providers between the interventional and placebo groups (p 0.05). According to the topics discussed in the workshops, a significant difference in patent knowledge was found after preworkshop and postworkshop, as shown in table 2, such as childhood illness (t= 3.79(4), F= 13.32(1,4), P=0.03), childhood obesity (t= 7.21(4), F= 46.32 (1,4), P=0.00), healthy eating (t= 0.89(4), F= 0.68(1,4), P=0.39), physical eating (t= 3.98(4), F= 7.32 No significant change has been observed in healthy eating either in interventional or in placebo group selected children.

According to table number 5, there were no appreciable changes between the intervention and placebo centres in the percentage of children falling into the underweight, overweight, or obese categories among all children (in both groups) measured at the pre-intervention period. The p values in respect to the children who were underweight, overweight, and obese did not significantly differ between the interventional and placebo group children after one year.

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			Intervention	Placebo
1	Age (0-4 years)		78	46
2	Sex M/F(%^{age})		29/49 (37/73)	18/28 (39/61)
3	With disability (%^{age})		02 (2.56)	03 (6.52)
4	With metabolic disorder		00	00
Intervention group and placebo group with children (N=124) were n=78 & n=46 respectively				
5	**Religion**	Hindu	23	14
		Muslim	47	29
		Christen	06	03
		Other	02	0
Intervention group and placebo group with family (N=106) were n=68 & n=38 respectively				
7	**Religion**	Hindu	21(30.8)	12(31.5)
		Muslim	43(63.2)	24(63.1)
		Christen	4(5.8)	2(5.2)
		Other	02(2.9)	0
8	**Education of parents**	Less than 10th class	75(48.4)	24(63.1)
		Bachelor	31(51.6)	14(36.4)
9	**Employment status**	Full time worker	41(38.8)	13(37.3)
		Part time worker	59(44.8)	22(57.2)
		Other	34(16.4)	03(7.8)
10	**Government subsides holder**	Receive any subsides for family	35(51.4)	15(39.0)
		Medical insurance for family	14(20.5)	21(54.6)
		Housing	23(33.8)	17(44.2)
		Child support	6(8.8)	4(10.4)
		Sukanya yojna	42(61.7)	26(67.6)
		Other	4(5.8)	7(18.2)
11	**Income status**	Below 3000 per month	46(67.6)	29(75.4)
		Below 10000 per month	22(32.3)	09(23.4)

Table 1: Characteristics of children & family included in the study

Sl	**Workshop topics**	**Pre-workshop (range 0-5)**	**Post-workshop (range 0-5)**	**t-statistic (df)**	**F-statistic(df)**	**p-value**
1	Childhood illness	4.03	4.52	3.79(4)	13.22(1,4)	0.03
2	Childhood obesity	2.32	3.47	7.21(4)	46.32(1,4)	0.00
3	Healthy eating	3.42	3.53	0.89(4)	0.68(1,4)	0.39
4	Physical activity	3.43	4.53	3.18(4)	7.32(1,4)	0.04
5	Vaccine program	4.39	4.47	4.64(4)	10.65(1,4)	0.04
6	Sukanya yojna	4.72	4.61	4.81(4)	12.34(1,4)	0.03
7	Raising healthy kids	3.25	4.37	3.62(4)	20.44(1,4)	0.02

Table 2: Results of pre and post workshop knowledge questionnaires of parents (included in intervention group)based on government directed programs for child care (child care centres N =5)

Note T-tests were conducted for continuous variables and chi-square tests forcategorical variables. There were missing data for some demographic variables. *p < 0.05 was found significant

	Children included in intervention group (N=78)			
Sl		**Preintervention**	**Post intervention**	***P*- value**
1	**Under weight**	56(71.6)	51(65.2)	0.51
2	**Overweight**	10(12.8)	12(15.3)	0.58
3	**Obese**	12(15.3)	11(14.0)	0.28
	Children included in placebogroup (N=46)			
		Preintervention	**Post intervention**	***P*- value**
1	**Under weight**	31(67.2)	30(65.1)	0.57
2	**Overweight**	12(26.0)	11(23.8)	0.59
3	**Obese**	3(6.5)	5(10.8)	0.79

Table 3: Effect of workshops conducted by health care professionals on selected population and their Frequency distribution among the child-level Body mass index category

Note: There were missing data for some demographic variables. *p < 0.05 was found significant

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IV. DISCUSSION

The goal of the current study was to connect medical advancement with childcare by educating parents through workshops offered by professionals who are experienced in childcare, like qualified nurses and doctors. Because socioeconomic considerations have a significant impact on childcare, this study was conducted. In addition to the observation that societal indicators of social conditions are essential causes of disease at all stages of development, McKeown's thesis asserts that socioeconomic factors continue to be highly correlated with population health (Colgrove et al 2002). As a result, we devised a plan to instruct parents with the help of medical school graduates. Although the Indian government is investing money in the hiring of medical specialists, it is not apparent whether this medical expansion is having a beneficial impact. Despite the fact that the United States spends roughly twice as much of its GDP on healthcare than other wealthy democracies do, according to several studies on medical investment, the health of the American people is worse than that of the populations of those other nations (Nixon et al 2006). And a lot of analysts think that the rising share of GDP going into healthcare cannot continue.

With respect to childhood illnesses, obesity, healthy eating, physical activity, the immunisation programme, and the Sukanya Yojna, this prospective study demonstrated that a one-year workshop programme has significnatly improved parent knowledge in the intervention group relative to the control group.

The results of our study are in line with those of Herm an A. et al. (2012), who found no link between reducing sed entary behaviour and increasing physical activity in children and alsofound no link between children's physical activity l evels and reductions in sedentary behaviour (similliar to our study).Preschoolers' engagement in demanding physical acti vity has been shown to be impacted by childcare policies on physical activity (Copeland K et al. 2011 & 2012 and Lideg aard et al 2020).It was found that treating children who were underweight, overweight, or obese was not significantly im pacted by the workshop. State and federal child care progra mmes were required in order to guarantee that kids were eng aging in physical activity.

When the two groups were compared, we found that the category of nutrient-dense foods had significantly improved but that the categories of disease or underweight, overweight, or obesity had not.

Children in the intervention group in a randomised control study of high-risk preschool-age children had lower BMIs and consumed fewer calories from carbohydrates than the control group, according to a six-month family intervention comprising parent and child groups for families with preschool-age children (Copeland K et al. 2011 & Reilly et al 2010). In a randomised control trial of high-risk preschool-age children, a six-month family intervention comprising parent and child groups revealed that children in the intervention group had lower BMIs and consumed fewer calories from carbohydrates than the control group (Copeland K et al. 2011 & Reilly et al 2010). A quasi-experimental study of a center-based physical activity intervention for predominantly Mexican-American children participating in Head Start programmes found that children in the intervention groups ingested more fruits, vegetables, and low-fat milk (Yin Z et al. 2012& Vernarelli et al 2011). Nevertheless, a randomised control trial of a teacher-based weight control intervention for African American preschool children found the only significant, positive improvement in food consumption (percent of calories from saturated fat) for the intervention versus control centres (Fitzgibbon et al., 2005).

The laws and regulations followed by child care facilities in North Carolina, Oklahoma, and New York City, where children were given fruits, non-fried vegetables, whole grains, and low-fat milk, were now adopted by child care facilities in India. These facilities were designed and renovated in accordance with these laws and guidelines (Sisson et al 2012). The results of our study agree with those of Bower J et al. (2008) who found that children spend between 55% and 80% of their time sitting immobile. According to Bower et al., preschoolers only engaged in physical activity 3 to 12 percent of the time. Physical activity is crucial to combating disorders including obesity, underweight, and overweight (Wang et al 2015).

Healthy eating and physical activity go hand in hand, but a one-year workshop or programme cannot force parents to increase their children's levels of physical activity (Larson et al 2011& Natale et al 2013). It can only educate the parents. The affordable childcare programme needs to be upgraded in order to increase children's physical activity levels and knowledge of healthy diet (Link et al 2002, Koester et al 2021 & Halaby et al 2004).The main issue with our session was that it didn't contain any information about the eating and exercising habits of parents at home. We will want more information at the child level and more surveys at daycare centres to complete our investigation. With the aid of this analysis, we were able to come to the conclusion that socioeconomic variables have a negative impact on children's health, despite the fact that the government makes financial investments in their health through a number of programmes and workshops.

Despite concerns over the sustainability of healthcare spending in the United States or any other industrialised nation, our findings demonstrate that medical investment is a significant positive predictor of population health. It is necessary to enhance the population's socioeconomic status, though (Zamora et al 2019). Our data suggest that the relationship between the medical expansion component and children's health may not be strong. Additional research is necessary to completely understand the reasons for this apparent discrepancy.

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