

Preterm Birth- A Concerning Global Issue: A Problem Tree Analysis

Muhammad Millat Hossain, SJM Ummul Ambia* and Shamima Islam Nipa

Bangladesh Health Professions Institute (BHPI), Bangladesh

***Corresponding Author:** SJM Ummul Ambia, Lecturer, Bangladesh Health Professions Institute (BHPI), Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka, Bangladesh.

Received: February 03, 2021; **Published:** February 27, 2021

Abstract

This article reviewing literature to focus the problem- "Increase preterm child-birth" analysis through problem tree, which is the participatory tool of mapping out main problems, along with their causes and effects. Pre-term birth has a great deal on the child mortality and morbidity. Preterm birth can cause of developmental delayed along with short and long-term disabilities. In addition, it can affect the psychological and social aspects of children with disabilities and their families. The impact of preterm child-birth is the raising number of mortality and economic burden to the family as well as to the society. Therefore, the problem tree analysis will facilitate the prevention of preterm and birth in future.

Keywords: Pre-term; Global Concern; Problem tree; Causes and Effect

Introduction

Preterm birth can be defined as the delivery of a child before 37 weeks pregnancy of a mother. World-wide, 5% to 18% preterm child born at each year [1]. The rate of preterm birth in developed countries is increasing day by day. Early delivery of the child hampered the normal development of their organs including brain and lung. Therefore, these children suffer with long term neurological, cardiopulmonary and others health related complications [1].

Preterm child usually dies under the age of five. In developing countries approximately 50% babies born \leq 32 weeks. These infants most frequently die as a result of infections, breathing difficulties. Furthermore, lack of accessible facilities for preterm neonatal basic care like warmth, breastfeeding etc. also associate factor of increase mortality rate. In Bangladesh 439,000 premature baby born each year. Among them, 26,100 children with age range less than 5 years die suffering with the complication of preterm birth [2].

In preterm newborns, prenatal, perinatal, and postnatal determinants can give rise to adverse neurological outcomes through complex causal pathways, with hypoxia/ischemia and infection/inflammation playing a major role. The risk of immature growth of brain and subsequent adverse clinical outcomes increases with decreasing gestational age (preterm birth) [3-5]. This review would be mapping out of the core problem "Increase preterm birth of the child" through problem tree analysis which would facilitate to take the necessary steps to present the preterm birth.

Materials and Methods

To conduct the review the authors reviewed 10 articles related with preterm birth. The articles were searched through Google scholar, Pubmed, Hinary and Science Direct search engines. There were 3 authors involved in the present study. Two of them searched the literatures based on the “Pre-term birth” and finalized the relevant articles based on the discussion. In addition, all the researchers were involved in analysis of the reviewing process and write up of the article. To develop a problem tree, the study identified the root causes, core problem and consequently, the effects and impacts of the “Pre-term birth”.

Results and Discussion

Throughout twelve literatures, the researchers concluded 3 root causes including poor maternal physical health, complicated features during pregnancy and poor maternal psychological health. These three root causes lead to increase preterm birth of the child; shown in the figure 1. Consequently, preterm birth emphasizes the neurodevelopmental delayed of the child and unstable health condition of the child; presented in the figure 2.

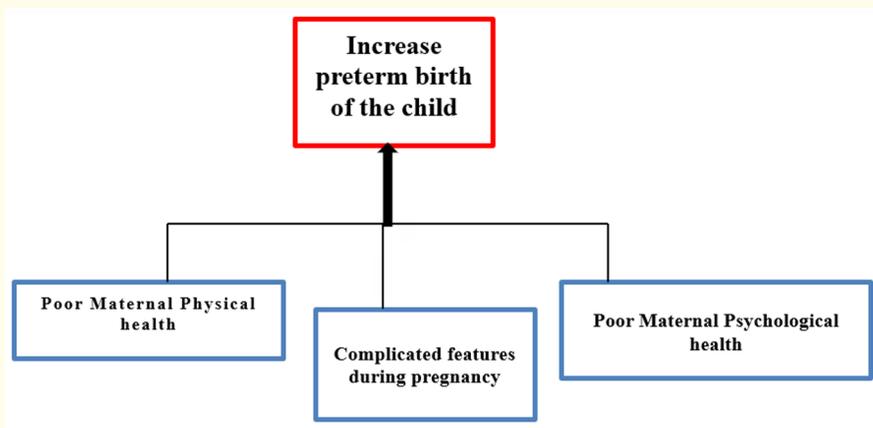


Figure 1: Root causes of preterm birth of the child.

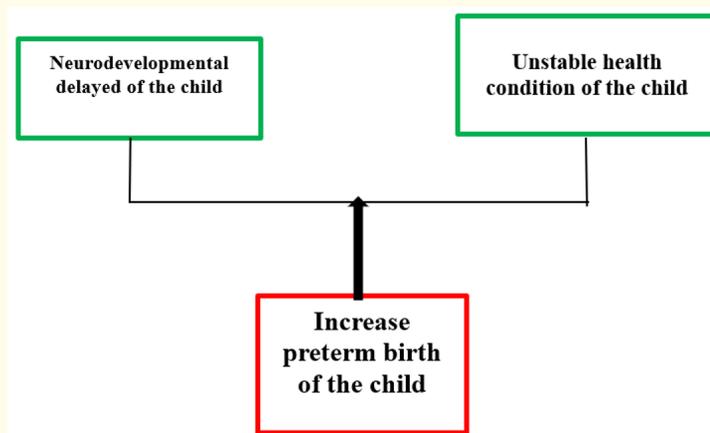


Figure 2: Effects of preterm birth of the child.

Poor maternal physical health

Different author's shows that women have high rates of low birth weight caused poor physical health status. Nutritional deficiency or malnutrition and level of physical activity or hard physical labor influence directly the poor maternal physical health. In border aspect the maternal socio-demographic characteristics associated with preterm birth including low socioeconomic and low educational status of women [6].

Poor nutritional status

Poor nutritional status at the pregnancy period causes of reduction of the blood volume in the body. Consequently, this reduced blood volume causes less in amount of uterine blood flow. Therefore, the fetus unable to proper amount of nutrition in mother's womb. On the other hand, obese women have greater chance to suffer pre-eclampsia and diabetes that leads to pre-term birth [7].

Complicated features during pregnancy

Maternal age

In a previous study it has been state that women with more than 35 years of age have a greater possibility of preterm delivery. The findings of the study also mentioned that, more frequently women with old gestational age deliver the small or large babies including preterm birth as well. Meanwhile, sometime these women need emergency C-section to deliver the baby which creates several complications. These studies have reported that preeclampsia, gestational hypertension and gestational diabetics spontaneously increase preterm birth through elective or emergency Cesarean section [6].

Pathological complications of uterine

During the pregnancy period a pregnant woman suffer with several inter and intra uterine infections. Sometime these infections might be persistent or recurrent as well. Gestational diabetes, hypertension and/or obesity can cause the systematic inflammation and causes the preterm birth [6].

Previous history of premature deliveries

In an epidemiological study by Goldenberg (2008) stated that approximately 15% to 50% women who have previous history of premature delivery have possibility to give preterm birth. These studies reported that women with preterm delivery have a 2.5-fold which increases the risk of preterm delivery in subsequent pregnancy [4].

Unintended of pregnancy

An unintended pregnancy is commonly defined as a pregnancy that is mistimed (e.g. earlier than desired) or unwanted. Several studies have found that unintended pregnancies, especially unwanted pregnancies, are related to preterm delivery. These are behaviors that contribute to poor pregnancy outcomes such as preterm delivery [4,6].

Multiple gestations

Multiple gestations are high risk pregnancies, which may be complicated pre-eclampsia, anemia, postpartum hemorrhage, intrauterine growth restriction which lead to preterm birth. That might be caused spontaneous preterm birth (associated with preterm, pre-labor rupture of the membranes or spontaneous preterm labor) and iatrogenic preterm birth (arising from a medical decision to deliver the baby or babies) occur more frequently in twin and triplet pregnancies than in singleton pregnancies. More than 50% of twins and almost all triplets are born before 37 weeks of gestation and extreme prematurity (birth at less than 28 weeks of gestation) also occurs more frequently in twin and triplet pregnancies [3,4,8].

Short inter-pregnancy interval

Several causal mechanisms have been proposed to explain the association between short inter-pregnancy interval and preterm birth such as- less time to restore maternal body nutritional status for another gestation, genital infections, maternal depletion and postpartum stress [4,6].

Poor maternal psychological health

Depression and stress

Depressing during pregnancy might influence pregnant women to negative habits including smoking, drug or alcohol use. Study reported that these bad habits might increase the risk of cardiopulmonary diseases, hypertension, diabetes etc. that lead to preterm birth. On the other hand, Study reported that emotional and psychological status of the pregnant mother influence the fetus status and may resultant preterm birth [6].

Chronic and catastrophic stress

The stress become chronic and called chronic stressor, such as being imprisoned or homeless during pregnancy or experiencing a catastrophic event like natural disasters - flood, earthquake, and manmade disaster occurring during pregnancy. A study reported chronic and catastrophic stress as a cause of preterm birth [3].

Low socioeconomic and educational status

Maternal health care and, pregnancy relevant issues influenced by the socioeconomic condition. Nutrition, work and physical activity, unintended pregnancy, and other psychological factors also directly involved on socioeconomic status. Women with poor socioeconomic status experienced more difficulties during their pregnancy period including poverty, poor living conditions, unhealthy lifestyle as well Low socioeconomic condition forces the maternal health in vulnerable conditions which increase the risk of preterm birth [4,6,7].

Effects of pre-term birth

Neurodevelopmental delayed of the child

Cognitive delayed/learning difficulty

Very preterm survivors also have high rates of dysfunction in other cognitive areas, such as attention, visual processing, academic progress, and executive function (which refers to processes that bring about purposeful behavior, important in a child's cognitive functioning, behavior, emotional control, and social interaction). Anderson and colleagues reported that preterm child at age 8 years scored less than controls of normal birth weight on full-scale IQ. They are also especially susceptible to difficulties related to inattention and hyperactivity and have emotional troubles at school age that affect academic functioning [6,8-10].

Physical developmental delay

Physical developmental delay one of the major effects of preterm birth. The studies between 1993 to 2002 the mortality rates has been declined after preterm birth (256 to 114 per 1000 live births), but the incidence of cerebral palsy increased over time from 44 to 100 per 1000 live births. Furthermore, preterm birth also effects on cognitive and learning difficulties [6,8-10].

Unstable health condition of the child

Chronic health condition

Preterm birth child mostly suffered with the cardio respiratory problems, visual impairment, severe hearing impairment, speech problem and other chronic health disorders. Previous study reported that preterm children need special care including medical and rehabilitation services even at their age range 10 to 12 years. [6,9,10].

Psychosocial and emotional effect on the family

The family of the preterm birth children faces an enormous psychosocial and emotional effects. The effect of psychological distress might have greatest for very preterm with high-risk infants in the first month of life and persisted during the first 2 years of life. By age 3 years, although there were no differences in distress symptoms, parenting stress remained greater than for term child [6].

The effect seems to vary according to medical risk factors, developmental outcome, family environment, and age at reporting. Higher effect was associated with low family income, less parental education, and the severity of the child’s functional handicap. Drotar and colleagues showed [6] the negative psychological and emotional effect dependent on low socioeconomic status and abnormal neurodevelopment status on the child of school age and reported that the effect was more pronounced for the underprivileged preterm child [9,10].

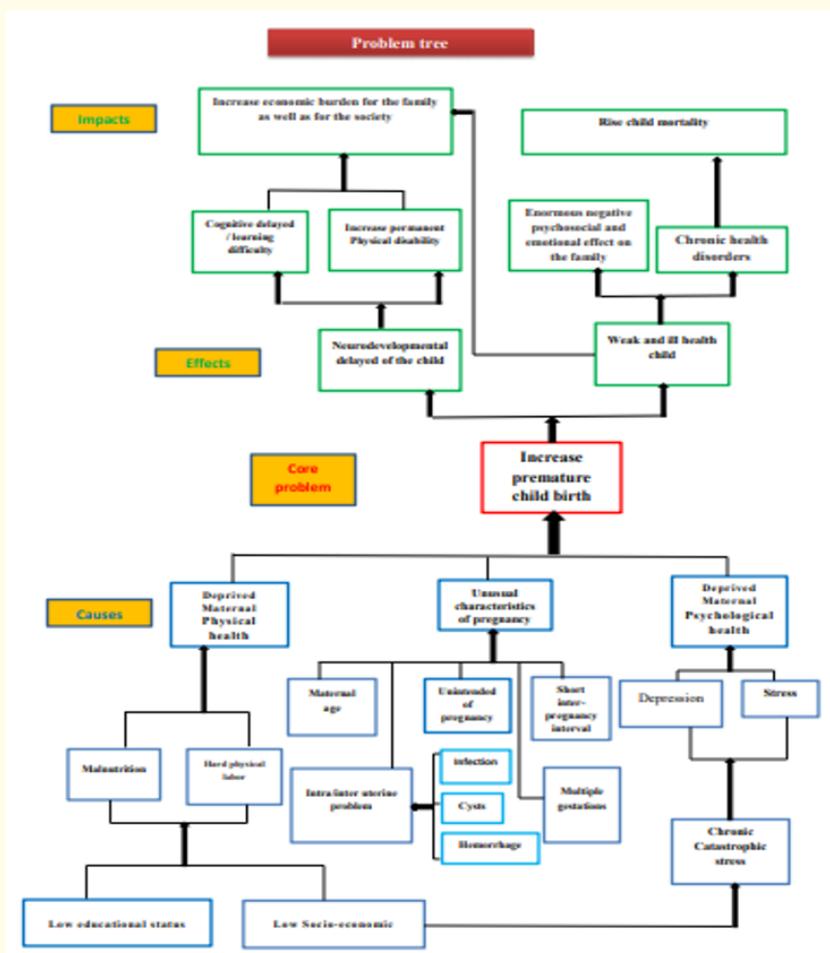


Figure 3: Problem tree analysis of preterm birth.

Impacts

Increase child mortality

Preterm birth is one of the major causes of child mortality in the developed, developing and underdeveloped country. In United States the mortality rate was 6.8 to 7.0/1,000 live birth at the year of 2002. This ration of mortality rate dramatically increased in 12.3% in the year 2003. This is the feature of the developed country so hypothetically can assume the situation of developing and underdeveloped countries. The special health care or neonatal intensive care unit is not sufficient on those countries. As the studies showed that differences in mortality have also been noted by level of neonatal care, which is highest for hospitals without a neonatal intensive care unit than for those with intermediate or non-tertiary care after preterm birth [11,12].

Conclusion

The increasing incidence and improved survival chances of infants of preterm birth and low birth weight, combined with the diffusion of new technologies, have increased the demand for and cost of care provided to these infants during the neonatal period and in later life. A number of studies in the scientific literature have estimated hospital service costs for preterm or low birth weight infants during the neonatal period. The study reported that there are more than 75% more cost needed for preterm child than a full-term child.

Acknowledgements

Authors would like to acknowledge the contributions of CRP-BHPI Librarian for her continuous cordial support in the present study.

Conflict of Interest

There is no financial interest or any conflict of interest exists.

Bibliography

1. Behrman Richard E and Adrienne Stith Butler. "Preterm birth: causes, consequences, and prevention." (2007).
2. "Preterm birth high in Bangladesh". The Asian Age Online, Bangladesh (dailyasianage.com) (2015).
3. Gernand Alison D., *et al.* "Maternal weight and body composition during pregnancy are associated with placental and birth weight in rural Bangladesh". *The Journal of Nutrition* 142.11 (2012): 2010-2016.
4. Goldenberg Robert L., *et al.* "Epidemiology and causes of preterm birth". *The Lancet* 371.9606 (2008): 75-84.
5. D'Onofrio Brian M., *et al.* "Preterm birth and mortality and morbidity: a population-based quasi-experimental study". *JAMA Psychiatry* 70.11 (2013): 1231-1240.
6. Shah Rashed., *et al.* "Incidence and risk factors of preterm birth in a rural Bangladeshi cohort". *BMC Pediatrics* 14.1 (2014): 1-11.
7. Khanam Rasheda., *et al.* "Maternal short stature and under-weight status are independent risk factors for preterm birth and small for gestational age in rural Bangladesh". *European Journal of Clinical Nutrition* 73.5 (2019): 733-742.
8. Rahman AHM Mahmudur. "A review on child and maternal health status of Bangladesh". *CHRISMED Journal of Health and Research* 5.1 (2018): 1.

9. Hack Maureen., *et al.* "Chronic conditions, functional limitations, and special health care needs of school-aged children born with extremely low-birth-weight in the 1990s". *The Journal of the American Medical Association* 294.3 (2005): 318-325.
10. Moster Dag., *et al.* "Long-term medical and social consequences of preterm birth". *New England Journal of Medicine* 359.3 (2008): 262-273.
11. Roberts Devender., *et al.* "Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth". *Cochrane Database of Systematic Reviews* 3 (2017).
12. Saigal Saroj and Lex W Doyle. "An overview of mortality and sequelae of preterm birth from infancy to adulthood". *The Lancet* 371.9608 (2008): 261-269.

Volume 5 Issue 3 March 2021

©All rights reserved by SJM Ummul Ambia., *et al.*