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PREVALANCE OF DEVELOPMENTAL DELAYS IN CHILDREN AND IT'S ASSOCIATED CAUSATIVE FACTORS

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Abstract

Objective: *The aim of this study is to check the prevalence of developmental delays in children and its associated causative factors.*

Study Design: *A Cross-Sectional Study.*

Place and Duration of the Study: *Allied Hospital Faisalabad Pakistan, Allied Hospital II Faisalabad Pakistan, Children Hospital Faisalabad Pakistan, Aziz Fatima hospital Faisalabad Pakistan, between February to April 2024.*

Method: *This study was involved 137 children, age range 3 to 60 months. Data collected from the patients' guardian by taking informed consent. Ages and Stages Questionnaire was used to collect data from the participants that came in Physiotherapy department with the complains of developmental delay. SPSS version 20 was used for data analysis.*

Results: *The result of the study showed that gross motor delays (78.83%) are more prominent. Second most prevalent developmental delays was personal social (59.85%) and communication delays (58.39%) with the least prevalent developmental delays was fine motor (57.67%), and problem solving (56.93%). Children from lower socio-economic backgrounds at higher risk for developmental.*

Conclusion: *Socio-economic factors play a crucial role and delays due to limited access to resources, inadequate nutrition, and increased exposure to stress was associated with developmental delay.*

INTRODUCTION

The term "developmental delay" (DD) refers to children who do not exhibit the typical developmental traits and abilities in the areas of speech, communication, motor and social/personal modification for children at the typical age. Various factors caused delay like genetic, premature birth, infections, environmental factor and neurodevelopmental disorders Biological and psychosocial risk factors that affect children's development are more prevalent in developing nations (1).

Biomedical and sociocultural factors interact continuously to influence the development of children. Developmental delay was found to be significantly correlated with maternal age, both paternal and maternal education level, the socioeconomic status of the family, and also with the existing consanguineal marriage. According to studies, children from low-income families are more

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vulnerable because shortages of the resource to meet the basic need. Poverty has long been linked to negative effects on children's growth, development, achievement, and performance in school (3).

There are three categories of children that are currently identified as being at risk: (1) biologically at risk children who are born into preterm fetal alcohol syndrome, or asphyxia (2). children who are considered environmentally vulnerable children who are considered disadvantaged due to a deficient social and physical environment that might limit growth and development. (3) Children with established risk and children who are struggling with a medical condition that is known to negatively affect their development (like Down syndrome). Children who are born at a risk to develop a developmental delay and those who have any medical condition which restricts their ability to develop normally psychophysically depend on factors related to infancy and potential developmental delay (4).

The appellation "Developmental Delay" defines the children who are unable to achieve the normal streams of developments. The precise definition is up for debate. It is better to think of developmental delay as a general complaint rather than a specific diagnosis. Children who are suspected for having developmental delay are evaluated in every stream of development such as expression and emotional, language and communication visual, problem solving, cognition, gross motor development and neurological developments. A model proposed by the National Center for the research purposes of Medical Rehabilitation is used to compare the different domains of developmental delays. This model of research for medical rehabilitation defines five classes of disability process that are, limitations in functional activity, impairments, physical disability, pathophysiology and societal limitations (5).

The domain of etiology is added. This model presents a sample that illustrate how present classifications design for mental hindrance, speech delays, cerebral paralysis and autism includes data from one or more than one domains. Delays in meeting developing milestones at the anticipated age are indicative of learning and adaptation deficits in children with GDD; these lags are prominent and predict Intellectual disabilities. A motor disorder called cerebral palsy (CP) is caused by damage to the normal development of the brain (6).

According to Iranian research, a child's developmental delay may result from a variety of circumstances, including diabetes, hypertension, pregnancy, family marriage, a history of abortion, high-risk pregnancies, and low birth weight. Some of the factors also increase the risk of developmental delays. These include depression of mother during gestation, iodine deficiency, gestational diabetes, stunting, and deficiency of hemoglobin, diminished cognitive stimulation, genetic diseases and exposure to violence**.** However there is very little evidence appear from China and a very small number of researches have been presented with the prevalence of developmental delays due to poverty in children below three years of age from rural sides of China (8).

Developmental delay is a major health issue because it diminishes the quality of life. There is limited literature review according to the Demicri. In rural areas parents had not awareness about at which stage which milestone should be achieved (1).

The aim of this study is to assess the prevalence of developmental delay in children for early detection and early intervention to prevent permanent damage to fine motor and gross motor skills.

METHODOLOGY

It was a cross-sectional study conducted in different Hospitals of Faisalabad Allied Hospital Faisalabad Pakistan, Allied Hospital II Faisalabad Pakistan, Children Hospital Faisalabad Pakistan, Aziz Fatima hospital Faisalabad Pakistan) between February 2024 to April 2024, participants were enrolled using propusive sampling. The study population consists of both genders (age range 3-60 months) children that were presented with developmental delay in the department of Physiotherapy. Data was collected from total 190 children's parent through face to face interview by using Ages and Stages Questionnaire. By using inclusion and exclusion criteria 137 children was included in research. All the parents were informed about the aim of the research project in detail and at the start of questionnaire a written consent were obtained from

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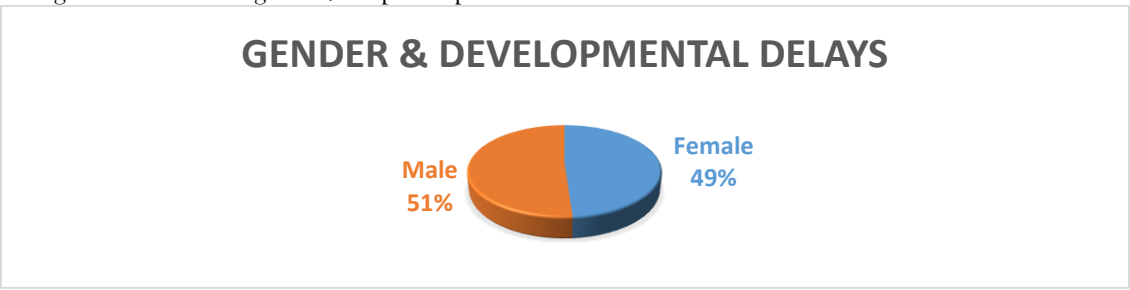
the participants. Collected data were analyzed by using SPSS version 20.

RESULTS

A cross-sectional survey was conducted to find out the prevalence of developmental delay in children and its association with various factors such as mother age, birth injury, baby weight at birth, consanguineous marriage, oxygen at delivery time, gestational duration, disease during gestation, genetic disease to a child, genetic disease in the family, adequate nutrition during the gestational period, and drug exposure during pregnancy. Purposive sampling was used to identify 137 participants from both genders ranging in age from 3 months to 5 years. Data was acquired using the Ages and Stages Questionnaire. Screening was carried out using a tool based on demographic data as well as inclusion and exclusion criteria.

Minimum age of the children was 9 months and maximum age was 60 months in which the developmental delays were reported highly at the age of 37 months and least reported at the age of 9 months. Highest number of Children reported 2.5kg weight at the time of birth. Out of 37 participants the developmental delays were more prominent in males 51.1% (n=70) than females 48.9% (n=67). 38.7% participants have gestational HTN, 10.2 % participants have gestational DM, 6.6% participants have both gestational DM and HTN, and 9.5 % have cerebral palsy. 89.1% participants have complete duration of gestation and 10.9 % do not have complete duration of gestation. 62.0 % participants have consanguineous marriage and 38.0 % do not have consanguineous marriage. 54% participants have genetic disease in family and 46% participants have no family history of genetic disease. 70.8% mothers have enough nutrition during pregnancy, but 29.2% mothers do not have enough nutrition during pregnancy. 38.7% participants have exposure to the different drugs during pregnancy and 61.3% participants do not have exposure to the different drugs during pregnancy. 58.39% children were present with communication delay, 78.83 with gross motor delay, 78.83 with fine motor delay, and 56.93% presented with delay in problem solving capability. (Table 1)

The table: 2 below show association between genetic delays and different factors affecting the milestones in children that there was no association between consanguineous marriage, birth injury and the developmental delays. There was strong association present between communication, problem solving and personal social with the developmental delays. And there was no association of gross motor and fine motor skills with the developmental delays. The results show that there was strong association between genetic diseases in child and communication, problem solving with the developmental delays. But there was no association of gross motor and fine motor skills with the developmental delays. The results show that there was no association between oxygen delivery at the time of birth and developmental delays. There was strong association present between fine motor with the developmental delays but there was no association present between communication, gross motor, and problem solving with the developmental delays.



Gender and developmental delays

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Table: 1 Developmental delays and other risk factors in children

Values for different factors in children	
Any injury at birth	7.3%
Oxygen delivery at birth	69.4%
Depression during gestation	7.3%
Diabetes during gestation	10.2%
Hypertension during gestation	38.7%
Diabetes and hypertension during gestation	6.6%
Cerebral palsy	9.5%
Developmental delays	
Gross motor movement	78.83%
Fine motor movements	57.67%
Problem solving	56.93%
Personal social	59.85%
Communication	58.39%
Other Questions asked	
Duration of gestation completed?	89.1%
Consanguineous Marriage?	62%
Any genetic disease in family?	54%
Enough nutrition to mother during pregnancy?	29.2%
Exposure to drugs during pregnancy?	38.7%

Table: 2 Associations between different factors and genetic delays in children

Different factors and genetic delays in children	p-values
Consanguineous marriage and communication	0.6
Consanguineous marriage and gross motor	0.4
Consanguineous marriage and fine motor	0.6
Consanguineous marriage and problem solving	0.3
Consanguineous marriage and Personal social	0.2
Birth injury and communication	0.1
Birth injury and gross motor	0.1
Birth injury and fine motor	0.4
Birth injury and problem solving	0.1
Birth injury and Personal social	0.5
Genetic disease in child and communication	0.00
Genetic disease in child and gross motor	0.1
Genetic disease in child and fine motor	1.01
Genetic disease in child and problem solving	0.01
Genetic disease in child and Personal social	0.00
Oxygen delivery to child and communication	0.04
Oxygen delivery marriage and gross motor	0.06
Oxygen delivery marriage and fine motor	0.00
Oxygen delivery marriage and problem solving	0.00

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Oxygen delivery marriage and Personal social	0.02
Nutrition of mother in pregnancy and communication	0.1
Nutrition of mother in pregnancy and gross motor	0.2
Nutrition of mother in pregnancy and fine motor	0.01
Nutrition of mother in pregnancy and problem solving	0.4
Nutrition of mother in pregnancy and Personal social	0.04
Genetic disease in family and communication	0.4
Genetic disease in family and gross motor	0.4
Genetic disease in family and fine motor	0.03
Genetic disease in family and problem solving	0.4
Genetic disease in family and Personal social	0.1

DISCUSSION

A survey study conducted on 137 participants. Minimum age of the children was 9 months and maximum age was 60 months in which the developmental delays were reported highly at the age of 37 months and least reported at the age of 9 months. Highest number of Children reported 2.5kg weight at the time of birth. The current study shows that developmental delays are more prominent in males than females. Another cross-sectional survey conducted by Bang in 2008 aim to find out association between developmental delays and their risk factors found similar results (1).

Another prospective cohort research that was conducted by Soleimani in 2018, Aim was to find out the prevalence of developmental delays and its association with gender, premature birth, and maternal education in children of age from birth to 4 to 60 months. The study was performed on 250 children by using Ages and Stages Questionnaire (ASQ) for the screening of participants. The results of this study show that developmental delays are more prevalent in boys than girls and there is no correlation of developmental delay with mother education (2).

As another result of this study was that gross motor delays (78.83%) are more prominent. Second most prevalent developmental delays were personal social (59.85%) and communication delays (58.39%) and the least prevalent developmental delays was fine motor (57.67%), and problem solving (56.39%). Many studies support these results. Recent study shows strong association between Socio-economic factors and developmental delays. Socio-economic factors play a crucial role, with children from lower socio-economic backgrounds at higher risk for developmental delays due to limited access to resources, inadequate nutrition, and increased exposure to stress. (3). Another study conducted on 100 children. A pilot study was conducted on children of age 4 to 60 months. Ages and Stages Questionnaire was used for the measurement of outcome. They concluded that gross motor and fine motor delays are more prominent after 1 year of age that supports the results of current study that were maximum reported at 37th month of age (4). Recent study conducted in turkey 2016, aimed to find out the prevalence of developmental delays and its association with health of those primary cares, and socioeconomic status. The method of study was cross sectional. The inclusion criteria of study were children under the age of 1-35 months. The outcome measure tool used was Ages and Stages Questionnaire and a Zung Self-Rating Depression Scale. They concluded that the prevalence of developmental delays is higher in low income families due to limited resources and limited educational opportunities. Results of this study

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supports current study. The results of current research shows that frequency of developmental delays are higher in families with low socioeconomic status 59.1% (n=81) (5).

Current study showed that consanguineous marriage has ratio was 62% that was high ratio. The cross sectional and descriptive study was conducted on prevalence of cerebral palsy and intellectual disability among children. They use Ages and Stages Questionnaire for the measurement of outcome. They concluded that developmental delays are 8.1 times more prominent in children of parents who have consanguineous marriage and also concluded that there is a strong relationship between developmental delays and mother's qualification (6).

Current study concluded that developmental delays have association with disease during gestation period, nutrition of mother during pregnancy, genetic disease in family and genetic disease to child. Current study also concluded that developmental delays have no association with exposure to drugs during pregnancy, exposure to toxins right after birth, consanguineous marriage, oxygen at the time of delivery, duration of gestation and birth injury. A recent study conducted Assessment of risk factors for developmental delays among children in a rural community concluded Socio-economic, ante-natal, natal and post-natal factors should be considered for prompt identification and initiation of intervention for Developmental delays (7).

CONCLUSION

The most prevalent developmental delays in children are gross motor delays (78.83%). Second most prevalent developmental delays were communication (58.39%) and personal social (59.85%) and the least prevalent developmental delays was fine motor (57.67%) and problem solving (56.39%). Socio-economic factors play a crucial role, with children from lower socio-economic backgrounds at higher risk for developmental delays due to limited access to resources, inadequate nutrition, and increased exposure to stress. Additionally, parental factors such as disease during gestational period, nutrition of mother during pregnancy, genetic disease in family and genetic disease to child have association with developmental delays. Factors like exposure to drugs during pregnancy, consanguineous marriage, oxygen at the time of delivery, duration of gestation and birth injury have no association with developmental delays.

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