

Article

Developmental Disabilities and Chronic Illness in Young Children

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Abstract: *Objective: To evaluate the association between developmental disabilities and chronic illnesses in young children and to identify key risk factors influencing their co-occurrence.*

Study Design: Cross-sectional analytical study.

Setting: Conducted at Children Hospital and Institute of Child Health, Multan from May 2024 to May 2025.

Methods: A total of 185 children aged 6 months to 5 years were enrolled using non-probability consecutive sampling. Data were collected through a structured questionnaire and medical record review, including demographic details, prenatal and perinatal history, and clinical diagnoses. Developmental disabilities were assessed using age-appropriate screening tools, while chronic illnesses were confirmed through clinical and diagnostic records.

Results: The mean age of participants was 2.8 ± 1.4 years, with a male predominance (58.4%). Developmental disabilities were present in 53.0% of children, while 60.5% had chronic illnesses. Co-occurrence of both conditions was observed in 36.8% of cases. Children with chronic illnesses had a significantly higher prevalence of developmental disabilities compared to those without (60.7% vs 40.5%, $p = 0.01$). Significant risk factors included prematurity ($p = 0.02$), low birth weight ($p = 0.01$), birth asphyxia ($p = 0.03$), and recurrent hospitalizations ($p = 0.01$). Multivariate analysis identified prematurity (AOR = 2.3), low birth weight (AOR = 2.7), chronic illness (AOR = 2.1), and recurrent hospitalizations (AOR = 2.5) as independent predictors.

Conclusion: Developmental disabilities and chronic illnesses frequently coexist in young children, with shared risk factors contributing to their occurrence. Early screening, integrated care, and targeted interventions are essential to improve long-term outcomes in this population

Keywords: Developmental disabilities; Chronic illness; Pediatric population; Early childhood development; Risk factors; Prematurity

INTRODUCTION

Young children with developmental disabilities and chronic illness represent a large and growing public health concern, especially in low and middle-income nations, where early diagnosis and treatment are still not optimal [1]. Early childhood is a critical period of rapid neurodevelopment, when genetic, biological, and environmental factors interact to determine long-term cognitive, behavioural, and physical outcomes. Any interference in this delicate period, either by chronic illness or developmental inadequacy, may lead to continuing functional disability and poor quality of life [2]. The developmental disabilities constitute a heterogeneous category of disorders associated with delays or limitations in motor, cognitive, language, or social spheres, and many of them begin in the prenatal or early postnatal period [3]. Among them are cerebral palsy, autism spectrum disorder, intellectual disability, and global developmental delay. At the same time, chronic diseases like congenital heart disease, asthma, epilepsy, and type 1 diabetes mellitus are becoming more common among pediatric patients since there are better survival rates and better provision of care to children and their neonatal patients, as well [4]. These conditions are traditionally researched separately but there is emerging evidence that there are a substantial overlap and interaction between them. The interrelation between chronic illnesses and developmental disabilities is complicated and two-sided [5]. The mechanisms that can influence neurodevelopment negatively in cases of chronic illnesses include hypoxia, metabolic imbalances, chronic inflammation and long-term hospitalisation [6]. These may restrict the child's exposure to environmental stimuli and learning experiences, thus affecting developmental growth. On the other hand, children with developmental disabilities might be more prone to chronic diseases because of the genetic syndromes, impaired immunity, or lack of physical activity. The interaction underscores the need for an integrated clinical approach that considers both developmental and medical needs [7].

Besides biological processes, several socio-demographic and environmental factors contribute to the burden of these conditions [8]. The maternal health, antenatal services, nutrition, birth complications, and socioeconomic factors are significant determinants of early childhood outcomes [9]. Delayed diagnosis, inaccessibility of specialised services, and poor awareness contribute to the effects of these disorders in resource-limited settings. Consequently, children with disabilities tend to show up late with severe impairments, which diminishes the impact of therapeutic interventions [10]. The developmental disabilities and chronic illnesses have long-term effects that are not only limited to the health outcomes of individuals but also cause significant psychosocial and economic impact on families and health care systems [11]. The ongoing demands of caring for children can strain caregivers, leading to emotional strain, financial limitations, and decreased productivity [12]. Moreover, the lack of access to early intervention, rehabilitation, and multidisciplinary care is also one of the reasons for differences in outcomes and restricts the possibility of optimal development [13].

Objective

To evaluate the association between developmental disabilities and chronic illnesses in young children and to identify key risk factors influencing their co-occurrence.

Methodology

This cross-sectional analytical study was conducted at Children Hospital and Institute of Child Health, Multan from May 2024 to May 2025. A total of 185 children were included in the study. Non-probability consecutive sampling was employed to recruit participants. All children meeting the inclusion criteria and presenting during the study period were consecutively enrolled until the required sample size was achieved.

Inclusion Criteria:

- Children aged 6 months to 5 years
- Children diagnosed with at least one developmental disability (e.g., global developmental delay, cerebral palsy, autism spectrum disorder)
- Children diagnosed with at least one chronic illness (e.g., congenital heart disease, asthma, epilepsy, diabetes mellitus)
- Children whose parents/guardians provided informed consent

Exclusion Criteria:

- Children with acute, self-limiting illnesses only
- Children with incomplete medical records
- Children with severe critical illness not allowing proper assessment
- Parents/guardians refusing consent

Data Collection

Data were collected using a structured and pre-tested questionnaire administered to parents or caregivers, along with a detailed review of the child's medical records. Information regarding demographic variables such as age, gender, and socioeconomic status was obtained. Prenatal and perinatal history, maternal health, antenatal care, mode of delivery, birth weight, prematurity and birth complications were captured. The postnatal factors included nutritional status, history of infections, hospitalizations, and immunization status were also recorded. Age-specific developmental screening instruments and clinical assessment by qualified medical personnel were used to conduct developmental assessment. The existence of

chronic conditions was established by clinical diagnoses and investigations documented, and subsequent history of treatment. The demographic characteristics (age, gender, socioeconomic status), maternal and birth-related factors, and postnatal exposures were the independent variables. Presence of developmental disabilities and chronic illnesses were the dependent variables. The main outcome measure was the presence of co-occurring developmental disabilities and chronic illnesses whereas the secondary outcomes were the severity and patterns of impairment.

Data Analysis

All collected data were entered and analysed using Statistical Package for the Social Sciences (SPSS) version 26. Quantitative variables, such as age, were reported as mean $\pm$ standard deviation, while qualitative variables were presented as frequencies and percentages. The association between developmental disabilities and chronic illnesses was assessed using the Chi-square test. A p-value of ≤ 0.05 was considered statistically significant.

Results

Data were collected from 185 patients, with a mean age of 2.8 ± 1.4 years. There was a male predominance, with 108 (58.4%) males and 77 (41.6%) females. The majority of participants belonged to a low socioeconomic status group (112, 60.5%), followed by middle (27.6%) and high (11.9%) socioeconomic classes. Developmental disabilities were present in 98 (53.0%) children, while 112 (60.5%) had chronic illnesses. Co-occurrence of both conditions was observed in 68 (36.8%) children, whereas 74 (40.0%) had only one condition and 43 (23.2%) had neither. Among children with developmental disabilities, global developmental delay was the most common type (44.9%), followed by cerebral palsy (27.6%), autism spectrum disorder (17.3%), and intellectual disability (10.2%).

Table 1: Demographic Characteristics, Disease Frequency, and Types of Developmental Disabilities (n = 185)

Variable	Category	n (%) / Mean $\pm$ SD
Age (years)	—	2.8 ± 1.4
Gender	Male	108 (58.4%)
	Female	77 (41.6%)
Socioeconomic Status	Low	112 (60.5%)
	Middle	51 (27.6%)
	High	22 (11.9%)
Developmental Disabilities	Present	98 (53.0%)
	Absent	87 (47.0%)
Chronic Illness	Present	112 (60.5%)
	Absent	73 (39.5%)
Co-occurrence	Both Present	68 (36.8%)
	Only One Condition	74 (40.0%)
	None	43 (23.2%)
Types of Developmental Disabilities (n = 98)	Global Developmental Delay	44 (44.9%)
	Cerebral Palsy	27 (27.6%)
	Autism Spectrum Disorder	17 (17.3%)
	Intellectual Disability	10 (10.2%)
Types of Chronic Illnesses (n = 112)	Asthma	33 (29.5%)
	Epilepsy	27 (24.1%)
	Congenital Heart Disease	24 (21.4%)
	Diabetes Mellitus	11 (9.8%)
	Others	17 (15.2%)

A statistically significant association was observed between chronic illness and developmental disabilities ($p = 0.01$). Among children with chronic illnesses, 68 (60.7%) had developmental disabilities compared to only 30 (40.5%) among those without

chronic illnesses

Table 2: Association Between Chronic Illness and Developmental Disabilities

Chronic Illness	Developmental Disability Present	Developmental Disability Absent	p-value
Yes (n = 112)	68 (60.7%)	44 (39.3%)	0.01
No (n = 73)	30 (40.5%)	43 (59.5%)	

Prematurity was significantly associated, with 46 (46.9%) children with developmental disabilities being premature compared to 20 (23.0%) in the non-disabled group ($p = 0.02$). Similarly, low birth weight was more common among children with developmental disabilities (50.0%) compared to those without (25.3%), showing a significant association ($p = 0.01$). Birth asphyxia was also significantly associated, present in 38 (38.8%) children with developmental disabilities compared to 18 (20.7%) in those without ($p = 0.03$).

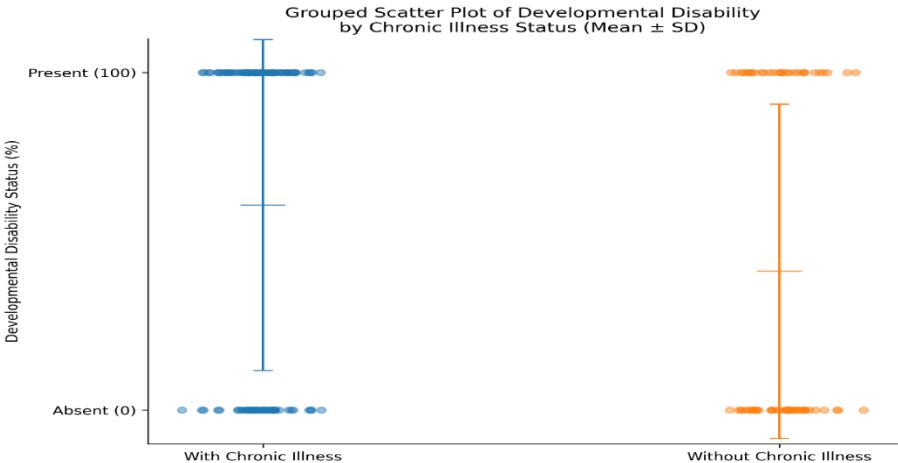
Table 3: Association of Risk Factors with Developmental Disabilities

Variable	Category	Developmental Disability Present n (%)	Developmental Disability Absent n (%)	p-value
Prematurity	Yes	46 (46.9%)	20 (23.0%)	0.02
	No	52 (53.1%)	67 (77.0%)	
Low Birth Weight	Yes	49 (50.0%)	22 (25.3%)	0.01
	No	49 (50.0%)	65 (74.7%)	
Birth Asphyxia	Yes	38 (38.8%)	18 (20.7%)	0.03
	No	60 (61.2%)	69 (79.3%)	

Prematurity increased the odds by 2.3 times (AOR = 2.3, 95% CI: 1.2–4.5, $p = 0.02$), while low birth weight showed an even stronger association with 2.7 times higher odds (AOR = 2.7, 95% CI: 1.4–5.1, $p = 0.01$). The presence of chronic illness was also an independent predictor (AOR = 2.1, 95% CI: 1.1–3.9, $p = 0.03$). Additionally, recurrent hospitalizations significantly increased the likelihood of developmental disabilities (AOR = 2.5, 95% CI: 1.3–4.7, $p = 0.01$).

Table 4: Multivariate Logistic Regression Analysis for Predictors of Developmental Disabilities

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval	p-value
Prematurity	2.3	1.2 – 4.5	0.02
Low Birth Weight	2.7	1.4 – 5.1	0.01
Chronic Illness	2.1	1.1 – 3.9	0.03
Recurrent Hospitalization	2.5	1.3 – 4.7	0.01



DISCUSSION

The current research compared the relationship between developmental disabilities and chronic illnesses in young children and provided the main clinical and socio-demographic risk factors that led to the co-occurrence of both diseases. The results reveal a significant amount of burden of both conditions, with over half of the children showing developmental disabilities (53.0%) and a greater percentage of having chronic illnesses (60.5%). It is worth noting that among the study's three-quarters of the population (36.8), co-occurrence of both conditions was evident in more than one-third, indicating a high degree of overlap that needs to be addressed together in clinical care. One major finding of this study is that there is a high correlation between chronic illnesses and developmental disabilities. The prevalence of developmental disabilities was much higher in children with chronic illnesses than in those without any chronic illnesses (60.7% vs 40.5%, $p = 0.01$). This finding is consistent with the prior studies, which have repeatedly indicated that neurodevelopmental outcomes could be impacted negatively by chronic medical conditions like epilepsy, congenital heart disease, and asthma because of hypoxia, frequent hospital admissions, abnormal metabolism, and decreased environmental stimulation [14]. The two-way relationship implies that not only do chronic illnesses lead to developmental delays, but also children with developmental delays are more susceptible to the acquisition of chronic illnesses [15]. Distribution of the developmental disabilities in this research showed that the most prevalent disabilities were global developmental delay, which was followed by cerebral palsy and autism spectrum disorder. This trend aligns with earlier studies in the same environment, where diagnosis is delayed and access to early intervention services is limited, leading to an increased prevalence of global developmental delay. The fact that most risk factors in such populations can be prevented or at least modified also underscores the importance of early screening and intervention programs [16].

Asthma and epilepsy were the most prevalent chronic diseases. This conforms to the past studies, which have found these conditions as causes of the chronic morbidity in the pediatric populations. Epilepsy has been greatly linked with developmental delay and cognitive impairment based on frequent seizures and neurological malfunction. Correspondingly, asthmatics among children can be subjected to intermittent hypoxia and limitation of activities, which indirectly affect development [17]. The paper also found some major prenatal and perinatal risk factors of developmental disability, such as prematurity, low birth weight, and birth asphyxia. These results are strongly supported by past studies, which highlight the crucial role of early-life insults in disrupting neurodevelopment. Premature babies and especially those who are underweight are at high risk because of underdeveloped organ systems, high vulnerability to infections and extended neonatal ICU stay. Neuronal injury and long-term developmental deficits are also caused by low birth weight and birth asphyxia [18].

Poor nutritional status and frequent hospitalisations were also significantly related to developmental disabilities, in addition to chronic illnesses, which are postnatal factors. Such findings reflect the cumulative burden of chronic diseases on a child's growth and development [19]. Hospitalisation can disrupt normal socialisation and learning processes, and malnutrition can affect not only physical but also brain development. Past studies have also established that children whose illnesses recur and those whose diet is of poor quality have higher chances of developing delays [20]. In the current research, multivariate analysis found prematurity, low birth weight, chronic illness, and frequent hospitalisations as independent predictors of developmental disabilities. These results support the multifactorial aetiology of developmental impairments and emphasise the necessity of specific interventions based on high-risk groups. Other studies have also highlighted the need to deal with modifiable risk factors in order to curb the incidence of developmental disabilities.

The clinical and the population health implications of this study are significant. The huge overlap between developmental disabilities and chronic illnesses indicates that the regular developmental screening must be integrated into the treatment of children with chronic illnesses. Timely intervention can be achieved by detecting at-risk children at an early age, which may lead to better outcomes in the long run. Moreover, fortification of maternal and child health services, neonatal services and accessibility of rehabilitation programs are critical measures to curbing this twofold burden. This study has some limitations in spite of its strengths. The cross-sectional design prevents the possibility of determining causal relationships between variables. Also, the research was carried out in one center and this could influence the generalization of the results. Clinical records and caregiver-reported information may also have reporting bias due to the reliance used. It is suggested that future longitudinal and multicentric studies be conducted to extend the information on the temporal relationship and mechanisms in developmental disabilities and chronic illnesses.

CONCLUSION

It is concluded that developmental disabilities and chronic illnesses commonly coexist in young children, with a significant proportion demonstrating overlap between the two conditions, and that children with chronic illnesses are at a higher risk of developing developmental impairments. Early-life factors such as prematurity, low birth weight, birth asphyxia, and recurrent hospitalizations, along with low socioeconomic status, play a critical role in increasing this risk. These findings highlight the importance of routine developmental screening, particularly in children with chronic conditions, to enable early diagnosis and timely intervention.

REFERENCES

1. Institute of Medicine (US) Committee on Nervous System Disorders in Developing Countries. Neurological, Psychiatric, and Developmental Disorders: Meeting the Challenge in the Developing World. Washington (DC): National Academies Press (US); 2001. 5, Developmental Disabilities. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK223473/>
2. Mastorci, F., Lazzeri, M. F. L., Ait-Ali, L., Festa, P., & Pingitore, A. (2025). Chronic Disease in Pediatric Population—A Narrative Review of Psychosocial Dimensions and Strategies for Management. *Children*, 12(8), 967. <https://doi.org/10.3390/children12080967>

3. Hamdani SU, Huma ZE, Wissow L, Rahman A, Gladstone M. Measuring functional disability in children with developmental disorders in low-resource settings: validation of Developmental Disorders-Children Disability Assessment Schedule (DD-CDAS) in rural Pakistan. *Glob Ment Health (Camb)*. 2020 Jul 13;7:e17. doi: 10.1017/gmh.2020.10. Erratum in: *Glob Ment Health (Camb)*. 2020 Aug 03;7:e20. doi: 10.1017/gmh.2020.13. PMID: 32913656; PMCID: PMC7443609.
4. Shabbir, S., Mahmood, K., Jamal, N., Ara, G., Fawad, B., & Salahuddin, S. (2025). Association of Possible Developmental Delays with Emotional and Behavioral Disorders, and Risk Factors in Children Under Six in Karachi, Pakistan: A Cross-sectional Study: Association of Developmental Delays with Emotional and Behavioral Disorders. *Pakistan Journal of Health Sciences*, 6(2), 88–94. <https://doi.org/10.54393/pjhs.v6i2.2738>
5. Gil JD, Ewerling F, Ferreira LZ, Barros AJ. Early Childhood Suspected Developmental Delay in 63 Low-and Middle-Income Countries: Large Within-and Between-Country Inequalities Documented Using National Health Surveys. *Journal of Global Health*. 2020 Jun; 10(1): 010427. doi: 10.7189/jogh.10.010427. DOI: <https://doi.org/10.7189/jogh.10.010427>
6. Abdoola S, Swanepoel DW, Van Der Linde J, Glascoe FP. Detecting Developmental Delays in Infants from A Low-Income South African Community: Comparing the BSID-III and PEDS tools. *Early Child Development and Care*. 2021 Mar; 191(4): 545-554. doi: 10.1080/03004430.2019.1628027. DOI: <https://doi.org/10.1080/03004430.2019.1628027>
7. Saleem J, Zakar R, Bukhari GM, Fatima A, Fischer F. Developmental Delay and Its Predictors Among Children Under Five Years of Age with Uncomplicated Severe Acute Malnutrition: A Cross-Sectional Study in Rural Pakistan. *BioMed Central Public Health*. 2021 Dec; 21: 1-0. doi: 10.1186/s12889-021-11445-w. DOI: <https://doi.org/10.1186/s12889-021-11445-w>
8. Zaib R, Yaqoob M, Iftikhar N, Qureshi EM, aur Rehman A. Delayed Speech in Children of Working and Non-Working Mothers in Lahore, Pakistan: Prevalence and Associated Factors. *Journal of Fatima Jinnah Medical University*. 2022; 16(3): 124-9. doi: 10.37018/GRMX3731. DOI: <https://doi.org/10.37018/GRMX3731>
9. Kumar R, Ali M, Pasha MS, Ansari HW, Durrani N. Knowledge, Attitude, and Practices of Parents Regarding the Red Flags of Developmental Milestones in Children Aged 0–5 Years in Karachi, Pakistan: A Cross-Sectional Study. *BioMed Central Pediatrics*. 2024 Feb; 24(1): 120. doi: 10.1186/s12887-024-04574-9. DOI: <https://doi.org/10.1186/s12887-024-04574-9>
10. Lipkin PH, Macias MM, Norwood KW, Brei TJ, Davidson LF, Davis BE et al. Promoting Optimal Development: Identifying Infants and Young Children with Developmental Disorders Through Developmental Surveillance and Screening. *Pediatrics*. 2020 Jan; 145(1). doi: 10.1542/peds.2019-3449. DOI: <https://doi.org/10.1542/peds.2019-3449>
11. Parts of the SWYC | Tufts Medicine [Internet]. [cited 2025 Feb 11]. Available from: <https://www.tuftsmedicine.org/medical-professionals-trainees/academic-departments/departments-pediatrics/survey-well-being-young-children/parts-swyc>.
12. Buckley N, Glasson EJ, Chen W, Epstein A, Leonard H, Skoss R et al. Prevalence Estimates of Mental Health Problems in Children and Adolescents with Intellectual Disability: A Systematic Review and Meta-Analysis. *Australian and New Zealand Journal of Psychiatry*. 2020 Oct; 54(10): 970-84. doi: 10.1177/0004867420924101. DOI: <https://doi.org/10.1177/0004867420924101>
13. Bishwokarma A, Shrestha D, Bhujel K, Chand N, Adhikari L, Kaphle M et al. Developmental Delay and Its Associated Factors among Children Under Five Years in Urban Slums of Nepal. *PloS One*. 2022 Feb; 17(2): e0263105. doi: 10.1371/journal.pone.0263105. DOI: <https://doi.org/10.1371/journal.pone.0263105>
14. Asim M. Silenced voices: Healthcare needs of children with disabilities in Pakistan. *J Ayub Med Coll Abbottabad* 2022;34(3):395–6
15. Kuruvilla S, Bustreo F, Kuo T, Mishra C, Taylor K, Fogstad H, Gupta GR, Gilmore K, Temmerman M and Thomas J (2016) The global strategy for women's, children's and adolescents' health (2016–2030): a roadmap based on evidence and country experience. *Bulletin of the World Health Organization* 94, 398.
16. Wagner, G.; Karwautz, A.; Philipp, J.; Truttmann, S.; Dür, W.; Waldherr, K.; Berger, G.; Zeiler, M. Mental Health and Health-Related Quality of Life in Austrian Adolescents with Chronic Physical Health Conditions: Results from the MHAT Study. *J. Clin. Med.* 2023, 12, 1927.
17. GBD 2019 Child and Adolescent Communicable Disease Collaborators. The unfinished agenda of communicable diseases among children and adolescents before the COVID-19 pandemic, 1990–2019: A systematic analysis of the Global Burden of Disease Study 2019. *Lancet* 2023, 402, 313–335
18. Akseer, N.; Mehta, S.; Wigle, J.; Chera, R.; Brickman, Z.J.; Al-Gashm, S.; Sorichetti, B.; Vandermorris, A.; Hipgrave, D.B.; Schwalbe, N.; et al. Non-communicable diseases among adolescents: Current status, determinants, interventions and policies. *BMC Public Health* 2020, 20, 1908.
19. Mutti, G.; Ait Ali, L.; Marotta, M.; Nunno, S.; Consigli, V.; Baratta, S.; Foffa, I. Psychological Impact of a Prenatal Diagnosis of Congenital Heart Disease on Parents: Is It Time for Tailored Psychological Support? *J. Cardiovasc. Dev. Dis.* 2024, 11, 31.
20. Colizzi, M.; Lasalvia, A.; Ruggeri, M. Prevention and early intervention in youth mental health: Is it time for a multidisciplinary and trans-diagnostic model for care? *Int. J. Ment. Health Syst.* 2020, 14, 23.