Annals of Human and Social Sciences
www.ahss.org.pk

RESEARCH PAPER

Nexus between Out of School Children and Child Disability: An Empirical Study based on household survey of Sindh, Pakistan

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ABSTRACT

In the contemporary world, no dimension of the world lives long without the aid of Goal-4 of SDGs focuses on inclusive, quality and equity based educational opportunities for everyone. The biggest barrier to achieve this goal is Out of school children. This paper analyses causal factors of this issue from child functioning perspective. This analysis uses microdata of Sindh MICS 2018-19 and the child disability is computed from the Child Functioning Module of the 5-17 Years-Questionnaire. Results of the study reveals that child disability is a significant determinant of out of school children. Female children are mostly likely to be out from the school as compare the male children; poverty also plays the pivotal role to keep children away from school. Children whose mothers are more educated and are living in the richer quintiles, have low risk of being out of school. Difficulties in child functioning domains such as seeing, self-care, communication and making friend are found significant determinants of out of school children.

| **Keywords:** | Child Disability, Child Functioning Module, Out of School Children, Pakistan, Sindh, Washington Group |

Introduction

Children not attending the school is a grave issue being faced by developing and less developed Countries. Pakistan has been suffering from this illness from decades, where every second child between the age of 5-16 is away from school. The debate on provision of formal education to children is getting heated with the passage of time as it remains an unfulfilled promise in many regions.

Since last century, early age learning and development is being emphasized and worked on. The World conference on Education-For-All (EFA) was held in 1990 at Jomtien, which lead to development of six educational goals. Goal 2 of EFA emphasized universal access and completion of Primary Education. Later on, Millennium Development Goals were agreed in 2000 which stressed achievement of universal primary education along gender equality and benchmark for learning outcomes.

There has been an impressive development afterwards but it also left gap between poor performing countries and those which worked on it and were close to meet the targets. After 2010, overall progress slowed down and inequalities of access and participation increased. Pre-schooling has increased but it was provided privately with high cost. It increased performance gap between children of richer and poorer families from beginning till primary and it also affected the level of endurance due to early learning on later progression. Issues of irregular attendance, children being over aged and failure to learn basic skills during primary schooling were also highlighted. (Lewin, 2015). Some progress

with few positive outcomes of previous efforts and still remaining huge areas for improvement lead to development of new targets for 2030.

In September 2015, United Nations General Assembly agreed on 17 new global Sustainable Development Goals (SDGs). Goal number 4 is specifically related to this study wherein member countries are required to ensure inclusiveness, equity and quality in education along with lifelong learning opportunities for everyone. First Sub Goal mentioned that every child should have free, complete, equitable, quality Primary and Secondary education with effective learning outcome. SDGs 2030 agenda was first adopted by Pakistan through a unanimous resolution of the Parliament.

Despite of all these measures, data form national survey shows a bleak picture for Pakistan which has been elaborated in table-1, the data is aggregate for primary and secondary age children. As per PSLM definition, Out of School Children (OOSC) are those who are not attending school between the age of 5 to 16.

Table 1
Comparative figures of Out of School Children (aged 5-16) from 2013-14 to 2019-20

OOSC (%)	Current Situation (2019-20)	Baseline (2013-14)
Pakistan	51	33
Punjab	56	27
Sindh	49	44
KPK	43	32
Baluchistan	36	51

The progress of OOSC indicator in all provinces is negative except Baluchistan; the plausible reason for this improvement may be the focus of last decade on Baluchistan to uplift Baloch people on social, economic and political level. Nevertheless, nearly half of the eligible children are out of school in Pakistan. The survey highlighted several reasons for this affliction.

Different studies have been conducted on the determinants of school dropouts and the out of school children and the various socioeconomic variables at individuals and households level are found the significant contributor which away children from school. The present study is conducted to gauge the impact of child disability on out of school children. From the theoretical perspective along with poor socioeconomic conditions, disability in the children makes children more deprive to spend their lives normally.

The United Nation's convention on the rights of disabled persons emphasizes to ensure the rights of disabled children on equal basis with other normal children. According to this convention it is the obligatory duty of every state to realize the rights of children with disabilities and make the policies to keep these children away from the risk of undergoing limited participation in the economic activities and developmental works. The disable persons are the reality of our world and world sustainable agenda declares that the disability-inclusive development is the inevitable for whole world. As far as education is concerned, the SDG indicator 4.5 discusses the elimination of gender inequalities in education and emphasizes on equal access to all levels of education as well as disabled children.

Assertively, the complete Goal-4 of SDGs sets out the target to ensure education and promote lifelong learning for all. Its first sub-goal emphasizes completion of primary as well as secondary education by all with effective learning outcomes. Indicators set benchmark for proficiency in reading and mathematics at different levels. Although, Pakistan has vowed to meet SGDs but these goals and targets are unattainable if such a huge chunk of population stays away from education.

Child Functioning

Students with physical and learning disabilities face a lot of challenges; child disability is also a barrier in the objective of human development. As this study is planned to assess that the child dis-functioning increases the likelihoods of school dropouts. According to Sindh MICS (2018-19) report less than 1% (i.e. 0.8%) population above age 18 in Sindh has functional difficulties, however the prevalence of disability between 5-17 years children is quite high which is 15 percent.

In 2001, revolutionary step was taken and UN Washington Group on Disability Statistics was established. The basic purpose of this group was to promote disability statistics and its uniform computation which is globally acceptance and comparable. In the disability statistics computation three different sets of questionnaires were developed, first one was based on short nature of questions which calculates functioning prevalence of adults. The second one was the extension of first questionnaire based on long questions with the same purpose of estimating adult functioning. For the current study's point of view, we would be more interested on the third questionnaire which is basically called Child Functioning Module (CFM) administered for two age groups one for under five children group and other for the group of 5-17 years' children. Both questionnaire is asked from child's mother or primary caretaker.

According to World Health Organization (WHO), disability of a person can be explained by problems with human functioning cause impairment, activity limitations or limited participation. Human functioning is classified into 13 domains which are See, Self-care, Walk, Hear, Recall, Communicate, Learn, Conduct, Adoptability, Concentrate, Friendship, Nervousness and Sadness/Depression. Child disability is usually an uncontrolled phenomenon. Parents of the disabled children wish them to progress like a normal person in all aspects of life including education. Through the special education, differently abled children can get education which empowers them to contribute and play their role in the society. An educated differently abled person can offer social benefits like knowledge sharing for society and can also earn private benefits like personal growth and monetary benefits; though to receive these benefits first social and private costs need be incurred.

Parents in less developed countries are solely responsible for, not only the physical care, but also to manage the finance which leads to indebtedness. Private costs in this perspective cannot be stretched further; increasing the role of state along with social welfare organizations. Pakistan adopted National policy for disabled persons in 2002 and signed Islamabad Declaration of Inclusive education in 2005. Further, national policy of education was adopted in 2017.

Table 2
Out of School Children Primary and Secondary for two time points

Sindh	2018-19	2014
Primary (5-9 years)	42.7	37.1
Secondary (10-14 years)	49.5	37.0

Earlier studies signify the importance of different socioeconomic variables, which impact on out of school children. In the current research, it is hypothesized that child disability is an import child deprivation which affects the child schooling. In this regards two research questions are developed and stated below:

Does the child disability is the one of the causal factor to keep child out from school?

What are the most important child malfunctioning domains which contribute out of school children?

Inequality in education indicators due to child disability

The socioeconomic survey (MICS) was conducted in Sindh (2018-19). In this report the functional difficulties are computed through Child-Functioning-Module. This section elaborates the inequalities in education indicators which are derived from child disabilities. In Sindh, Early Childhood Education (ECE) prevalence is 10.3%, from which the prevalence of disabled children is 7% and children without disability is 10.5%.
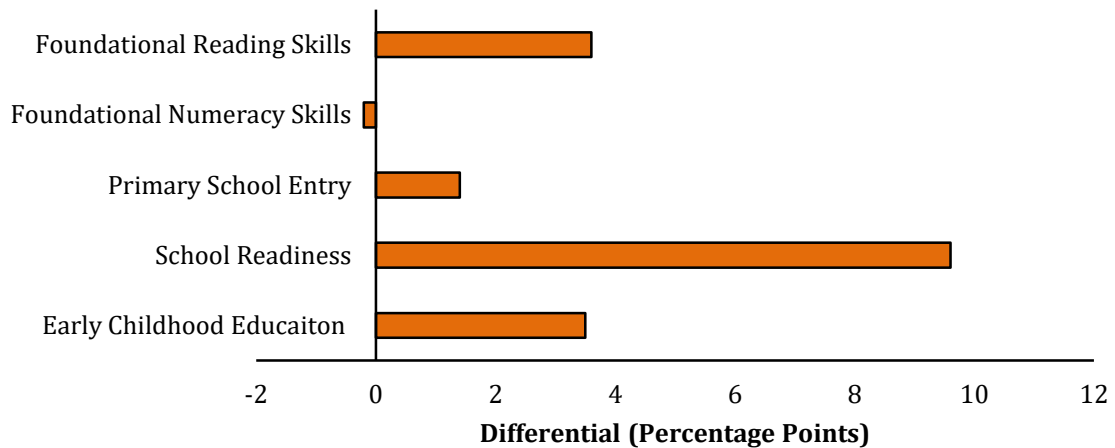

Figure 1. Difference in the prevalence Sindh, Pakistan between disable and non-disable children Source: Another's Computation from Sindh MICS 2018-19

Along with ECE the school readiness is an important education indicator which basically shows the readiness of family to start their children's education its prevalence at Sindh level is 57.2% and the difference between disable and non-disable children in this indicator is 9.6 percentage points. The percentage of Primary School Entry in Sindh is 17.2%, however no such big differential exist between disable and non-disable children for this indicator.

In the indicator of the education-quality 'foundational reading skills' huge inequality exists between non-disable and differently able students, however numeracy data is in favor of disable children though this inequality is not significant. The pictorial presentation (figure 1) of inequalities in the education indicators shows that the child disability is a driving force which creates differentials and make disable children more deprive.

Literature Review

Key studies conducted on the issues of out of school children and children with disability are reviewed and discussed in this section. Different researchers examined the relationship between out of school children and socioeconomic factors, however the studies on out of school children in relation with child disabilities are conducted by few authors and the existing literature identifies that this issues should be examined in deep.

Porteus *et al.* (2000) studied the reasons of children being out of school in South Africa, for such purpose they have selected three deprived urban communities under the jurisdiction of Gutenberg Department of Education. Through the process of door to door visits a sample of 93 OOSC, between 5 to 17 years of age, were selected. Techniques of initial contact interviews, in-depth interviews and group workshops were applied on the selected sample. Six underlying factors have been revealed from the applied techniques. Around 40.6% of participants thought "Poverty" as the main reason of OOSC, whereas 16.5%, 15.5%,

13.7%, 11.6% and 2.1% responses were in favor of "Individual child-related health, cognitive and attitudinal".

Ingrum (2006) focused on interaction between high school dropouts and socioeconomic status and learning disabilities, for this logit model has been used for empirical analysis and results show that number of school dropouts increases with increase in learning disabilities and with decrease in economic status and with interaction of these two variables as well.

A community survey conducted in South Africa in 2007 by Statistics South Africa. In this survey, data from 246,618 households is collected for the children aged 7 to 15 years. The survey provides the estimate of the number of compulsory school-aged children who are out of school and their characteristics/profile.

Fleisch, Shindler & Perry (2008) used the findings of that survey and found that children who are disable, not living with their biological parents, who themselves are the head of a household, living in a family eligible for social grants but for any reason not receiving it, children whose one or both parents are dead and children who are living in farms and small towns are more likely to be out of school.

Mukherjee (2010) has undertaken a field survey, to collect primary data, in selected rural areas of 4 districts of West-Benegal, India, to observe the status of out-of-school children and their characteristics. It was observed that 19% of surveyed children were out of school. The incidence of OOSC has positive and significant relationship with the backwardness of the area, poverty and lucrative earning opportunities for children, whereas, has negative relationship with informal schooling and with better school facilities.

Mogasale et al (2012) studied children with impaired vision and hearing, subnormal intelligence and chronic medical conditions and noted their performance in reading, writing, comprehension and calculation. He mentioned that 12.5% of sample children had dysgraphia, 11.2 % had dyslexia and 10.5% had dyscalculia. Overall, 15.17% of children had these kinds of specific learning disabilities, which was higher compared to previous estimates in India.

Sharma & Ng (2014) undertaken literature review to determine the ways to bring OOSC (especially OOSC with disabilities) into school and retain them. Various databases were searched to identify relevant articles for the review and articles which were published after year 2000 are included in the review only. The total of 23 articles is used in this review which has identified the economical, socio-cultural and school related variables that contribute in out of school children. Alternative education, rebates and incentives and community awareness programs are the strategies identified to bring OOSC into the schools. The review also found that there is insufficient research on the OOSC with disabilities; however, results of research on OOSC without disabilities could be helpful in the case of OOSC with disabilities.

Deluca, Tramontano & Kett (2014) have conducted the survey on disability and Inclusive Education. For this purpose, they have selected 67 head teachers, 183 teachers and 186 parents/caregivers of children with disabilities from 268 schools in the four selected districts of Mashonaland West Province (MWP), North Zimbabwe. The survey revealed that there is lack of training in special education need/IE, therefore more training is needed. Majority of respondents believe the shortage of assistive devices as the main hurdle for children with disabilities from going to school. Other hurdles include distance from school and transportation. Head teachers and teachers indicate human resource allocation and financial administration as the major issues.

Shanker, Marian & Swimmer (2015) conducted the study by reviewing the academic literature on interventions on out of school children around the world to provide a way forward for potential interventions in South Asia and elsewhere. This review highlights the effectiveness of government interventions to abstain children from laboring instead of taking education. In addition to this they also found that incorporation of OOSC data into larger data system will decrease the number of OOSC.

Fixing the Broken Promise of Education for All (2015) a report produced by the Hawke, A. (2015). This report summarized the work of the Global Initiative on OOSC and recommended that post 2015 development agenda should include matter of OOSC as high priority. The report highlighted the importance of national administrative data collection for better understanding of school attendance and learning especially in case of children with disabilities. According to the report the main reason of OOSC are the conflicts going on in the countries, gender discrimination, poverty, child labor, lack of schooling in languages children speak at home and disabilities of children.

Mithout, A. L. (2016) collects the MEXT data and conducts the ethnographic fieldwork in 2013 and 2014 to analyze the results of "inclusive education" reform after a decade of its implementation. Inclusive education is the reform which promotes the integration of less and dis-abled children within the Japanese education system and society. It has been found that effectiveness of reform depends upon the type of disability considered.

Manzoor, Hameed & Nabeel (2016) carried out the survey to identify the causes of OOSC to put forward necessary measures for their integration in education system. They have selected 433 OOSC with disabilities across all tehsils of district Sheikhupura and Kasur for structured interviews along with their parents. They have found that 96% of children with disabilities are out of school in Pakistan due to lack of school readiness, admission policy, poverty, child health conditions, distance from home to school and over protection of children with disabilities. They also highlighted other reasons such as limited budget, staff, physical infrastructure and transport facilities.

Vayachuta, Ubol & Soopanyo (2016) conducted a qualitative research to formulate the lifelong education model for "out-of-school" children and youth by investigating their current status along with concerned statistics, problems and causes of problems. For the purpose of this study existing books, articles, journals, databases, websites and digital media were reviewed and in-depth interviews have been taken from informed officials from related organizations and from "out-of-school" children as well. The study revealed that poverty is the main cause that children remained "out-of-school".

Bhatty, Saraf and Gupta (2017) conducted the intensive micro-study to investigate the impact of irregular attendance on the numbers of out of children in India. Survey of households and all government schools of panchayat have provided the sample population of the children belongs to the age group of 5-17 years. According to the findings of the survey 17.15% of total children are out of school. In their analysis they have used the nine explanatory variables; caste, gender, grade, mother's occupation, school-infrastructure, distance-to-school-cluster, highest grade in school, availability of female school teacher and attendance of teacher in the school. Results show grade, mother-occupation, infrastructure, high schools and teacher's presence have significant positive impact, whereas, distance, female-teacher have the inverse impact.

Manzoor, Hameed & Nabeel (2018) investigated the perceptions about the value of education. For this purpose, they have selected 433 parents of children with disabilities from two districts of Punjab. Data was collected through the interview cum questionnaire. The study reveals that majority of parents were positive towards the education of their children. Lack of school readiness, distance from special school and poverty were reported

as major barriers to education. They have argued that inclusive education is the only way forward.

Pradhan *et al.* (2018) conducted a demographic and health cross-sectional survey, by using systematic sampling, in Deh Chuhar a semi-urban town in Karachi, Pakistan, during December 2015 to February 2016. In this survey data collected from 245 households (women of childbearing age ranges between 15 to 49 years of age) for the children aged 3 to 15. The majority i.e. 60% of households were found poor and more than quarter i.e. 37% were found illiterate. It was found that 22.9% of children were found out of school with no significant gender difference. Study found that following reasons for out of school children; children's lack of interest in the education (42%), high educational expenses (23%), households' representatives perceived that their children were too young to attend school (16%), Admission related concerns (7%) and physical and mental impairments in the children (5%), moreover, children's requirement for earning and unavailability of transport were among the least cited reasons.

Rehman & Khan (2021) conducted a time series study and collected the secondary data from the World Bank (2019) for the period 2002 to 2017 to measure the impact of GDP per capita, population growth and inflation on child labor represented by out of school children by applying the empirical technique. They found that inflation and population growth have positive while GDP per capita has negative relationship with out of school children.

Ambreen & Mohyuddin (2022) examined the overall misrepresentation of OOSC in Pakistan and observed that children who are not included in the national database are remained deprived. Data was collected from educational policies and reports and from interview with native community and stakeholders. On analysis it is found that no work has been done in past regarding calculation of number of OOSC in Pakistan. The study concluded that for effective policy making regarding OOSC data in respect of semi-visible and invisible OOSC should be gathered and included in the national database.

Thurlow, Sinclair & Johnson (2002) discussed the high dropout rates in children with disabilities and identifies the characteristics of dropouts which mainly include children with disabilities and belongs from low-income group families.

After reviewing the literature of research studies published locally and internationally it is revealed that there are very few studies have been conducted which discuss the relationship between out of school children and disabilities in children. This shows the significance of research in this area to enhance the understanding of relation between out of school children and children disabilities. In Pakistan, some studies for limited districts have been conducted by researchers; however, no study regarding relationship of out of school children with disabilities has been conducted in Sindh.

Another research gap is also found in the existing literature that the disaggregated impact of child dis-functioning on out of school children is not estimated. Disaggregated analysis can be useful to understand the intensity of each domain in relation with out of school children and can be used to provide coping strategies against the various dis-functionalities of child.

Material and Methods

To perform the empirical analysis, the microdata of Sindh MICS 2018-19 is used. It is the largest socioeconomic and district level representative survey of Sindh, Pakistan based on the sample of 20,540 households across the province. In this survey total 14,690 households are identified with at least one child aged 5-17 from which total 14,452 mothers/ caretakers are interviewed. Usually the prevalence of disability is reported less,

in this regard the large sample is required to perform the disability analysis. The data of 14,452 children is good enough to achieve the desire level of significance. In MICS, the functional difficulty variable is computed by using the Washington Group Child Functioning Module (CFM).

Computation of disability variable

Child Functioning Module (CFM) is developed by United Nation's Washing Group on disability statistics is used in the 6th round of MICS globally, simultaneously in Sindh MICS 2018-19 same methodology is used to compute disability variable. As this module focuses on the children age 5-17 years in this connection MICS uses a separate questionnaire of children of age 5 to 17 years and these questionnaire is responded by mother/ primary caretaker of every child.

The CFM seeks to quantify the degree to which kids struggle in the subsequent 13 domains of child functioning such as seeing, hearing, walking, self-care, talking, learning, remembering, thinking, accepting change, managing conduct, making new friends, anxiousness, and sadness are among the functional domains and these all domains are included in the Questionnaire for Children Ages 5 to 17. As the disability is totally a qualitative response, to make these responses into quantitative nature, the functional difficulty of a child is classified into following four responses.

- No difficulty
- Somewhat difficulty
- A lot of difficulty
- Cannot do at all

Out of all 13 domains, two domains of child functioning anxiety and depression have different nature and to capture the dis-functioning in these domains following options are asked.

- Never
- Few times a year
- Monthly
- Weekly
- Daily

For the calculation child disability, having answered "A lot of difficulty" or "Cannot at all" to questions within any of the listed domains is considered to have a functional difficulty for children aged 5 to 17 years, with the exception of the last two domains of anxiety and depression, where the response category "Daily" is taken into account.

Model Specification

To estimate the probabilities, the out of school children is modeled by using the binary logistics model. In current study, the dependent variable is of binomial nature as it has two possible outcomes, 1 if a child is out-of-school and 0 other wise. The general mathematical function can be formed as:

$$\Pr(OOSC_i) = \Upsilon_i = f(dis_i, \boldsymbol{X}'_i, \boldsymbol{Z}'_i) \tag{1}$$

Where, Υ_i is the probability that the child is out-of-school, *dis* shows the children with disability, $\boldsymbol{X}$ represents the matrix of control variables of child's individual characteristics and $\boldsymbol{Z}$ represents matrix of control variables at household level.

The logistic regression model specifies as:

$$\Upsilon_i = \frac{e^{\alpha + dis_i + X'_i + Z'_i\theta}}{1 + e^{\alpha + dis_i + X'_i + Z'_i\theta}} \tag{2}$$

To convert the responses into odds-ratio or relative risk from the probabilities the expression of the logit model is given as under:

$$ln\left(\Upsilon_i/1 - \Upsilon_i\right) = \alpha + dis_i + X'_i + Z'_i\theta \tag{3}$$

Where, $\Upsilon_i/1 - \Upsilon_i$ is the ratio of the probability of success and the probability of failure make odds ratio. The extended logistic regression model to estimate the odd-ratio is expressed as:

Model-I

$$ln\left(\Upsilon_i/1 - \Upsilon_i\right) = \theta_0 + \theta_1 Gen_i + \theta_2 Age_i + \theta_3 Disability_i + \theta_4 WQ_i + \theta_5 ME_i + \gamma_i$$
$$(4)$$

This model helps to answer the first research question of the estimation of impact of disability on the out of school children. The second research Model is used to measure disaggregate impact of child functioning dimensions on the dependent variable and the following is the extended form of the model.

Model-II

$$ln\left(\Upsilon_i/1 - \Upsilon_i\right) = \beta_0 + \beta_1 Gen_i + \beta_2 Age_i + \beta_3 WQ_i + \beta_4 ME_i + \beta_5 DS + \beta_6 DH_i +$$
$$\beta_7 DSC_i + \beta_8 DC(IN)_i + \beta_9 DC(OH)_i + \beta_{10} DL_i + \beta_{11} DCom_i + \beta_{12} DAC_i + \beta_{13} DCB_i +$$
$$\beta_{14} DMF_i + \beta_{15} Anx_i + \beta_{14} Dep_i + \epsilon_i \tag{5}$$

Description of the dependent and the explanatory variables used in the both models are presented in table-3.

Model's Diagnostics

To assess the fitting of the non-linear regression, the log-likelihood statistic is computed and as per the general understanding, greater the value of Log Likelihood among the models indicates that the model is best-fit, as the value of Log-Likelihood reported in negative therefor another interpretation in terms of absolute value; the lower log-likelihood shows the model is best fit. The computed log-likelihood is used in the Log-Likelihood ratio (LR) test which is also called omnibus-test, follows the Chi-square distribution. It statistically tests, whether the coefficients of explanatory variables have significant impact jointly on the dependent variable.

Alternative diagnostic for the non-liner modelling is Pseudo-R^2 which provides the quasi-look of original R-square (*goodness of fit*). Different statistics of Pseudo-R^2 are available in the literature and analysis software also provides some common Pesudo-R-Sqr. measures such as McFadden, Nagelkerke and Cox-Snell, in the present study the results of Nagelkerke are reported. According to Gujarati (2004) the goodness-of-fit statistics are not much important in the probabilistic modeling, however the significance and signs of coefficients are important for econometric explanation of regressors.

Table 3
Description of variables included in Model-I and Model-II

Var. Notation	Var. Name	Description
Gen	Gender	Child gender, dichotomous responses 1 for boys and 0 for girls
Age	Age	Ages are in years which is the covariate variable and child age ranged from 5 to 17 years.
Disability	Child Disability	Computed in MICS by using CFM, 1 shows child is disable and 0 otherwise.
WQ	Wealth Quintiles	Wealth Quintile is computed in MICS on the basis of household's assets by using the approach of PCA. Wealth quintile variable has five different categories 0 to 4; 0 means poorest and 4 is for richest.
ME	Mother's Education	Mothers education is divided into five categories; where 0 'None/ pre-primary', 1 'primary' 2 'middle', 3 'secondary' and 4 'higher'.
DS	Difficulty in seeing	Child difficulties in the set of all child functioning is recorded into four different categories. 0 'No-difficulty', 1 'somewhat difficulty', 2 'a lot of difficulty' and 4 'cannot do at all'.
DH	Difficulty in hearing	
DSC	Difficulty in self-care	
DC(IN)	Difficulty in communication inside home	
DC(OH)	Difficulty in communication outside home	
DL	Difficulty in learning	
DCom	Difficulty in communication	
DAC	Difficulty in accepting changes	
DCB	Difficulty in controlling behavior	
DMF	Difficulty in making friend	
Anx	Anxiety	For the domains of anxiousness and depression the dis-functioning is recorded into five different categories, 0 'Never' 1 'few times in a year', 2 'monthly' 3 'weekly' 4 'daily'.
Dep	Depression	

Empirical findings

This section provides the empirical analysis on the relationship between the out of school children and children with disability. The section is divided into two parts, first part provides descriptive statistics analysis and the later part provides the inferential statistical analysis. Child and housing characteristics are the important explanatory variables in the model such as the age of child, wealth index and mother's education.

Table 4
Region wise descriptive figures for individual and household level variables

	Child Age (years)		Wealth Quintiles		Mother's Education		Child Education	
	mean	Sd	mean	Sd	mean	Sd	mean	Sd

Sindh	10.5	3.7	1.8	1.4	0.7	1.3	0.8	1.0
Urban	10.6	3.8	2.7	1.1	1.3	1.5	1.1	1.1
Rural	10.3	3.7	0.9	1.0	0.2	0.7	0.6	0.9

In the microdata set the mean age of the child is 10.5 years, however no significant different exists in the mean age with respect to regions. The mean wealth-quintile of households in Sindh is around 2 (i.e. lower middle class), though the huge inequality is reported between urban and rural areas. Mother's average education at aggregate level is in between pre-primary and primary while the mothers who are living in urban areas are more educated than rural mothers. Children of Sindh (aged 5-17) irrespective with disability or not have poor education level which is in between ECE and primary, similarly the urban children have good opportunity to get education and have higher education level as compared to children who are living in rural areas.

Table 5
Gender, region and wealth wise descriptive statistics

	Out of School Children (%)	Child Disability (%)	Mother's Literacy (%)
Sindh	47.2	15.0	31.0
Boys	41.1	14.8	31.0
Girls	54.0	15.2	31.0
Urban	33.2	17.1	48.4
Rural	60.3	13.0	14.4
Poorest	75.7	11.9	3.9
Richest	14.8	16.4	76.4

According to computed results from table-4 almost half of the children of age 5 to 17 years are out school and the prevalence of this indicator is higher for girls than boys. Child disability is reported 15% among the children 5-17 years in Sindh, however this deprivation is not categorically associated with child gender, area of residence and the household wealth status. Mother's literacy has huge inequality in the regions and the wealth quintiles. According to the theory, mother's education plays a vital role in the child education so regional and income inequalities are significant derivers of the out of school children.

Table 6
Logistic Regression results of Model-I for Out of School Children

Variables	Beta-coefficients	Significance (prob.)	Odds Ratio	C.I. (95%) for Odds Ratio	
				Lower	Upper
Non-disable (Ref. cat.)					
Disability	0.295	0.000	1.34	1.26	1.43
Control Variables (individual)					
Girls (Ref. cat.)					
Boys	-0.681	0.000	0.51	0.48	0.53
Child Age	0.046	0.000	1.05	1.04	1.05
Control Variables (household)					
Wealth Quintiles					
Poorest (Ref. cat.)					
Poorer	-0.648	0.000	0.52	0.49	0.56
Middle	-1.305	0.000	0.27	0.25	0.29
Richer	-1.674	0.000	0.19	0.17	0.20
Richest	-2.110	0.000	0.12	0.11	0.13
Mother's Education					
None/ pre-primary (Ref. cat.)					

Primary	-0.872	0.000	0.42	0.39	0.45
Middle	-1.063	0.000	0.35	0.31	0.39
Secondary	-1.313	0.000	0.27	0.24	0.30
Higher	-2.110	0.000	0.12	0.10	0.14
Constant	1.078	0.000	2.94		
n	14,440				
Pseudo R-sqr. (naglekarke)	0.317				
(-2)Log likelihood	45,124.382				
LR (omnibus test)	Chi-sqr=11,027.194		P-vlaue: 0.000		

The Model-I is estimated to measure the impact of child disability on the child schooling status. The results of coefficients with p-vlaues and the odds ratio along with the confidence interval at 95% confidence-level are presented in the table-5. The values of odds ratio present the expected change in the likelihoods of out-of-school children due to per unit change in the explanatory variables, this change is perceived with respect change in reference category and which is also called omitted category. If the odd size is exactly 'one' means the explanatory variable has no any association with the dependent variable. The reported value of odd ratio is greater than 1, reflects the positive the association between explanatory variable and the response variable, while the odds ratio is lesser than on, indicates the inverse relationship between variables.

According to the results the gender variable is negatively associated with out of school children shows that the girls are more likely to be out of school as compared to reference category 'boys' in Sindh. The estimated odds ratio of gender is 0.51 which is below 1, concluded that the boys are 49% less likely to be out of school as compared to the reference category (i.e. girls). The age variable is positively related with the dependent variable, shows that as the child age increases the odds of out of school increase, estimated results are aligned with the research is conducted by Satti and Jamil (2021).

The main variable of child disability is showing the positive/ direct association with the dependent variable, the simplest interpretation of this relation is that the both variables are moving in same direction, as the difficulties of child in functioning increase so the chances of the children to be out of school increase. The odds ratio of this coefficient is 1.34, which may also be interpreted as in percentage form, the probability of children with disability to out of school is 34% higher than the children which are not disable. Present results are similar with analytical conclusions are drawn in the earlier studies of UNCEF (2015) for Pakistan and Manzoor, Hameed & Nabeel (2016) for two districts of Punjab.

The wealth quintiles are highly significant and negatively associated with the variable of out of school children, that shows the odds of a child to be out of school are much higher in the poor families. Like the odds ratio of middle quintile is 0.25 which is less than 1, mean 75% middle class families children are less likely to be out of school as compared to the children of poorest families. If we observe the coefficients of all factors of wealth quintile, the chances of children to be out of school decreases as their family's wealth status improves. Results are consistent with economic theory and earlier studies conducted by using wealth quintiles. Impact of mother's education is highly significant with the variable of out of school children and negative signs of coefficients of the categories of mother's education illustrates that the probability of out-of-school declines as the mother's education increases. To understand the odds ratio, the odds of children to be out-of-school are 88% less likely for those whose mothers are highly educated than their uneducated mother counterpart; results are in line with (Satti and Jamil, 2021).

The diagnostics of model, such as LR test (omnibus test) with the null hypothesis of 'model is not overall good-fit' or 'explanatory variables do not significantly affect dependent variable jointly' shows the estimated model is overall good fit and have overall significance.; as the Ho is rejected with the p-value of 0.000 and chi-square is 11,027. The coefficient of determination Pseudo R-square is 31.7%.

Table 7
Logistic Regression results of Model-II (disaggregated model) for Out of School Children

Variables*	Beta-coefficients	Significance (prob.)	Odds Ratio	C.I. (95%) for Odds Ratio	
				Lower	Upper
Control Variables					
Gender	-0.677	0.000	0.51	0.49	0.53
Child Age	0.046	0.000	1.05	1.04	1.05
Wealth Quintiles	-0.548	0.000	0.58	0.57	0.59
Mother's Education	-0.499	0.000	0.61	0.59	0.62
Difficulty in Functioning Domains					
Seeing	0.298	0.000	1.35	1.19	1.52
Hearing	-0.050	0.494	0.95	0.82	1.09
Self-care	0.235	0.000	1.26	1.13	1.41
Communication inside home	0.459	0.000	1.58	1.34	1.87
Communication outside home	0.178	0.029	1.19	1.02	1.40
Learning	0.052	0.374	1.05	0.94	1.18
Concentrating	-0.026	0.654	0.98	0.87	1.09
Accept changes	-0.231	0.000	0.97	0.73	0.86
Controlling behavior	0.020	0.544	1.02	0.96	1.09
Making friends	0.079	0.064	1.08	0.99	1.18
Anxiety	0.000	0.990	1.00	0.96	1.04
Depression	-0.001	0.956	0.99	0.96	1.05
Constant	0.980	0.000	2.67		
n	14,353				
Pseudo R-sqr. (naglekarke)	0.319				
(-2)Log likelihood	44,813.205				
LR (omnibus test)	Chi-sqr=11,001.976		P-vlaue: 0.000		

*variables are taken as covariates

The disaggregated model is executed to examine the functionality wise impact on out of school children. Some domains are not included in the model such as walking due to very less number of children found with this problem in the sample and inclusion of it reduces the *n* for modeling. The child functionality of seeing has positive and highly significant impact on out of school children. The positive sign indicates that as the difficulty of seeing increases, the possibility of out of school rises. In all the explanatory variables of child functioning the omitted category is 'no difficulty/never' means a normal child. So the

child with difficulty of seeing are 35% more likely to be out of school as compare to the normal children. Results reveal the domain of hearing is insignificant.

Self-care is an important child functioning which is defined as, it is the act of looking out for oneself by engaging in healthy activities and proactive sickness management when necessary. Every day, people make decisions about their diet, exercise, sleep, and dental care as a sort of self-care. The lacking in self-care is the big domain of disability, in this connection this regressor has highly statistical significant association with out-of-children. It is defined as; the increasing difficulty of child self-care rises the chances of their out of school. The odds ratio self-care is 1.26>1 which shows the positive relationship with dependent variable and it says that the probability of out of school is expected to be 1.26 times more if child is facing difficulty in self-care.

Communication functioning is further divided into two categories, communication of child inside home and outside home. As the child communication functionality is an important domain of concern with child education and it is also found significant in the model, though the responsiveness of communication inside home is more than the responsiveness of child communication outside home. The likelihoods of a child to be out of school is 58% more than the child who is not facing any difficulty in communication.

In the logit model the domains of learning and concentrating are not found significant with the issue of out-of-school children. One believable reason for this insignificance may be that these domains of child functioning are more related to the academic performance and the difficulty in theses dimension does not qualify child directly disable. The variable of accept changes found in opposition with the theory, it reflects that the increase in difficulty to accept changes decreases the chances of out of school, but it is interesting to note that the value of odds ratio for accept changes is quite near to 1, which means there is almost no impact of this domain on the response variable.

Making friends is an important aspect of the socialization and the child loneliness or to work in isolation can also one of the reason of out of school children. In the empirical model, this domain found significant and the difficulty in making friends is positively related with the variable of out of children. The odds ratio of this domain is 1.08 which indicates that the odds of out of school is expected to be 1.08 times more if child is suffering from the dis-functioning of making friends.

As per the results of Model-II, difficulties in controlling behavior and the anxiety/ depression complaints of a child do not cause in their out from school. All three domains' odds ratio are almost 1 showing indifferent behavior with the variable of out of school children. The model-II has very healthy log likelihood value and LR is highly significant and shows the model is overall significant and good-fit.

Conclusion

The present research analyzed the relationship between the 'out of school children' and the 'child disability' and the second component of this study was to identified the child functioning domains in which they are facing lot of difficulties and this deficiency significantly contributes in keep away children from school. This analysis is carried out on the microdata of Sindh MICS 2018-19 which was surveyed by Sindh Bureau of Statistics with the technical support of UNICEF. During examining the relationship, it was learnt 47.2% children of school going age are out of the school, while this incidence has much gender wise, area of residence wise and wealth quintiles wise inequality. As per child functioning data, total 15% children aged 5-17 years are reported disable in Sindh. We find that, contrary to the common perception the prevalence of children with disability would be higher in the most deprived segments of the society; however, it is found that the disability is relatively

higher in the urban areas as compared to rural and relatively higher in the richer quintile than poorer.

This study concludes that, the child disability significantly affected the child education and it increases the risk of keep away children from school. The probability of children with disability are out from school is 34% higher than the children which are not disable. Important control variables of individual nature show that, the girls are more likely to out from school as compared to their counterpart (male children) and the increasing age of the child also raises the risk of children out from school. The control variables at household level, wealth quintiles and mother's education both reduce the chances of a child to out form school. Literature conforms the strong association between poverty and child education and our study also reached on the conclusion that if child is disable and residing in the poorest quintiles have strong chances to be out from school.

Secondly, the findings of the econometric model of child functioning domains show that the seeing, self-care, communication and making friend are most impacting and statistically significant child-functioning domains. 'Lot of difficult' or 'cannot do at all' in these domains significantly cause the children out from school. Child learning, concentration and state of anxiety and depression are not found the substantial drivers out of school children. As per our analysis these dimensions are much more related to the quality of education and the lacking of a child in these dimensions may affect child learning process badly.

Finally, we conclude and suggest that, keeping the impact of control variables, the child disability is the significant determinant of the out of school children. Severe difficulties in some domains of child functioning such as seeing, communication and self-care are the important contributors to keep out children from school. The children having difficulties in functioning and belongs to the poor families, though their mothers are uneducated are flagged as the most deprived children of our society with respect to our dependent variable OOSC. These children need special attention of government and welfare organizations, in this regards authors suggested that the awareness should be raised in the favor of this marginalized part of the society. Government may support to these in the provision of equipment for disabled children and the government should increase the network of special education so the out of school prevalence may improve. Moreover, public and private sectors should ensure the job opportunities for the differently abled persons.

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