

RESEARCH ARTICLE

## **Prevalence of Behavioral Problems among Pakistani Children with Down Syndrome: A Comparative Study of Typically Developed Children and Children with Down Syndrome**

*Amna Hassan<sup>\*,#</sup>, Nazia Iqbal<sup>\*\*</sup>, Seema Gul<sup>\*\*</sup>, Samia Mazhar<sup>\*\*\*</sup>*

<sup>\*</sup>Department of Psychology, University of Wah, Wah Cantt, Pakistan; <sup>\*\*</sup>Department of Psychology, International Islamic University, Islamabad, Pakistan; <sup>\*\*\*</sup>Department of Applied Psychology, Riphah International University, Islamabad, Pakistan.

### **Abstract**

To determine prevalence of behavior problems among children with Down syndrome and normal children as well as to explore the relationship between intelligence level and problems in behavior among normal and DS children in Pakistan. The study used a quantitative research design, and questionnaires were used for data collection purpose with diagnosed children with DS (N=40), and normal children (N=40) with age ranges from 8 to 11 years, from Taxila, Wah Cantt, Rawalpindi, Islamabad and Haripur. The statistical analyses of correlation, t-test and ANOVAs were used. Results showed that 60% Down syndrome children show high score on CBPQ (M=136.95, SD=25.77), whereas 100% normal children show low score on CBPQ (M=91.30, SD=11.37). A negative relationship was found between intelligence level and behavior problems ( $r=-0.603^{**}$ ,  $p<0.01$ ). Down syndrome children show more behavioral problems than normal (N=80) ( $t=-10.24$ ,  $p<0.01$ ). *ASEAN Journal of Psychiatry, Vol. 23(5), May 2022: 1-12.*

**Keywords:** Behavioural Problems, Child Behavioural Problems Questionnaire, Colored Progressive Matrices, Down Syndrome, Intelligence

### **Introduction**

Compared to other developmental disorders, the prevalence rate of Down syndrome is very high [1]. It is a chromosomal disorder that is genetically identified by phenotypic features and developmental delay. Three types of Down syndrome are trisomy 21 presence of 47 chromosomes, translocation number of chromosomes are normal, but the material of extra chromosome 21 is attached to chromosome 14 or another chromosome, and mosaicism some cells have 46 and some cells have 47 chromosomes. [2] Typical features of Down syndrome are abundant neck skin; mouth corners turned downward, general hypotonia, flat face, dysplastic ear, an abnormally small chin, *i.e.*, microgenia, a round face, protruding or oversized tongue, *i.e.*, macroglossia, an almond shape to the eyes caused by an epicanthic fold of the eyelid [3], the separation between the upper and lower eyelids,

*i.e.*, palpebral fissures and white spots on the iris of the eye, and the gap between first and second toes [4]. Though not all types of Down syndrome children have these features, primarily mosaic cases, the presence of most of these features, along with the history of developmental delay, is a clear indication of Down syndrome. However, these features may vary significantly from one individual to another, and, contrary to popular opinion, the number of characteristics present does not predict the level of intelligence. Children with Down syndrome usually tend to have lower than average cognitive abilities. Generally, these people's cognitive skills fall in the moderate to severe categories of mental retardation [5]. Some of the individuals that have been supported by their families since their birth, and got proper help from psychotherapists, may show improvement in their behavioural characteristics as well as their cognitive abilities. The average IQ of children with Down syndrome is around 50, compared to normal

children with an IQ of 100 [6]. Long-standing difficulties with intelligibility can presumably be attributed to underdeveloped phonological patterns associated with Down syndrome [7]. Moreover, in children with down's syndrome the non-fluency of speech and language are considered to be very common [8].

Usually, behavioural problems in children do not indicate any developmental disturbance. Problems in behaviour are observed in both typically and abnormally developing children. Behavioural problems are common among children with developmental disorder as well as among school-aged children. Reports indicate that up to 15 to 25 per cent of school-aged children show behavioural or psychosocial problems [9]. Outcomes of child behaviour and development are affected by various factors, including factors at individual, family and community level [10]. Individual-level factors include child health, temperament, biology, genetics, and age. Family level variables that may affect child behaviour and development may consist of family structure and role; parenting beliefs, practices and goals; parental physical and mental health status; and household socioeconomic status [11]. Neighbourhood characteristics, peer influences, schools, health care and economic opportunities like factors are included in macro-level factors. Each of these variables has been shown to have either direct or indirect effect on child developmental issues such as behavioural problems, academic and school performance, and emotional health. In Pakistan, more than ninety percent of Down syndrome cases are accurately diagnosed with the help of clinical features in the early years of their lives [12]. Children with Down syndrome often have behavioural and physical problems. They are generally mildly to moderately intellectually disabled. Their language is delayed. They use few words and speak less. Their speech is usually unintelligible. The weakness in communication is observed throughout their lives [13]. They tend to engage in problematic behaviour such as doing the same thing repeatedly, disobeying orders, talking with themselves and avoiding others. Because of several psychological problems, these children need supervision throughout their lives [14].

Many areas of the Down syndrome behavioural phenotype have been well researched, with strengths and weaknesses identified in information processing, social functioning, motor development, and language. Another area of potential importance in the Down syndrome behavioural phenotype relates to the personality-motivational style. A more nuanced exploration of personality-motivation in Down syndrome reveals great complexity in personality

development and motivational style over time. In addition to these positive perceptions of personality in individuals with Down syndrome, other research reports have described individuals with Down syndrome as showing a specific motivational orientation involving lower levels of task persistence and higher levels of off-task social behaviours [15]. This lowered persistence is sometimes complemented by a stubborn or strong-willed personality streak, also described in studies of temperament in Down syndrome [16,17]. Guo et al. in 2008 reported that the prevalence of behaviour problems, especially problems related to learning, communication, and psychosomatic issues, in customarily developed children aged 3 to 5 years is above average in Changsha, China. McCarthy conducted a longitudinal cohort study of 50 people with Down syndrome in 2008. They were assessed with the same behavioural measure used in both childhood and adult life. The early risk factors assessed included childhood functioning, childhood psychopathology and early family environment as determined by measurements of parental mental health, quality of parental marriage and social background. Children with Down syndrome at risk for severe behaviour disorder in adult life may be identified in childhood, and appropriate interventions offered to reduce their risk [18]. Moreover, Fidler et al. (2008) observed deficits with the development of means-end thinking in pre-school-aged children with Down syndrome relative to children with other developmental delays. Learning for children with Down syndrome between birth and 11 years old can be characterised by difficulty maintaining existing skills and constant use of counterproductive strategies for novel problem-solving tasks.

The literature has documented that associated behavioural problems are common in mentally disabled children, particularly in younger and lower IQ children. Children with Down syndrome were selected because of the high prevalence rate of this disorder. Moreover, a quick diagnosis can be made in the case of these children based on their facial and physical features and observable developmental delays. As the disorder is usually diagnosed early, parents of such children are more ready to accept their children's limitations than is the case with other forms of developmental disorders. Prior research demonstrated that children with higher intellectual ability show a smaller number of problems in behaviour. The present study aims to understand the relationship between intelligence and behaviour problems among children with Down syndrome. The prevalence of behavioural problems is also compared between groups, *i.e.*, regular and Down syndrome children. To study the behavioural problems of such

children, their behaviour can be cured, re-shaped and children with Down syndrome are educating in mainstream schools, how can they be handled while keeping in view their behavioural problems. Due to their low mental and disturbing behaviour, teachers and other average students of mainstream schools should be instructed to deal with special children. Besides this, parents should also be taught that these children need special attention and care in every aspect of their lives. Enriched therapies since their early childhood would be beneficial for such children in controlling their aggression, self-injurious behaviour, hyper activity and withdrawal behaviours. Dispositional factors such as inheritance, ecological factors like poverty, inadequate housing, and family factors like divorce, loss or death of a parent etc., have influenced the developmental process of normal children and Down syndrome children [19]. By understanding these factors that contribute to the behavioural problems not only in children with Down syndrome but also in typically developed children, researchers may design proper intervention strategies for such children. By doing this in time, the behavioural problems in children can be rooted out easily. Still, if we ignore these problems in childhood, then these become more strong habits of individuals and become challenging for therapy providers and caregivers as well. Through this research attention of parents or caregivers can also be drawn toward the original causes of behaviour problems. When all these aspects should be focused on, then these children would be able to spend life in a much better way.

### **Objectives**

Following are the main objectives of the study;

1. To investigate the prevalence of behavioral problems among children with down syndrome
2. To study the relationship between intelligence level and behavioral problems among children with Down syndrome and normally developed children
3. To determine the level of intelligence and prevalence of behavioral problems in children with Down syndrome and normal children
4. To explore the gender difference in Down syndrome population in expressing problems in behaviour

### **Hypotheses**

The hypotheses of the study are as follows:

- modified with the help of behavioural therapies. If
1. The prevalence of behavioural problems in children with down syndrome will be higher than the prevalence in normal children
  2. There will be a relationship between intelligence and behavioural problems shown by children with Down syndrome.
  3. Down syndrome children with above-average intelligence will have fewer behavioural problems than children with average and below-average intelligence.
  4. Normal children with above-average intelligence will have fewer behavioural problems than children with average intelligence.
  5. Children with Down syndrome will have more significant behavioural problems than normal children
  6. Boys with Down syndrome will show more behaviour problems than normal girls
  7. Males with Down syndrome will tend to offer more significant higher behavioural problems than females with Down syndrome.

### **Method**

#### *Research design*

The current study was cross-sectional based on survey method.

#### **Sample**

Participants of the study were comprised of Normal children (N=40) and children with Down syndrome (N=40), with age ranges from 8-11 years. Data was gathered by using purposive sampling technique from different government and non-government schools for special education in Rawalpindi, Islamabad, Wah Cantt, and Hazro. Written informed consent was taken before scale administration.

#### **Inclusion Criteria**

Following inclusion criteria was used.

1. Children with diagnosed disorder of Down syndrome with age group of 8-11 years were selected.
2. Normal children with age group of 8 – 11 years were selected.
3. Down syndrome children with below average and average intelligence level were selected by screening through CPM.
4. Children with above average and average intelligence level were selected.

### **Exclusion criteria**

Following exclusion criteria were used.

1. Children with any other developmental disability were excluded from the study.

### **Instruments**

#### *Child Behavior Problem Questionnaire*

In order to measure the degree of child externalising behaviour problems, child behaviour problem questionnaire (CBPQ)-Urdu version [20] was used. Parents and teachers were asked to fill out the Urdu version of CBPQ. It consists of 36 items with seven response categories (1=totally false-7=totally true). The cut-off score used in the study was 126. Scores below 126 on CBPQ indicates fewer behavioural problems, while a score of 126 or above indicates more behavioural problems. The reliability of the CBPQ scale was .84.

#### *Raven's Coloured Progressive Matrices*

To assess intelligence level, raven's coloured progressive matrices [21] was used. CPM consisted of three sets i.e., A, Ab, and B of twelve problems. These sets are arranged to assess the chief cognitive processes of children aged 12 years of age or less. The correct response on each issue is scored as 1, and then the total score is calculated. The result is calculated in the form of percentile. If a child scores at or above the 95th percentile, then he/she falls in the category of "intellectually superior." If a child scores at or above the 75th percentile, then he/she is said to be "definitely above average." If a child scores between the 25th and 75th percentile, then he/she is said to be "intellectual average." If a child scores at or below the 25th percentile, then he/she falls in the category of "definitely below average." If the child scores at or below the 5th percentile, then he/she will be "intellectually defective."

### **Ethical Considerations**

The study followed all the ethical principles of psychological research.

### **Procedure**

The study proceeded by carrying out the permission from the higher authorities of governmental and non-governmental institutes of special education as well as institutes of normal children. All respondents were informed about the study and provided informed consent. It was ensured that participation would be anonymous and they have right to decline at any stage from participation. Following instructions were given to the subjects; "Looked at this" the upper figure was pointed "it was a pattern with a piece cut out of it. Each of these pieces each piece, in turn, was pointed was the right shape to fit the space, but only one was the right pattern". When children pointed toward the right option, they were scored as 1 against each issue, more significant, and when they failed to answer, they were given no score. Raw scores of CPM were used in this study to determine the level of intelligence. The teachers were asked to fill up the CBPQ while keeping in view the behaviour of children with Down syndrome. Following instructions were given to teachers; "By considering their behavioural problems, marked tick against one of the given category, i.e., "totally false," "false to a greater extent," "false to some extent," "do not know," "true to some extent," "true to a greater extent," "totally true." The researcher responded to the queries of participants before, during and after the questionnaires completed. In the end, the researcher appreciated and thanks to the respondents for participation.

### **Results and Discussion**

The present investigation examined the prevalence of behaviour problems of children with Down Syndrome between the ages of 8 and 12 and their relationship with the intellectual level. Although correlational investigation aimed to explore the difference in behaviour problems expressed by normal children and children with Down syndrome. Raven's Coloured Progressive Matrices ( $\alpha=0.93$ ) and Child Behavior Problem questionnaire ( $\alpha=0.90$ ) were used, shows good reliability (see Table 1). Results of the present study indicate a highly significant correlation between behavioural problems expressed by children with Down's syndrome and their intellectual abilities [22].

**Table 1. Alpha reliability and correlation analysis of study instruments (N=80)**

S. No	Scale	No. of Items	$\alpha$
1	Child Behavior Problem Questionnaire	36	0.9
2	Raven's Coloured Progressive Matrices	36	0.93

Results from the present study are consistent with those of earlier studies of Down's Syndrome. The first hypothesis is that the prevalence of behavioural problems in children with Down's Syndrome will be more prevalent in normal children. The prevalence

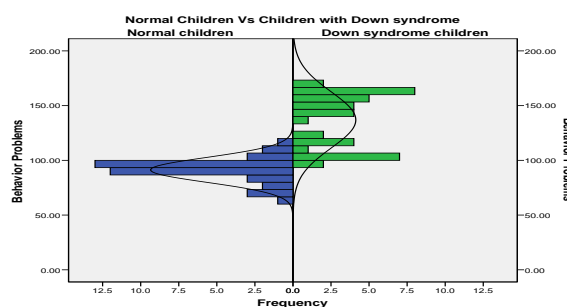
rate of behavioural problems among children with down's syndrome is found to be higher than that of normal children. Mean and standard deviation of behavior problems expressed by children with Down syndrome as well as normal children (See Table 2).

**Table 2. Frequency and percentages of behavior problems among children with down syndrome and normal children (N=80)**

	M	SD	f	%
Children with Down syndrome	136.95	25.77		
High Behavior Problems			24	60%
Low Behavior Problems			16	40%
Normal Children	91.3	11.37		
High Behavior Problems			0	0%
Low Behavior Problems			40	100%

From the table it is obvious that rate of high behavior problems in children with Down syndrome is 60% whereas rate of low behavior problems is 40%. On the contrary, there is 0% high behavior problem in normal children whereas whole sample has low behavior problems *i.e.* 100%. Thus, this table and Figure 1 support first hypothesis *i.e.* prevalence of

behavior problems in children with Down syndrome is more than prevalence in normal children. The range of behaviour problems among normal children satisfies the normal curve, whereas the range of behaviour problems among children with Down syndrome does not satisfy the normal curve.



**Figure 1. Graphical representation of behavioural problems of normal children and children with down syndrome.**

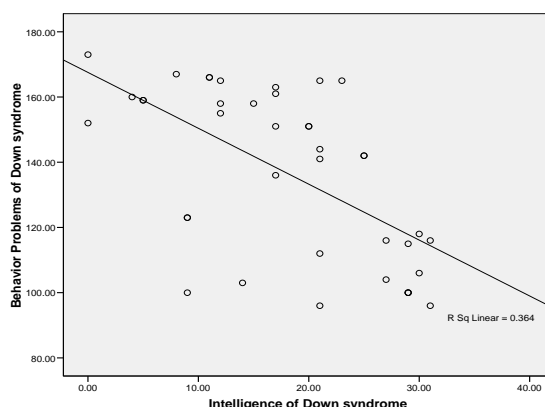
The study's second hypothesis was that there would be a relationship between intelligence and behavioural problems in children with Down's syndrome. (Table 3) represents significant negative correlation ( $r=-0.60^{**}$ ,  $p<0.01$ ) between behavior problems and intelligence level of children with Down syndrome. It represents that children with Down syndrome have low intelligence level and show more behavioral problems. Similarly, the literature suggests that children with Down's

syndrome had significantly lower IQ's and more severe, odd stereotypic behaviours, anxiety and social withdrawal. The present study explored the negative relationship between intellectual level and behavioural problems. If children have a more philosophical level, then they will have a quick understanding and broader spectrum, thus show fewer problems in behaviour. Figure 2 depicts the negative relationship between Behavior problems and intelligence level of children with Down syndrome.

**Table 3. Correlation between behavioural problems and intelligence level of children with down syndrome (N=40).**

Scale	Intelligence of DS
Behavior Problems of DS	-0.60 <sup>**</sup>

*Note. DS=Down syndrome*



**Figure 2. Graphical representation of relationship between behavior problems and intelligence level of children with Down syndrome**

The third hypothesis of the investigation was that Down's syndrome children with above-average intelligence would show fewer behavioural problems than children with average and below-average intelligence. The results indicate that Down's syndrome children with above-average intelligence level showed fewer behavioural problems than those having average and below-average intelligence (See Table 4). Through this table, the differences in the

mean scores of three groups based on intelligence *i.e.*, above average intelligence, average intelligence and below average intelligence of children with Down syndrome on CBPQ can be seen. The significant F value ( $F(2, 37)=13.5$ ,  $p<0.01$ ) of three groups of children with Down syndrome indicates that Down syndrome children with below average intelligence express more behavioral problems than Down syndrome children with above average intelligence.

**Table 4. Intelligence Differences of children with Down syndrome on problematic behavior (N=40)**

Scale	Below Average Intelligence (n=28)		Average Intelligence (n=4)		Above Average Intelligence (n=8)		F	p
	M	SD	M	SD	M	SD		

CBPQ	147.25	22.23	126	19.11	106.37	8.71	13.5	0
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Note. \*\*\*  $p < 0.000$ , CBPQ=Child Behavior Problem Questionnaire

The fourth hypothesis of the study was that normal children with above-average intelligence would show fewer behavioural problems than children with average intelligence. The results indicate that the above-average group of normal children shows low-grade behaviour problems compared to the middle intelligence group (see Tables 5 and 6). Table 5 shows the comparison of three groups based on intelligence. Mean difference of below average intelligence and above average intelligence is highly significant. However, there is no significant mean

difference between average intelligence and above average intelligence. Table 6 shows the differences in the mean scores of two groups based on intelligence *i.e.* above average intelligence and average intelligence of normal children on problematic behavior. The significant t-value of above average and average intelligence of normal children shows that children with average intelligence express more behavioral problems than children with above average intelligence ( $t=2.38, p<0.05$ ). There exists a negative relationship between both of the groups.

**Table 5. Post-hoc test for three groups for above average intelligence, average intelligence and below average intelligence**

Multiple Comparisons						
(I) intellectual level of Ds	(J) intellectual level of Ds	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
Below Average Intelligence	Average Intelligence	21.25	10.75279	0.132	-5.0028	47.5028
	Above Average Intelligence	40.87500(*)	8.0646	0	21.1854	60.5646
Average Intelligence	Below Average Intelligence	-21.25	10.75279	0.132	- 47.5028	5.0028
	Above Average Intelligence	19.625	12.31887	0.261	- 10.4513	49.7013
Above Average Intelligence	Below Average Intelligence	- 40.87500(*)	8.0646	0	- 60.5646	- 21.1854
	Average Intelligence	-19.625	12.31887	0.261	- 49.7013	10.4513

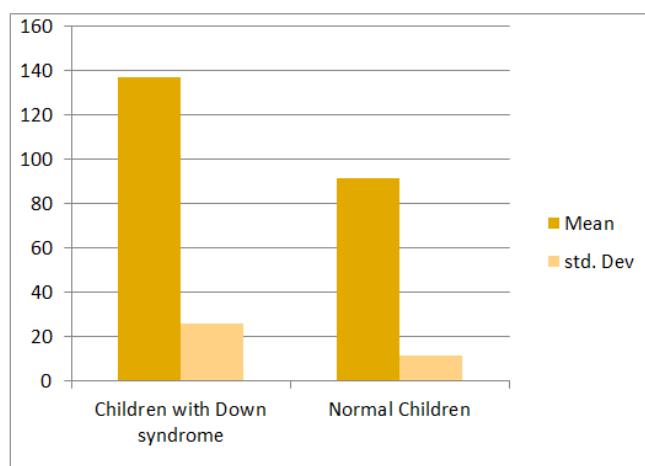
**Table 6. Comparison of normal children with average and below average intelligence on problematic behavior (N=40)**

Scale	Average Intelligence (n=12)		Below Average Intelligence (n=28)				CI		Cohen's
	M	SD	M	SD	t	p	LL	UL	d
CBPQ	97.5	9.42	88.64	11.23	2.38	0.02	1.35	16.36	0.85

Note. \*  $p < .05$ , CBPQ=Child Behavior Problem Questionnaire

The fifth hypothesis of the investigation was that children with Down's syndrome show more behavioural problems than normal children. Results indicate that children with Down's syndrome show more behavioural problems than normal children (Table 7). Mean scores in the table 7 shows that there is a difference in the behavior problems expressed by

children with Down syndrome and normal children. There is a significant t-value, indicating that children with Down syndrome express more behavioral problems than normal children ( $t=-10.24$ ,  $p<0.01$ ). Figure 3 shows that mean behavior problems expressed by children with Down syndrome is greater than the mean behavior problems expressed by normal children (Figure 3).



**Figure 3. Graph showing the difference in the mean scores and standard deviations of normal and down syndrome children on CBPQ**

**Table 7. T-test analysis for children with down syndrome and normal on problematic behavior (N=80)**

Scale	Children with Down syndrome (n=40)		Normal children (n=40)				CI		Cohen's
	M	SD	M	SD	t	p	LL	UL	d
CBPQ	136.95	25.77	91.3	11.37	-10.24	0	54.5	36.78	2.29

Note. \*\*\*  $p<0.000$ , CBPQ=Child Behavior Problem Questionnaire

The sixth hypothesis of the study was that boys with Down's syndrome would show more behaviour problems than normal girls. Results indicate that boys with Down's syndrome express more significant issues in behaviour than normal girls. In the present study, boys with Down's syndrome are more inclined to show low intelligence level and less cognitive abilities than girls belonging to the average population (see Table 8). As a result of more minor

cognitive abilities, boys with Down's syndrome show higher rates of behavioural problems. Table 8 shows a significant difference in gender showing the behavioral problems. The significant t-value ( $t=9.13$ ,  $p<0.01$ ) indicates that the boys with Down syndrome tend to show more behavioral problems than normal girls. The seventh hypothesis of the study was males with Down's syndrome would tend to show more significant behavioural problems than females with



Down's syndrome (see Table 9). It shows the differences in the mean scores of male and female with Down syndrome on Child Behavior Problem Questionnaire. The difference in the means of male

and female on CBPQ shows that males with Down syndrome express more behavioral problems than females with Down syndrome ( $t=2.65, p<0.05$ ).

**Table 8. T-test Analysis for Boys with Down syndrome and Normal girls on Problematic Behavior (N=40)**

Scale	Children with Down syndrome (n=20)		Normal children (n=20)				CI		Cohen's
	M	SD	M	SD	t	p	LL	UL	D
CBPQ	147	23.18	91.85	13.85	9.13	0	42.92	67.37	0.82

Note. \*\*\*  $p < .000$ , CBPQ = Child Behavior Problem Questionnaire

**Table 9. T-test Analysis for Boys and Girls with Down Syndrome on Problematic Behavior (N = 40)**

Scale	Boys (n=20)		Girls (n=20)				CI		Cohen's
	M	SD	M	SD	t	p	LL	UL	D
CBPQ	147	23.18	126.9	24.75	2.65	0	4.74	35.45	0.38

Note. \*  $p < .05$ , CBPQ=Child Behavior Problem Questionnaire

Individuals with Down's syndrome show significant individual differences in cognitive abilities and skills. Evidence suggests that some children with Down's syndrome may have above average intelligence level, although most of them have moderate to severe mental retardation. On the other hand, if children have low IQ levels, then they will show more problems in not only behaviour but in many different aspects of their lives such as social, emotional, language and communication. Children with Down's Syndrome usually tend to have lower than average cognitive abilities. Generally, these people's cognitive skills fall in the moderate to severe categories of mental retardation. If proper family support and psychotherapies have been provided to such individuals since their birth, then they may show improvement in their behavioural characteristics as well as their cognitive abilities. The average IQ of children with Down's syndrome is around 50, compared to normal children with an IQ of 100.

Findings of the study suggest that children with above-average intelligence levels were less likely to be "at risk for" or present with clinically significant behaviour problems. Chen et al. in 2006 concluded that given any maternal IQ, the higher IQ child is always at lower risk for behaviour and other issues than the more down IQ child. Among children with similar IQ, maternal IQ does not explain much of the variation in child behaviour, neuropsychological

function or achievement. The findings of the current study can be supported by the research conducted by Gau et al. in 2008. They found that children with Down 's syndrome demonstrated significantly more severe symptoms of a wide range of behavioural problems than normal children, such as attention problems, delinquency, social problems, somatic complaints, thought problems, and withdrawal.

Research conducted by to evaluate the mental health, behaviour, and intellectual abilities of people with Down's syndrome supports the present study findings related to gender differences. According to results, 33 per cent of male children with Down's syndrome experienced behaviour problems related to hyperactivity. Behavioural issues such as self-injurious behaviour and aggressive behaviour were more common in males than females with down's syndrome. It has been well documented that, when faced with cognitive or intellectual challenges, children with Down syndrome are more likely than developmentally-matched children to avoid the tasks with both positive and negative behaviours. Most often, younger children refuse to look at a job, struggle out of chairs, or show sudden crying behaviour; older children with Down's syndrome are known to recruit social strategies (clapping hands, blowing bubbles to engage the experimenter and distract them from the task at hand.

## Conclusion

The findings of the present investigation revealed that the prevalence of behaviour problems among children with Down's syndrome is higher than normal children. Percentages of behavioural Channell et al. 2021. It is also concluded that children with lower IQ levels show more behavioural problems than children with higher IQ levels. Significant gender differences are also calculated from the down's syndrome population. Interventions can be planned for such children in order to overcome their behavioral problems. In future, behavioral problems can also be discovered with other developmental disorders. Identifying the children with Down syndrome with neglecting and

problems among normal and Down's syndrome children is significant, indicating a higher prevalence rate of behavioural problems among Down's syndrome. It is being said, Down's syndrome does appear to have a distinct cognitive phenotype

ignored parenting would allow us to study the prevalence of behavioral problems in them. In Pakistan, the society stigmatizes such Down syndrome children just because of intellectual disability. Neglecting attitudes of significant others as well as society leads to behavioral problems. This study opens the door for clinicians and psychologists to implement therapeutic intervention plans and counseling not only for such children but also for the society and caregivers.

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**Corresponding Author:** *Amna Hassan, Department of Psychology, University of Wah, Wah Cantt, Pakistan.*

**E-mail:** amna.hassan@uow.edu.pk

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