Pakistan Languages and Humanities Review
www.plhr.org.pk

RESEARCH PAPER

A Study on Effectiveness of Early Intervention Programs used for Children with Intellectual Disabilities

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DOI	http://doi.org/10.47205/plhr.2022(6-III)39

ABSTRACT

The present study was designed to see the effectiveness of early intervention programs available for children with intellectual disabilities in Lahore. This research study was quantitative and used a cross-sectional survey design. The data were collected from 120 parents using purposive sampling technique. A self-constructed structured questionnaire was designed to measure the effectiveness of the available programs. Data was collected from the parents of children with intellectual disabilities from Amin Maktab, Rising Son and Autism Institute situated in the Lahore. Descriptive and inferential statistics were used to analyze the data and study findings revealed that majority of parents (41%) were using dietary intervention, followed by medical intervention (23%), behavioral therapy (19%) educational intervention (17%). Results showed that majority of parents (49%) started taking early intervention during the age of 3-4 years. One-way analysis of variance revealed that the intervention started earlier (0-2 years) showed significant improvement in intellectual functioning and adaptive behaviors of children with intellectual disabilities but no significant difference between parents' preference for early intervention and the gender of children was found. The study highlights the need for future researches on a larger sample including other disabilities as well.

Keywords	Adaptive Behavior, Behavioral Intervention, Children with Intellectual Disabilities, Dietary Intervention, Early Interventions, Educational Intervention, Medical Intervention

Introduction

The estimation about the number of children facing or at risk facing intellectual disabilities seemed to be staggering worldwide (Guralnick, 2006). Pakistan has more than the anticipated number of incredibly intellectually disabled children with estimations about the spread range from 19.1/1000 with disable to 65/1000 for mild disability (Mirza et al., 2009). There is an increasing commitment worldwide that recognizes the magnitude and scope of this problem and asks for comprehensive early intervention services and supports to families and their vulnerable young children (Blackman, 2008).

Early intervention (EI) is considered the necessary means to meet the priorities and needs of children with intellectual disabilities and their families (Mas et al., 2016).

EI programs are expected that they would partially, or sometimes entirely, prevent the risk factors from causing their negative influence on the development of children. While another expectation is that, even for those children who are identified with intellectual disabilities, early intervention not only minimizes the intellectual delays, but it also reduces secondary complications. The available scholarship argues that it has many realistic outcomes for many families and to their children (Guralnick, 2005).

As far as the Intellectual Disability is concerned, CWIDs have historically been given a range of labels, which include "subnormal", "mental handicap," and "mental retardation." However, at the international level, intellectual disability is favored (Schuengel, Rest, Stanford & Hastings, 2019). From the perspective of the American Association on Mental Retardation (AAMR), "This can be considered as a kind of disability, categorized by the limitations of both intellectual functioning and adaptive behavior which may be seen in skills like social, conceptual, adaptive and practical (AAMR, 2002). Such disabilities usually get originate before 18 years of age. CWIDs are usually classified as having problems relating to Cognitive Functioning like learning new skills, memorization, problem-solving and Adaptive functioning, which refers to an individuals' ability to perform day-to-day tasks.

American Psychological Association (APA) (2013) projects that 1% of the overall population has an intellectual disability. Since literature highlights that lifespan for people with ID has been increased, so individuals with ID have a more susceptibility to have an additional psychological disorder than the general population not having ID (APA, 2013). Furthermore, It has been estimated that the percentage of ID and added mental disorder exists in the range of 30 to 50 percent or can exceed that if diagnostic overshadowing takes place. Considering the higher rate of added mental disorders followed by ID, it is therefore, important to make people especially parents trained, educated and aware of special needs and challenges faced with ID. With an increasing number of facilities for such children in Pakistan, it becomes worth knowing the perceptions of parents regarding contemporary available EI interventions and their results.

The purpose of the present quantitative study was to compare and evaluate the effectiveness of Early Intervention programs designed for children with Intellectual disabilities in the selected schools of Lahore. This was done by measuring the perceptions of their parents regarding the effectiveness of the intervention they experienced.

Literature Review

Prior to the 18th century, the perception toward those with ID varied within the society (Harbour & Maulik, 2010). During the settlements of the American colonies in the 1600s, people with ID received treatment resembling slavery and involved being sold off at various auction events (Wehmeyer & Patton, 2000). On the contrary, however, some people in the communities did extend support and demonstrated a willingness to provide help to those who required care. By the late 1600s, the society's perception gradually transitioned, and the perception was that people with ID were of the lower class and therefore undeserving of the basic rights to which others were entitled (Wehmeyer & Patton, 2000). As the new century began, treatment toward people with ID was marked by inhumane gestures, and many were required to live in unbearable environments filled with filth.

A similar theme occurred, according to Wehmeyer and Patton (2000), in the 1700s to the mid-1800s that encompassed a sense of pessimism regarding the

possibility that people with ID can learn and receive some form of education. Eugenics Movement. In 1869, after carefully exploring the connection between heredity and talent, Sir Francis Galston, the cousin of well-known Charles Darwin, introduced the Eugenics Movement and the philosophy behind it (Harbour & Maulik, 2010). The primary aim of this movement was to strengthen the pool of people in society who were believed to have superior qualities and eliminate those with ID. This movement postulated that because of the impact genetics plays on personality and the level of intellect and to preserve and facilitate the human species, reproductions must be somehow monitored and managed (Harbour & Maulik, 2010).

The term idiot was one of the first terms used to refer to someone with ID and dates back to ancient Greece (Degeneffe & Terciano, 2011). The term since then has gradually undergone numerous changes. In 1908, the phrase mental retardation emerged and was defined by Tredgold [as cited in American Association of Mental Retardation (AAMR), 2002] as a "state of mental defect from birth" or "from an early age, the cause being inadequate cerebral development".

Eldevik et al. (2010) analyzed that almost 64% of children in group taking behavioral intervention were found to meet the objective criteria for getting reliable change in IQ. On the other hand, 14% in the eclectic comparison group showed this. The results of the study suggested that children with intellectual disabilities may get benefit from behavioral intervention.

In addition, individuals with ID display deficits in gross motor skills and physical fitness abilities; motivation is a critical factor in supporting exercise interests and outcomes (Lotan, Isakov, Kessel, & Merrick, 2004). Although most scrutiny in current research has been laid on the cognitive functioning of individuals having ID, problems like gross motor skills are often evidenced in the same people (Vuijk et al., 2010). Gross motor skills are important to develop, as they promote a healthy lifestyle (Strong et al., 2005). In addition, these skills are considered to be integral components to cognitive development (Piek et al., 2008). The value of physical activity for children, including physical education class and recess, is recognized as important to the development and has a positive impact on motor and academic performance (Kohl & Cook, 2013).

According to Totsika et al. (2013) a child's behavioral problems, instead of his or her IDs, are associated with lesser well-being of the parents. While other researches also emphasized that having a child facing IDs might lead to positive aspects in the family's life (Lloyd & Hastings, 2008). Viewing in this background, scholars have suggested that mothers of children having disabilities keep greater optimistic perceptions than the fathers of such ones. Other than these, some researches have also suggested that well-being, maternal stress and the way in which ID influences the members of family differ in various phases of a family accordingly, which may expand in the future (Totsika et al., 2013).

Research Hypothesis

Other than five research questions, the researcher had already formulated the two hypotheses to test via data analysis:

HI There is no significant difference in the effectiveness of early intervention to children with intellectual disabilities on the basis of their age.

HII There is no significant difference in the preference of parents for early intervention on the basis of parents' educational level.

Materials and Methods

Research Design

The study used quantitative Survey Research Design. Frankel and Wollen (2012) enlisted the characteristics of survey research as information collected from a group of people to describe some aspects or characteristics (such as belief, opinions, attitudes, abilities, and/or knowledge) of the sample from a certain population.

Sample and sampling technique

The sample of the study comprised of total 120 sampling units (parents of children with IDs), 60 fathers and 60 mothers of children with intellectual disabilities. The data was gathered from the parents of children with intellectual disabilities who had taken some early intervention. The majority of these parents belonged to Amin Maktab, Rising Son and Autism Institute Lahore. As the Purposive Sampling technique looked the most suitable technique to select the sample for the present study (Neuman, 2006).

Research Instrument

The process of forming a questionnaire for data collection is known as instrumentation. Creswell and Hirose (2019) stated that to use a survey instrument, researchers can develop their own tool for the survey. Two sub-constructs (Adaptive behaviors and intellectual functioning) were used to frame the questionnaire. The questionnaire consisted of the two parts; the first part comprised of questions like demographics which also included the independent variable. It was measured on a categorical scale.

Data Analysis

After collecting the data, it was analyzed by using Software Statistical Package for Social Science (Version 21). Both descriptive and inferential analysis were used.

Results and Discussion

Table 1
Early intervention programs most commonly used for children with intellectual disabilities in district Lahore

Interventions	Percentage (%)
Medical	23
Dietary	41
Educational	17
Behavioral intervention	19
Total	100

Table shows the distribution of respondents with respect to early intervention programs available for children with intellectual disabilities. Data reveals that about one-fourth of respondents there were medical facilities available for them, more than (41%) know about the dietary interventions, 17% about the educational while remaining 18 percent about the behavioral interventions were most commonly used for children with intellectual disabilities in Lahore.

Table 2
Percentage of parents' responses for improvement in adaptive behaviors of children with intellectual Disability

Sr No.	Statements	Agree (%)	Disagree (%)
1	Socialization with peers	92	3
2	Pencil holding	92	4
3	Running ability	88	2
4	Dressing ability	87	11
5	Paper cutting	87	5

The above table showed that a majority of the parents responded that they observed improvements in the adaptive behaviors of their children with intellectual disabilities after getting the early intervention programs.85% a cut of point of significant improvement as result showed. Majority of parents (92%) reported improvement in Socialization with peers and pencil holding while (88%) reported that physical ability to running improved in child and (87%) reported cutting of paper and child ability to dress up also improved.

Table 3
Type of intervention given to boys with ID

Interventions	*F*	%
Medical	7	12.3
Dietary	28	49.1
Educational	10	17.5
Behavioral	12	21.1
Total	57	100.0

Table shows the distribution of data according to type of intervention given to boys with ID. Data showed that 23.3% of the children were provided with medical intervention, 40.8% with dietary, 17.5% with educational and 18.3% with behavioral intervention.

Table 4
Type of intervention given to girls with ID

Interventions	*F*	%
Medical	21	33.3
Dietary	21	33.3
Educational	11	17.5
Behavioral	10	15.9
Total	63	100.0

Table shows the distribution of data according to type of intervention given to girls with ID. Data showed that 33.3% of the children were provided with medical intervention, 33.3% with dietary, 17.5% with educational and 15.9% with behavioral intervention.

Table 5
One-Way analysis of variance significant difference in the effectiveness of early intervention to children with intellectual disabilities on the based on their age.

	N	M	SD	Sig. (Two-Tailed)
0-2 years	44	112.45	6.92	0.001
3-4 years	52	108.18	8.53	

5 Years	24	93.50	11.553
Total	120	106.96	11.097

Table 6
Post-Hoc test on children age at which intervention started and its effectiveness

(I) Age of starting intervention	(J) Age starting intervention	MD (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
0-2	3-4	3.935*	.029	.41	7.46
	5	18.955*	.000	14.58	23.33

In table shown above, one-way analysis of variance revealed that there is a significant effect of child's age when intervention started, on the effectiveness of the specific intervention. Subjects were divided into three groups according to age (Group 1: 0-2 years; Group 2: 3-4 years; Group 3: 5 years). There was a statistically significant difference at the $p<.05$ level in the use of early intervention [$F(2, 117) = 39.17$, $p=.000$]. While reaching statistical significance, the actual difference in mean scores between the groups was medium. The effect size, calculated using eta squared, was .4 which in Cohen's (1988) terms would be considered a large effect size as he classified .01 as a small effect, .06 as large effect and .14 as a large effect. *Post-hoc* comparisons using the Tukey HSD test indicated that the mean score for Group 1 (M=112.45, SD=6.92) was significantly different from Group 2 (M=108.52, SD=8.53) & Group 3 (M=93.5, SD=11.553). The findings rejected the null hypothesis and showed that there was statistically significant difference between the three age groups. One-way analysis of variance revealed that the intervention started earlier (0-2 years) showed significant improvement in intellectual functioning and adaptive behaviors of children with intellectual disabilities.

Table 7
Percentage of parents' responses for improvement in Intellectual Functioning of Children with Intellectual disability

Sr No	Statements	Agree (%)	Disagree (%)
1	Learning new words	86	4
2	Differentiate colors	86	7
3	Art and craft improved	85	3
4	Better math solving	85	15

Table revealed that the majority of the parents reported improvements in the intellectual functioning of their children with intellectual disabilities. 85% a cut of point of significant improvement as result showed. After getting early intervention programs. Results revealed that the majority of the parents reported improvements in the intellectual functioning of their children with intellectual disabilities after getting early intervention programs. (86%) respondents reported improvement in learning words and differentiate in colors while (85%) reported improvement in solving math and betterment in art and craft.

Table 8
Cross-tabulation of mother's qualification and their choice for EI.

Parents qualification	Medical	Dietary	educational	Behavior
Graduation	2 (3.4)	2 (3.4)	5 (1.6)	1 (1.6)
Masters	11 (12.5)	16 (12.5)	4 (6.0)	6 (6.0)

M Phil or above	8 (5.1)	3 (5.1)	1 (2.4)	3 (2.4)
	X^2 =13.779	df=6	Sig=0.32	

In table, crosstab revealed that there is a significant association exist between mothers' choice of EI and their level of qualification.

Mothers with master's degree mostly choose dietary intervention in first choice after this they prefer to choose medical intervention, while in remain options they choose behavioral intervention and in last they go with educational intervention

Discussion

Findings highlight that the majority of parents stated betterment in the intellectual functioning of the children as a result of early interventions. This was consistent with the findings of Vogt et al. (2012) who investigated the association between muscular strength and work performance with students having mild Intellectual Disability at the high school level. Their study results demonstrated significant increases in physical and work performance were evidenced after the participants completed the community-based resistance training program. The findings suggest, given intervention programs, that individuals with ID increase in functioning and are able to develop specific skills, such as those necessary in the workplace.

Findings also stated that seventy-five percent of parents reported improvements in gross motor skills of children with intellectual disabilities. This was found in line with the findings of Kohl and Cook (2013) who found improvements in child's wellbeing. They stated that the value of physical activity for children, including physical education class and recess, is recognized as important to development, and has a positive impact on motor and academic performance (Kohl & Cook, 2013).

In study it seen that communication of children with peers improved by using of intervention as in data most of children having down syndrome but with autism it also a good percentage of children who improved their communications skills in literature review PECS a method of improvement in communication may be helpful for the speaking of children with intellectual disability.

Findings also presented that more than two-thirds of parents reported improvements in the adaptive behavior of the children as a result of early interventions. This finding has been in line with the findings of Eldevik et al. (2010) who examined early behavioral intervention among children with intellectual disabilities. The researchers found a statistically significant difference in intelligence, as well as adaptive behavior scores, were found for the behavioral intervention group. Where nearly two third of the children in group taking behavioral intervention found to meet the objective criteria for getting reliable change. On the other hand, in the eclectic comparison group showed this. Results of the study suggested that children with intellectual disabilities may get benefit from behavioral intervention.

Conclusion

In light of the discussion, the following conclusion has been drawn for the present study.

The study highlighted that majority of parents of children with intellectual impairment use dietary intervention along with medical and physical interventions. Especially the mothers holding a master's degree preferred dietary management for their children, as reported by the study respondents. Even through early intervention is very beneficial yet parents take time to decide about the right intervention for their children. Most of the parents in current study reported that they started their children' intervention during 3-4 years of the age of their child, which is considered as less effective. In addition, it was also concluded that parents who have started taking intervention for their children during 0-2 years of their age, found significant improvement in the intellectual functioning and adaptive behaviors of their children. On the basis of sufficient evidence, it was concluded that effectiveness of early intervention programs in Lahore, Pakistan significantly differs with respect to age of child, gender of child and qualification of the parents for children with intellectual disabilities under the current research settings. However, no statistically significant difference was found for the choice for early intervention on the basis of the child's gender. It is, therefore concluded that early interventions in Pakistan, especially in Lahore, are effective and providing good results to the children with intellectual disabilities.

Recommendations

1. Another study might be conducted in the other parts of the country for comparing the availability and effectiveness of early intervention programs.
2. A future study might be done by using Qualitative research methods to explore the reasons of the delayed start of early intervention programs.
3. SOP's for Childcare Health policy should be devised for early identification of child's disabilities.
4. People awareness needs to be improved on the special needs of the children with intellectual disabilities.

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