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Study Environment and Academic Success: An Empirical Study on Impacts of Study Environment on Disabled Children Memory, Attention and Academic Success

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Abstract:
Purpose: Hearing impaired children educational achievements depends on their memory and attention. The study analyzes the significance and effect of learning environment in working memory, attention and academic achievement of hearing impaired children. The study aimed at identifying healthy environment suitable for hearing impaired children to achieve academic success.
Method: The study sample comprised 80 hearing impaired children. 43 students residing at boarding school and 37 students studying at boarding school but residing at home environment were selected randomly. Survey and observation was followed. Descriptive statistics and independent sample t-test were used to test the academic behavior of students residing at boarding school and home environment.
Results: The study revealed significant difference between the hearing impaired children residing at boarding school and residing at home environment during their secondary education. Students residing at home found to be distracted by the social forces and that influenced their academic achievement. Though the learning environment found to influence memory and attention, there is no significant difference in education achievement.
Conclusion: The study encourages educational support providers and parents of hearing impaired children to offer assistance in facilitating their learning process. Parents and tutors are advised to understand the difficulties encounter by hearing impaired children in the learning process and suggest customizing teaching strategies.

Keywords: *Hearing impaired children, residing environment and educational achievement*

1. Introduction

Knowledge development begins from the day infant gets in to the new world. Speed and accuracy of linguistic and knowledge development depends on the ability of infants to extract information from the environment and that plays a key role in every movement and growth of children. Motor output and growth of childrendepends upon sensory experiences and sensory inputs, which receives information from the environment through eyes, ears and skin (Fiorentino,1972). According to Savelsbergetal. (1991) infants respond quickly to auditory inputs, which co-ordinates eye, head and body movements. Auditory vocal process facilitates linguistic development, cognitive development, acquisition of speech and memory in children. Thehearing impaired children's inability to experienceauditory sensation leads to memory related problems. Since learning is an auditory process, hearing impaired children are abnormally slow in their linguistic development, which inevitably influences educational achievement.

Cognitive development is a continuous process, which depends on the process by which brain gets information from the external environment and learns from the surroundings. According to Lang (2002) children's interest in learning process not only stems from external environment but also from own characteristics, such as their cognitive abilities. Such cognitive skills found to play a key role in the learning behavior of individual children (Lang, 2002).Cognitive abilities and cognitive development also influenced by the environmental cues and the effect depends on the level of exposure to external environment. Such learning environment not only influences the education behavior of normal children with high cognitive abilities but also the hearing impaired children. Supporting this, Lang and Kovalik (2001)found positive relationship between the consistent education support offered at school environment and students learning behavior and performance. Support services received from boarding School and home environment believed to play significant role in determining the educational achievement of hearing impaired children.

Normally hearing impaired children shows high variation in their conceptual development due to their inevitable disabilities. Factors influencing educational achievement of hearing impaired children are the level of impairment, age at onset and additional handicapping such as attention deficit disorder and visual impairment (Powers, 2003). Past researches well documented the problems encounter by hearing impaired children inschool education and suggest offering support services to achieve better performance (Lang, 2002). Research focusing onthe boarding place (home and school) and its influence on educational achievement of hearing impaired children is limited. Hence, the studyaimed at investigating hearing impaired children's learning behavior and academic achievement simultaneously with the boarding places.Specifically, the study aimed at investigating differences between hearing impaired children residing at boarding

school environment and home environment, on recalling memory, attention abilities, learning behavior and academic achievement.

2. Review of Literature

2.1. Residing Place Influence on Working Memory

Working memory is one of the core processes of executive functions (Baddeley and Logie, 1999; Smith and Jonides, 1997) and is considered to be the salient source for speech, language development, and cognitive development in children (Fry and Hale, 2000). Recent research indicates that home environment is the primary source of working memory in children at earlier stage before they enter in to school environment (Bernier et al., 2010). Children growing in less supportive family are more likely to have unhealthy executive functions (Repetti, Taylor, & Seeman, 2002).Lack of working memory affects cognitive processes such as reading, learning, attention and academic achievement (Fry and Hale, 2000).Healthy environment includes continuous monitoring, regular training, early intervention programs, emotional and social support. According to Thorell et al., (2009), working memory and cognitive growth of children can be improved through parents supported early intervention program. School environment also provides such a support and offer proper guidance and training to improve cognitive growth, capabilities and executive functions of children (Bierman et al., 2008; Diamond et al., 2007; Jaeggi et al., 2008; Lillard and Else-Quest, 2006].Hence, the study investigates the influence of living environment on working memory of hearing impaired children. Specifically, the study compares working memory in hearing impaired children residing at boarding school environment and home environment.

2.1.1. Residing Place Influence on Attention Capabilities:

The working memory task performed by brain is activated by attention. Literature indicates positive relationship between attention and working memory(Duncan et al., 2007; Pagani et al., 2010). Neural networking theory indicates that attention and working memory overlap when the brain is stimulated to perform an action. (LaBar et al., 1999). Recent advances in cognitive neuroscience have identified three functionally independent attention networks that correspond to the brain; orienting, alerting, and executive attention networks ([Berger et al., 2000], [Fan et al., 2002], [Fernandez-Dugue and Posner, 1997], [Fernandez-Dugue and Posner, 2001], [Posner and Petersen, 1990] and [Rueda et al., 2005]). The orienting network comprises of missing text content while reading, missing the continuity during speech or listening from others and disconnection of attention while read and write. The alerting network can be measured by continuous performance task such as; clarifying their doubts or misunderstanding immediately and maintaining alertness. The executive network manages communication with other individuals and focus on particular task to complete. Past studies indicate that hearing impaired individuals are impulsive (Kelly et al., 1993) and have difficulty in sustaining their attention (Parasnis, Samar, G. Berent, (2001), Quittner et al.,1994), compared to normal hearing children. Children with hearing impaired problemdo not follow specific pathway to learn or acquire communication from the environment and that often leads to attention deficit disorder.

Attention deficit disorder (ADD) is the most common neurodevelopment disorder of childhood which not only affects children education and growth but also associated with morbidity in social and academic success (Szymanski et al., 2001).Attention deficit disorder also found to hamper language acquisitionand executive functional performance in hearing impaired children (Szymanski et al.,2001). The core symptoms of attention deficit disorder are short attention span for mental age, impulsivity (acting without thinking of consequences), and distractibility (inability to maintain focus on a needed task) (Wiznitzer, 2009). Research evidence the effect of home environment on attention deficit in children (Dumas et al., 2005; Evans, 2004).Specifically, children from higher home chaos (overcrowding, inconsistent daily schedules) tend to have high impulsivity, low attention focusing(Dumas et al., 2005), persistence and other attention difficulties (Evans, Hygge, & Bullinger, 1995), which also believed to influence hearing impaired children learning behavior and educational achievement. On the other hand, the quality of learning environment in school shapes the future development of children skill set (Anders et.al, 2010) and effect attention capabilities in children and motivates them to achieve in their higher education.Thus, the present study hypothesis that hearing impaired children's boarding environment influence attention executive functions and learning behavior.

2.1.2. Academic Achievement of Hearing Impaired Children

Academic achievement of hearing impaired children requires support services and motivation, as theysuffer with attention problems and interest in studies. The effect of hearing impairment in educational achievement is complex, which depends on family, society, culture and environment (Lane, 1984).Brejli (1999) states that hearing impaired children find difficulties in completing higher education due to their poor quality primary and secondary education. Developed countries support hearing impaired children further education and encourage them to study at universities with the supporting services. According to Brejli (1999), hard of hearing individuals have more chance to cope up with their studies at higher education level compare to the children with severe hearing loss or profoundly deaf.

According to Cremer (1991), hearing impaired children needstrong support services to attain success in education. Support services include tutoring, note taking, interpretation and oral training (Cremer, 1991). Orlandoet.al., (1997)state that hearing impaired children in higher education require tutoring support to improve grade, understand lecture, improve their reading and writing abilities and to clarify classroom notes. Unfortunately, Very few instructors put forth their effort to modify or adjust their mode of teaching and teaching materials appropriate for hearing impaired children (Marschark, Sapere, Convertino, & Seewagen, et al., 2005). Researches are at primitive stage in identifying appropriate

teaching technology that fosters hearing impaired children educational capabilities.In a highly competitive world, success is judged by academic achievement, economic status and very often conformity to a social attainments and values. Academic success depends on the individual's learning environment, support from caregivers and various resources suitable to enrich their abilities. Therefore, the study aimed at investing the effects of residential placeson memory and attention, learning behavior and educational achievement of hearing impaired children

3. Method

3.1. Participants

The study investigated, hearing impaired children's memory, attention, learning behavior and their orientation towards exams. 80 hearing impaired children were randomly selected from a special education boarding school meant for hearing impaired children. Amongthe participants, 43 wereresiding at school and 37 were living at home while attending school.

3.2. Procedure

Questionnaire was distributed and explained to each child chosen as samples with the help of specialized assistants. Students learning behavior and their performance at school and home were also collected from teachers. Researcher also monitored the respondents' performance at class room. Personal interviews with parents of hearing impaired children were also conducted to assess the learning behavior of students at home. The data were assessed for missing responses and coded into SPSS 17. Descriptive statistics and independent sample t-test were used to analyze the hearing impaired children learning behavior and to assess the existence of differences between students boarding at schooland studentsstaying at home while doing their studies.

4. Results

Results indicate that majority of the students participated in the study have had working memory problem (see Table 1). Respondents indicated their inability in recalling what they have learned (72.5 %) in every lecture and that lead to difficulties in writing exams (78.75%). In addition, several students forgot to do their homework (41.25 %) and at times they forgot to wear hearing aid (62.5 %). Results indicate significant differences across the hearing impaired students residing at school and home (see Table1). Students residing at boarding school recall their subjects better than those residing at home. It is interesting that students staying in school spend more time for revising the material they learned at school and have routine study behavior compared to scholars staying at home. As students residing at school are provided with tutoring and other assistance to help with education, their performance is found to be better. In addition, boarders at school are encouraged to study during regular study hours and that provide opportunity to revise the subjects learned, which significantly improved their recalling abilities. The reasons behind low performance of students living at home are lack of assistance and support they received from their parents and family members. As both the parents of hearing impaired students were working, they found little or no time to spend with their children. In addition, several parents find difficulties in communicating with their hearing impaired children and that hinder their effort in helping their children in completing homework and facilitating learning process.

Working memory	**Total Respondents (80)**		**Boarders at school Respondents (43)**		**Living at home Respondents (37)**		**Chi-square test P < .05**
	Number	**%**	**Number**	**%**	Number	%	
In ability to perform delayed recall task	58	72.5	35	81.39	23	62.16	Significant
Continuous performing task	63	78.75	37	86.04	26	70.27	Significant
Immediate recall task	57	71.25	28	65.11	29	78.37	Significant
Visual recall task	33	41.25	3	6.97	30	81.08	Significant
short term memory loss	50	62.5	37	86.04	13	35.13	Significant

Table 1: Working Memory and Learning Behavior of Hearing Impaired Children

Hearing impaired children attention behavior shows high deviations and the results portray differences between residents of school and home environment (Table2). Thirty seven percent of the respondents stated that they often misunderstand the subject matter and get doubts. Of them, only 13.7% of the students clarify their doubts immediately. Students residing at school (41.86%) get opportunity to approach tutors and teachers any time to clarify their doubts. On

the other hand, students living at home (32.43%) don't get such opportunities and assistance, which influences their learning and performance in exams. Interestingly, results show significant difference between residence of school and home environment on their interest in focusing on a particular task constantly. Students living at home show high level of attention in extracurricular activities such as cooking and stitching (vocational interest). On the other hand, students residing at school often engage in academic activities. Boarders of school are also able to concentrate on two or more task such as read and write simultaneously, where the students residing at home lag behind. 45% of the respondents participated in the study stated that they miss continuity in tutoring due to lack of attention, frequent external distraction and their inability to understand the instructors. 40% of the respondents indicated that they miss tutoring due to frequent absentia. In addition, results indicated no significant differences between residence of school and home on their absentia behavior. Interestingly, the result indicates significant differences between residence of school and home on their ability to read the text without missing contents. The result indicates that students living at school have significant progress in attention while reading comprehension and practicing mode is better than students living at home environment.

Attention towards learning	**Total Respondents (80)**		**Boarders at school Respondents (43)**		**Living at home Respondents (37)**		**Chi-square test P < .05**
	Number	%	Number	%	Number	%	
Doubts in subjects	30	37.5	18	41.86	12	32.43	No significant
Clarifying the doubts immediately	11	13.75	7	16.27	4	10.81	No significant
Communication with teachers	61	76.25	36	83.72	25	67.56	Significant
Missing the continuity in class	36	45	18	41.86	18	48.64	No significant
Frequent absentia in class	32	40	16	37.20	16	43.24	No significant
Focus on to particular task	71	88.75	34	79.06	37	100	Significant
Reading the paragraphs without missing the content	45	56.25	27	62.79	18	48.64	Significant

Table 2: Attention and Learning Behavior of Hearing-Impaired Children

Academic achievement is the salient purpose for which the hearing impaired children strive hard. Though students living at schoollearn and prepare very hard for the examination, their performance in exam is not as expected.Afraid of exams and fear of the consequences are the major factors contribute to their failure.Lack of confidence makes the hearing impaired children afraid of exams, emotionally disturbed and feels sick. Residence of school (69.76%) and students living at home (56.75%) shows no variation in their academic achievement. Majority of the hearing impaired students (60%) reported that they feel disappointed when they receive low grade in exams.

Ability	**Total Respondents (80)**		**Boarders at school Respondents (43)**		**Living at home Respondents (37)**		**Chi square test P < .05**
	Number	**%**	**Number**	**%**	**Number**	**%**	
Afraid of writing exams	74	92.5	43	100	31	83.78	Significant
Stagnant in class	51	63.75	30	69.76	21	56.75	No significant
Passed in all subjects	25	31.25	16	37.20	9	24.32	No significant
Disappointment	48	60	29	67.44	19	51.35	No significant

Table 3: Academic Achievement of Hearing Impaired Children

5. Discussions

The study investigated the learning behavior of hearing impaired children in association with memory, attention and achievement. Hearing impaired children are relatively lower in their recalling process (memory) than normal children. The results support Quittner (2010) findings which indicate attention difficulties and language difficulties encounter by hearing impaired children. In addition academic achievement differs according to the individual student's effort, external environment and learning behavior. As suggested by Spradbrow and Power (2000), the study found that hearing impaired children often miss information and knowledge delivered by lecturers and tutors. Specifically, hearing

impaired childrenprefer direct instructional approach with personal supportive care (tutoring) overclassroom based mass learning. Supporting Marschark et.al, (2005) findings, the results indicate thathearing impaired children performance in examinations is below satisfactory level. Thus, the instructors are expected to adopt suitable teaching materials and pedagogy in the classroom to meet the needs of hearing impaired children and contribute to their success academiclearning.

Moreover, the exploratory study with teachers revealed that children are psychologically disturbed due to their family problems and avoidance from siblings and normal peer group. Parents often don't understand their own child's feeling and expressions and that contribute to the low performance of students living at home environment. Misunderstanding and conflicts in the family affects the child's overall development and leads to emotional disturbance and that also distract hearing impaired children attention from learning process. Thus, residing place significantly contributes to their attention and educational performance. In addition, both boarders at school and students living at home environment perceive significant problems such as concentration (attention), memory and emotional disturbances like fear and anxiety to exams. Lack of care and support from parents and care givers contribute to the emotional insatiability.

Though learning environment found to influence memory and attention, there are no significant differences between the children residing at school and home environment in educational achievement. Hearing impaired children residing at school perform better in school activities and homework with the assistance of personal care and aid offered at boarding school compared to students living at home. Students living in home environment found to be distracted by the social forces and that lead to poor performance at class. Thus the results support, Hong and Milgram (2000; p.269)findings that suggest 'student's intellectual ability and over all motivation comparatively similar to learning activities at school and home at any given time, learning at home environment is affected by various other factors that are unique to each student'. Home environment, family conditions and peer group influence are the social forces found to influences learning behavior of hearing impaired children. Thus, children from home have high variations in learning when compare to children residing at boarding school. Hearing impaired children's learning behavior varies according to the place where they are residing;the type of support and resources receives from their care takers. Thusthe present research contributes the need for suitable environment, well equipped with technological and manpower resources to enrich the educational achievement among hearing impaired children.

6. Recommendation

The study encourages parents of hearing impaired children to offer help and assistance to facilitate their children learning process. Special schools should provide latest technologies and customized curriculum to improve the hearing impaired children learning behavior**.** Schools should measures IQ level of hearing impaired children before placing the hearing impaired students in particular grade level. This will help teachers to evaluate memory level and attention span of the students. IQ level test will also help teachers to implement appropriate and customized teaching mode and that help hearing impaired children to improve learning capabilities and achieve educational goals. As parental involvement plays a major role in facilitating hearing impaired students' educational achievement, parents should provide emotional care and support to their children. Parents of hearing impaired children should have active participation in the school activities to improve the children's learning atmosphere. Though boarding school environment helps to improve children's learning behavior, parents should spend enough time with the children to develop emotional bond and to understand their difficulties. Early intervention training program should also provide to the parents with the children.

7. Future research

The present study focused on recalling process in memory and attention deficiency in hearing impaired children and future research should focus other domains such as perception, consolidation and retrieval of stored memory. A comparative study of developed and developing countries approach in hearing impaired children's achievement in relation with learning environment may offer further insights. Exploratory studythat focusing on parents of hearing impaired children effort in providing assistance to improve the children's memory and attention may yield appealing results. Future research can also investigate the cause and effect relationship between teaching mode and learning behavior of hearing impaired children.

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