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ORIGINAL ARTICLE

Prevalence of Sensory Processing Challenges among Young Children in Pakistan: Implications for School-Based Services and Family Context

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Abstract

Background: In Pakistan, the developmental screening is based mainly on the physical milestones where minimal attention is given to the process of sensory processing, which is a pillar of cognitive, motor, and behavioral development. This oversight is in the wake of worldly indications that sensory processing difficulties (SPD) are strongly associated with severe difficulties in learning, emotional regulation, and social engagement. The aim of this study was to establish the number of young children in Pakistan who are facing sensory processing problems in order to support the idea of systematic screening of development and occupational therapy in schools.

Methods: A cross-sectional survey was utilized. Convenience sampling was used to recruit 384 children aged between 4 and 8 years in the community in Karachi. Sensory Processing Challenges (SPC) checklist. Parents were administered a validated version of a checklist based on the standardized tools. Children with neurodevelopmental disorders (e.g., Autism, ADHD) who were diagnosed before were excluded. The analysis was conducted with the use of SPSS version 20 with the help of descriptive statistics and frequency analysis.

Results: A strong percentage of children portrayed practices that were related to sensory processing difficulties. Among the most important findings were high levels of problems with transitions (67.9% in preschoolers) and unforeseen tantrums (60.7% in preschoolers). School-going children were affected by extreme sensitivity to touch, with 87.3% indicating that they had trouble with being touched. In all, 22.5% of the total sample had reached the threshold of possible SPD, with a marginally higher result in boys (23%) compared to girls (21%).

Conclusion: The results show that the prevalence of sensory processing problems is high among Pakistani children, and it is important to note that there is an acute deficit in the monitoring of child health. Sensory development screening is desperately required in primary healthcare, and there is a need to develop school occupational therapy services to detect and intervene at an early stage, which would eventually lead to improved mental health and academic performance.

Keywords: *Sensory Processing, Prevalence, School-Based Occupational Therapy, Family Systems.*

Introduction

The state of child development is a complex task, to which the checklists, focusing on physical development and gross motor skills, are the traditional methods of monitoring it in Pakistan.[1] Nonetheless, a very important, yet not always detectable, layer of development is sensory processing, which is described as a neurobiological process through which the nervous system receives, organizes, and interprets sensory information about the environment to generate an adaptive motor or behavioural response.[2] Sensory processing is the basis upon which cognitive control, emotional regulation and skilled motor performance are constructed.

In certain children, this does not go on as normal and results in Sensory Processing Difficulties (SPD). Such children may perceive this world as either overwhelming or underwhelming; they may be hypersensitive (over-responsive) to stimuli such as sounds, lights, or touch, or hyposensitive (under-responsive), in pursuit of extreme sensual experiences, or otherwise unresponsive.[3-4] Studies have proposed that patterns of sensory processing, both genetically predisposed and environmental, can define the development of personality and social functioning.[5-7] Nevertheless, sensory symptoms of severity that are significant enough to impair everyday functioning are common worldwide, estimated to occur in 1 per 6 children, and of those children that do, about 5% suffer to the level needed to diagnose a Sensory Processing Disorder.[8-9] In Pakistan, however, children with symptoms of sensory-related behavioral or learning challenges are often misunderstood or later misdiagnosed, which leaves the child to continue to be affected into adulthood, impairing educational achievement, employment, and social connections.[10-11]

This research is thus of paramount importance. It aims at determining the initial prevalence rates of sensory processing difficulties in young children who develop normally in Pakistan. In addition to quantification, the research focuses on the socio-cultural background of these difficulties by seeking possible correlations with family structure (joint vs. nuclear) and sibling relationships. A family environment is a key modulator of sensory experiences, parenting habits, and the intensity with which a child encounters relationships and stimuli in the home setting, which can either buffer or increase sensory vulnerabilities.[12-13] In South Asian cultures, joint family systems are typically found, and this can have varied effects on sensory development processes as compared to nuclear family homes.[14]

Finally, this study presents the empirical findings that can facilitate the change of the system. The two important policies and practices innovations were promoted by illustrating the magnitude of the problem, including the introduction of sensory screening in the context of regular developmental evaluations during the primary healthcare levels and the formalization of school-based occupational therapy (OT) services. School-based OTs are well-positioned to work with teachers and parents to provide supporting environments, sensory interventions, and skills that facilitate learning and engagement, therefore, filling a significant gap in the existing child health and education infrastructure of Pakistan.[15-16]

Methodology

Study Design & Setting

The survey was a cross-sectional, community based survey carried out in Karachi, Pakistan in a time span of more than six months. The data were collected in a variety of environments that families frequented, such as in public parks, schools (parent-teacher meetings), residential compounds, and in hospital outpatient settings.

Participants & Sampling

The expected population proportion was 50 percent to be used to generate the highest possible sample size in the absence of prior local data, and then the sample size was computed with the OpenEpi software (with a confidence level of 95 percent and a margin of error of 5 percent). A convenience sampling was done to recruit the participants.

Inclusion Criteria

Children, usually developing, aged 4-8 years of either gender.

Exclusion Criteria

Children in whom a parent-reported diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorder, Cerebral Palsy, or any other known psychological, neurological, or developmental disorder.

The undiagnosed population was targeted by eliminating those children who had been diagnosed with SPD or specific learning disabilities.

Data Collection Instrument

The main tool was a Sensory Processing Challenges (SPC) Checklist that was based on the existing materials, including those of the STAR Institute of SPD. The checklist consisted of 14 questions that investigated behaviors in the domains of senses (e.g., tactile sensitivity, vestibular-proprioceptive seeking, auditory over-responsivity, and difficulties in praxis and emotional regulation). Respondents would say Yes, or No to each behavior. The checklist was introduced by the demographic part that included the age of the child, his/her sex, type of family (joint / nuclear), number of siblings, and parental education/occupation.

Procedure

The trained research assistants went to parents or the main caregivers, informed them of the purpose of the study in Urdu, and then gave verbal and written informed consent. The checklist was given as a structured interview so as to make the checklist understandable. All data were anonymized.

Data Analysis

The IBM SPSS Statistics (Version 20) was used to enter and analyze data. Since results were in categories, analysis largely consisted of:

- ***Descriptive Statistics:*** Frequencies and percentages to explain the sample demographics and prevalence of each SPC item.
- ***Prevalence Calculation:*** The general and gender stratified prevalence of potential SPD was calculated using a set cutoff score on the SPC checklist.

Ethical Considerations

The strictness of ethical principles was observed. The respondent was free to withdraw at will. No data was obtained, and data were stored safely under the supervision of the principal investigator.

Results

Demographic Characteristics

The sample consisted of 384 children, divided into preschool (4-5 years, n=56) and school-age (6-8 years, n=134) groups for finer analysis. The gender distribution was relatively balanced. Family structure data (Table 1) showed a near-equal split between joint and nuclear families for preschoolers, while school-aged children were more frequently from nuclear families (57.5%). Data on sibling numbers are presented in Table 2.

Table 1: Family System of Participants

Age Group	Family Type	Frequency (n)	Percentage (%)
Preschool	Joint Family	27	48.2
	Nuclear Family	29	51.8
School-age	Joint Family	**52**	**38.8**
	Nuclear Family	**77**	**57.5**

Table 2: Number of Siblings

Age Group	No. of Siblings	Frequency (n)	Percentage (%)
Preschool	0	10	17.9
	1	17	30.4
	2	19	33.9
	≥3	10	17.9
School-age	**0**	**20**	**14.9**
	1	**32**	**23.9**
	2	**45**	**33.6**
	≥3	**37**	**27.6**

Prevalence of Sensory Processing Challenges

The overall prevalence of children scoring above the cutoff on the SPC checklist was 22.5%. A slightly higher prevalence was observed in boys (23%) compared to girls (21%).

Table 3: Frequency of Specific Sensory Processing Challenges by Age Group

Item	Behavioral Indicator	Preschool (Yes %)	School-Age (Yes %)
1	**Difficulty with toilet training**	26.8%	20.1%
2	**Over-sensitivity to touch/smell/noise**	30.4%	26.1%
3	**Unaware of being touched/bumped**	19.6%	19.4%
4	**Avoids fine motor tasks**	12.5%	19.4%
5	**Unsure how to move body in space**	10.7%	15.7%

6	**Difficulty learning new motor tasks**	10.7%	11.9%
7	**In constant motion**	14.3%	45.0%
8	**Touches everything**	**50.0%**	**12.7%**
9	**Difficulty making friends**	14.3%	14.9%
10	**Difficulty with transitions**	**67.9%**	**8.2%**
11	**Sudden mood changes/tantrums**	**60.7%**	**17.2%**
12	**Appears weak, slumps, sedentary**	21.4%	32.8%
13	**Difficult-to-understand speech**	14.3%	20.1%
14	**Difficulty following verbal instructions**	10.7%	13.4%

Preschoolers exhibited pronounced challenges with emotional and behavioral regulation, notably difficulty with transitions (67.9%) and unexpected tantrums (60.7%). Tactile seeking ("touches everything") was also high (50%).

School-aged children showed a different profile, with a high frequency of tactile defensiveness ("difficulty being touched") at 87.3% and increased reports of being in constant motion (45.0%), which may impact classroom sitting tolerance.

Discussion

This study represented the first community-based estimate of sensory processing issues in young children in Pakistan, with a significant prevalence of 22.5% being identified. This statistic highlights that sensory integration problems are not a marginal point but a developmental fact in which about one out of five children exhibits some sort of symptoms related to sensory issues, which is consistent with the worldwide estimates on large neurodevelopment disorders.[17]

Of interest is the different presentation of the age groups. The high scores on the transition difficulties and emotional lability in preschoolers (Items 10 and 11) are probably due not only to the problem of poor sensual modulation, but also to the emerging ability of emotional regulation at such a time of rapid developmental change,[18] and how these difficulties may be translated into alternative, possibly more academically disruptive, behaviors at a later stage. The place of family setting, which is not the central emphasis of the present research, gives essential cultural coloring.[19] It was found that most of the children with known SPC had a nuclear family (76.5%), with more than three out of every four having a sibling. Although such a distribution can be attributed to sampling trends, it raises a question. The nuclear family setting, which is getting more and more popular in urban Pakistan, might offer a more limited palette of sensory input and interactional experience, possibly not as chaotic but also less full of varying social stimuli, than the traditional joint family.[20] Parenting styles, conditioned by parental stress and the knowledge of sensory requirements, also play a determining role. It has been proven that parents of children with sensory sensitivities are easily stressed and, therefore, tend to be authoritarian or permissive, thereby worsening behavioral difficulties in the child.[21-22]

Strengths and Limitations

One of the main strengths of the research is that it is the first research to investigate an under-researched health concern in Pakistan with the use of community-based sample to increase the generalizability to the urban population. Nevertheless, there are restrictions that should be realized. The screening checklist although practical is not a diagnostic instrument. The cross-sectional design is a snapshot, which does not allow making causal assumptions about family dynamics and SPD. Parent report could be influenced by bias and the convenience sampling technique restricts on the sample representativeness. In addition, the use of diagnosed children in this study, though methodologically correct to estimate the prevalence of undiagnosed, implies that the overall community burden of SPD is probably greater.

Practice and Policy Implications

The conclusions have immediate implications. To begin with, they present a very strong case for the need to incorporate sensory processing screening in the Pakistan's current maternal and child health programs. Community health workers and pediatricians could use simple, culturally-specific checklists to identify at-risk children to whom they could make follow-up evaluations.[23] Second, and most importantly, the research offers a strong evidence base to support the argument on mandatory school-based occupational therapy (OT) services. OTs are professionals in the analysis of the person-environment-occupation fit. In schools, they are able to: 1) educate teachers to identify sensory red flags and make classrooms (e.g., by creating quiet corners, introducing movement breaks); 2) directly engage children in sensory integration and motor skills necessary to handwrite and

take care of themselves; and 3) consult parents to adopt supportive sensory strategies at home.[24-25]

Conclusion

Sensory processing problems are common and effective among young children in Pakistan. To solve this concealed demand, it is necessary to have a paradigm shift in the priorities of child health and child education. The future studies ought to use longitudinal designs and generic diagnostic instruments to better the trajectories and causal mechanisms. To design culturally resonant interventions, qualitative studies that address the lived experiences of families and teachers are required. Finally, prioritizing the concept of sensory health as one of the principles of comprehensive development, Pakistan can make a crucial step towards creating an environment in which all children will be able to learn, engage, and flourish.

Author Contributions

Farheen Aslam: Study conception and design, literature review, data collection, data entry, statistical analysis, methodology development, data interpretation, manuscript preparation, review, and revision.

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Conflict of Interest

The author declare no conflicts of interest in relation to this research study.

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References

1. Daly G, Jackson J, Lynch H. Family life and autistic children with sensory processing differences: A qualitative evidence synthesis of occupational participation. Frontiers in Psychology. 2022 Oct 20;13:940478.
2. McLean MA, Niknafs N, Scoten OC, Chau CM, MacKay M, Weinberg J, Synnes A, Miller SP, Grunau RE. Sensory processing and cortisol at age 4 years: Procedural pain-related stress in children born very preterm. Developmental psychobiology. 2021 Jul;63(5):915-30.
3. Armstrong S. Sensory processing in children and adults with learning difficulties (Doctoral dissertation, University of Sheffield).
4. Lefebvre A, Tillmann J, Cliquet F, Amsellem F, Maruani A, Leblond C, Beggiato A, Germanaud D, Amestoy A, Ly-Le Moal M, Umbricht D. Tackling hypo and hyper sensory processing heterogeneity in autism: From clinical stratification to genetic pathways. Autism Research. 2023 Feb;16(2):364-78.
5. Istvan EM, Nevill RE, Mazurek MO. Sensory over-responsivity, repetitive behavior, and emotional functioning in boys with and without autism spectrum disorder. Research in Autism Spectrum Disorders. 2020 Jul 1;75:101573.
6. Dean EE, Little L, Tomchek S, Dunn W. Sensory processing in the general population: Adaptability, resiliency, and challenging behavior. The American Journal of Occupational Therapy. 2018 Jan 1;72(1):7201195060p1-8.
7. Bas S, Kaandorp M, de Kleijn ZP, Braaksma WJ, Bakx AW, Greven CU. Experiences of adults high in the personality trait sensory processing sensitivity: A qualitative study. Journal of Clinical Medicine. 2021 Oct 24;10(21):4912.
8. Carter AS, Ben-Sasson A, Briggs-Gowan MJ. Sensory over-responsivity, psychopathology, and family impairment in school-aged children. Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Dec 1;50(12):1210-9.
9. Ahn RR, Miller LJ, Milberger S, McIntosh DN. Prevalence of parents' perceptions of sensory processing disorders among kindergarten children. The American journal of occupational therapy. 2004 May 1;58(3):287-93.
10. Fletcher T, Anderson-Seidens J, Wagner H, Linyard M, Nicolette E. Caregivers' perceptions of barriers and supports for children with sensory processing disorders. Australian Occupational Therapy Journal. 2019 Oct;66(5):617-26.
11. Links PS, Eynan R. The relationship between personality disorders and Axis I psychopathology: deconstructing comorbidity. Annual review of clinical psychology. 2013 Mar 28;9(1):529-54.
12. Goldberg A, Scharf M. How do highly sensitive persons parent their adolescent children? The role of sensory processing sensitivity in parenting practices. Journal of Social and Personal Relationships. 2020 Jun;37(6):1825-42.
13. Neel ML, Slaughter JC, Stark AR, Maitre NL. Parenting style associations with sensory threshold and behaviour: a prospective cohort study in term/preterm infants. Acta Paediatrica. 2019 Sep;108(9):1616-23.
14. Nadeem MT, Malik M, Akhter MS, Farooq HS, Manj MS. Joint and nuclear family systems: An analysis in the light of Islamic traditions. PalArch's J Archaeol Egypt/Eqyptol. 2022;19:2048-56.
15. Rens L, Joosten A. Investigating the experiences in a school-based occupational therapy program to inform community-based paediatric occupational

therapy practice. Australian Occupational Therapy Journal. 2014 Jun;61(3):148-58.
16. Villeneuve M. A critical examination of school-based occupational therapy collaborative consultation. Canadian Journal of Occupational Therapy. 2009 Jul;76(1_suppl):206-18.
17. Marshall K. Quality of Life and Wellbeing in Children, Adolescents, and Adults with Fontan Physiology and their Parents (Doctoral dissertation, University of New South Wales (Australia)).
18. Williams KE, Bentley LA, Savage S, Eager R, Nielson C. Rhythm and movement delivered by teachers supports self-regulation skills of preschool-aged children in disadvantaged communities: A clustered RCT. Early Childhood Research Quarterly. 2023 Oct 1;65:115-28.
19. Nightingale R, Sumner E, Prunty M, Barnett AL. Handwriting and typing: Occupational therapy practice when supporting adolescents with handwriting difficulties. British Journal of Occupational Therapy. 2022 Nov;85(11):891-9.
20. Yousefzai HA, Qahhhar W. The Role of Family System (Joint and Nuclear) on Psychological Distress of Parents Having Child with Non-Specific Mental Retardation.
21. Goldberg A, Zibenberg A. Parenting an Adolescent: The Case of the Avoidant Highly Sensitive Mother. Child Psychiatry & Human Development. 2024 Sep 20:1-9.
22. Amici F, Röder S, Kiess W, Borte M, Zenclussen AC, Widdig A, Herberth G. Maternal stress, child behavior and the promotive role of older siblings. BMC Public Health. 2022 Apr 29;22(1):863.
23. Galal D, El-Negamy E, Abd-Elhamid K. ROLE OF SENSORY INTEGRATION IN REHABILITATION OF PATIENTS WITH DISABILITIES: A REVIEW ARTICLE. Egyptian Journal of Applied Science. 2023;38(5):76-91.
24. Zainol M, Kadar M, Razaob NA, Wan Yunus F. The need for a handwriting intervention guideline for occupational therapists in the Malaysian context. Journal of Occupational Therapy, Schools, & Early Intervention. 2023 Jul 3;16(3):382-403.
25. Pergantis P, Drigas A. Sensory integration therapy as enabler for developing emotional intelligence in children with autism spectrum disorder and the ICT's role. Brazilian Journal of Science. 2023 Dec 1;2(12):53-65.