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Survey of the knowledge, attitude and practices regarding sensory processing disorders in special educators

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ABSTRACT

Background: Sensory Processing Disorder (SPD) is a condition which affects the way brain processes sensory information. It impacts social and classroom performance. Special educators may be important stakeholder in identification and management of SPD's. *Methods:* An online KAP questionnaire was designed to understand awareness of SPD's in special educators. The face and content validation was done by 5 subject experts. 108 special educators participated in this study. *Results:* Only 35% of the special educators were aware of SPD's through curriculum for special education. Many were unsure of the presentation of SPD's. 54% agreed that SPD's may affect academic performance. 42% were unaware that sensory integration therapy is practiced by neurophysiotherapists. 88% agreed communication between therapists and special educators will lead to better outcomes. *Conclusions:* Most of the special educators had a basic idea of SPD's but lacked detailed knowledge. They perceived that a child's behavior and performance may be influenced by the environment. There is need for an integrated approach for treatment of SPD's.

Keywords: Sensory Processing Disorders, Special Educators, Neurophysiotherapy

1. INTRODUCTION

Ayres and Mailloux, (1981) defined sensory integration as: "The neurological process that organises sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment". Sensory Processing Disorder (SPD) is a dysfunction in the way children process and use sensory information for regulation of motor performance and function. Initially identified by Ayres and Mailloux, (1981) as sensory integration dysfunction, the term SPD, may be included in the subsequent revision of the Diagnostic Statistical Manual and the International Classification of Diseases manual (May-Benson et al., 2009). The Sensory Integration process can be divided into 4 phases: Registration, modulation, discrimination and response (Ayres and Mailloux, 1981; Galiana-Simal et al., 2020). Visual, auditory, tactile, smell, vestibular, proprioception and gustatory are the systems involved in SPD. It may affect one sense like hearing, touch,

etc., or affect multiple senses. It is estimated that the SPD's may exist in 5-16.5% of the general population. Patients can be under or over responsive to the sensory stimuli (Lucy et al., 2009). Around 40-80% of children with various disabilities may exhibit signs and symptoms of SPD's (Ahn et al., 2004; Dahlgren and Gillberg, 1989). A study done in Pune, India reported that 53.4% patients with learning disability had definite SPD (Mutsuddi and Sadhale, 2009). A Meta analytical study revealed that the incidence of sensory differences were highest in studies that included children aged 6-9 years (Kientz and Dunn, 1997).

A child with sensory integration dysfunction may find it difficult to control the responses to sensory stimulation. The consequences of poor attention, abnormal arousal and emotional regulation problems negatively affect learning, not just for the individual child but also for the whole class (Ben-Sasson et al., 2009; Bar-Shalita and Cermak, 2015). Attention difficulties, distractibility and inability to process complex tasks, changing from one task to another may limit the prospects for successful school experiences. The prevalence of the disorder suggests a need for programs to educate parents, teachers, physicians and caretakers about SPD's (Ahn et al., 2004). SPD's involve behaviours that directly impact classroom performance socially and academically. It is imperative therefore for special educators to not only to be aware of SPD's but also be a part of the integrated treatment of this condition. This will facilitate better student teacher interactions and bring about increased academic and social competence in the students (Cosbey et al., 2010).

The curriculum for special education in India generally includes an overview of common neurological conditions. SPD's are not included in these curricula. This lack of knowledge may affect student teacher relationship negatively and reduce the possibility of early referrals for therapy. Early intervention has proven to be crucial in treatment of children having SPD's (Crasta et al., 2020). A study conducted in Malaysia indicated that most of the teachers involved in special education schools lack in understanding of SPD (Natar and Farhana, 2020).

This study primarily aims to assess the knowledge of SPD's in special educators. A KAP questionnaire is classically used to conduct surveys of this kind. KAP surveys are usually planned before implementation of an awareness or intervention program. Analysis of the data generated from such surveys may provide valuable insights for the structuring of awareness or intervention programs. These surveys can also be used pre and post interventions to measure the success of such programs (Al-Ahdab, 2021).

2. METHODS

This was an online study conducted from July 2021-Jan 2022. A KAP questionnaire was prepared and validated by subject experts. Out of the five subject experts three were neurophysiotherapists and two were special educators. Four sensitization lectures prior to the administration of the KAP questionnaire were conducted for the participants. These lectures oriented the participants to the aims and objectives of this study and helped to clarify doubts.

Study Design

This was survey conducted across Mumbai, Mumbai suburbs, Thane and Raigad and Pune districts using the cluster sampling technique. It included special educators with a Bachelor's degree in special education (B. Ed) or Diploma in special education (D. Ed) and having fluency in English language. General teachers were excluded from the study. The representative target sample size needed, to achieve the study objectives and sufficient statistical power, was calculated with Minitab sample size calculator. Keeping the error margin at ±5%, a confidence level of 95% and binomial distribution, a sample size of 142 participants was calculated. A total of 154 special educators received the KAP questionnaire in the Google Forms format via Email and WhatsApp. 108 special educators chose to respond and participate in this study. 71% of the calculated sample population was achieved with a dropout rate of 29%.

Tools

A validated KAP questionnaire with 13 questions in the Knowledge domain, 6 in Attitudes Domain and 4 in Practices Domain.

Ethical considerations

The study obtained approval from the Institutional Ethics Committee for Biomedical research of DY Patil University, the number (DYP/IECBH/2021/267).

3. RESULTS

Demographic data and graphical analysis was done using Microsoft Excel software.

Table 1 Participant demographic characteristics

Characteristic (N=108)	N (Collected %)
Age	
Mean	35
Standard deviation	14
Sex	
Female	99 (92%)
Male	9 (8%)
Years of teaching experience	
0-5 years	62 (57%)
5-10 years	12 (11%)
More than 10 years	34 (32%)
Employment sector	
Private special Schools	45%
Private clinics	21%
Government hospitals	12%
Government schools	8%
Others	14%

Table 2 Distribution of special educators as per the geographical location

Geographical Location	Participants (N=108)	Participants (%)
Mumbai	25	23%
Mumbai Suburbs	38	35%
Thane	24	22%
Pune	12	12%
Raigad	09	8%

KAP Questionnaire

Table 3.1 Knowledge domain of KAP questionnaire

Q. No.	Questions	Percentage Responses		
		Yes	No	Not Sure
01	Have you heard about Sensory Processing Disorders?	73%	15%	12%

Q2.	If yes, how did you come to know about Sensory Processing Disorders?	Categories	Percentage Responses
		Curriculum	35%
		Clinical Practice	34%
		Internet	13%
		OT/Physiotherapist	7%
		Peers	7%
		Research Journal	4%

Q3.	Conditions associated with SPD's.	Conditions	Percentage Responses
		Autism Spectrum Disorder	19%
		Abnormal response to certain sensations	17%
		Auditory / Vision Disorders	10%
		Cerebral Palsy & Downs Syndrome	10%
		Unaware	9%
		Attention Deficit Hyperactivity Syndrome	7%

		Learning Disability	7%
		Others	20%

Q. No.	List of Questions	Percentage Responses		
		Yes	No	Not Sure
4	Do you think SPD's affect sensory systems?	73%	4%	23%

Q5.	Which sensory systems are affected?	Sensory Systems	Percentage Responses
		None	23%
		Visual	18%
		Auditory	17%
		Tactile	15%
		Gustatory	9%
		Olfactory	8%
		Proprioceptive	5%
		Vestibular	5%

Q. No.	List of Questions	Percentage Responses		
		Yes	No	Not Sure
06	Awareness of response to sensory overload	71%	9%	20%
07	Motor difficulties in SPD	69%	14%	17%

Q.8	Awareness of SPD terminology	Category	Percentage Responses
		Sensory hyposensitivity	58%
		Sensory hypersensitivity	77%
		Sensory defensiveness	22%
		Sensory overload	49%

Q.9	Trigger stimuli for sensory overload	Category	Percentage Responses
		Loud noises	85%
		Bright colours	72%
		Different food textures	68%
		Fitting clothes	59%

Q. No.	List of Questions	Percentage Responses		
		Yes	No	Not Sure
10	SPD may affect academic performance	54%	6%	40%
11	Awareness of Sensory Integration (SI) Therapy?	76%	16%	8%
12	Awareness of SI therapy	74%	2%	24%

Q.13	SI Therapy could use different	Category	Percentage Responses
		Textures	86%
		Colours	71%
		Surfaces	73%
		Sounds	75%

Table 3.2 Attitude domain of KAP questionnaire

Q. No.	List of Questions	Percentage of Responses		
		Yes	No	Not Sure
14	Do you think children may have difficulty in perceiving certain sensations?	77%	3%	20%

Q.15	SI Therapy is usually practised by	Category	Percentage Responses
		Paediatricians	20%
		Occupational Therapists	85%
		Neurophysiotherapists	58%
		General Medical Practitioners	4%

Q. No.	List of Questions	Percentage of Responses		
		Yes	No	Not Sure
16	Do you think that special school teachers should be aware of SPD's?	90%	5%	5%
17	Role of special educators in referrals of SPD patients	88%	5%	7%
18	Need for communication between special educators with neurophysiotherapists.	88%	4%	8%
19	Is the feedback given by special educators important?	92%	5%	3%

Table 3.3 Practices domain of KAP questionnaire

Q. No.	List of Questions	Percentage of Responses		
		Yes	No	Not Sure
20	Have you ever come across a child with SPD?	59%	29%	12%
21	Have you ever referred a child for physiotherapy therapy?	68%	32%	0%
22	Have you seen a child's behaviour getting influenced by the environment?	83%	3%	14%
23	Does physiotherapy therapy bring about positive outcomes in children with SPD?	80%	1%	19%

4. DISCUSSION

KAP surveys extensively used in research to gain deeper insights and knowledge about the topic of interest. Qualitative and quantitative analysis was done in this study. (Roy et al., 2020; Andrade et al., 2020). As per Table 1, the mean age of the 108 participants was 35 years (± 14) and 92% were females. Most of the participants in the study were special educators or remedial teachers employed with private special schools. 57% special educators had a teaching experience of less than 5 years, 11% had experience of 5-10 years and 32% had experience of more than 10 years. As per cluster sampling (Table 2) special educators were included from Mumbai, Mumbai suburbs, Thane, Pune and Raigad districts.

The required certification for preschool teachers typically includes courses such as introduction to child development, early childhood philosophies, curricula, health and safety and home/school relations. Hence, despite significant percentages of children with developmental delays, childhood disorders and other sensory related challenges, preschool teacher's training in special education is usually limited (Mizrahi, 2012). Analysis of the knowledge aspects of the KAP questionnaire (Table 3.1) revealed that for question 1 and 2, although majority of the special educators had heard about SPD's only 35% knew about SPD's through their curriculum. The rest had heard about SPD's through clinical practice, internet, interactions with therapists and research journals. The curriculum for Bachelor of Education-Special Education (B.Ed. Sp. Ed) course includes only an overview of the different neurological conditions like Cerebral Palsy, Polio and Multiple Sclerosis. As per question 3, most of the special educators were not aware of the broad spectrum of conditions which are likely associated with SPD like Cerebral Palsy, Attention Deficit Hyperactivity Syndrome, Tourette's disorders, developmental delays etc. As questions 4,5,6,7 and 8 delved deeper to test the specifics in the knowledge domain, most participants were unsure about their answers. Notably, 23% of the special educators were unsure as to which sensory system could be affected in SPD's. Similarly, many special educators were unaware or unsure of the responses

observed in children with SPD's or the difficulties faced by them. Among the SPD terminology, majority had heard about sensory hypersensitivity and hyposensitivity but only a few had heard about sensory overload and defensiveness. In response to question 9, 85% were aware that loud noises could cause sensory overload followed by bright colors, food textures and fitting clothes. In question 10, 54% participants thought that SPD's may affect academic performance while 40% were unsure. Researches have shown that teachers have a lack of understanding of SPD and the strategies to be implemented for sensory difficulties (Wild and Steeley, 2018). Training for sensory processing is essential for teachers is essential and may help in identifying and supporting children with autism (Ruttledge and Cathcart, 2019). As per the responses to 11, 12 and 13 majority of the special educators were aware of Sensory Integration Therapy and its use in the treatment of SPD's. This could be attributed to the fact that 43% of the participants of had more than 5 years of clinical experience and had regular interactions with neurophysiotherapists and occupational therapists.

In the attitudes domain (Table 3.2), in response to question 14 and 15, 77% of the special educators agreed that some children may have difficulty in perceiving certain sensations. 90% agreed that there should be awareness of SPD's. In responses to questions 17, 18 and 19, 88% of the participants agreed that they can play role in referral of children to therapists and there is a need for communication with therapists. 92% special educators agreed that feedback given by special educators to therapists is important. In the practices domain (Table 3.3), answer to question 20 revealed that 59% of the special educators had come across a child with SPD. As per the responses to questions 21, 22, 23, many special educators in their professional experience, had come across students exhibiting sensory issues. Majority of the participants had referred a child for physiotherapy and agreed that a child's behavior can get influenced by the perceived environment. Positive outcomes were observed in their students after receiving physiotherapy. Through their interactions with seniors, peers, physiotherapists and occupational therapists' special educators seem to have basic level of awareness about this condition but are unsure about many critical aspects of SPD's. Hence there may be missed opportunities to identify these children early on. Our findings indicate that it is important to include the concepts of sensory integration and SPD's in the formal education of special educators considering the prevalence and high impact of this disorder on the child's behavior, academic and social performance. Not only should the training for teachers should be sustained and ongoing but it should most importantly focus on attitudinal change (Ghosh, 2017; Butera et al, 2020). It is possible to get children with disabilities to be part of mainstream education with early intervention. Early detection and support of the right teacher can help children can overcome difficulties by the time they reach middle school. A well-informed educator can bring about a much-needed sensitivity in the classrooms while pushing the boundaries for academic achievements. The integrated treatment approach for Sensory Integration will also be further strengthened by the inclusion of special educators. In India, there is a need for early intervention to be given utmost priority. This study hopes to shed some light on the lack of trained workforce in schools to meet with the challenges of students facing sensory processing issues.

5. CONCLUSION

Although the most of special educators have a basic idea of Sensory Integration and SPD's, they lack detailed knowledge of the subject. Most of the participants are interested in gaining comprehensive knowledge of SPD. Special educators perceive that a child's behavior and performance may be influenced by the environment and the appropriate treatment strategies may bring about a significant change in the behavioral and academic outcomes. They are of the opinion that collaborative efforts between therapists and special educators are imperative for treatment of students with sensory processing issues.

Clinical Implications

Formal education of special educators about SPD's will have better social as well as academic outcomes for the children having SPD'. This is also likely to bring about much needed early referrals to trained practitioners of sensory integration therapy.

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Author Contributions

Dr Pranjal Grover (Principal investigator): Participated at every stage of the research process from proposal drafting through report writing and oversaw the entire project.

Dr Ajit Dabholkar: Participated at every stage of the research process from proposal drafting through report writing and oversaw the entire project.

Informed Consent

Informed Consent was obtained from all individual participants in the study.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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