

A Literature Review on The Effects of Sensory Integration for Special Needs Children

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ABSTRACT

Sensory integration (SI) is a natural process of human that involved brain. In this process, information from environment receives by all the senses of human namely visual, auditory, gustatory, olfactory, vestibular, proprioception, and tactile system will be managed then given meaning and filtered whether the information was important or not. Nowadays, SI is widely applied diagnosing and treating special needs children with autism spectrum disorder (ASD) and Attention-Deficit Hyperactivity Disorder (ADHD). SI is widely used approach for the interventions with diverse circumstances and symptomology, but more studies are needed to determine on the effects of the SI. To examine and fill in the existed gaps, present study applied narrative review to synthesize and discuss in details on the effects of sensory integration toward the special needs children focusing on children with ASD and ADHD. Inconsistent results from previous studies are founded, and SI is helping in enhancement of various aspects and skills of the children with ASD and ADHD. Sensory integration development by Williams and Shellenberger (1996) is used to explain and summary present study. More future studies are recommended to fill this large existing gap, and strong scientific evidence for the effectiveness of SI interventions is urgently needed. Additionally, future researchers or practitioners of SI encouraged to determine the optimal intensity zone for the individuals which is the “just-right” challenge to maximize their performance along with the development of skills during the SI intervention.

Keyword: - *Sensory integration, special needs, sensory processing, sensory processing disorder*

1. Introduction

Sensory integration (SI) is a natural process of human that involved brain. In this process, information from environment receive by all the senses of human will be managed then given meaning and filtered whether the information was important or not. This process allowed individuals to behave according to their experiences and was the basis for daily routine included subsequent social behavior and academic abilities [1] SI helps people to understand and respond appropriately to different sensory experiences. For example, seeing colors, hearing sounds, and feeling textures. In short, SI involved how human brains takes in and makes sense of what human see, hear, touch and smell. SI included the 7 senses or systems of human namely visual, auditory, gustatory, olfactory, vestibular, proprioception, and tactile system [1] [2]. When individuals are facing issues on organizing and interpret information from the senses, the individuals may consist of sensory processing disorder (SPD) in which SPD is a condition that the brain has difficulties with organizing and responding into appropriate responses. In short, SPD can be understood as neurological “traffic jam” in the certain part of the brain that has trouble organizing and interpret information from the senses [2]. Children diagnosed with SPD are facing the issue of oversensitive or under-responsive to their surrounding which caused difficulty or challenges in their daily life [3]. Nowadays, SI is widely applied diagnosing and treating special needs children with autism spectrum disorder (ASD) and Attention-Deficit Hyperactivity Disorder (ADHD) [4] [5]. The implementation of SI in clinical intervention and the other related professionals is increasing from time to time particularly for the special needs children who consist of symptoms and diagnosed SPD, but the large-scale studies, evidence and literature supports are needed to fill in the existed gaps on the effectiveness of SI [6]. In short, SI is widely used approach for the interventions with diverse circumstances and symptomology, but more studies are needed to determine on the effects of the SI [7]. To examine and fill in the

existed gaps, present study applied narrative review to synthesize and discuss in details on the effects of sensory integration toward the special needs children focusing on children with ASD and ADHD.

1.1 Research objectives

1. To determine the effects of Sensory Integration on children with ASD.
2. To determine the effects of Sensory Integration on children with ADHD.

2. Literature review

2.1 Sensory Integration on ASD

Sensory integration plays a significant role in children with ASD as they may have challenges in processing and responding to sensory information, such as being hypersensitive or hyposensitive to certain sensory experiences. In a pilot study on children with ASD, more significant changes occurred in the SI treatment group along with a significant reduction in autistic behaviors [8]. The research by Dr. A. Jean Ayres consists of high consistent that SI is helping the individuals with ASD to become better in many aspects [9]. Therefore, SI is an intervention frequently requested by parents and is often applied by occupational therapists for children with ASD including educators serve in special education contexts [10]. In a study on effect of sensory integration therapy (SIT) on different aspects of occupational performance in children with ASD provide a similar result that subjects who are in SI intervention group showed significantly greater improvement included Sensory Profile domains, except for the domain of emotional reactions and emotional/social responses [11]. Additionally, SI did significant enhance the gross and fine motor skills of the children with ASD. As the study on effectiveness of sensory integration program in children with ASD using pre and post tests with the instrument namely Peabody Developmental Motor Scale (PDMS-2) concluded that SI program was effective to treat the children with ASD as the children become more independent and participate in everyday activities [12]. In a systematic review study, the researchers examine on the effectiveness of Ayres Sensory Integration® (ASI) for the individuals with ASD. Result showed that moderate evidence was found to support the use of ASI, and the higher-level studies with bigger samples size are recommended [13]. On the other hand, there were a systematical review on the previous studies does not support the use of SI in both intervention and education for children with ASD as the 8 out of 25 selected reviewed studies show mixed results, and 14 out of 25 selected reviewed studies found no benefits for the application of SI on children with ASD [14]. In short, previous studies show inconsistent results, but SI plays several roles in the development of children with ASD.

2.2 Sensory Integration on ADHD

The symptoms of SPD are increasingly found in the children with ADHD [15]. Parents of children with ADHD tend to be more likely let their children to join SI training compare to guideline-recommended ADHD treatment. However, researchers suggested enhancing risk of developing psychiatric disorders for children with ADHD who join SI training, and the effects of SI for ADHD children ought to be examined and discussed more in the future studies and practices [16]. A systematic review on this particular topic also supports the results with the statement that SI in children with ADHD is not a well-studied topic for now as previously researchers consist of many reported limitations to reach a firm conclusion. However, the systematic review study reported that SI problem or known as SPD in this study is more common compare to the typical children [17]. On the other hand, in a study of children and adults with ADHD, result showed that sensory processing problem is positive associated with ADHD which mean that the increasing number of SPD are found in the children and adults with ADHD [18]. Hence, is it highly potential that SI training also increasing applied by professionals to deal with the individuals with ADHD. This particular result also supported by another study of the sensory processing abilities of children with ADHD with the statement that children with ADHD tend to be consist of sensory processing issues in which their circumstances may lead to the inappropriate behavioral and learning responses in their daily activities [19]. Interestingly, the study in Korea on 20 low-income children with ADHD claimed that SI intervention is improving the self-esteem and the social skill ability of the subjects, and SI is recommended in general elementary institutions [20]. In short, SPD are often part of these multiple diagnoses included ADHD. Therefore, approach to deal with all the disorders simultaneously ought to be concern and recognized treatment protocols are a crucial element [21].

3. Method

To achieve the objectives of this study, literature review on previous studies is carried out to get obtain the insight [22]. This study applies the non-systematic review method namely narrative review to examine the effects of Sensory Integration on special needs children focusing on children with ASD and ADHD. By using narrative reviews, researcher can describe what is known about a topic while conducting a review and critique of the previous literature. Hence, this method is useful for all kind of studies including those topics that already explored by previous researchers or those topics that less famous and less studied by researchers as the way to gain new insights [23] [24]. In this study, the researcher collected the previous literatures through search methods in 3 difference online databases namely Google Scholar, Scopus, and Web of Science. The keywords that used for the searching of this study are Sensory integration, special needs, sensory processing, sensory processing disorder. Other related terms used to obtain more previous studies were attention deficit hyperactivity disorder, autism spectrum disorder, and special needs children.

4. Discussion

According to the previous studies, both research and scientific evidences on SI intervention related to ASD and ADHD are still highly needed to make a firm conclusion on the effectiveness of SI. SI did improve many aspects of the children with ASD and ADHD such as gross motor and fine motor skills. Reason behind of this particular improvement is SI is a intervention that requires the children to participate actively in physical, social and functional activities through active, individually tailored, sensory-rich experiences along with the development of various skills [25]. Moreover, SI activities are designed to give a “just-right” challenge in which requiring the individuals to use their most advanced, adaptive skills, and encouraging them to build on these skills [26]. Again, more studies and scientific experiments are required to examine on the effectiveness of SI included the part of “just-right” challenge to maximize the benefits for the individuals who involved in the SI intervention. Additionally, the concept of Individual Zones of Optimal Functioning (IZOF) model can be referred as the strategy to study on the part of “just-right” challenge.

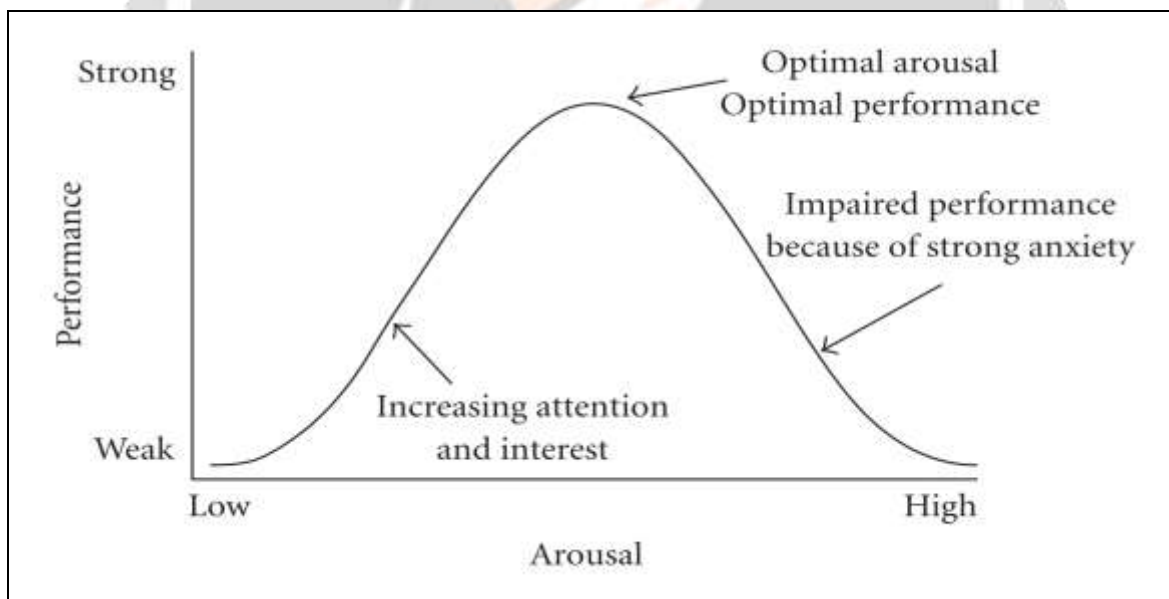


Fig -1: Individual Zone of Functioning (IZOF) model (Ruiz et al., 2015).

In short, successful performance more likely occurs when the intensity of optimal states is higher and the intensity of non-optimal states is lower. Whereas, unsuccessful performance more likely occurred with the non-optimal state is higher and optimal state is lower [27] [24]. Therefore, future researchers or practitioners of SI encouraged to determine the optimal intensity zone for the individuals which is the “just-right” challenge to maximize their performance along with the development of skills during the SI intervention. Through the synthesise of the previous

studies using narrative review method, researcher concluded present study with the theoretical basis as the summarize and insight. The Sensory Integration Development by Williams and Shellenberger (1996) [28] is adopted by researcher in present study as the interpretation and summary for the synthesized of previous studies.

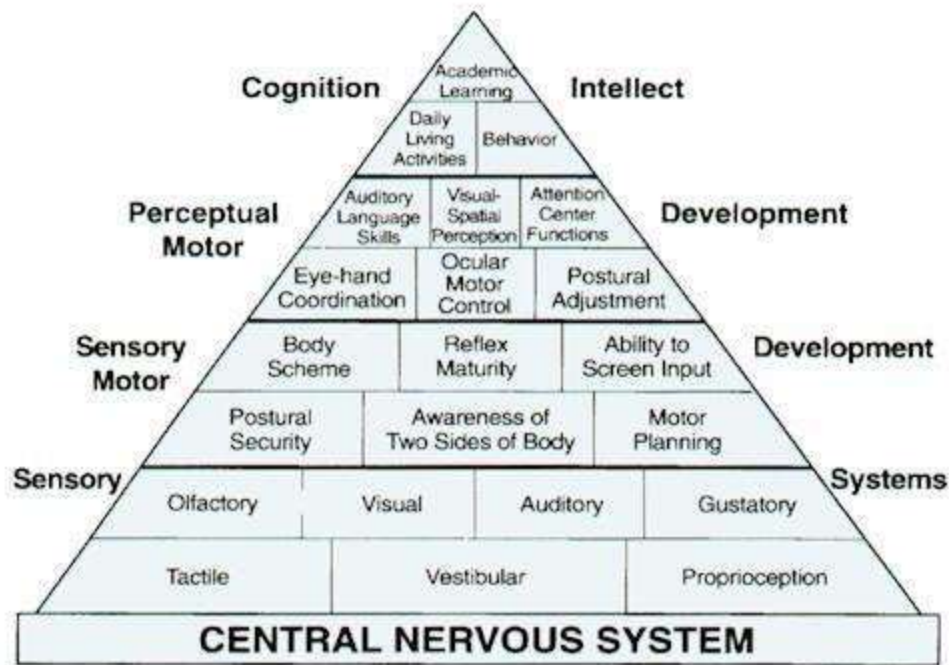


Fig -1: Sensory Integration Development Williams and Shellenberger (1996).

As human receive input or information from environment through the 7 sensory systems namely olfactory, visual, auditory, gustatory, tactile, vestibular, and proprioception, then the information received proceed to the next stages along with the response and development of the other related skills in humans' daily life. Children with ASD and ADHD are dealing with the similar issues that listed in the SI development model above. Therefore, SI activities might be one of the potential strategies or interventions for professionals or educators to practice under the strict supervision on the effect for the children with ASD and ADHD. Besides, additional future research is strongly encouraged to examine and determine the strong scientific evidence for the effectiveness of SI interventions.

5. Conclusion

Inconsistent results from previous studies are reported in present review study. However, SI has been reported by some of the previous practitioners that SI is helping in enhancement of various aspects and skills of the children with ASD and ADHD. The concept of sensory integration development by Williams and Shellenberger (1996) adopted by researcher of present study as the summarization of this narrative review as all the related elements that discussed on previous studies are listed and concerned in this model. More future studies are recommended to fill this large existing gap, and strong scientific evidence for the effectiveness of SI interventions is urgently needed.

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