

Issues Related to Teachers' Knowledge and Early Intervention Services Offered to Early Learners with Sensory Processing Disorder in the UAE

القضايا المتعلقة بمدى معرفة المعلمات باضطراب التكامل الحسي و ما هي خدمات التدخل المبكر المقدمة لطلاب المرحلة المبكرة الذين يعانون من اضطراب التكامل الحسي في دولة الإمارات

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Abbreviation:

Sensory Integration	SI
Sensory Processing Disorder	SPD
Sensory Integration Praxis Test	SIPT
Sensory Profile	SP
Class Teacher	CT
Teacher Assistant	TA
Shadow Teacher	ST
occupational therapists	OT
Learning Support Teacher	LST
Visual, Auditory, and Kinaesthetic Teaching Styles	VAK
Attention-Deficit/ Hyperactivity Disorder	ADHD
Pervasive Developmental Disorder	PDD

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Abstract

The purpose of this study was to investigate issues related to teachers' knowledge and early intervention services offered to early learners with Sensory Processing Disorder in the UAE.

The subjects in this study were fifty-five class teachers of Kindergarten One, Kindergarten Two, Grade One, and Grade Two from nine schools offering different curriculums, seven occupational therapists from different special need and learning centres in Dubai/Sharjah, and two pupils.

The research tools used in this study were a questionnaire given to the fifty class teachers, semi-structured interviews with occupational therapists, and two case studies for pupils with sensory issues. The questionnaire was aimed at learning about what early years teachers know about Sensory Processing Disorder. Data from the questionnaire was analysed with Minitab version 16. The semi-structured interviews were to gain knowledge about where SPD stands in the UAE. The case studies were to learn if the teacher's knowledge about SPD affects the pupils' learning experience in class.

The major findings in this study revealed that the majority of teachers lacked knowledge about Sensory Processing Disorder and spreading awareness to educate teachers about SPD was needed. SPD is still a hidden disorder in the UAE that affects many pupils. Early intervention services and teacher's knowledge about SPD made a positive impact on the pupil's learning experience, behaviour, and social interaction with peers in class.

الغرض من هذه الدراسة بحث القضايا المتعلقة بمدى معرفة المعلمين باضطراب التكامل الحسي و ما هي خدمات التدخل المبكر المقدمة لطلاب المرحلة المبكرة للذين يعانون من اضطراب التكامل الحسي في دولة الإمارات.

وكانت العينة في هذه الدراسة مؤلفة من 55 معلمة من رياض الأطفال للمرحلتين الأولى والثانية، و الصف الأول، و الصف الثاني من تسع مدارس تقدم مناهج مختلفة في إمارة الشارقة، وسبعة أخصائي علاج وظيفي من مراكز مختلفة لذوي الإحتياجات الخاصة ومراكز التعلم في دبي / الشارقة، وتلميذان.

كانت أدوات البحث المستخدمة في هذه الدراسة إستبيان قدم للمعلمات، مقابلات شبه منظمة مع أخصائي في العلاج الوظيفي، ودراسة حالتين لتلميذين يعانون من مشاكل حسية. و كان الهدف من الإستبيان التعرف على مدى دراية المعلمات بارتباط المشاكل الحسية بمشاكل التعلم للكشف عنها و التدخل المبكر. تم تحليل بيانات الاستبيان باستخدام MINITAB 16. كانت المقابلات شبه منظمة لاكتساب المعرفة حول أين يقف اضطراب التكامل الحسي في دولة الإمارات العربية المتحدة. وكانت دراسات الحالة لمعرفة ما إذا كانت معرفة و دراية المعلمة باضطراب التكامل الحسي لها تأثير على تجربة التلاميذ التعليمية في داخل الصف.

كشفت نتائج هذه الدراسة أن غالبية المعلمات يفتقرن إلى المعرفة باضطراب المعالجة الحسية، ولذلك نشر الوعي لتثقيف المعلمات حاجة ضرورية. لا يزال هذا الاضطراب الذي يؤثر على العديد من التلاميذ في دولة الإمارات العربية المتحدة مجهول عند الكثيرين. و لذلك فإن توفير خدمات التدخل المبكر و زيادة معرفة المعلمات بهذا الاضطراب سيكون له أثر ايجابي على التجربة التعليمية للطالب داخل الفصل و سيؤثر ايجابيا على سلوكه و تفاعله الإجتماعي و تعامله مع أقرانه في الفصل.

Issues Related to Teachers' Knowledge and Early Intervention Services Offered to Early Learners with Sensory Processing Disorder in the UAE

Chapter 1—Introduction

Only recently has the Sensory Processing Disorder (SPD) been recognised and entered the public domain. Whilst there may have been cases of SPD prior to the 1960's, it was only discussed as a disorder following the early work of Dr. Ayres's studies of children with learning problems (Bundy, Lane & Murray 2002). With her vast experience she organised her ideas and observation regarding children with learning problems associated with sensory processing issues into a theory called Sensory Integration (SI); it is one of the most researched and controversial theories in the occupational therapy field (Spritzer et al. 1996). A vast group of scientific researchers are still actively conducting research on SPD; a list of their names, research studies and contributions can be found on the SPD foundation website (SPD Foundation 2012).

All children are equal in the right to be educated even if the child has an “unofficial” learning disorder. According to Bruce and Meggitt (2002) children are more alike than different; the only difference is that children with learning disabilities learn and process information differently than typical children. This is due to abnormal brain function; however, they can have normal to average intelligence. Amongst children with learning disabilities, some exhibit deficits in their fine motor, gross motor skills, and coordination in addition to poor sensory processing. A dysfunction in discriminating sensory input is assumed to contribute to a wide range of learning disabilities including problems with attention, memory, reasoning, sequencing, delayed speech, language and communication skills, as well as poor academic performance (Kinnealey & Miller 1993; Frarchi 1998; Cermak & Mitchell 2006).

Current research indicates that 5% to 16% of children have SPD (Murray-Slutsky & Paris 2005; Bialer & Miller 2011). This paper believes that since it is a must to ensure that all children will have fair opportunities in education, it is important to be aware of the early signs of SPD for early intervention. According to Kranowitz (2005) it is a positive thing to identify children with

SPD as it is the first step in understanding where the child's learning and behaviour problems stems from. Souroulla, Panayiotou, and Kokkinos (2009) stated in their study the role of the teacher in identifying learning disabilities that "students with learning difficulties are not identified and not referred for professional assessment until they have failed for number of years which will expose them to years of academic failure and frustration." As a result of this late identification, children with learning difficulties will lack opportunities to receive the appropriate interventions before their deficiencies become massive (Portwood 1999; Kranowitz 2003; Kranowitz 2005). Consequently, children with learning difficulties will be more likely to suffer from low self-esteem, declined motivation, and will demonstrate behavioral difficulties. (Lyon 1996; Satz & Fletcher 1988; Taylor 2000, cited in Souroulla Panayiotou & Kokkinos 2009; Portwood 1999; Kranowitz 2005).

In this research, issues related to knowledge and services offered to early learners with SPD in the UAE will be investigated. Just like many parts of the world, in the UAE, many pupils are not recognised as having SPD until they have failed repeatedly. Unfortunately, many pupils experience a range of failures which affect the child's self-esteem, and eventually they will drop out of school at an early stage (Portwoot 1999). Early services for intervention and provision will potentially avert these emotional problems (Portwood 1999; Kranowitz 2005). The survey's result revealed that teachers in the UAE do not have adequate knowledge about SPD and how sensory problems affect pupils' behaviour. Consequently, the educators' knowledge regarding SPD and attitudes toward teaching children with challenging academic and behavior needs in mainstream classes will be investigated.

Furthermore, this research will investigate how early learners with SPD are diagnosed in the UAE. Where can SPD be diagnosed correctly? Who are the professionals that are certified to diagnose this disorder? What is the role of those professionals in forming a link between school and home to understand the child's disorder to support their learning journey? As these issues are still being not researched in the UAE and even in the Arab world, investigating this topic will help to shed some light on the areas that needs to be developed. It is anticipated that this paper will develop awareness regarding strategies, resources, teaching methods, and classroom

modification strategies to educate teachers and parents about SPD. Thus, teachers will have greater knowledge about SPD and will learn how to support pupils with this disorder in order to concentrate their efforts on the problematic areas. Consequently, early detection will potentially have a positive influence and effect on early learners' with SPD and on their academic achievement at later stages.

Importance of the Study in UAE

The UAE does not recognise SPD as a disability. The UAE upholds and follows the United Nations belief for Human Rights in Education for All (EFA) and their policies who do not recognise SPD. So it is not surprising that SPD is not listed within the special need categories which qualify pupils to receive special education programs and related services. SPD is not clearly included in the special educational needs categories and services despite a child with SPD having all the recognised difficulties in the "School's for All Guide Book" (MOE 2010). SPD is still a hidden disorder in the UAE that impacts negatively on the academic performance, behaviour, social interaction, and communication of many pupils. This paper will argue that this disorder must be recognised and added to special educational need categories in the UAE to qualify those children for intervention programs.

This study is extremely important as the issue related to identify, recognise, and offer early intervention services to children with sensory issues was certainly not investigated in the UAE or in the Arab world. Therefore, this study will be the first of its kind in this region, and it will aid to spread awareness regarding SPD. Also, this paper is adequate to our culture and environment in the UAE. Optimistically, SPD will be further investigated in the UAE.

The Rationale and the Significance of this Study to the Researcher

As a learning support teacher, the researcher has taught many pupils who exhibited all the following problems at once: speech delays; social interaction problems; over/under-sensitivity to stimulus; fine/gross/balance difficulties; and reading, writing, mathematical, and attention problems. The researcher always wondered why it was so difficult to reach to them. Why was playing indoors, outdoors, or with peers not spontaneous and a natural thing for them to do?

With continuous search to meet their challenging needs, some of them were assessed, and they have been diagnosed with SPD.

Then the researcher started to learn more and more about SPD. Developing my knowledge about this disorder helped me to be a better teacher. Just like Kranowitz (2005, p. xxv) “as my knowledge increased, so did my teaching skills.” When the researcher started to address the pupils’ sensory problems and find ways to overcome those problems, it made the researcher’s teaching very rich in sensory experiences. Those pupils started to enjoy what was overwhelming in their own classrooms. Transferring this knowledge and the rich sensory teaching methods to the class teachers and parents had a positive impact on those pupils’ behaviour, academic performance, and their self-esteem. This realisation gave the researcher a very strong motive to investigate this disorder thoroughly to:

1. Establish awareness about SPD among early years teachers, parents, and the community for early detection and intervention.
2. Understand the challenges and issues related to the current services offered to early learners with SPD in the UAE.

Research Questions

The research questions are formed in a sensible manner taking into consideration appropriate research methodology to ensure the investigation validity (Robson 2002).

1. What do early years teachers know about SPD?
2. What is the effect of teacher’s knowledge about SPD on the academic and behaviour development of a pupil with SPD?
3. What are the identification tools, professionals, and procedures to diagnose SPD in the UAE?

Chapter 2—Literature Review

Before beginning the research, it was important to research the most effective methods to achieve the most accurate findings. As such, the review spends time analysing different methods of researching SPD, reviewing the theory of SI very comprehensively, and reviewing the most effective methods to conduct this study. Therefore, the literature review will be based on the current research and findings of the SI theory. Whilst this paper is concerned with SPD in the UAE, the literature review analyses how SPD has developed and what are the best diagnostic tools and intervention methods used.

The History of Sensory Processing Disorder Theory

SPD remains a controversial subject despite the extensive research history and will continue to be a popular area of research interest in occupational therapy (Bundy Lane & Murray 2002; Gavin et al. 2011). Dr. Ayres has had a vast influence on the occupational therapy's field, and her theory of SI was developed over thirty years of methodical approaches' of "research-then-theory" and "theory-then-research" manner (Mailloux 1990; Kinnealey & Miller 1993; Roley et al. 2007). The theory of SI is used to "explain behaviour, plan intervention, and predict how behaviour will change through intervention" (Bundy Lane & Murray 2002; Roley et al. 2007). As a result of empirical research and studies, Dr. Ayres's theories and work are still developing and changing. In addition, this new knowledge is influencing the theory and its practice (Kinnealey & Miller 1993; Miller et al. 2007b). Dr. Ayres considered this dynamic change in the theory as a positive thing (Kinnealey & Miller 1993; Bialer & Miller 2011). As the theory of SI is not a fact, but is an organisation of ideas, and with research it is anticipated to be supported with facts (Kinnealey & Miller 1993).

SPD is not due to a brain damage or disease but it is "indigestion of the brain" as Dr. Ayres described it (Kranowitz 2005, p.69). In the literature, the causes of SPD are not clearly identified; however, Westwood (2004) mentioned a few studies conducted by Gubbay (1985) which connected nearly 50% of the diagnosed cases with dyspraxia to significant potential causes evident during pregnancy and birth complications. Bialer and Miller (2011) and Westwood (2004) also discussed environmental factors that might cause SPD, such as lack of external stimuli and poor nutrition at an early age.

Dr. Ayres related behavioural and learning problems to a neurological process base (Ayres 1972b; 1972c, cited in Kinnealey & Miller 1993, p. 475). SI theory hypothesises that one's normal development ability to process sensory input from the environment is essential for learning (Bundy, Lane & Murray 2002). According to Bundy, Lane, and Murray (2002, p. 4), Dr. Jean Ayers defined SI as

neurological processes that organize sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment.

However, according to Frarchi (1998) the relationship between SI and learning difficulties has been debated and criticised.

One main reason of the sensory integration theory's failure to penetrate the learning disabilities field is because it does little to improve the construct of learning disabilities. Sensory integration theory broadly refers to learning disabilities as a homogeneous group with general achievements failure (Frarchi 1998, p. 2).

Therefore, current research outlines that understandings of SPD lead wisely to classifying subtypes of learning disabilities into different patterns of dysfunctions and subtypes categories of SPD (Frarchi 1998, Cermak & Mitchell 2006; Miller et al. 2007a). It is possible to divide disorders of SPD into main categories, and they may overlap (Cermak & Mitchell 2006). As a result, precise cognitive and academic performance profiles will lead to the categorisation of reading-disabled and arithmetic-disabled subgroups. By examining the research case studies in this paper, it is predicted to find support from results regarding some of the subgroups of SPD.

Prevalence of SPD with Other Disorders

The researcher believes that SPD get misdiagnosed in the UAE due to the lack of knowledge about the prevalence of SPD with other disorders. This section is included to avert confusion between SPD and sensory problems that are a result of other developmental disorders. Therefore, this section of the literature review explores valuable and recent evidence regarding prevalence of SPD with other disorders.

According to Kranowitz (2005), SPD is often misdiagnosed with other disorders and learning problems. Following these findings the researcher believes that spreading knowledge regarding SPD and the prevalence of SPD with other disorders will create a cross curricula between other

professionals such as psychologists and speech therapists and may aid in diagnosing SPD correctly.

SPD stands alone, and it often overlaps with other disorders (Kranowitz 2005; Murray-Slutsky & Paris 2005). SPD could manifest in typical developed children who do not have any significant or recognised disorder (Kranowitz 2005). Recent studies have concluded, based on empirical evidence, that there is dissociation between ADHD and SPD although some symptoms may overlap (Mangeot et al. 2001; Ahn et al. 2004; Parush et al. 2006; Reynolds & Lane 2009; Lane, Reynolds & Thacker 2010; Miller, Nielsen & Schoen 2012). Recent research findings have proved significant difference in sensory profile patterns amongst children with SPD and other children with autism, PDD, asperger syndrome, ADHD, gifted children, cerebral palsy, and children with cochlear implants, just to mention a few (Johnson-Ecker & Parham 2000; Mangeot et al. 2001; Watling, Deitz & White 2001; Dunn, Myles & Orr 2002; Schaaf et al. 2003; Yochman, Parush & Ornoy 2004; Pfeiffer et al. 2005; Prakash & Vaishampayan 2007; Tomchek & Dunn 2007; Ashburner, Ziviani & Rodger 2008; Gere et al. 2009; Dunn 2009; Bharadwaj, Daniel & Matzke 2009; Gal, Murray & Passmore 2010; Reynolds & Lane 2009; Davies & Tucker 2010; Gavin et al. 2011). More importantly, a study by Gavin et al. (2011) presented empirical evidence of significant differences in brain processing between children with SPD and typical children. This discriminated finding confirms that the mechanisms of sensory registration model could correctly classify children with SPD with 79% accuracy. Additionally, these findings are consistent with previous studies that examined auditory sensory registration mechanism in children with SPD and with other disabilities (Gavin et al. 2011).

Furthermore, SPD is evident in individuals with developmental disabilities, and the rate is up to 30% (Schaaf et al. 2010; Lane & Schaaf 2010). In the UAE, it is difficult to estimate the percentages since there is no central statistics agency. Nonetheless, evidence would suggest that the UAE is similar to the worldwide average of the population regarding the percentage of people with SPD. (Bradshaw, Tennant & Lydiatt 2004).

SPD and Learning Difficulties

The researcher believes that analysing the impact of SPD in the UAE is important, as SPD contributes to several learning, social, emotional, and physical difficulties. Thus, the investigator has outlined how previous research proves that SPD impacts on these areas of development. This section of the literature review provides information on the subject of the correlation between SPD and how it contributes to several of the learning, social, emotional, and physical coordination difficulties.

According to Portwood (1999) Ahn et al. (2004) children with sensory problems will frequently experience significant distress in a structured environment. Thus, sensory problems become more obvious in settings that contain physical, social activities, and stimuli such as in school or day-care (Portwood 1999; Ahn et al. 2004). Also, children with SPD have problems in their functional skills, Parham and Mailoux (2001 Cited in Ahn et al. 2004, p. 288) have summarised five functional impairments that are associated with SPD:

decreased social skills and participation in play occupations; decreased frequency, duration, or complexity of adaptive responses; impaired self-confidence or self-esteem or both; deficient adaptive or daily life skills; and diminished fine-, gross-, and sensory-motor skill development

Ahn et al. (2004) states that fundamental skills for learning involve reception and processing of physical and environmental stimulation, then transformation of these stimuli into the nerve system. Impairment in the sensory system, developmental delays, and functional abilities will affect negatively on behaviour, emotion, motor skills, and cognitive abilities (Kandel et al. 1994 Cited in Ahn et al. 2004). Furthermore, as stated by Kranowitz and Newman (2010) all the later skills are very important for attainment of academic skills of writing, reading, and social interaction. Children learn and master their skills through play and social interaction (Bundy et al. 2007). SPD affects negatively on the child's abilities to meaningfully interact with peers and the environment (Bundy et al. 2007). Supportive findings from the case studies observations will show how meeting the child's learning styles and sensory problems make a positive impact on the child's learning and social interaction experience in class even if the pupil has severe SPD. On the other hand, not meeting the needs of a pupil with sensory problems negatively affects his learning and social interaction.

Studies in neuroscience and neuropsychology helped professionals to view learning in a different perspective (Allen 1982; Burgess 1989; Cohen & Reed 1995; Goverover et al. 2009; Schaaf et al. 2010; Gavin et al. 2011). Now, it is scientifically proven that physical and cognitive activation happens as a result of changes in the nature and location of electrophysiology and neurochemicals in the brain (Westwood 2004). According to Meade (2001 cited in Westwood 2004) learning occurs when the brain is able to process information, capture, store, and retrieve records of information in a connected brain cells of circuits.

SI theory has been developed based on children with learning difficulties who experience unique SI problems (Ayres 1975a). According to Ayres (1975a) those difficulties may be associated with a flawed progress in the early stages of sensory-motor development because of inefficient neurological processing (Ayres 1975a; Franchi 1998; Kranowitz 2005). According to Portwood (1999) dyspraxia is a consequence of immature developments in some parts of the brain. That explains why children with learning disabilities have visual processing difficulties and more precisely in their spatial visualisation and visual motor skills (Humphrise et al. 1996; O'Brien et al. 1988 cited in Davies & Tucker 2010; Franchi 1988). Therefore, academic deficits are the result of the child's brain inability to adequately interpret sensory information (Ayres 1975b).

Pupils' learning and behaviour problems should not be overlooked. Therefore, spreading awareness for teachers, parents, and pediatricians in the UAE about early signs of SPD is crucial in identifying the SPD symptoms for early intervention. The observation in this paper is focused on the pupils' behaviours and learning problems that are due to inadequate sensory processing and integration. All the mentioned learning problems and behaviour were present in the pupils that were observed.

It was shown that SPD has an impact on children's learning, social, emotional, and physical coordination difficulties; it is therefore important that here in the UAE we take this into account. Also included in this information is part of the occupational therapists interviews' analysis to see how people perceive SPD in the UAE.

The Efficiency of Occupational Therapy and the Benefits of Early Intervention Sensory Integration Based-Treatment

Occupational therapy has always been an essential part in the treatments of children with mild motor problems and developmental delays (Wilson, et al. 2000). Children who exhibit mild to moderate learning and behaviour problems related to disorders in sensory processing are the ones who will mainly receive SI treatment (McCauley, 2006). It is vital to mention that SI does not change the medical condition for individuals with cerebral palsy, mental retardation, autism, and fragile X (Kinnealey & Miller 1993). However, occupational therapy may help those individuals to develop relaxation techniques when they are overwhelmed by facilitating positive engagement and participation in different sensory experiences (Reynolds & Lane 2009).

According to Lane and Schaaf (2010) SI framework is the most investigated approach in the field of occupational therapy. On the other hand, SI theory and practice did not reach to an equipoise stage, where all the stakeholders are in a state of agreement (Schaaf & Miller 2005). Though, SI theory and practice are comparatively new and still under research if compared to the fields of psychology or medicine as examples (Schaaf & Miller 2005). Also, it is very complicated to critically analyse research effectiveness of SI treatment due to many aspects (Kinnealey & Miller 1993; Spitzer et al. 1996). One aspect is related to instruments' limitations that are available in occupational therapy. Also, there is a lack of professional of well-standardised, reliable, and valid measurement tools. The second aspect is for the variety result and methods that are used in studies (Kinnealey & Miller 1993; Cermak & Henderson 1989-1990; Spitzer et al. 1996). Additionally, there are many intervention programs and publications that been erroneously associated with Ayres's work and SI theory (Roley et al. 2007).

Many case studies regarding the effectiveness of SI approach were published in peer-reviewed literature (Schaaf & Miller 2005; Miller et al. 2007c; Parham et al. 2007). In 1982, Ottenbacher examined forty-nine published research studies, in addition to eight studies that met strict standards to analyse the effectiveness of SI treatment (Cermak & Henderson 1989-1990). Ottenbacher found positive effect on 78.8% of children who received SI treatment compared to the children who did not received SI treatment. These positive effects were evident in their motor performance, academic achievement, and language functioning, self-stimulation, and

behaviour (Kinnealey & Miller 1993; Spitzer et al. 1996; Cermak & Henderson 1989-1990; Cohn 2001). Clark and Pierce (1988, cited in Kinnealey & Miller 1993) provided another positive support for the SI therapy; they comprehensively reviewed documented single subject studies and group design studies. Also, they concluded that there were positive effects results of SI therapy from both studies (Kinnealey & Miller 1993; Cermak & Henderson 1989-1990). Moreover, there is a strong support that indicates the ability of nervous system's plasticity and the ability to change in response to environmental input and demands during SI treatment (Lane & Schaaf 2010). On the other hand, although many studies indicated the effectiveness of SI approach in improving children's motor skills, sensory processing, and academic performance, no absolute conclusions regarding the efficacy can be drawn (Miller et al. 2007c; Parham et al. 2007).

Additionally, many studies were done with impractical explanations of its multiple outcomes and non-significant statistical results regarding the effectiveness of the SI treatment. Densem, et al. (1989) described some of the statistical result as a "fishing expedition," because they were hard to interpret (cited in Schaaf & Miller 2005, p. 146). Finally, a grant study was conducted by a large group of occupational leaders to assess the validity of SI outcomes (Parham et al. 2007). They concluded that the studies with indefinite conclusions regarding SI effectiveness were because of the weak fidelity in regards to therapeutic process (Parham et al 2007). What is meant by "Fidelity" is to what extent the intervention based SI approach is faithful and loyal to its fundamental theoretical and clinical strategies (Praham et al. 2007). They recommended to carefully consider the fidelity of the SI approach in treatment before making inferences regarding the effectiveness (Parham et al. 2007).

How is SPD Diagnosed?

Since this research looks at whether there is adequate provision for children with SPD in the UAE it is important to look at how SPD is diagnosed. Within the case study section of this paper, the researcher will be looking at how the pupil was diagnosed. Consequently, the researcher has dedicated a section of the literature review to looking at how current research suggested SPD should be diagnosed. This section provides general consideration for screening and

assessments for SPD. It is vital to pay attention to the assessments used, as different assessments tools generated different subtypes of SPD (Davies & Tucker 2010).

SPD is a unique disorder. For that reason, assessment should be focused on how the child processes sensory input and manages environmental challenges simultaneously (ICDL n.d.). Occupational therapists with certified Sensory Integration Praxis Test (SIPT) are the most appropriate professionals to complete the comprehensive assessment (ICDL n.d.). Also, SPD evaluation should be completed along with collection of other important information (Kinnealey & Miller 1993). "Observation and parent interview are particularly important for screening, for enabling the practitioner to identify potential problems as well as the need for more in-depth assessment" (ICDL n.d., P. 160). Judgement-based assessments have many advantages and offer a balance between objective standardised tests and the subjective nature of clinical observations (Burton & Miller, 1998).

Studies in the Middle East Regarding Sensory Processing Disorder

In the Middle East and the Arab world, the majority of studies regarding SPD found by the researcher were insignificant. Mostly they were translations of information about SI's theory, and the symptoms of SPD published in non-scientific and online newspaper (AAWSAT 2010; Hasan & Azzam n.d.). One study completed in the UAE by Reynolds (2010). Reynolds (2010) investigated the effectiveness of SI therapy on neuro-physiological development. However, this study is full of bias due to many issues in the research. For example, the study did not mention how the independent variables were controlled. Also, it did not mention the effect of maturation on the nervous system, and there was no control of external therapies, parental influence, or teaching methods.

In addition, there was a bias control as all the occupational therapists were employed by the manager of the BILD and the same therapist performed the evaluations and the treatments. Moreover, there was absent of external control for treatment implementation. Finally, the study was not published in a credible journal to consider their findings as reliable.

Whilst there is next to no research on SPD in the Gulf Region, there have been some conducted in Jerusalem. Some of these studies were published in the American Journals of Occupational

Therapy, and another study was published in the *Developmental Medicine and Child Neurology Journal* (Yochman, Parush & Ornoy 2004; Bar-Shalita, Batine & Parush 2008; Golos et al. 2011). All these studies were conducted by the faculty of Medicine of Hadassah and the Hebrew University of Jerusalem (Yochman, Parush & Ornoy 2004; Bar-Shalita, Vatine & Parush 2008; Golos et al. 2011). Two studies asserted on the significance of early detection, and early intervention by a multidisciplinary team that should include occupational therapist, teaching staff and parents to help the child grow out of his/her difficulties (Bar-Shalita, Vatine & Parush 2008; Golos et al. 2011). The study that was conducted by Yochman, Parush, and Ornoy (2004) contributed to support the prevalence between SPD and ADHD, but children with ADHD exhibited significantly lower scores on sensory profile questionnaire than children without ADHD (Yochman, Parush & Ornoy 2004). They concluded that ADHD children are at higher risk of various sensory processing deficits (Yochman, Parush & Ornoy 2004). Moreover, at the BUID's library there is not even a single text book, study, or article about this disorder.

After reviewing the vast literature regarding SPD and exploring the development of the SI's theory, it became clear that SPD impacts many children's learning and behaviour. Also, SPD can be overlooked by the first inline professionals who deal with young learners because of their lack of knowledge about SPD; especially the early years foundation stage teachers and paediatricians. Therefore, investigating SPD is a need in the UAE to learn if spreading awareness regarding SPD is necessary or not. The following chapter will present how the study will be conducted.

Chapter 3—Methodology

The ethical approach of this investigation was guided by the BUID's ethical code. All questionnaires, interviews, and observation approvals were preceded with written approvals from BUID. This chapter covers a discussion of the methodology and the research designed using quantitative and qualitative tools which were considered appropriate for this study. According to Robson (2002) the research methodology creates the framework of the project. To ensure the results of this investigation are reliable, the following methodology was chosen: to investigate services offered at some of the main special need centres in Dubai and Sharjah; observations of two pupils with sensory problems, semi-structured interviews with occupational therapists, interviews with parents, interviews with teachers that have pupils with SPD/sensory problems, and a quantitative teachers' questionnaire.

SPD and services offered to early learners have never been investigated in the UAE. Consequently, triangulating the data will be from various sources to ensure reliable and valid data collection. This investigation is intended to answer the research questions with a purpose to investigate issues related to services offered to early learners with SPD in the UAE. Each research methodology has its own set of assumptions. By applying more than one method, a triangulation can produce different kinds of data on the same investigated topic which is anticipated to result in improving the quality of the research (Denscombe 2003; Dawson 2009). Also, corroborating more than one method can enhance the validity of the collected data. Though it does not mean that the researcher is right, but consistent data can add some confidence on the research findings (Denscombe 2003).

Questionnaires

Following the current literature on SPD that states SPD can be misinterpreted as behavioural, motor in-coordination, attention, hyperactivity, or emotional problems (Murray-Slutsky & Paris 2005). The researcher has hypothesised accordingly that due to the teachers' lack of knowledge regarding SPD, teachers do not link between the child's poor academic performance, uncoordinated movements, attention difficulties, social, and behaviour problems with the

child's sensory issues. The questionnaire is aimed at learning more about what early years teachers know about SPD.

Therefore, the quantitative section of the paper will include teachers' questionnaires to investigate their knowledge and understanding of SPD. The statistical testings were completed with Minitab version 16. This tool was chosen because questionnaires tend to describe the collected information not to explain why teachers have or do not have knowledge about SPD (Munn & Denver 2004). Moreover, from the collected data and the results of the questionnaires some correlations can be made between some of the questions which may lead to tentative explanations for some of the issues raised in the questionnaire. All the data from the questionnaires will be analysed and presented quantitatively. These findings will be addressed in the discussion's chapter with the possibility of some of the findings being addressed for future research.

The questionnaire included general questions about the teachers' education background to statistically test if there is any correlation between their background and knowledge about SPD. Also, the questionnaire consisted of general questions regarding SPD, poor academic performance, sensory issues, and behavioural problems, just to mention a few (Appendix 11). A pilot study was conducted at the researcher's school. The questionnaires were answered by fifty-five class teachers. According to (Peterson 2000) administrating a pilot study should involve similar research conditions of the actual investigation. Consequently, the sample of the questionnaires used in this study includes teachers with a wide range of cultural diversity, different education back grounds, knowledge, experience, and language. After analysing the survey, some ambiguous and unrelated questions regarding the objective of the survey were deleted. The questionnaire was edited to refine the collected data and to ensure conceptually the research's questions (Yin 2009; Robson 2002). The refined questionnaire was translated into Arabic to target government schools, as well as to provide an alternative language option.

In order to distribute the questionnaire at government and private schools in Sharjah a written letter was sent by the British University in Dubai in Arabic to Sharjah Education Zone. Sharjah Education Zone approved the researcher's request. A circular was sent on the same day to all

the government and private schools in Sharjah to allow the researcher to distribute the questionnaires (Appendix 12). The schools were selected randomly, with different curriculums, reflecting the UAE's diverse population. The questionnaire targeted only kindergarten and grade one teachers from private and government schools.

Data Collection

A total of a hundred and twenty questionnaires were distributed in nine schools in Sharjah, three public and six private schools. The private schools' curriculums were British, Arabic, and American. The questionnaires were handed over in each school to the section's coordinator of the kindergarten, and Grade One/Two. A clarification about the disorder was discussed with the sections' coordinators. The instructions that were given to the coordinators clearly stated not to conduct any research while the teachers are answering the questions. The reason why it was decided not to implement a "face to face questionnaire" was to avoid any influence from the researcher. Also, the teachers' answers should be based on their current knowledge regarding this subject. Fifty-two questionnaires were completed by teachers from private schools. Unfortunately, only three out of forty-five questionnaires were completed by government schools' teachers. In total, fifty-five completed questionnaires came from all the schools.

Following completion of the survey the coordinators and teachers were very keen to learn more about this disorder; a workshop about SPD will consequently be arranged. This will aid to spread awareness about the disorder and sensory problems that leads to academic difficulties and behavioural problems.

Semi-Structured Interviews with Occupational Therapists

The semi-structured interview was chosen to allow a certain flexibility to reflect on the answers given rather than being restricted by a rigid model of questions (Creswell 2008). Following Robsin's (2002) views, semi-structured interviews were conducted in a qualitative manner with occupational therapists from several special centres in Dubai, and Sharjah. The semi-structured interviews with occupational therapists will be linked to the most recent findings in the literature to the UAE.

Denscombe (2003) argues interviews can be strongly justified when they are conducted with key professionals in the field as they are the ones who can provide privileged information. It was decided to interview occupational therapists as they can provide valuable information because they are the main professionals who diagnose SPD. Also, occupational therapists are directly involved with children, parents, and teachers.

The semi-structured interviews are targeted to know how SPD is diagnosed in the UAE? Is it over or under diagnosed in the UAE? Is it misdiagnosed with other disorders in the UAE? Do medical professionals, teachers, and parents know enough about SPD in the UAE? What is the impact of occupational therapy and the benefits of early intervention base SI treatment? In-depth details will be presented in the occupational therapists finding section.

The first group of semi-structured interviews were conducted at Kids First Medical Centre. Kids First, is one of the special learning centres in Dubai. They are a complete parent resource that provides parents with educational consultations, parental seminars, and trainings. Furthermore, they are specialised in the assessment and the treatment of learning difficulties, behaviour issues, psychology, physical therapy, occupational therapy, and speech-language therapy (Kids First Medical Center 2012). The communication with Kids First Medical Centre was arranged via email. The therapist requested to receive the questions by email before scheduling a meeting. The questions were answered and returned back to the researcher. A meeting was agreed as a group interview at Kids First which lasted for an hour with three occupational therapists. The interview was documented using a recorder and writing notes.

The second interview was conducted with an occupational therapist from Sharjah City for Humanitarian Services (SCHS) at the Early Intervention Centre. SCHS is “a non-profit organisation founded in 1979 as a branch of the Arab Family Organisation in the Gulf region” (SCHS 2012). SCHS serves hundreds of individuals with disabilities from different nationalities and age groups (SCHS 2012). To approve the meeting with the researcher, an official letter was sent to the Director of the Early Intervention Centre from BUID. Then a meeting was arranged via phone. The meeting with the occupational therapist took place at the Early Intervention Centre and was documented with a recorder and writing notes.

The third interview was with the Kids in Motion's director, a registered occupational therapist with the national accrediting body and with the UAE's Ministry of Social Affairs. She is also a certified SIPT examiner. Kids in Motion, is a paediatric and therapy services centre providing various therapy services. They specialise in dealing with children with SPD, Autism, speech delay, and physical disabilities just to mention a few. The interview was arranged via email then by phone. The semi-structured interview was done in two phases, first a face to face interview at Kids in Motion. Then the interview was completed by phone to meet her busy schedule.

The other interviews were arranged via emails due the occupational therapists busy schedules. The questions were answered then emailed back to the researcher. Face to face interviews were then arranged with the occupational therapists.

Multiple Case Studies

Several research methods will be conducted to formulate a triangulation between the multiple case studies in this paper. According to Gomm et al. (2000) collecting data from several sources is considered strength since by examining more than one case study the researcher will be able to identify casual processes that are not possible in other research methods because case studies are examined thoroughly and over several periods of time. Consequently, the overall study that is based on several sources of data collections and on multiple case studies is considered to be a more robust study and the evidence that is drawn is more convincing (Herriott & Firestone 1983, cited in Yin 2009, p. 53).

Another benefit of case studies is that they are a valuable method for studying humans as they focus on all the small details that are involved within the real context of an individual (Yin 2009). Gomm et al. (2000) argue that some case study research is to provide conclusions about general types of phenomena. Therefore, the major aim of conducting these multiple case studies is to draw conclusions about general issues related to sensory problems in children with any subtype of SPD in regular learning settings.

Observation

Sensory processing problems are unique in each child (ICDL n.d.). As such, observation will be used to detect the child's sensory problems in his structured and unstructured situations taking

into consideration the various schools' environment settings. Sensory problems become observable while the child is interacting with the environment (Kranowitz 2005; Kranowitz & Newman 2010). Unstructured situations will include free play and lunch time; structured situations will include class observations for a typical school day. The main purpose of these observations is to explore the child's reaction to the sensory demands of the various environments in all situations. Thus, this methodology was chosen as it is the only tool that can provide a rich insight into the child's sensory problems while dealing with motor challenges and academic complexity all at once (Denscombe 2003).

The children are selected regarding two different learning settings conditions to conduct comparisons. The first setting will be to observe a child that is identified and diagnosed with sensory problems and who undergoes regular occupational therapy sessions. The child's teacher is in regular contact and follows up with parents and the therapist to best accommodate the child's needs at school. The second setting will be to observe a child who it is believed to experience sensory problems and is not yet diagnosed or attending regular therapy sessions and the teacher has no prior knowledge about SPD. Sensory Profile (SP) by Dunn will be administrated by parents with the researcher. The SP will be interpreted and marked by a certified occupational therapist to certify that the child has sensory problems.

The observations are administrated with the parents and schools approvals. All the following skills will be targeted during the observations: time on task, behaviour problems, playing skills, social and interaction skills, participation in different and unfamiliar activities, self-esteem, ability to maintain attention focus, and motor skills. From the observations a comparison between the children learning experience in the two different settings will be made. The researcher is not making any assumptions regarding whether or not the teachers' knowledge positively or negatively affects the child's daily routine at school. From the observations it is anticipated to find out if the teachers' knowledge about SPD makes an impact in the child's learning experience and social interaction with their peers in different situations at school.

Interviews

Semi-structured interviews will be conducted in a qualitative manner with class teachers and parents of a child that is diagnosed with any type of SPD. Also, interviews will be conducted with parents of a child that have sensory problems and academic challenges, but the child is not yet diagnosed with SPD or undergoes regular therapy.

Parents' Interviews

There were two different types of parents' interviews. The first type was with parents of a child that was identified and diagnosed with sensory problems and who goes for regular occupational therapy. The interview questions highlighted the child's sensory processing problems and how it impacted the child and the family. The questions were adapted from the Interdisciplinary Clinical Council on Developmental and Learning Disorders (ICDL n.d.) manual (ICDL n.d.). In addition, there were questions about their child's experience at home before and after the diagnoses and the intervention. The interview was conducted with the parents of a boy that was diagnosed with autism and dyspraxia. The boy's name is Danny, and he is in grade two. The parents' interview took place at Kids in Motion.

The second interview was with parents of a child who experienced sensory problems and is not diagnosed and does not undergo occupational therapy. The interview included the conduction of the Sensory Profile Caregiver Questionnaire (Dunn 2000). The normative interpretation of this assessment was done by a qualified occupational therapist to provide evidence of sensory processing problems. The boy's name is Eisa, and he is in grade one; the interview was conducted with his mother at Eisa's school.

Teachers' Interview

The first interview was with Danny's class teacher. The second interview was with Eisa's class teacher. The interview questions highlighted the pupils' sensory processing problems and how they impacted their academic progress, social interaction, and behaviour. The questions were adapted from the ICDC (n.d.) manual. In addition, there were questions about the pupils' sensory experience at school.

Documentation

The researcher will document the pupils' school academic records and examine the pupil's diagnostic reports, assessments, and progress reports.

Limitations of the Study

The study was initially designed to follow up with pupils' that are diagnosed with any sub-type of SPD, undergo regular therapy, and attend mainstream schools. Many leading special need centres in Dubai were approached to be given access to follow up with two children to conduct the study. The communication and requests were arranged by email. Unfortunately, none of the centres were keen to cooperate for several reasons. To mention a few, some of the children are from high profile families, and thus it would be very difficult to get their approval, and some schools did not allow several observations to be conducted. One family, for instance, did not approve the researcher's request because they did not want the school to be aware that their child undergoes intensive occupational, speech, and play therapy. The child is four years old and was assessed in the United States. He was ruled out of autism spectrum and ADHD and was not given any label. He is verbal, but his language is not yet fully developed, and he is very hyper with a short concentration span, has very weak fine/gross motor skills (weak muscle tone), is a very picky eater, and has many sensory problems. According to his occupational therapist, he is a perfect example of a child with a standalone case of SPD. Due to the mentioned reasons a change in the methodology had to be made.

Finding resources regarding SPD was a quite a challenge. Books regarding SPD were unavailable at any of the main and major book stores in the UAE. Only a couple general guides for parents were found (Kranowitz 2003; Kranowitz 2005). Also, at the BUID's library, there was not a single text book about SPD. Therefore, ordering the books from overseas suppliers was the only option. The process has to be done through a main book store in the UAE. Receiving the books took up to three months which was time consuming. Moreover, the Internet restrictions limited the researcher from accessing a variety of journals without going through long process to get access to some journals. The researcher found that the American Journal of Occupational

Therapy is a valuable source of information regarding SPD. A study was conducted by Arbesman & Lieberman (2010, p. 3). Their study was to systematically review “occupational therapy for children and adolescents with difficulty processing and integrating sensory information.” They realised that the American Journal of Occupational Therapy “provided them with up-to-date answers to critical questions that been answered only on basis of clinical expertise” (Arbesman & Lieberman 2010, p. 372).

Generalisation is an issue in this study. First, the random sample that was selected for the survey may not be representative of the whole population’s perspective regarding SPD. For instance, the researcher was only able to collect three questionnaires back out of forty-five questionnaires that were distributed in government schools. Secondly, the researcher also recognises a sampling limitation as the two case studies might not fully reflect the larger population of children with SPD in the UAE. Also, the lack of resources was a limitation of this survey, but if the survey was conducted by a professional team with access to more resources, the results would have been more comprehensive. However, these limitations can be considered into future research.

To avoid bias from the researcher, interviews with class teachers and parents were sent and returned via email before personal interviews were conducted. The same method was followed with the occupational therapists. The teachers’ questionnaire was decided to be implemented not in a “face to face” manner to avoid any influence from the researcher which may lead to bias. Also, the Sensory Profile is a standardised questionnaire that was interpreted by an external occupational therapist.

Only seven occupational therapists participated in this research. It was very challenging to get interviews with occupational therapists within the limited time that was assigned to complete this study. Besides that, it was a long process of formal approvals that each centre requested to be able to meet with their occupational therapists. Furthermore, all the occupational therapists had very busy therapy schedules.

Chapter 4—Finding of the Research

To obtain answers to the research questions, the data was collected from different sources. This chapter will include illustrations of the questionnaire's result and the results of the occupational therapist interviews. The chapter will also include two case studies demonstrating the reality of two pupils that have sensory problems in two different learning settings. The findings will be analysed thoroughly in the following chapter.

Results from the Questionnaires

The first section includes A, B, C, and D questions which are about general information regarding the age group they teachers teach, the level of their education, where they obtained their degree from, and years of teaching experience. The numbers of participants were fifty-five class teachers from nine schools in Sharjah, three public and six private schools.

Chart-1 illustrates the age group the teachers teach. The highest percentage was 36% for Kindergarten Two, followed by 33% for Kindergarten One. Grade One presented 25% of the samples and only 6% of the teachers teach Grade Two.

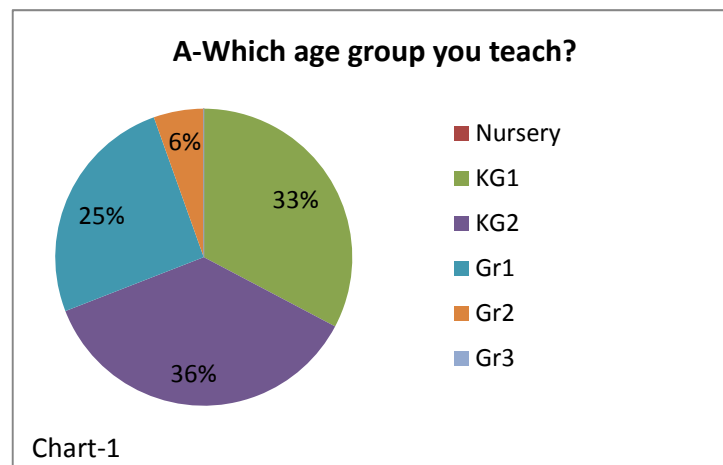
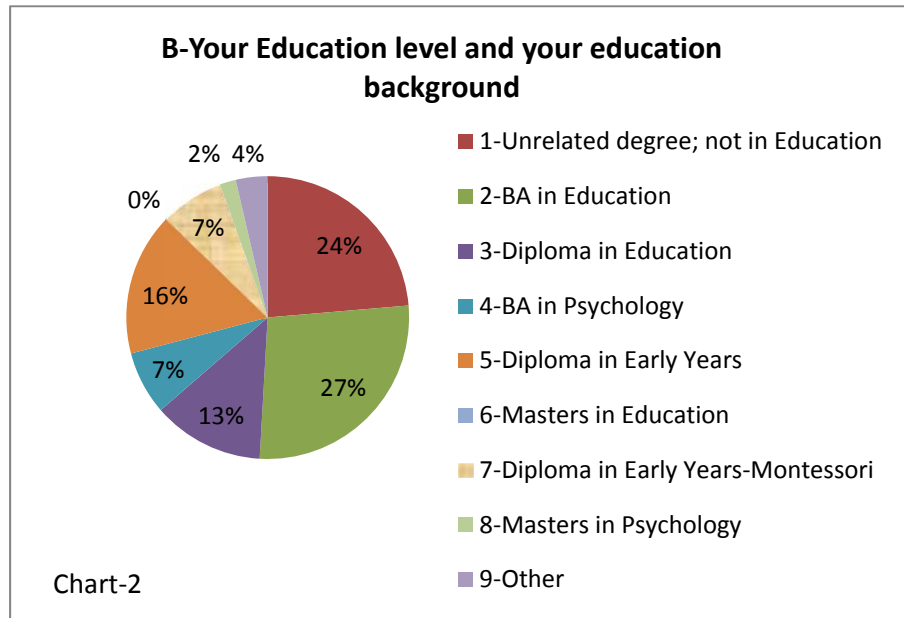


Chart-2 illustrates the teachers' level of education. The major aim from this question is to find out if there is a relation between the teachers' knowledge regarding SPD and their educational background.



When cross-tabulating this question with Q3 regarding the teachers' prior knowledge about SPD, it was concluded that only teachers with a BA in Psychology (column 4) have a noticeable higher knowledge about SPD in comparison with other educational backgrounds. However, this finding is insignificant to conduct further statistics testing because only four respondents have a BA in Psychology. Furthermore, when cross-tabulating Q3 with QC in Table-1 it was found that there is no statistically significant difference between the origins of the degree and having prior knowledge about SPD.

Table-1- Tabulated statistics: Q3- Do you have prior knowledge about SPD & QB- Educational background									
Rows: Q3 Columns: B									
	1	2	3	4	5	7	8	9	All
1	30.77	20.00	28.57	75.00	33.33	0.00	0.00	0.00	27.27
2	69.23	80.00	71.43	25.00	66.67	100.00	100.00	100.00	72.73
All	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Cell Contents: % of Column									

Note for column 6: None of the participants had a Masters in Education. This is statistically insignificant because of sample size (n=0).

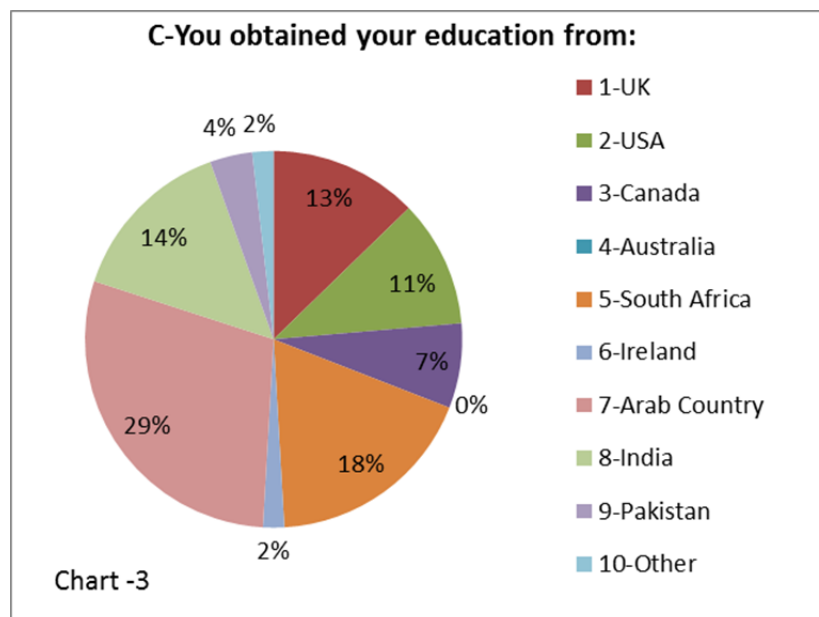


Table-2-Tabulated statistics: Q3-Do you have prior knowledge about SPD & QC-Place of obtaining degree

Rows: Q3 Columns: C

	1	2	3	5	6	7	8	9	10	All
1	1	1	1	2	1	7	2	0	0	15
2	6	5	3	8	0	9	6	2	1	40
All	7	6	4	10	1	16	8	2	1	55

Cell Contents: Count

Note: for column 6: One participant has a degree from Ireland. This is statistically insignificant because of sample size ($n=1$). Also for column 4: none of the participants had a degree from Australia. This is statistically insignificant because of sample size ($n=0$).

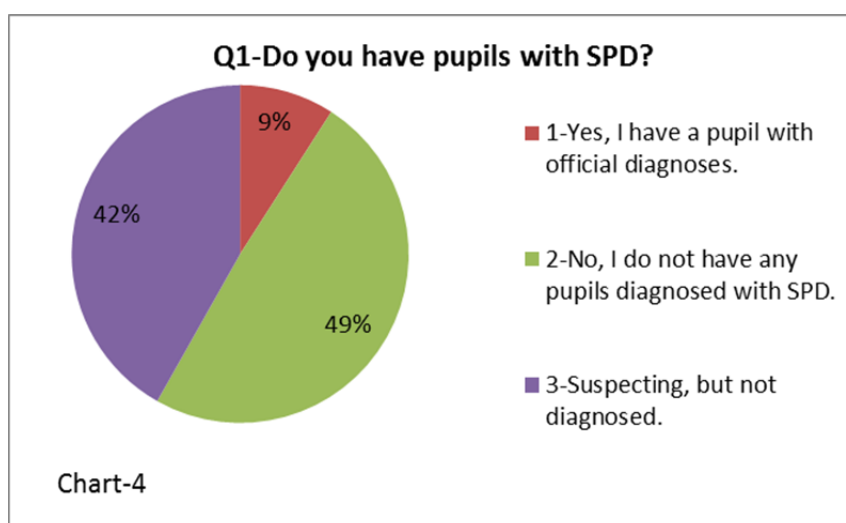


Table-3-Tally for Discrete Variables: Q1-Do you have pupils with SPD?		
Q1	Count	Percent
1	5	9.09
2	27	49.09
3	23	41.82
N=55		

Chart-5 demonstrates that 9% of teachers have shown that they have pupils with SPD. Also about 42% suspected that the pupils have SPD, but the action of recognition of disorder was not taken. More clarification regarding this result will be presented in Q10 analyse. 49% of the respondents indicated that they do not have any pupils with SPD.

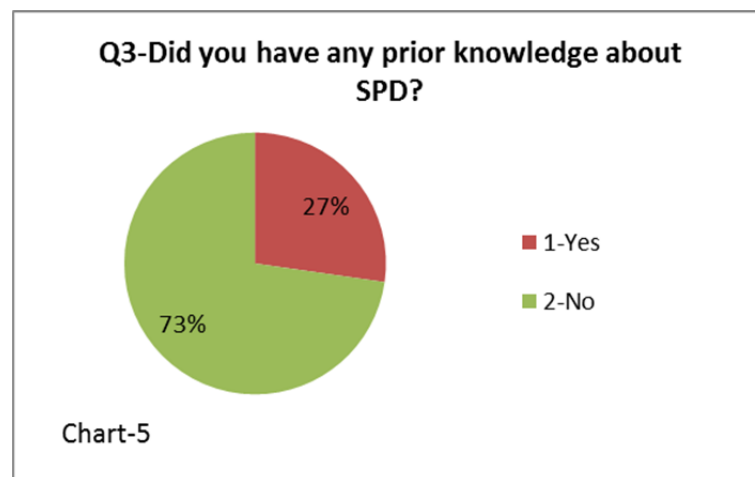


Chart-5 shows that the majority of respondents do not have any prior knowledge about SPD.

Ho: Proportion of teachers who do not know about SPD is at most 60 %.

Ha: Proportion of teachers who do not know about SPD more than 60%.

Table-4-Test and CI for One Proportion: Did you have any prior knowledge about SPD?					
Test of $p = 0.6$ vs $p > 0.6$					
Sample	X	N	Sample p	95% Lower Bound	Exact P-Value
1	40	55	0.727273	0.611549	0.035

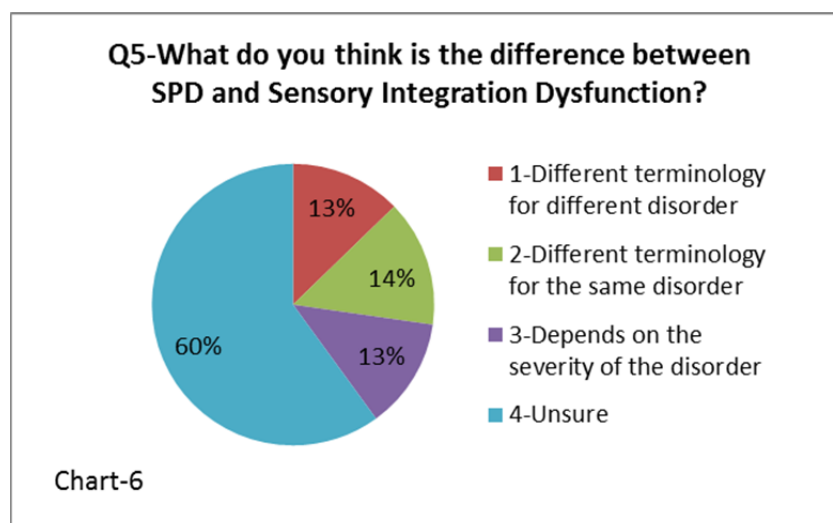
At 5% level of significance, we can conclude that the proportion of all teachers who did not know about SPD was more than 60%. Simultaneously, Q4 adds additional confirmatory to the findings from Q3 as the research tested the same hypotheses on Q4:

Ho: Proportion of teachers who do not know about SPD is at most 50 %.

Ha: Proportion of teachers who do not know about SPD more than 50%.

Table-5-Test and CI for One Proportion: Q3- How did you get to know about SPD?					
Test of $p = 0.5$ vs $p > 0.5$					
Sample	X	N	Sample p	95% Lower Bound	Exact P-Value
1	34	55	0.618182	0.498465	0.052

At 10% level of significance, we can conclude that proportion of all teachers who did not know about SPD was more than 50%. It is vital to mention that the concluded results from cross-tabulated Q3 and Q4 revealed that only fifteen respondents indicated they have prior knowledge about SPD. Fifteen respondents is too small a number to do any further statistical tests and that explains why 60% of respondents were unable to answer Q5 represented by Chart-6



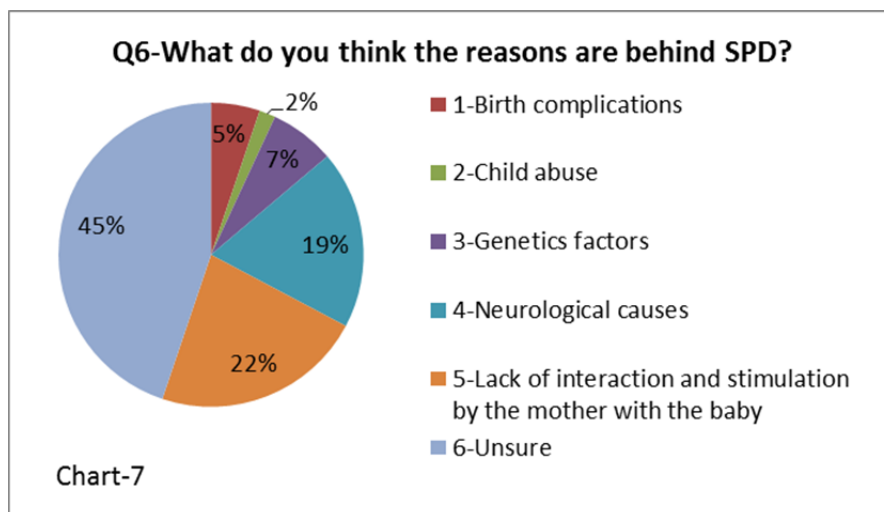
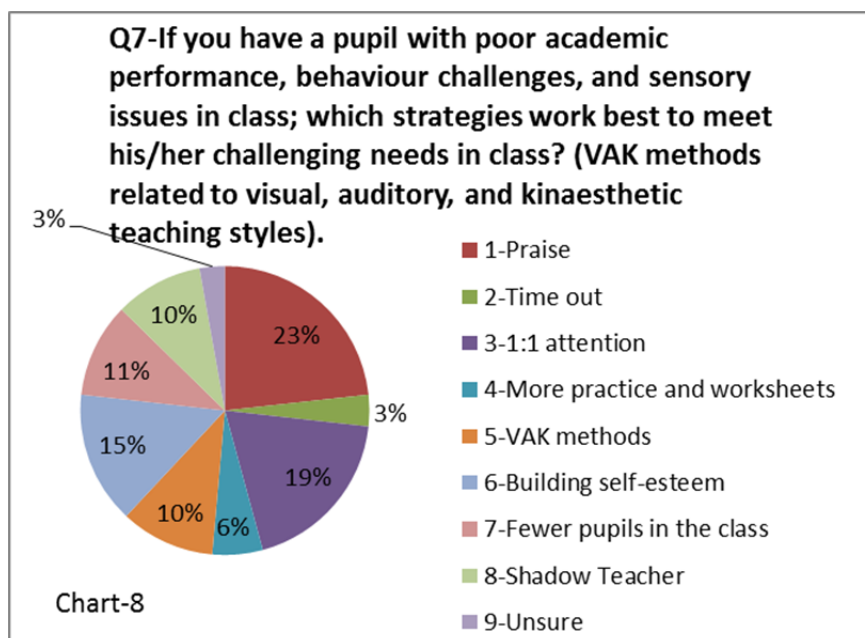


Chart-7 shows how the majority were unsure about the reasons behind SPD. The most noticeable proportions shows that 22% of the respondents believe that lack of interaction and stimulation by the mother with the baby may cause SPD.



From the result of Q7 that is illustrated in Chart-8, only 10% of the teachers indicated that the visual, auditory and kinaesthetic teaching methods (VAK) are the most effective methods and strategies to meet the pupils' challenging needs. Only 15% found that building self-esteem is an effective strategy to help meet the pupils' challenging needs.

H_0 : Proportion of teachers who ignored VAK strategies is at most 80 %.

H_a : Proportion of teachers who ignored VAK strategies is higher than 80%.

Table-6-Test and CI for One Proportion: Q7				
Test of $p = 0.8$ vs $p > 0.8$				
Sample	X	N	95% Lower Bound	Exact P-Value
1	127	142	0.842009	0.002

Since the p-value is small, there is statistically significant evidence that proportion of teachers who ignored VAK strategies is higher than 80%.

The main purpose of Q8 was not for diagnosing pupils with SPD. It was to anticipate what teachers would see the symptoms of SPD. This question was answered by 100% of the respondents indicating some of the symptoms exist in a particular pupil they have taught. That support what was mentioned in the literature review that, between all pupils, it is estimated that up to 15% of pupils to have SPD.

To learn if education regarding SPD is needed or not, the following theory was tested for Q9: the majority of respondents do not believe that education is needed for teachers about SPD vs. the majority of respondents who believe that education is needed for teachers about SPD.

$$H_0: p \leq 0.5$$

$$H_a: p > 0.5$$

Table-7-Test and CI for One Proportion: Q9					
Test of $p = 0.5$ vs $p > 0.5$					
Sample	X	N	Sample p	95% Lower Bound	
1	110	196	0.561224	0.499971	0.050

Since the p-value is small ($p\text{-value}=0.05$) it can be concluded that it is statistically significant that the majority of respondents believe that more education concerning SPD is needed. The level of significance used. By computing 95% confidence interval it reconfirmed the hypothesis testing results. Also, the research can confirm that the true proportion of all respondents who believe that more education concerning SPD is needed is between 49% and 63%.

Table-8-CI for One Proportion: Is education concerning SPD is needed or not?					
Sample	X	N	Sample p	95% CI	
1	110	196	0.561224	0.631846	0.488723

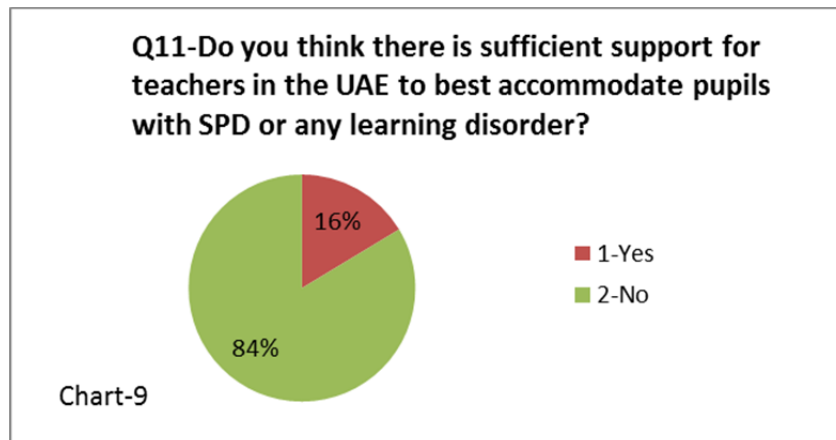
From Q10 the researcher has hypothesised the following:

Ho: Proportion of teachers that are unsure how to distinguish if a child's tantrum is a sensory problem and not just bad behaviour is less than or equal to 60%.

Ha: Proportion of teachers that are unsure how to distinguish if a child's tantrum is a sensory problem and not just bad behaviour is higher than 60%.

Table-9-Test and CI for One Proportion: Q10					
Test of $p = 0.6$ vs $p > 0.6$					
Sample	X	N	Sample p	95% Lower Bound	Exact P-Value
1	41	55	0.745455	0.631022	0.018

Since p-value is small, there is statistically significant evidence for us to conclude that the proportion of teachers who were unsure how to distinguish if a child's tantrum is a sensory problem or not just bad behaviour is higher than 60%.



The above Chart-9 shows that the teachers have a negative attitude toward the support they receive in the UAE to best accommodate pupils either with SPD or any learning problems.

Results From the Occupational Therapists Semi-Structured Interviews

A total of seven occupational therapists (OT) were interviewed from seven different centres in Dubai and Sharjah. They all have a BA in pediatrics and occupational therapy. They were from different European countries. Only one OT was from an Arab country and could speak Arabic. Three OTs have master degrees in pediatrics and occupational therapy. One is working on her PhD in occupational therapy. Three OTs were trained on the SI approach, but only two occupational therapists were certified to administer the SIPT. They all agreed that the UAE has a scarce number of OT professionals. The table below summarises the services offered.

#	Centre Name	Location	OT	SI Trained	SIPT Certified	Assessment Tools	Therapy Approach
1	Kids First	Dubai	4	Yes	1	Mix	Mix
2	Kids in Motion	Dubai	1	Yes	1	Mix	Mix
3	Early Intervention Centre	Dubai	1	No	No	Autism assessments	Mix
4	Sharjah City of Humanitarian Services	Sharjah	1	No	No	No	Clinical Observation
5	Al Amal Learning Centre for learning Difficulties	Sharjah	0	NA	NA	NA	NA
6	Khtwah	Sharjah	0	NA	NA	NA	NA
7	Learning Disabilities Centre - In process	Sharjah	1	Yes	0	Mix	Mix

All OTs that were interviewed by the researcher did not come across any study conducted in the Middle East about SPD. According to two of the occupational therapists who were part of the study that was conducted by the BILD, the results of the study were “tweaked” modified and lacked in many scientific clinical research (Appendix 5).

All OTs agreed that SPD does stand alone as a disorder. Also, SPD can be a diagnostic that is associated with other neurological disorders such as ADHD, dyslexia, and autism just to mention a few. The majority of OTs believed that SPD is under diagnosed in the UAE. Also, they agreed that the percentage of children suffering from SPD is higher than 15% in the UAE as many children who get diagnosed with ADHA or autism were actually suffering from SPD. They also believed that children who are labelled as slow learners could be labelled so because they

have sensory problems. There is a very thin line between misdiagnosed disorders and SPD. It may also be difficult to distinguish between the symptoms of SPD and other disorders which may negatively affect the child's treatment. For instance, the children who undergo SI therapy treatment do it to improve their neurodevelopment and overcome their sensory problems. As a result, the children are able to overcome some of their academic challenges.

Additionally, one OT stated that specific conditions have specific treatment approaches. She added that children who suffer solely from SPD improve when treated. While if a child with autism was misdiagnosed with SPD, professionals will focus on the sensory problems and not on treating the child's real problems. Therefore, before diagnosing children with SPD, other conditions must be ruled out. For that reason, getting the right diagnoses is very important to distinguish which problem is primary and which is secondary in the child's learning. The majority of cases of children diagnosed with SPD in the UAE exhibited sensory modulation, over/under-responsivity, and dyspraxia.

Not surprisingly all the OTs were in agreement regarding some reasons behind the big numbers of children suffering from sensory issues in the UAE. The OTs believed that the same percentage of children with SPD in the literature studies applies in the UAE. They attributed that to the environmental factors in the UAE, as the children do not play outdoors naturally like other children nor are they exposed to different sensory stimuli. Children often lack imagination, and they do not know how to play. Also, they all agreed on cultural issues and poor parental skills as reasons for presenting SPD. The majority of children they work with were cared for by their nannies, watch TV for long hours, and play on electronic gadgets for long periods of time. It was also mentioned that many parents suffer in silence to avoid the stigma of having a special needs child. This is due to the lack of knowledge about SPD; parents are afraid of stigma as people link SPD/sensory problems with autism.

Only two OTs commented on why SPD is not listed in the DSM-V. They believed that if SPD does not make it onto the final list, this will impact the financial coverage of the treatment expenses if the child was only diagnosed with SPD. Also, other professionals will continue to fit the symptoms into other categories in order to obtain necessary treatment covered by insurance or

the government to be eligible for intervention services. However, many cases fail to fit any category, such as a child's case from Kids in Motion who was ruled out of autism and ADHD in the USA. He purely suffers with SPD, but his parents have to cover all the therapy and treatments expenses. The OTs specified some reasons for SPD not making it onto the list, such as the lack of empirical research that includes randomised controlled clinical trials, longitudinal studies, and reporting the effectiveness and the outcome of SI therapy approach.

The OTs kept on mentioning the lack of awareness regarding SPD by medical professionals, parents, teachers, and other professionals who are directly involved with children. For instance, premature babies and colic babies are usually the first alarming events where SPD problems can be detected and monitored. They all believe very strongly that spreading awareness about SPD is very important. They suggested workshops for parents and teachers.

According to all of the OTs, sensory diet is important for individuals with sensory problems. Sensory diet is mostly effective when all caretakers understand the nature of the child's sensory problems and the necessity of the adjustment. The sensory diet should be incorporated into the child's school and home environment.

SIPT is the best tool to diagnose SPD; however, it is very expensive to be administrated. Therefore, an OT depends on sensory profile, clinical observation, a thorough developmental history about the child, teachers, and parents questionnaires. Also, there are a few SIPT OTs certified in the UAE.

Case Study-1

Only at Kids in Motion, were kind enough to arrange a meeting with Danny's parents. Danny is seven and a half years old, and he is in grade two. He attends an International Baccalaureate (IB) private school in Dubai. Danny was diagnosed with autism and dyspraxia since the age of two. He has many sensory problems which are more severe in his case than in a child that is only diagnosed with SPD as a distinct disorder. Danny goes regularly for his speech, OT, swimming, and behaviour/play therapy at Kids in Motion. At home, he does light occupational therapy. He is verbal with English as his first language, he can read very well, and he has good numeracy skills. He has weak upper muscle tone. Besides that, he has problems with his

working memory which affects his following a set of verbal instructions, and he finds it difficult to apply skills that require multiple steps and sequencing. The parents were very supportive; they arranged for the researcher to get access to Danny's school to learn about his daily routine at home.

Danny was observed in the playground, classroom, lunchtime, and in the library, and he exhibited many behaviours that were related to sensory issues. The observation was focusing on how his sensory problems are handled, managed, and solved by his class teacher with the support of his shadow teacher to aid him cope socially and academically in his class.

Danny's Class Observation

Danny's class was very quiet place; he was one of 20 pupils, and English is their first language. The class teacher (CT) spoke in a very soft voice, and there were no background noises or distractions from the pupils during their work time. When the noise level increased, the CT only made an action that got all the pupils attention, and they got quiet again.

When Danny was observed in the classroom, the playground, and the cafeteria he exhibited the following behaviours:

- He had memory problems, and he needed to be reminded about how to follow the daily routine in the school and in the classroom.
- He had a problem interacting with his peers.
- Danny had difficulties sitting still on his seat and on the carpet.
- He had problems understanding and following several oral instructions.
- He had a problem organising his work steps to perform a task.
- He had attention problems, and he could not remain focused because he was unable to integrate his sensory system with the sensory input from the environment.
- He had problems with his fine motor, gross motor, and balance skills.
- He was oversensitive to visual, auditory, and olfactory sensory inputs.
- He had problems expressing his feelings that were related to his sensory problems.

Every morning Danny's mom dropped him at the gate and the shadow teacher (ST) met and greeted him there. It was observed that Danny was struggling to carry his bag along with his lunch box. Also, he found it difficult to stand and walk in a balanced manner. While the ST reminded Danny how he should stand during the National Anthem, he was squinting and avoiding eye contacts to avoid the sun light. The sun light was not that strong as the time was almost 7:20 am. The ST noticed that so she turned his face the opposite side, then he was able to look almost directly at her face, but occasionally he avoided giving her eye contact.

At the playground Danny played in the same areas and in the same order. He ran with his hand curled up, not moving sequentially. While he was running, he slammed his feet on the ground; first his toes touched the ground then his heel. Danny sat in a shaded area. Then he climbed the monkey bars. Danny did not join the line-up time by hearing the duty teacher's whistle. When he saw the pupils were gathering in the line-up area, he followed them. He lined up with his class mates, but he struggled to stand still, and he appeared unbalanced.

Inside the classroom, the ST and his class teacher gave Danny all the required support and tools to make him able to cope with his peers and the class work. While the teacher was lecturing, the ST helped Danny to remain seated and focused. He has a sensory cushion to sit on it; it helped him to regulate his vestibular and sensory seeking needs in a productive manner. The ST practised eye tracking, balancing, and crossing the midline activities when he was unable to retain focus or follow class routine.

In the English language lessons, after the CT finished the lesson, the ST helped Danny to perform the class work. Danny had very good reading skills, but he did not comprehend everything he read. Therefore, she divided the class assignment into shorter tasks. She provided him with visual aids along with auditory aids to help Danny develop his auditory skills. Also, she kept on challenging him with what he was good at. For instance, in language he was good at knowing the nouns, verbs, adjectives, synonyms, and antonyms; however, he had problems with pronouns. She did not give him direct answers; instead, she continuously asked him questions integrating new words to extend his vocabulary. Also, the class teacher and the

ST made him identify his strengths and his learning style. When he had to perform a challenging task, both teachers were able to make him complete it successfully and on time.

However, it was observed that the CT sometimes was not linking between Danny's behaviour and his sensory problems. Also, in some occasions the class teacher was unsure about Danny's behaviour if it was due to his sensory problems or if it was just misbehaving. In some occurrences, Danny was unable to sit still on the floor on the chair or follow the class's routine. The ST intervened in such occurrences to get Danny to integrate his sensory system in the class environment.

For instance, one day the class teacher presented a movie about a special kind of art. The pupils had to sit on the carpet to watch it, but there was strong sunlight. A group of pupils moved to the back and did not sit on the carpet; the CT asked them if they had a convincing reason for doing that. They all said that the sunlight was too strong in their eyes, and they could not keep their eyes open. On the other hand, the CT did not allow Danny to move to a less bright spot, not paying attention to the fact that he was oversensitive to sunlight. Instead, she tried to keep him sitting on his regular spot on the carpet. Danny was moving all the time, keeping his head down on the floor, touching the carpet, and he did not pay attention to the movie. The class teacher gave him several warnings, but he ignored her. The carpet area was overwhelming for Danny, even the typical pupils had to change their places on the carpet to avoid the direct sun light.

During that time the ST was not in the classroom. She had gone to prepare some teaching materials for Danny without telling him. After a while the shadow teacher came back, Danny looked at her, and he threw his sensory cushion across the room to get her attention. This is a typical behaviour for a child with autism (Whitaker et al. 2001). Also a child with dyspraxia finds it difficult to accept unexpected events without previous warning (Portwood 1998). The class teacher was upset about Danny's behaviour, and she wanted to take the cushion away. The CT and the ST had a discussion regarding Danny's disturbing behaviour. The CT believed that Danny did not need this sensory cushion, and it was the reason why he was disturbing the class. The ST explained to the CT that the cushion was very important for Danny's tactile, vestibular,

and balance to make him able to remain seated in one place. He was oversensitive to the direct sunlight, and he could not express his discomfort.

Danny's Math class assignments involved solving word problems that included vocabulary with directionalities, making their own word problems, complete a pattern, and measurement. Danny was successfully able to solve number problems, complete a pattern, and measure. He needed visual illustrations and used real objects to solve word problems that were written in a story style. Also he was unable to make his own word problems without the help of his class teacher and his ST. They allowed him to make word problems about his favourite book series or anything he was fascinated about.

As Danny was diagnosed with autism, he had an approval from the Ministry of Education to skip Arabic lessons. Instead he went to the library with his ST to practise some concepts that Danny needed additional one-on-one support with. The ST practised new skills many times by including visual, auditory, and kinaesthetic aids until he was able to apply the new skill to a new situation. For example Danny struggled with skip counting as it required sequencing skills which he lacked because of his dyspraxia (Portwood 1998). By using visual, auditory, and kinaesthetic teaching approaches (VAK) Danny successfully learned to skip count in twos, fives, and tens. Also, the ST worked on developing his auditory, visual, tactile, fine motor, gross motor, sequencing, and following several oral instructions to increase his memory span. Moreover, she worked on his vocabulary and his speaking skills to extend his vocabulary.

At lunch time Danny was familiar with the routine. He carried his lunch box and water bottle down the stairs. He struggled more going down the stairs than going up. The lunch time was for forty minutes, but the first twenty minutes were for free play. Danny exhibited the same play skills and patterns that he displayed in the morning time. At the cafeteria, Danny always sat at his favourite spot next to his buddy friends. He was not overwhelmed by the noise and the number of pupils in the cafeteria. First, he sniffed the food before eating it. If he liked it, he would chew the food, but if he did not like the food he swallowed it without chewing. At pack up time, Danny struggled to fit everything back inside his lunch box. The ST guided

Danny to pack up his lunch box, by giving him oral instructions to follow using first, next, and last.

Danny's Parents Interview

The interview questions were basically to know about Danny's sensory experience at home. Danny has a very structured daily routine that was divided between school, home, and his therapy centre. His mother provided Danny with a very rich sensory experience at home. He has his own sensory room that they use daily to help him integrate his sensory system. Both parents asserted on the great benefits of Danny's early intervention. They witnessed an enormous improvement in his behaviour within the first eighteen months. They also said that Danny started to accept change and initiated new activities more when they worked on improving his sensory problems.

Danny's Class Teacher Interview

The CT's interview questions were focused on Danny's sensory problems that exhibited at school. Danny's class and ST managed his sensory problems by maintaining a regular and expected routine. The CT used visual daily time table which helped Danny accept new activities that were displayed on the time table. Danny enjoyed almost all the school activities except the activities that involved messy play and group play.

With the ST's support, Danny's CT was aware of his specific sensory problems. Acknowledging his sensory issues and triggers helped his class teacher learn how to manage his negative behaviour in the class with minimum effort. That greatly helped to not restrict the learning environment and experience for the other pupils in Danny's class.

Case Study-2

Eisa is seven and a half years old. He is in Grade One. He was retained in Kindergarten Two based on his parents' requests. The mother claimed that Eisa just needed time to grow out of his academic challenges. Eisa was chosen by the researcher based on his history of behaviour, social interaction, and academic challenges after a thorough review of his school progress reports since he was in Kindergarten One. It was recommended by the school's counsellor and

his CT to conduct a full assessment for Eisa at a special needs centre. The mother was unconvinced that Eisa needed any special need services.

A meeting was conducted with the mother after the school's approval. Eisa's mother was very cooperative; several meetings were conducted with her to complete the Sensory Profile Caregiver Questionnaire assessment by Winnie Dunn. The Sensory Profile was also completed by his class teacher. Both Sensory Profiles were compiled by a licensed OT to acquire a holistic knowledge regarding Eisa's sensory challenges in both settings, and then it was analysed. The full report is attached in appendix 6 and 7.

Arabic is his first language and English is only spoken at school. Eisa was born prematurely at five and a half months following a normal delivery. He was kept in an incubator for three and a half months, received oxygen, and had an intravenous tube inserted for feeding (appendix 8). Eisa remained in the hospital for two months after the incubator (appendix 1). According to Kranowitz (2005) premature birth, low birth weight, and lengthy hospitalisation can be factors causes SPD which were all manifested in Eisa's case. Eisa suffers from asthma, and he is on regular medication. Also, he is short sighted with a lazy eye (right). Eisa did not have regular sleeping patterns. Eisa's milestones were recorded late. He did not crawl, and by the age of two, with support, he started walking (appendix 8). The curriculum offered in Eisa's school is a British modified curriculum, which benefits from the new literacy and numeracy strategies that have recently been introduced in the United Kingdom. Arabic is taught for all children, and there are separate classes for Arabs and non-Arabs pupils. Eisa should be evaluated by formative assessments. No accommodation or modifications are made to meet his challenging needs.

Eisa's Class Observation

Eisa's class was a reasonably quiet place, and he was one of twenty-five pupils. English was the second language for all the pupils in the class. The CT spoke in a very clear and slow voice; there was no a background noise or distractions from the pupils during their work time. When the noise level increased, the CT only made an action that got all the pupils attention, and they got quiet again.

When Eisa was observed in English, Math, Arabic, Islamic Music, and on the playground; he exhibited the following behaviours:

- He had memory problems; he needed to be reminded about how to follow the daily routine in the school, in the classroom, and even with directions. Also, needed assistants to organise his subjects' folders in the located places.
- He had a problem playing sensibly with his peers.
- Eisa had difficulties sitting still on his seat and on the carpet; he rocks continuously.
- He had problems understanding and following several oral instructions.
- He had a problem organising his work steps to perform a task.
- He had rigid sequence of motor actions and behaviours.
- He had problems with his self-help skills. He cannot dress and undress himself, and he needed assistance with cleaning.
- He had attention problems, and he could not remain focused on a task without one-on-one assistance.
- He had great difficulties with his fine motor, gross motor, and balance skills.
- He was under-sensitive to visual and auditory sensory inputs.
- He had problems expressing his feelings; he reversed syllables in speech, paused, stuttered, and stammered in Arabic and English.

Every morning Eisa's mother dropped him in his classroom. It was observed that Eisa was struggling to carry and climb upstairs carrying his back bag and lunch box. His mother carried his bag and his lunch box for him. Eisa's mother opened his bag, and she kept each folder in the located boxes. Eisa was very attached to his mother; he kept on hugging and kissing her. Every day she would stay with him in the class until the National Anthem was over and all his classmates and class teacher came back from the line up time.

Inside the classroom, the class teacher supported Eisa along with the other twenty-four pupils. While the teacher was lecturing she made sure that Eisa was sitting in front of her on the carpet. However, if the CT did not call him he always went to sit last in the carpet. While he was sitting in the front row, it was observed that Eisa could not remain focused, rocked

unconsciously, and kept on repeating sequence of sensory and motor actions. He kept on banging his foot on the floor while rocking, touching his lips, and making a sucking-like action with his tongue.

In the English language lessons, the CT presented the new learning concepts verbally with simple visual illustrations from the class workbooks. Then all the pupils had to transfer what they had learned on their own workbooks. There was limited hands-on activities, discussion, and practice on the new concepts; all the pupils had to spend a long time completing pages in their class workbooks. Eisa was unable to complete the pages in his workbooks. He had very weak fine motor skills; he put excessive force on the pencil; and frequently he would stop writing. He could not write legibly with recognised letter formation; he could not stay on the line; and he did not leave appropriate spaces between words. The task involved cutting and sticking pictures. Eisa struggled to manipulate the scissors along on the line. Eisa stopped cutting, and he looked intensely at the scissors while he was opening and closing them. Then the CT took the scissors and the pictures from Eisa to cut them for him.

He could not complete any task without one-on-one support from his CT. She had to give him one instruction at a time with visual sketches illustrated on a white board kept in front of him. Also, she had to stand behind his chair to prevent him from pushing the chair back dropping his upper body very closely on the table. Whenever the CT had to attend to support any pupil, Eisa pushed his chair to the back, collapsed on the table, and then stopped writing. Also, it was observed that Eisa did not follow the teacher's assistant's (TA) instructions; therefore, the CT kept on spending most of her time supporting Eisa.

Eisa's Math class assignments involved solving word problems that included vocabulary with directionality, sorting, adding, subtracting, sequencing, skip counting in twos, fives, and tens, doubling numbers from one through ten, completing a pattern, knowing the odd/even numbers up to 100, reading time in hour/half, and measurement. It was observed that Eisa was able to solve very simple problems such as sorting objects by shapes or colour. When the CT asked Eisa a question, he took a long time to respond, and if he answered correctly, he showed immature behaviour by laughing and flapping his hands. Eisa was able to count up to twenty, knew only

the 2D shapes, and could perform simple addition/subtractions for numbers between one and ten. He was unable to sequence the days of the week, months, patterns, or even to skip count. He could not solve word problems; he could not perform tasks that needed several steps without the CT's one-on-one guidance. It was repeatedly observed that Eisa had problems processing auditory information. For example, if the instructions were with visual clues, he would be able to follow the instructions. He followed the actions and the visual input better than the auditory input.

Eisa was observed during the mental Math test. The test was held every Thursday in the first period. All grade one sections took the test at the same time. All the pupils were familiar with the test's routine as they had been trained on the test since the beginning of the academic year. The pupils get marks for this test, and the test book had to be signed by the parents. The pupils had to listen to ten questions and write only the answers without writing the problem. A pupil with auditory processing, hearing, or dyspraxia, just to mention a few learning problems, would not be able to perform well on this test. A pupil with any of the previous problems will not be able to hold the auditory input, process it, and solve the problem within a short and limited time without visual input. This test was a regular routine in the school across all the primary sections, and the test did not consider these learning problems or learning styles differences between pupils; unfortunately, almost every week Eisa failed this test. After question seven, Eisa did not follow the oral instructions. He was obsessed with cars and wheels. He drew cars in his test book. The TA was giving him one-on-one directions, but it was an overwhelming experience for him to sit and listen for a long time. The test duration was twenty minutes which gave pupils two minutes for each question to listen, think, and then write the answer on the test book (see appendix?).

In the learning support lesson, a different learning experience was observed than what Eisa experienced in his classroom. He takes three learning support lessons a week. The learning support teacher (LST) picked Eisa along with four other pupils from the class. She started with warm up and exercises that included directionality, balancing, and following a sequence of

motor actions. Eisa was unable to follow the actions that included directionality and balancing. Also, he was unable to cross his midline to coordinate his hand and knee actions while marching. He was unable to lift his knees up to touch them with the opposite hand. He was touching the right hand on the right knee and the left hand on the left knee. He had great difficulties coordinating his hand eye movement with his eyes. The learning support teacher kept on encouraging him to finish the exercises.

The LST presented a new set of high frequency words (HFWs). The objective of the lesson was to locate and read significant parts of the text in the story. The LST worked on each story for two weeks to make sure the pupils comprehended the words' meanings, and they were able to read the words by sight. The LST presented the HFW in a very interactive way. She read the words and gave a turn for each pupil to use the HFW in sentences of their own. Eisa was able to read the HFW: the, they, this, to, up. However, when he read, he was stuttering, stammering, and pausing. The LST kept on praising and encouraging the whole group.

The LST gave each pupil in the group a puppet presenting the animals characters from the story. The LST wanted the pupils to be able to speak in English while they were having fun. Eisa was enjoying the role play and tried very hard to make proper sentences. He spoke in two to three word sentences but missed pronouns and verbs. Also, the LST worked on developing the pupils' language by asking them questions about the story to see their abilities to sequence the event, the characters and to retell the story in their own word. The LST asked Eisa to tell her which animals he saw first in the story. Eisa recalled a few of the animals' characters but was unable to sequence the story's events. The LST presented the characters' puppets in front of him in the correct order to help him to sequence the characters. Also, the LST created pictures cards from the story, and she labeled each card with a number to help Eisa to sequence the events of the story.

In the learning support class, it was observed that Eisa was more focused, and he managed to work independently. That could be because of the small number of pupils in the group. The reading lesson was very interactive; Eisa was paying attention, and he did not rock or suck his

tongue as much he did in the class. Also, the LST incorporated visual, auditory, and kinesthetic teaching methods to meet Eisa's and the other pupils' challenges needs.

In the Arabic and Islamic lessons, Eisa was able to remain attentive for longer periods of time. He was excited to communicate in Arabic, but sometimes he spoke out to get attention; both the Arabic and Islamic teachers ignored this behaviour. Both lessons were more interactive than his main lessons in English and math. Eisa was able to follow some of the teachers' instructions but was unable to open his book on the correct page or complete the writing tasks. To save time, the teachers gave Eisa his books, and they opened it for him, while all the other pupils did that without help. He was unable to correctly locate all of his body parts in the Arabic lesson.

The Arabic and Islamic lessons were interactive. The teachers incorporated a variety of teaching methods in each lesson, hands-on activities involving all the pupils in an experiment, role-play, and visual demonstration. Eisa's sensory seeking behaviours were less observed. He was engaging and paying more attention to the teachers. It could be due to the topic, language, and the interactive activities that the teachers were implementing in the lessons.

In the playground, Eisa ran with his hands curled up. While climbing the ladder to slide on the slide, he held on the rail. He put both of his feet on one step and did not go up or down the ladder using his feet alternatively. Eisa climbed the ladder very carefully and used both of his hands to support him while sliding. He was following his best friend, and he kept on pushing the boys in the playground. The boys were not bothered by Eisa's behaviour. The play time was only for fifteen minutes then all the pupils had to return to class to eat their lunch. Eisa was the last one to respond to the teacher's call. In the music lesson, Eisa was unable to follow and coordinate his movements with the songs' words and actions.

Eisa's Mother's Interview

The interview with Eisa's mother was to complete the sensory profile. The mother mentioned that after Eisa was born, she was advised to monitor his growth progress as it was strongly

expected that Eisa would experience some developmental delays. She continued all the pediatrics that were later involved with Eisa assured her that there was nothing to worry about, and he would only reach his milestones a little late.

Eisa's Sensory Profile (3-10 Years)

The sensory profile assessment result confirmed that Eisa has sensory-based problems. He demonstrated uneven sensory profile patterns. He demonstrated a typical performance on touch processing. He has probable difference scores in the oral-sensory processing and modulation of visual input sections. Eisa obtained definite difference scores in the auditory processing, visual processing, vestibular processing, multisensory processing, and behavioural emotional sections. Furthermore, Eisa scored definite differences in low registration, sensation seeking, sensory sensitivity, and sensation avoiding areas.

A detailed interpretation to link between Eisa's class observations and his sensory profile results will be presented in the discussion chapter. The following tables illustrate his scores.

Sensory Processing Summary						
		Less than others			More than others	
Sensory Processing Section	Raw Score	Definite Difference	Probable Difference	Typical Performance	Probable Difference	Definite Difference
A. Auditory Processing	13/40	**	40---39	38---30	29---26	25-X--8
B. Visual Processing	22/45	**	45---42	41---32	31---27	26-X--9
C. Vestibular Processing	21/55	**	**	55---48	47---45	44--X-11
D. Touch Processing	85/90	**	90--89	88-X--73	72---65	64---18
E. Multisensory Processing	15/35	**	35---34	33---27	26---24	23-X--7
F. Oral Sensory Processing	44/60	**	60	59---46	45X---40	39---12
Modulation						
G. Sensory Processing Related to Endurance/Tone	22/45	**	**	45---39	38---36	35-X--9
H. Modulation Related to Body Position and Movement	31/50	**	50	49---41	40---36	35-X--10
I. Modulation of Movement Affecting Activity Level	14/35	35---34	33---31	30---23	22---19	18-X--7
J. Modulation of Sensory Input Affecting Emotional Responses	5/20	**	**	20---16	15---14	13--X-4
K. Modulation of Visual	12/20	**	20	19---15	14---X 12	11---4

Factor Summary						
		Less than others			More than others	
	Raw Score	Definite Difference	Probable Difference	Typical Performance	Probable Difference	Definite Difference
1. Sensory Seeking	60/85	**	85---82	81---63	62--X-55	54---17
2. Emotional Reactive	46/80	**	80---75	74---57	56---48	47--X-16
3. Low Endurance/Tone	22/45	**	**	45---39	38---36	35--X-9
4. Oral Sensory Sensitivity	33/45	**	45	44--X-33	32---27	26---9
5. Inattention/Distractibility	7/35	**	35---33	32---25	24---22	21--X7
6. Poor Registration	32/40	**	**	40---33	32X---30	29---8
7. Sensory Sensitivity	4/20	**	**	20---16	15---14	13--X4
8. Sedentary	4/20	**	20---18	20---12	11-10	9--X4
9. Fine Motor/Perceptual	3/15	**	**	15---10	9---8	7--X3

Quadrant Summary						
		Less than others			More than others	
Quadrant	Raw Score	Definite Difference	Probable Difference	Typical Performance	Probable Difference	Definite Difference
1. Low Registration	36/75	**	75---73	72---64	63---59	58--X-15
2. Sensation Seeking	85/130	**	130---124	123---103	102---92	91--X-26
3. Sensory Sensitivity	63/100	**	100---95	94---81	80---73	72--X-20
4. Sensation Avoiding	79/145	145---141	140---134	133---113	112---103	102-X--29

Eisa's Class Teacher's Interview

The CT's interview questions were focused on Eisa's sensory problems that exhibited at school. Eisa's CT managed his challenging needs by supporting him one-on-one. Eisa enjoyed almost all the school activities except the activities that involved messy play and any activity that needed fine motor skills. Also, he did not like to participate in structured play. He was mostly disorganised if he had to perform a task that involved several steps and writing. He had poor sense of directions and easily got lost. Eisa had a rigid sequence of sensory behaviours that he exhibited all day. He had poor self-help skills. He might wet himself, and he needed assistance to dress and undress himself. He enjoyed playing with his best friend, but mostly he would imitate what his friend did.

Interpretations regarding Eisa class observations and his sensory profile assessment will be analysed thoroughly in the following chapter. Also, a comparison between Danny's and Eisa's learning experience will be discussed. The comparison will focus on:

- Teacher's knowledge regarding SPD and how it impacted on their learning experience.
- Effect of early intervention on their behaviour, language, skills, and academic outcomes.
- The quality of support that was provided in each learning setting.
- Curriculum differentiation, accommodation, and modification that were offered.
- Teachers' effort to manage behaviours that were related to sensory problems.

Chapter 5—Discussion, Conclusion, and Recommendation

This chapter will be summarising previous discussed issues related to teachers' knowledge regarding SPD. Also, this chapter will present what was found available for early learners with SPD and then compare the two case studies in light of this study's findings. The next section will be to present the study's conclusions followed by recommendations.

Survey's Discussion

The results from the questionnaire confirmed the researcher's first hypothesis: mainly that the majority of teachers did not have satisfactory awareness regarding the disorder, and more education is needed regarding SPD.

Only the teachers who had a degree in psychology were aware and knowledgeable about the causes and symptoms of the disorder. Forty-two percent of the teachers were suspected of having pupils with sensory problems, but those pupils were not referred for diagnoses and early intervention. That is because the teachers were unable to distinguish between the child's sensory behaviour problems and regular behaviour problems as the percentage of teachers that were unsure was higher than 60%. To manage the children in school situations it would be necessary to have the knowledge regarding SPD, to be able to manage a pure behaviour problem and then refer for clarification and support but not to diagnose children. This is an additional confirmation to the results obtained that more education is needed regarding SPD to be able identify those pupils at an early stage, as many pupils remain undiagnosed until they fail grades repeatedly (Portwood 1999). Nine percent of teachers indicated that they have pupils diagnosed with SPD, which confirms the findings in the literature that up to 15% of pupils have SPD (Murray-Slutsky & Paris 2005; Biel & Peske 2009; Bialer & Miller 2011). Furthermore, 100% of the teachers answered question eight that listed some of the main symptoms of SPD. This proves that each class has pupils who are struggling to cope academically because of having sensory based problems.

Surprisingly, not only were the majority of teachers unaware about the disorder, but also they were unsure about how to meet the challenging needs of pupils with sensory issues and those who were poor academically. Only 10% indicated that they implement VAK methods to meet

those pupils challenging needs. According to Aurther and Cremin (2010) these methods are very effective with pupils with sensory processing issues, pupils with learning disorders, and even typical pupils. According to the results from the survey, VAK methods were not widely implemented by teachers. Also, merely 15% of the teachers worked on building the pupils' self-esteem. It is very crucial for these pupils to build their confidence as they always experience failure at school (Portwood 1999).

Taken together, all these results explain why 84% of the teachers believed that there was no sufficient support in the UAE to best accommodate pupils with SPD or any disorder. This finding was in line with Alghazo and Gaad (2004) who have stated that teachers have negative attitudes toward teaching children with academic and behaviour challenging needs in mainstream classes. These negative attitudes are because of the teachers' lack of knowledge, support, and skill that is needed to deal with such challenging pupils (Alghazo & Gaad 2004). Consequently, this lack of knowledge will hinder and delay the discovery of the child's disorder for early intervention programs at an early stage.

Occupational Semi-Structured Interviews Discussion

The interviews with occupational therapists reflected where SPD stands in the UAE.

Studies Conducted in the Arab World and the UAE

With no exception all the OTs did not come across any studies conducted in the Arab World except Reynolds (2010) study. However, this study was not accepted for publishing in the American Journal of Occupational Therapy due to the previous mentioned reasons. This shows how SPD is unrecognised in this part of the world. This result confirms the researcher's results of not finding a credible research and studies conducted on SPD in this part of the world.

General Knowledge, Awareness, and Early Intervention Services Regarding SPD in the UAE

The OTs confirmed what is in the literature: that SPD is an actual disorder and that it does coexist with other conditions (Kranowitz 2003). The percentage of children with sensory problems is high in the UAE. Their conclusion was based the large number of pupils they work with. Due to environmental issues in the UAE, children do not get opportunities to play outside

like children in other countries. Moreover, due to the lack of knowledge regarding SPD in the UAE by medical paediatricians and teachers many children remain undiagnosed unless the child has serious symptoms such as autism or Down syndrome. This delays identifying the child's problems at an early age for early intervention.

Adding SPD on the DSM-5 list will bring more attention to the disorder and will spread awareness as SPD symptoms will be listed on the DSM website. Furthermore, once SPD is listed in the DSM-V, it will find its place listed within IDEA and then consequently on the special educational need (SEN) categories in the UAE. This will aid in classifying children according to their actual needs to be able to qualify them for SEN services.

Children who undergo SI frame of reference do improve. However, SI should not be used in an isolated manner, as most children do not present only with SPD. Accommodating, managing the environment, other sensory treatment approaches, and the child's learning styles should be included in the treatment plan. With more clear distinction between children with SPD and other developmental disorders with sensory problems SI intervention becomes more effective (Kranowitz 2005; Kinnealey & Miller 1993). According to Ayres (1979) SI treatment, approached when combined with special education, will potentially improve academic scores of children with learning disabilities (Cohn 2001).

How SPD is Diagnosed in the UAE

From the literature, the SIPT is considered one of the most comprehensive assessments of the SI, and it is widely used (Bundy, Lane & Murrar 2010) but not in the UAE (Appendix 5). It is a battery of seventeen subsets for children from four years, six months through eight years, to eleven months (ICDL n.d.; Kinnealey & Miller 1993).

The examiner of the SIPT must have experience in paediatrics and knowledgeable in statistics and measurements. Also, the examiner must be a qualified observer, completed courses that covers the theory of SI, administration, and interpretation of the SIPT (Kinnealey & Miller 1993; appendix 5). Unfortunately, SIPT is expensive to administer. For example, to administer SIPT in the UAE, it would cost starting from 3200 DHS which makes it expensive and difficult to follow up, and there are a few SIPT certified professionals in the UAE (ICDL n.d.). Also SIPT has

limitations when it is applied on a diverse population such as in the UAE with language differences between the examiner and the child (Spitzer et al. 1996, appendix 5). Moreover, SIPT is a lengthy assessment tool that takes from ninety to 120 minutes.

To overcome the SIPT limitations and meet the needs of children with sensory problems in the UAE from different backgrounds, it is important to include additional screening tools such as observation and interviews (Spitzer et al. 1996) considering the cultural and language background. Thus, SI assessments are not strictly limited to SIPT. Thus, many assessments can be interpreted from a SI frame of reference, although they were not initially intended as a specific measure of SI status (Kinnealey & Miller 1993; ICDL n.d.; appendix 5). Therefore, all the centres that were investigated in Dubai and Sharjah depended on sensory profile, teacher's questionnaire, and clinical observation as those tools are appropriate to the diverse culture in the UAE.

Dunn and colleagues developed the Sensory Profile (SP) Caregiver Questionnaire to assess the sensory responses of typical and atypical children to a variety of daily sensory experiences (Ermer & Dunn 1998; Johnson-Ecker & Parham 2000). SP captures heterogeneity of children with and without disabilities because it contains combination of factors that discriminate between children with and without disabilities. Also, the full SP discriminates groups of children with disability from each other (Ermer & Dunn 1998; McIntosh et al. 1999; Johnson-Ecker & Parham 2000; Watling, Deitz & White 2001; Dunn, Myles & Orr 2002; Pfeiffer et al. 2005; Dunn 2009; Gere et al. 2009). In addition, the full SP is a valid and reliable tool as it is a standardised and normative assessment tool, and it takes from twenty to thirty minutes to be completed (Dunn, Myles & Orr 2002; Pfeiffer et al. 2005; White et al. 2007; Tomchek & Dunn 2007; Gere et al. 2009).

Case Studies Discussion

From the observer's point of view, there is a connection between the teachers' knowledge about SPD and the pupils' behaviour experience in the class. Also, the teaching methods used by the teachers have a huge impact on the pupils' learning and academic performance. Pupils observed in this study showed completely different learning experiences in regards to the

pupils' time on task, distributive behaviour, attention span, productivity in performing a task with minimum direct support, and how the teachers focused on the pupil's to strengthen their learning.

At Danny's school, the teaching was very rich and sensitive to his learning style. In a lesson, the teacher used visual, auditory, and kinaesthetic teaching methods including multimedia technologies that met all the pupils' individual needs. Danny was a kinaesthetic learner, and he was able to understand challenging concepts because the teaching was meeting his challenging sensory and behaviour problems.

The shadow teacher was a qualified educational psychologist. She was very knowledgeable about Danny's difficulties. She knew how to challenge Danny by focusing on his strengths to comprehend any new and challenging concept. She was on regular and weekly contact with his occupational and speech therapist. Also, she attended his therapy sessions that were held during the week to learn how to support him in the class. Furthermore the shadow teacher guided the class teacher on how to handle Danny when he exhibited inappropriate behaviours that were due to his sensory problems. Moreover, Danny did not restrict the learning atmosphere as he had all the human and physical support to allow him able to cope with his sensory disorder.

In Eisa's case, he was restricting the classroom teaching environment and the quality of teaching time that the teacher had to spend with all the pupils. The teacher was trying to make Eisa complete his class work without knowing how to address the real cause of his challenges. That can be explained due to the lack of their knowledge regarding the sensory causes of Eisa's learning and behaviour challenges. Eisa did not overcome his behaviour and academic difficulties and was not able to cope with his class work independently. It was observed that Eisa's class teacher was not linking between Eisa's behaviour and his sensory problems. All the challenges Eisa had experienced could be due to his poor auditory and visual processing which were evident in his sensory profile assessment. From the observation, Eisa depended on his class teacher to finish his tasks; however, when he was given occasional instructions using auditory, along with visual aids, he was able to perform more independently. The teaching was

sensitive to the pupils who had typical auditory, visual, and attention problems. The English and math lessons lacked hands on and multimedia technology to diverse learning for different learning styles.

Eisa had definite differences in his scores on his modulation, vestibular, discrimination, and proprioceptive senses in comparison to a normative peer group. Thus he had difficulties in paying attention, he did not have subconscious awareness of his own body parts, how his body parts related to one another, and to his surrounding environment (Kranowitz 2005). Also, Eisa was hyposensitive within his vestibular system. That's why he sought out additional movement; he had difficulty sitting still. He rocked and craved intense movement experience. His body was very stiff, he tired easily, and he did not have enough energy to move. Balancing and coordinating the two sides of his body were extremely difficult. He could not pronounce October and sequence the days of the week in order (Kranowitz 2003).

Eisa was continuously unable to keep his posture straight, and he collapsed on the table. Therefore, the class teacher had to stand behind his chair to stop him from pushing his chair back and collapse on the table. That behaviour was due to his poor vestibular and muscle tone problem (Murray-Slutsky & Paris 2005) and those problems were evident in his sensory profile. As a result, Eisa's behaviour restricted the learning environment for other pupils as the teacher had to spend most of her time behind his chair while he had to write. According to Murray-Slutsky and Paris (2005) a child with poor sensory modulation, would operate in low gear or under-responsive, have difficulty generating enough muscle effort and might collapse on the table when writing. Unfortunately, no proper intervention was used to help him develop the muscle tone of his trunk, shoulders girdle, and arms. For instance, using an angle note table on the top of his table would help to keep his back straight. Also a sensory cushion would give him a sense of balance and stability on his seat. Murray-Slutsky and Paris (2005) stated that using inflated seat cushions could provide constructive vestibular input and could position the child correctly for work. Moreover, simple pushups against the wall or table and carrying heavy objects such as books around the classroom would help Eisa to maintain attention for longer periods (Kranowitz & Newman 2010). Instead he developed a negative habit to continuously

get the teacher's attention. Consequently, his sensory problem converted to negative behaviours. According to Murray-Slutsky and Paris (2005) they believed that behaviour is learned once it was repeated.

From Eisa's sensory profile report it showed that his fine motor and perceptual abilities were in the definite difference category. Eisa's tactile discrimination problem interfered with his abilities to perform skilled discriminatory tasks. Eisa had great difficulties isolating his fingers. His gross motor skills were awkward and uncoordinated, and he had many difficulties with age appropriate skills, such as riding a bike, climbing, and other sports activities. Tactile discrimination disorders affect gross motor skills, making the child awkward and uncoordinated.

Crossing the midline is very important for acquiring academic skills such as reading and writing. Also, crossing the midline is essential to develop play skills and self-help skills such as dressing (Stilwell 1981; Cermak & Ayres 1984; Kranowitz & Newman 2010). Eisa avoided any writing tasks; his fine motor skills were very weak, and he could not manipulate the pencil smoothly. He put lots of pressure on his pencil; he could not stay on the line; his letter formations were very poor; and he even could not open his book to find a particular page. Using a bookmark could help Eisa to be more independent instead of an adult opening the book for him. He could not use a scissors, untwist his water bottle, unbutton his shirt or trousers, and he could not open his lunch box easily. All the previous problems were due to his tactile sensory problems which affected his fine motor gross motor and functional skills.

The teachers were forced to do for Eisa things that he could not do independently, due to the busy schedule, short periods' time as each period was only half an hour, and lots of written work that had to be done in the school's text books. Eisa did not have a shadow teacher to support him to work independently and allow him to think when he had to solve problems. He did not receive occupational therapy to help him overcome his sensory seeking problems, functional skills, and help with his help skills. He did not even undergo speech therapy to help him with his articulation, stuttering, and stammering problems. He is seven and a half years old, but his speech, behaviour, social interaction, and help skills are less than his chronological age.

Eisa had all the causes that could cause SPD; he was born premature, kept in an incubator with no mother-child contact for months. Unfortunately, no intervention services were facilities for him by the pediatrician that followed his case. On the other hand, Danny who was diagnosed with severe autism and at an early age had an early intervention which made him more capable than Eisa and able to function at an appropriate age level.

Conclusion

The purpose of this study was to investigate the offered services and teachers' knowledge regarding SPD in the UAE. The resulting data was supported by related teachers' questionnaire, semi-structured interviews with occupational therapists, and two case studies.

Teacher's knowledge regarding SPD did affect how to differentiate and understand the child's challenges. Also, the teacher's awareness and knowledge about SPD made a difference in the child's learning and social experience in class. The intervention and the educational provision that Danny received were positively impacting his language development, motor skills, and academic performance. The school, teachers, and parents are continuing to work as a team to meet Danny's learning, behaviour, and sensory challenging needs. Also, being sensitive to Danny's learning styles made a positive difference in his learning experience.

On the other hand, teachers did not always have the knowledge, support, and skills to deal with pupils with sensory problems. They had negative attitudes toward teaching children with sensory needs. Teachers should implement VAK methods to meet diverse learning styles, as it is expected with the new enforcement of inclusive education from the Ministry of Education in the UAE that the number of pupils with SPD and other difficulties will raise. Thus, teachers need to be educated about SPD, which will also help in recognising children with sensory issues at an early stage for early detection and intervention to avert academic and emotional problems.

Therefore, it can be concluded from this study increasing teachers' knowledge regarding SPD, providing early intervention services and regular occupational therapy, and providing all the required tools and staff will help to successfully include very challenging children. To be able to generalise the researcher's findings, a large-scale study is needed. This can be considered as a further area for research in the UAE.

Without a doubt, SPD does exist as a standalone disorder that affects many young learners in the UAE. It is imperative not to overlook the child's behaviour problems, social problems, speech delays, and early functional skills. SPD is still a hidden disorder that impacts negatively on the academic performance, behaviour, social interaction, and communication of many other pupils. Hence, this disorder must be recognised and added to special educational need

categories in the UAE. Consequently, other pupils such as Eisa will be identified at an early stage to receive proper intervention and provisions that will provide them with the support they require to meet their challenging sensory, social, and other learning needs.

Recommendation

Spreading awareness about the early signs of SPD will help in changing the community's attitude toward seeking help. That will make parents understand and not justify their child's developmental delays and negative behaviour as a normal phase that he/she will grow out of.

Create a website for professionals to help them recognise SPD symptoms at an early age. That will help to create a cross curricula between professionals such as speech pathologists, educational physiologists, and paediatricians. Also, it would be a convenient tool for early years teachers and parents to implement fun activities that will help in developing the sensory integration system for typical and atypical children.

Create and implement a sensory motor program for young learners to be part of the early years foundation stage curriculum in the UAE. This program will be specifically designed to develop the children's functional and play skills to help mature the children's social, physical, and academic readiness skills which they will need in the future.

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