بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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قسم

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Sensory Integration Therapy as a management of Sensory Deficits in Autistic Spectrum Disorders

A Systematic Review

Submitted for Partial Fulfillment of Master Degree in Phoniatrics

By

Heba Mamdouh Abdul-Majeed

M.B., B.Ch. Faculty of Medicine, Ain Shams University

Under supervision of

Prof. Dr. Nirvana Gamal El-Din Hafez

Professor of Phoniatrics

Phoniatrics Unit – Otorhinolaryngology Department

Faculty of Medicine, Ain Shams University

Dr. Mona Sameeh Khodeir

Lecturer of Phoniatrics

Phoniatrics Unit –Otorhinolaryngology Department

Faculty of Medicine, Ain Shams University

Faculty of Medicine

Ain Shams University

2020-2021

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH**, the Kindest and Most Merciful.

I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Nirvana Gamal El-Din Hafez,** Professor of Phoniatrics, Phoniatrics Unit – Otorhinolaryngology Department, Faculty of Medicine, Ain Shams University for her keen guidance, kind supervision, valuable advice, and continuous encouragement, which made possible the completion of this work.

I am also delighted to express my deepest gratitude and thanks to **Dr. Mona Sameeh Khodeir,** Lecturer of Phoniatrics, Phoniatrics Unit –Otorhinolaryngology Department, Faculty of Medicine, Ain Shams University**,** for her kind care, continuous supervision, valuable instructions, constant help, and great assistance throughout this work.

Finally, I owe my dear and lovely family a lot for their continuous support and love.

Heba Mamdouh

List of Contents

List of Abbreviations

Abb.	Full term
ADHD	Attention deficit hyperactivity disorder
ADLs	Activities of daily living
ANCOVA	An analysis of covariance
AP	Auditory Processing
APD	Auditory Processing Disorder
AS	Asperger`s Syndrome
ASD	Autism spectrum disorder
ASI	Ayres sensory integration therapy
ASIFM	Ayres sensory integration fidelity measure
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders
DSM-V	Diagnostic and Statistical Manual - 5
FAS	Fetal Alcohol Syndrome
FM	Fine motor
FMP	Fine Motor Perceptual
GAS	Goal Attainment Scale
GI	Gastrointestinal
ID	Inattention Distractibility
JMAP	Japanese Miller Assessment for Pre-schoolers
LET	Low Endurance Tone
MAP	Miller Assessment for Pre-schoolers
MMAAL	Modulation of Movements affecting Activity Level
MP	Multisensory Processing
MRBPM	Modulation related to Body Position and Movement
MSIAER	Modulation of Sensory Input affecting Emotional Responses
MSP	Multisensory Processing
MVIAERL	Modulation of Visual Input affecting Emotional Response and Level
OCD	Obsessive-Compulsive Disorder

List of Abbreviations Cont...

Abb.	Full term
OSP	Oral Sensory Processing
OSS	Oral Sensory Sensitivity
OT	Occupational therapy
OT-SI	Occupational therapy using the SI approach
PDD-NOS	Pervasive Developmental Disorder Not Otherwise Specified
PR	Poor Registration
QNST-II	Quick Neurological Screening Test (2nd edition)
RCT	Randomized Controlled Trial
SBMD	Sensory based motor disorder
SC	Sensory craving
SCOPE	Short Child Occupational Profile
SDD	Sensory discrimination disorder SMD Sensory Modulation Disorder
SI	Sensory Integration
SIPT	Sensory Integration and Praxis Test
SIT	Sensory integration therapy
SMD	Sensory modulation disorder
SOR	Sensory over-responsivity
SP	Sensory Processing
SP	Sensory Profile
SPD	Sensory processing disorder
SPM	Sensory Processing Measure
SPRET	Sensory Processing related to Endurance Tone
SRS	Social Responsiveness Scale
SS	Sensory seeking
SSN	Sensory Sensitivity
SUR	Sensory under-responsivity

List of Abbreviations Cont...

Abb.	Full term
TD	Typical development
TP	Touch Processing
VeP	Vestibular Processing
VP	Visual Processing
VPD	Visual Processing Disorder

List of Tables

List of Figures

INTRODUCTION

Individuals with ASD have been found to have high rates of abnormalities of sensory functioning. Abnormalities in all sensory modalities have been reported in ASD, and a broad range of disturbances may be observed **(Marco et al., 2011)**.

Researchers have found uniform modulation abnormalities in several sensory systems while, at the same time, been burdened by heterogeneity in sensory processing amongst participants diagnosed with autism. Specifically, researchers have indicated that individuals with autism present with a unique combination of hyper-responsiveness, hypo-responsiveness, and sensory-seeking within the auditory sensory system which responsible for the perception of sound, the proprioceptive sensory system which is responsible for the perception of input from joint capsules, ligaments, muscles, tendons, and skin, and in the multisensory system which is responsible for the summation of input from all other sensory systems **(Ashburner et al., 2013).**

Though, researchers have sought to identify a biological cause for the abnormal behaviors observed in individuals with ASD. One hypothesis is that abnormal behaviors are caused by a defect in the nervous system in which sensory stimuli are processed and integrated abnormally **(Ayres, 1972; Lang et al., 2012).** Sensory integration therapy (SIT) is an extension of this hypothesis and further speculates that, given the nervous

system's ability to change (neuroplasticity), providing specific forms of sensory stimulation in the appropriate dosage may improve the nervous system's ability to process sensory stimuli. This may then result in reductions in problem behaviors and more efficient learning **(Lane et al., 2010).** However, the exact nature of the nervous system's impairment and the influence of SIT on sensory processing is currently the subject of debate and ongoing research **(Lane and Schaaf, 2010).**

Using gross motor activities that activate the vestibular and somatosensory systems **(Mailloux and Roley, 2010),** the goal of SIT is to increase the child's ability to integrate sensory information, thereby demonstrating more organized and adaptive behaviors, including increased joint attention, social skill, motor planning, and perceptual skill**.** Traditional SIT is provided in a clinic with specially designed equipment (e.g. swings, therapy balls, inner tubes, trampolines, and climbing walls) that can provide vestibular and proprioceptive challenges embedded in playful, goal-directed activities **(Case-Smith et al., 2015)**.

A systematic review by **May-Benson and Koomar (2010)** examined 27 studies conducted between 1972 and 2007 investigated the efficacy of the sensory integration approach. Findings indicated that sensory integration interventions may contribute to improved outcomes in individualized goals, reading and related skills, sensory-motor skills and motor planning, and socialization, behavioral regulation, and attention but that more research is needed, specifically, studies that more

closely adhere to the principles of the Ayres Sensory Integration® (ASI) intervention.

Despite this highly reported use of ASI in clinical practice, confusion exists about the evidence for its effectiveness **(Schaaf & Case-Smith, 2014).**

One of the researches that investigated the efficacy of SIT for children with ASD is that **Miller et al. (2007).** It indicated that children with ASD undergoing occupational therapy using the SI approach (OT-SI) made significant gains compared with an Activity Protocol group and a no-treatment group on goal attainment scaling and some other parameters of performance. The OT-SI group improvement trends on the Short Sensory Profile and other measures were in the hypothesized direction. Additionally, **Fazlioğlu and Baran (2008)** reported that statistically significant differences in the Sensory Evaluation Form for Children with Autism (a measure of sensory processing disorder) scores between SIT groups and control groups indicated that SIT positively affected children with autism **(Iwanaga et al., 2014).**

However, some studies have not affirmed the effectiveness of SIT compared with other therapy forms. A review study **(Baranek, 2002)** suggested that outcomes of SIT for children with autism in psycho-educational and motor categories are stronger than in other areas compared with no