

Current evidence suggests that Sensory Integration (SI) treatment interventions are as effective as other forms of therapy in behavioural outcomes for youth and young adults with early psychosis.

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CLINICAL SCENARIO:

The concept of Sensory Integration (SI) dates back to the works of Dr. A. Jean Ayres in the 1970s (OT Innovations, 2007). Primarily focusing her work on children with sensory processing difficulties and autism, Ayres described sensory integration as the neurological process that organizes the sensations from the body and surrounding environment, making it possible to function effectively within the environment (OT Innovations, 2007). Over the past three decades, continued work in sensory theories has led to the development of sensory modulation, commonly referred to as the “ability to organize and regulate one’s responses to sensory and motor stimulation in a graded and adaptive manner” (Champagne, 2006). As defined, both SI and sensory modulation are evaluated both neurophysiologically and behaviourally, making them relevant and applicable to a wide range of patients and diagnostic groups. Treatment efficacy employing sensory modulation techniques has expanded from children with autism to a range of clients including adolescents, adults, and older adults. The application of sensory modulation has been broadened for use with learning disabilities, mental retardation, brain dysfunction, aphasia, delayed motor skills, and the psychiatric population (Centre for Reviews and Dissemination, 2007). Increased interest in the topic and its expanding use in the psychiatric settings have led me to consider integrating sensory techniques into my own practice as it appears to acknowledge both the underlying neurological deficits experienced by individuals with psychosis, while concurrently addressing more observable behavioural outcomes. In addressing these concerns in my patients, such as disorganized social behaviour, more higher-level functional goals such as return to work, school, and independent living become plausible.

FOCUSSED CLINICAL QUESTION:

Does an inpatient group, using activities based on sensory integration/ modulation, increase the ability to generate more adaptive social behaviours in clients aged 17-25 experiencing early psychosis?

SUMMARY of Search, ‘Best’ Evidence’ appraised, and Key Findings:

- 1 meta- analysis on the efficacy of sensory integration approaches (Centre for Reviews and Dissemination, 2007)
- 1 randomized control trial
- 3 case series
- Studies published between 1990-2007 were considered

CLINICAL BOTTOM LINE:

The results of this meta- analysis conclude that SI treatment approaches are no more effective than other treatment interventions in specific outcome areas of psychoeducation, motor function, behaviour, language, and sensory- perceptual function. When compared to no treatment alternatives, there appears to be some value to SI techniques. Other studies reviewed, however not critically appraised, mention similar results to this meta-analysis but also comment on value of group intervention method on improved social behaviour as it provides a close social context for peer interaction (Reisman & Blakeney, 1991; Soper & Thorley, 1996).

There are limited studies published from 1990- 2007 (one was found to date), specifically evaluating the effectiveness of SI therapy with the early psychosis and schizophrenia population. The majority of studies on this topic were published between 1970's and 1980's.

Limitation of this CAT: This critically appraised paper (or topic) has /has not been peer-reviewed by one other independent person/a lecturer.

SEARCH STRATEGY:**Terms used to guide Search Strategy:**

- **P**atient/Client Group: Adolescent, adult, psychosis, schizophrenia, learning disability
- **I**ntervention (or Assessment): Sensory integration, sensory modulation, sensory motor integration, group, individual
- **C**omparison: Are sensory integration activities effective in adapting social behaviours for those with early psychosis? Are they more effective than other forms of therapy in adapting these behaviours?
- **O**utcome(s): Adaptations in social behaviour, increased engagement in functional tasks/ activities, increased attention

Databases and sites searched	Search Terms <i>Various combinations of terms</i>	Limits used
CINAHL	Sensory integration, sensory modulation, sensory motor integration, behaviour, schizophrenia	English, treatment outcomes, adult, publication year 1990- 2007

EBM Reviews (Cochrane Database of Systematic Reviews, Cochrane Central Registry of Controlled Trials, ACP Journal Club, Database of Reviews and Effects)	Sensory integration, sensory modulation, behaviour	Publication year 1990- 2007
EMBase	Sensory integration, sensory modulation, psychosis	English, publication year 1990- 2007
MEDLINE	Sensory integration, sensory modulation, psychosis	English, human, publication 1990-2007
PubMed	Sensory integration, sensory modulation, behaviour, psychosis	English, publication 1990- 2007
PyscINFO	Sensory integration, sensory modulation, psychosis	Publication 1990-2007

INCLUSION and EXCLUSION CRITERIA

- Inclusion:
 - adolescents (ages 13-18 years) and adults (ages 19- 44 years)
 - diagnoses of psychosis, schizophrenia, or learning disabilities
 - inpatient or outpatient based treatment
 - group delivery method or individual therapy programs using Sensory Integrative Therapy (SIT) techniques or activities
 - outcomes were relevant to the clinical question posed and addressed the general effectiveness of sensory integration, the effects on client behaviour, affect, and level of engagement in functional tasks.
- Exclusion:
 - geriatrics or older adults
 - editorials, letters, and/or commentaries

- articles pertaining exclusively to pre- school aged or school-aged children
- diagnostic groups exclusively in the categories of mental retardation, autism, and dementia
- studies focusing on brain structure, ego development, or that did not evaluate the effectiveness SIT was omitted

RESULTS OF SEARCH

Studies meeting inclusion/ exclusion criteria and publication dates (1990-2007) from database searches:

CINAHL- 2

EBM Reviews- 1

PsycINFO- 1

Additional citation review- 1

All other database searches resulted in zero hits due to restriction in publication dates. Articles published in 1970's and 80's, though relevant to topic, were excluded for review. Additional citation review of retrieved articles resulted in 1 additional article.

Table 1: Summary of Study Designs of Articles retrieved

Study Design/ Methodology of Articles Retrieved	Level	Number Located	Author (Year)
Meta- analysis	1a-	1	<ul style="list-style-type: none"> • Centre for Reviews and Dissemination (2007)
Randomized Control Trial	1b	1	<ul style="list-style-type: none"> • Reisman & Blakeney (1991)
Case- series	4, 4-	3	<ul style="list-style-type: none"> • Urwin & Ballinger (2005) • Green et al. (2003) • Soper & Thorley (1996)

BEST EVIDENCE

The following study/paper was identified as the 'best' evidence and selected for critical appraisal:

Centre for Reviews and Dissemination. (2007). A meta-analysis of research on sensory integration treatment (structured abstract). *Database of Abstracts of Reviews of Effects*, 3(3) Retrieved September 27 ,2007 from EBM Reviews- Database of Abstracts of Reviews of Effects database.

Reasons for selecting this study were:

- Highest level of evidence

- Most recent meta- analysis to date
- Compared the effectiveness of sensory integration treatment modalities with alternative forms of treatment and no treatment
- Studies that were reviewed in the meta-analysis included subjects that closely resembled my population in question (youth and young adults with psychosis) as well as outcome in question (behaviour)

SUMMARY OF BEST EVIDENCE

Table 2 A meta- analysis of research on sensory integration treatment (structured abstract) by (Centre for Reviews and Dissemination, 2007)

Aim/Objective of the Study/Systematic Review:

A meta-analysis of existing studies to explore the effectiveness of sensory integration (SI) treatment approaches in various behavioural domains and for different client populations compared to no or other treatment strategies.

Study Design:

Meta-analysis

Search Strategy

Published literature from 1972 to 1994 searched in computer databases (ERIC, PsycLIT, MEDLINE, Dissertation Abstracts), manual hand searches of article references, personal contacts with authors, and consultation with the Sensory Integration International Association.

Selection Criteria

Inclusion criteria for studies:

- Children, adolescents, or adults with learning disabilities, mental retardation, minor brain dysfunction, aphasia, motor delay, and psychiatric illness.
- All study designs except case studies, single group-design, and laboratory-type stimulation.
- Investigations had to compare SI treatment versus no treatment or an alternative treatment. At least 2 interventions had to be compared.
- Reported findings that allowed for quantitative analysis in the broad categories of: psychoeducation, motor function, behaviour, language function, and sensory-perceptual function.

Methods

Authors did not state how data was extracted for this review, nor the number of authors involved in data extraction.

Setting: N/A

Participants:

Search strategy resulted in 16 studies comparing SI with no treatment (SI/NT), where N= 578; and 16 studies comparing SI with an alternative treatment (SI/ALT), where N= 441.

Intervention Investigated

Control: No treatment (NT) or Alternative treatment (ALT)

Experimental: Sensory integration treatment (SI)

Outcome Measures

Effect sizes calculated from studies' pre- and post- test measures and standard deviations, and chi-square statistics. Corrected effect sizes were calculated by using a correction factor for sample size biases to obtain an unbiased estimate.

Main Findings:

Comparison or Outcome	Effect Size	Confidence Interval
SI/ NT	0.29	95% (0.12, 0.48)
SI/ ALT	0.09	95% (-0.11, 0.28)
Older Studies	0.60	95% (0.33, 0.86)
Recent Studies	0.03	95% (-0.20, 0.26)
Psychoeducation	0.39	Not reported
Motor Function	0.40	Not reported

Original Authors' Conclusions

1. For SI/NT comparison, a significant effect was found for SI treatment effects for earlier studies but not for more recent studies.
2. Larger effect sizes were found as outcomes for psychoeducation and motor categories.
3. SI treatment interventions were concluded to be as effective as other forms of alternative treatment.
4. For SI/ ALT studies, the average effect size was 0.09 and therefore not statistically significant from zero.

Critical Appraisal:

Validity (*Methodology, rigour, selection, bias*)

Quality of the studies were based on the following:

1. Implementation or design-related variables (design quality, sampling method, number of outcome measures, number of measurement categories, professional affiliation of researchers, geographic location, publication year)
2. Treatment- related variables affecting quality of SI treatment approaches (total treatment hours, diagnosis, age)

The authors search strategy was clearly specified and heterogeneity of the studies was taken into consideration. The authors' conclusion appeared to be justified by the available and documented evidence.

Limitations:

No reports by authors on how validity of studies reviewed were assessed. As well, no report on how decisions were made in developing the inclusion/exclusion criteria, how data extraction was completed and description of the terms “earlier” studies versus “more recent” studies. It would also be of interest to the reader as to have been given some examples of “alternative treatment” methods.

Interpretation of Results

See Main Findings and Author’s conclusion sections.

Summary/Conclusion:

- For SI/NT, significant treatment effects were found for SI in earlier studies but not for more recent studies, supporting the need to investigate SI treatment effects for more recent studies.
- SI treatment had no significant effect in outcomes of: behaviour, language, and sensory-perceptual function. Larger effect sizes in psychoeducation and motor function were seen.
- In general, SI treatment interventions were concluded to be as effective as other forms of alternative treatment, supporting the need for rigorous studies investigating the effect of alternative treatment methods as an adjunct to SI treatment.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

The results of this meta- analysis conclude that SI treatment approaches are no more effective than other treatment interventions in specific outcome areas of psychoeducation, motor function, behaviour, language, and sensory- perceptual function. When compared to no treatment alternatives, there appears to be some value to SI techniques. Other studies reviewed, however not critically appraised, mention similar results to this meta-analysis but also comment on value of group intervention method on improved social behaviour as it provides a close social context for peer interaction (Reisman & Blakeney, 1991; Soper & Thorley, 1996).

Locally, there are a small number of inpatient psychiatric units implementing sensory integration/ modulation group sessions to their programming, with clinician’s subjectively monitoring positive changes in social behaviour and interactions. Despite the current evidence for the effectiveness of SI treatment approaches, there appears to be inherent benefits of group SI therapy. In addition, group work is a cost-effective means of delivering treatment to a number of patients within limited time constraints (Ehmann, MacEwan, & Honer, 2004).

Future research may wish to focus on value of SI in combination with alternative treatment methods to assess the value of SI therapy in conjunction with standard treatment practices, as well as evaluating the effectiveness of individual SI therapy sessions versus group SI therapy sessions.

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