The effectiveness of allied health therapy in the symptomatic management of progressive supranuclear palsy: a systematic review

Erica Tilley
Master of Clinical Science
Joanna Briggs Institute
Faculty of Health Sciences
The University of Adelaide
Australia

February 2016
Table of Contents

ABSTRACT ........................................................................................................................................ IV

DECLARATION ................................................................................................................................... VI

ACKNOWLEDGEMENTS ...................................................................................................................... VII

CHAPTER 1: INTRODUCTION AND BACKGROUND ........................................................................... 1

1.1. INTRODUCTION ............................................................................................................................ 1

1.2 STRUCTURE OF DISSERTATION .................................................................................................... 1

1.3. REVIEW OBJECTIVE/QUESTION .................................................................................................. 2

1.4. BACKGROUND .............................................................................................................................. 2

1.4.1. Classifying and diagnosing progressive supranuclear palsy ......................................................... 2

1.4.2. Types of progressive supranuclear palsy ..................................................................................... 7

1.4.3. Symptoms of progressive supranuclear palsy ............................................................................ 8

1.4.4. Allied health management of progressive supranuclear palsy and current literature within the field ................................................................................................................................................................................................. 10

CATEGORY OF SYMPTOMS .................................................................................................................. 13

1.5. OVERVIEW OF THE SCIENCE OF EVIDENCE SYNTHESIS AND THE NEED FOR A SYSTEMATIC REVIEW ................................................................................................................................................................................................. 14

1.5.1. Evidence-based practice and evidence-based healthcare: .......................................................... 14

1.5.2. Evidence-based practice in allied health: .................................................................................... 15

1.5.3. Need for a systematic review: .................................................................................................... 18

1.5.4. Evidence synthesis: ................................................................................................................... 19

1.6. METHODOLOGICAL APPROACH ................................................................................................ 20

CHAPTER 2: METHODS .......................................................................................................................... 22

2.1. INCLUSION CRITERIA ...................................................................................................................... 22

2.1.1. Types of participants ................................................................................................................ 22

2.1.2. Types of interventions/comparator ........................................................................................... 22

2.1.3. Outcomes .................................................................................................................................. 22

2.1.4. Types of studies ......................................................................................................................... 23

2.2. SEARCH STRATEGY ....................................................................................................................... 23

2.3. ASSESSMENT OF METHODOLOGICAL QUALITY ........................................................................ 24

2.4. DATA COLLECTION ....................................................................................................................... 24

2.5. DATA SYNTHESIS ........................................................................................................................ 24

CHAPTER 3: RESULTS ............................................................................................................................ 25

3.1. SEARCH RESULTS .......................................................................................................................... 25

IDENTIFICATION .............................................................................................................................. 28

SCREENING ......................................................................................................................................... 28

ELIGIBILITY .......................................................................................................................................... 28

INCLUDED ........................................................................................................................................... 28
3.2. ASSESSMENT OF METHODOLOGICAL QUALITY ............................................................................................................. 29
3.3. DESCRIPTION OF INCLUDED STUDIES ......................................................................................................................... 31
  3.3.1. Overview of studies ..................................................................................................................................................... 31
  3.3.2. Study settings ............................................................................................................................................................. 31
  3.3.3. Age/participant numbers/gender ................................................................................................................................. 31
  3.3.4. Medications/co-morbidities ......................................................................................................................................... 31
  3.3.5. Baseline activity and onset of disease duration ........................................................................................................... 32
  3.3.6. Interventions/comparators ........................................................................................................................................... 35
  3.3.7. Outcome measures ....................................................................................................................................................... 38
  3.3.8. Statistical analysis used ................................................................................................................................................. 38
3.4. FINDINGS OF THE REVIEW ............................................................................................................................................... 40

CHAPTER 4: DISCUSSION .................................................................................................................................................. 44
  4.1. OVERVIEW OF FINDINGS ................................................................................................................................................ 44
  4.2. LIMITATIONS TO THE SYSTEMATIC REVIEW .............................................................................................................. 46
  4.3. IMPLICATIONS FOR PRACTICE ..................................................................................................................................... 47
  4.4. IMPLICATIONS FOR RESEARCH .................................................................................................................................. 47
  4.5. CONCLUSION .................................................................................................................................................................... 48

APPENDIX I: SEARCH STRATEGY ......................................................................................................................................... 50
APPENDIX II: CRITICAL APPRAISAL INSTRUMENTS ............................................................................................................. 56
APPENDIX III: DATA EXTRACTION INSTRUMENTS ............................................................................................................... 58
APPENDIX IV: AUTHORS CONTACTED .................................................................................................................................. 60
APPENDIX V: DESCRIPTION OF OUTCOME MEASURES/BASELINE CHARACTERISTICS USED IN THE SIX INTERVENTION STUDIES MEETING THE METHODOLOGICAL QUALITY REQUIREMENTS: .................................................. 61
APPENDIX VI: DESCRIPTION OF STATISTICAL ANALYSIS PERFORMED ON OUTCOME MEASURES BY STUDIES: 64
APPENDIX VII: SUMMARY OF RESULTS FROM THE SIX STUDIES: ......................................................................................... 66
APPENDIX VIII: PROGRESSIVE SUPRANUCLEAR PALSY RATING SCALE OUTCOME MEASURE RESULTS IN SANTENS (2009)68: ........................................................................................................................................ 74
APPENDIX IX: FINDINGS FROM THE STUDY THAT USED THE PARKINSON’S DISEASE QUESTIONNAIRE-3976 IN NICOLAI ET AL. 66 ........................................................................................................................................... 75
APPENDIX X: JOANNA BRIGGS INSTITUTE GRADES OF RECOMMENDATIONS. 157 ........................................................................................................................................ 76
REFERENCES ........................................................................................................................................................................ 77
Abstract

Background
Progressive supranuclear palsy is an adult onset neurodegenerative condition. Progressive supranuclear palsy is an aggressive condition associated with a continual loss of function and commonly, death due to aspiration pneumonia. Currently there is no cure, and dopaminergic medications have limited symptomatic benefit for patients. Physiotherapy, occupational therapy, and speech therapy strategies to optimize independence and function are important and show promising effectiveness in practice. Mobility, speech and swallowing problems are some of the most commonly experienced symptoms and are experienced across all stages of the disease.

Objectives
This systematic review aimed to identify and examine the effectiveness of physical, occupational, and speech therapy interventions in the symptomatic management of progressive supranuclear palsy.

Inclusion criteria
This review included participants with progressive supranuclear palsy as per the National Institute for Neurological Disorders and Stroke and the Society of Progressive Supranuclear Palsy criteria, aged over 40 years of age from all community and clinical settings. This review included studies evaluating any physical, occupational or speech therapy interventions that addressed mobility, vision, swallowing, communication or cognitive/neuropsychiatric difficulties experienced by patients with progressive supranuclear palsy compared with usual care and/or baseline measurements. Outcomes of interest included the degree of change, or no change in common symptoms including mobility, vision, swallowing, communication and cognition. All types of quantitative study designs were eligible for inclusion.

Methods
A three-step search strategy was utilized to identify published and unpublished English language studies from between 1996 and 2014 from 11 databases. Methodological appraisal was conducted by two independent reviewers using standardized instruments and relevant data was extracted from included papers using standardized data extraction tools and presented in narrative form due to heterogeneity of interventions.

Results
Six studies of varying methodological quality and small sample sizes were included.
No occupational therapy or speech therapy interventions were identified. Five studies examined physiotherapy rehabilitation programs and one study examined non-invasive brain stimulation. There is preliminary evidence to support the use of various physiotherapy rehabilitation programs. Physiotherapy rehabilitation programs that combine a dynamic antigravity postural system and a vibration sound system or combine balance and posture exercises with audiobiofeedback appear to improve balance. Combined balance and eye movement training appear to improve stance time and gait speed. Balance training appears to improve step length. Balance and eye movement training may improve vertical gaze fixation and gaze error scores. Balance and posture exercises with audiobiofeedback may improve cognition and communication aspects of quality of life.

**Conclusion**

Research into the effectiveness of allied health therapeutic interventions for progressive supranuclear palsy symptoms is in its infancy with what can be understood as preliminary evidence for the effectiveness of a number of physiotherapy interventions. High quality studies with large sample sizes are needed. Further research is urgently required to both add further evidence to these results and to identify and investigate effective interventions including occupational therapy and speech therapy interventions to manage mobility, vision, swallowing, communication and cognitive/neuropsychiatric symptoms associated with this devastating condition.

**Keywords**

Physiotherapy; physical therapy; occupational therapy; speech therapy; speech pathology; Steele-Richardson-Olszewski syndrome; Richardson’s syndrome; PSP; systematic review.
Declaration

I, Erica Tilley, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

I also give permission for the digital version of my thesis to be made available on the web, via the University’s digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

__________________________________________
Erica Tilley
8th February 2016
Acknowledgements

I would like to acknowledge my partner, Ben. Without his unfettered support, there would be no beginning or ending.

A big thank you to my academic supervisors past and present from the Joanna Briggs Institute; Dr Micah Peters, Dr Sarahlouise White and Dr Cindy Stern. I have benefited so much from your time and expertise.

Many thanks also to Dr James McLoughlin and Dr Sebastian Doeltgen for your expertise and advice.

Thank you Professor Simon Koblar for inspiring an interest in research. I vowed I would never do a higher degree by research and now I must eat my words!

I would also like to thank my colleagues and managers who have been so supportive of my studies; Linda Sexton, Amanda Crockett-Naini, Helen Tedesco, Anne Walters, Natalie Knight and Ella James.

Thankyou to Ali Morshed, Masters of Clinical Science candidate for providing peer critical appraisal of studies included in this systematic review.

Finally, I would also like to acknowledge the passing of the ‘father of evidence-based medicine’, David Sackett, in May 2015.