A CLINICAL INVESTIGATION OF CHIROPRACTIC NEURO EMOTIONAL TECHNIQUE (NET) FOR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (AD/HD) IN CHILDREN

A thesis presented in candidature for the degree of

Master of Science (Honours)

by

Fay Karpouzis

BSc (UNSW), Post Grad Dip Chiro, DO

Department of Chiropractic

Faculty of Science

Macquarie University

Sydney, Australia

August 2010

Table of Contents

Table of Contents i
List of Tables v
List of Figures vii
List of Appendices ix
Master's Summary xiii
Statement of Originality xv
Dedication xvi
Acknowledgments xvii
Abbreviations xix

CHAPTER 1 1

INTRODUCTION 1
1.1 Introduction 2
1.2 Thesis objectives and research questions 2
1.3 Thesis aims 4
1.4 Hypothesis for research question 2 4
1.5 Thesis background 5
1.6 Thesis rationale 7
1.7 Thesis composition 14
1.8 Summary 16
1.9 References 17

CHAPTER 2 27

LITERATURE REVIEW: 27

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (AD/HD) 27
2.1 Introduction 28
2.2 History of AD/HD terminology 28
2.3 Diagnostic criteria 29
2.4 Differential diagnosis 32
2.5 Comorbid disorders 34
2.6 Epidemiology 36
2.7 Aetiology 36
2.8 Prognosis and outcomes 40
2.9 Assessment of AD/HD 42
2.10 Treatment and management of AD/HD 46
2.10.1 Pharmacological Interventions 48
2.10.2 Systematic reviews of AD/HD treatments 51
2.10.3 Psychosocial management 59
2.10.4 Multimodal therapies 63
2.11 Industry-funded research, conflict of interests and ghost-writing 64
2.12 Complementary and alternative medicine/non-traditional treatment and management for AD/HD 67
2.12.1 Integrative approaches to AD/HD 78
2.12.2 CAM conclusions 80
2.13 Summation 81
2.14 References 83

CHAPTER 3 105

CHIROPRACTIC CARE FOR PAEDIATRIC AND ADOLESCENT ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A SYSTEMATIC REVIEW 105
3.1 Introduction 106
3.2 Abstract 107
3.3 Background 108
3.4 Objective 110

3.5 Methods ... 110
3.6 Results ... 114
3.7 Discussion ... 115
3.8 Conclusions ... 120
3.9 Summary ... 121
3.10 References ... 122

CHAPTER 4 ... 130

METHODOLOGY OF A RANDOMISED CONTROLLED TRIAL OF NET THERAPY FOR PAEDIATRIC AD/HD ... 130

4.1 Introduction ... 131
4.2 Standards in the Design of a Randomised Controlled Trial ... 132
4.3 Clinical Trial Approvals ... 134
4.4 Research Question 2 ... 135
4.5 Objectives ... 135
4.6 Hypothesis ... 135
4.7 Method ... 135
4.7.1 Settings ... 135
4.7.2 Care Providers (Practitioners) ... 135
4.7.3 Participants ... 136
4.7.4 Measures ... 137
4.7.4.1 Diagnostic Criteria ... 137
4.7.4.2 Outcome Measures ... 138
4.7.5 Advertising ... 141
4.7.6 Recruitment ... 141
4.7.7 Telephone Screening ... 141
4.7.8 Informed Consent ... 143
4.7.9 Risks ... 143
4.7.10 Withdrawals ... 143
4.7.11 Allocation of Groups/Randomisation/Concealment ... 143
4.7.12 Blinding ... 144
4.7.13 Sample size ... 144
4.7.14 Study Protocol ... 145
4.7.15 Protocol Training ... 146
4.8 Neuro Emotional Technique ... 147
4.8.1 NET definition ... 147
4.8.2 NET Protocol ... 149
4.8.3 Sham Protocol for Group A ... 164
4.9 Statistical methods ... 166
4.10 Summary ... 166
4.11 References ... 168

CHAPTER 5 ... 172

RESULTS OF A RANDOMISED CONTROLLED TRIAL OF NET THERAPY FOR PAEDIATRIC AD/HD ... 172

5.1 Introduction ... 173
5.2 Participant randomisation ... 174
5.3 Description of care providers ... 175
5.4 Deviations from original study ... 178
5.5 Recruitment ... 178
5.6 Characteristics of study participants ... 178
5.7 Raw data/unadjusted results for CPRS-R:L and CTRS-R:L ... 182
5.7.1 Baseline scores ... 182
5.7.2 Minimally clinically important difference ... 185
5.7.3 Clinically meaningful results ... 189
5.8 Statistical analysis of data for CPRS-R:L and CTRS-R:L ... 191
5.8.1 Conners' Parent Rating Scales-Revised:Long version (CPRS-R:L) ... 192
5.8.1.1 Month 1: Primary Outcome Measures for CPRS-R:L ... 192
5.8.1.2 Month 1: Secondary Outcome Measures for CPRS-R:L ... 193

5.8.1.3 Month 7: Primary Outcome Measures for CPRS-R:L 195
5.8.1.4 Month 7: Secondary Outcome Measures for CPRS-R:L 196
5.8.2 Conners' Teacher Rating Scales-Revised:Long Version (CTRS-R:L) 199
5.8.2.1 Month 1: Primary Outcome Measures for CTRS-R:L 199
5.8.2.2 Month 1: Secondary Outcome Measures for CTRS-R:L 199
5.8.2.3 Month 7: Primary Outcome Measures for CTRS-R:L 200
5.8.2.4 Month 7: Secondary Outcome Measures for CTRS-R:L 200
5.9 Effect sizes 201
5.10 Adjusted mean subscale scores between baseline, months 1 and 7 for CPRS-R:L and CTRS-R:L 202
5.11 Ancillary analyses (ITT, sensitivity and additional analyses) 211
5.12 Adverse reactions 221
5.13 Protocol violations 221
5.13.1 Attrition 221
5.13.2 Non-compliance 222
5.13.3 Withdrawal 223
5.13.4 Adherence 223
5.14 Parent feedback 223
5.15 Summary 224
5.16 References 227

CHAPTER 6 229

DISCUSSION OF THE RCT RESULTS OF NET THERAPY FOR PAEDIATRIC AD/HD 229
6.1 Introduction 230
6.2 Proposed mechanism of action of NET therapy 230
6.3 Discussion of the randomised controlled trial of NET therapy for paediatric AD/HD 234
6.3.1 Clinically meaningful results of the RCT 234
6.3.2 Discussion of statistical analyses 235
6.3.3 Discussion of discrepancies between informants of the RCT 243
6.3.4 Do the results support the research hypothesis? 247
6.3.5 Have the results achieved the aims of this research project? 248
6.3.6 How do study results of the RCT compare to the studies in the literature? 248
6.3.7 Are the results of the RCT generalisable? 249
6.3.8 What are the limitations of this study? 253
6.3.9 What are the strengths of this study? 259
6.3.10 Future research projects 261
6.4 Conclusions 264
6.5 References 269

APPENDICES FOR THESIS CHAPTERS 281

List of Tables

Table 2.1: DSM-IV-TR Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder 31

Table 2.2: DSM-IV-TR subtypes for AD/HD 32

Table 2.3: Common behaviour rating scales used in the assessment of AD/HD and monitoring of treatment 45

Table 2.4: Kemper's model of holistic care 68

Table 4.1: Inclusion criteria for study participants 137

Table 4.2: Exclusion criteria for study participants 137

Table 4.3: Interpretive guidelines for T-scores and percentiles for the CRS-R 139

Table 4.4: List of NET therapy protocol – referential statements for treatment group B 151

Table 4.5: Net protocol for group B six-monthly follow-up treatments 164

Table 4.6: Sham protocol number 1: referential statements 165

Table 5.1: Baseline characteristics of randomised participants and parents at study entry 181

Table 5.2: Interpretive guidelines for T-scores and percentiles for the CRS-R 183

Table 5.3: Baseline scores, percentiles and p-values for Sham, NET, and Control groups for Conners' Parent and Teacher Rating Scales 184

Table 5.4: CPRS-R:L and CTRS-R:L differences between baseline and months 1 and 7 score mean decreases of subscale scores H, K, L, M, and N for Sham, NET, and Control groups 186

Table 5.5a: CPRS-R:L subscales H, K, L, M and N: numbers and proportions of participant subscales scores ≤65 for months 0, 1 and 7 189

Table 5.5b: CTRS-R:L subscales H, K, L, M and N: numbers and proportions of participant subscales scores ≤65 for months 0, 1 and 7 190

Table 5.6a: Final multivariate model for ANCOVAs for subscales H, K, L, M, and N for the CPRS-R:L complete case analysis 194

Table 5.6b: Final multivariate model for ANCOVA for subscales H, K, L, M, and N for the CTRS-R:L complete case analysis 198

Table 5.7: Effect sizes for CPRS-R:L and CTRS-R:L for each subscale for NET therapy as compared to Sham therapy 201

Table 5.8: Mean scores for months 1 and 7 with matched baseline scores for CPRS-R:L and CTRS-R:L for Sham, NET, and Control groups 203

Table 5.9: Comparison between completers and non-completers of the study 215

Table 5.10: Final multivariate model for ANCOVAs for subscale H, K, L, M, and N for the CPRS-R:L ITT analysis 217

Table 5.11: Final multivariate model for ANCOVAs for CPRS-R:L using Control versus NET 219

Table 5.12: Comparison between the complete case analysis and the ITT analysis for months 1 and 7 CPRS-R:L 220

Table 6.1: Comparing study cohort to Australian and USA cohorts 253

Table 6.2: Post-randomisation exclusions 259

Table 6.3: CONSORT checklist of items to include when reporting a randomised controlled trial 260

List of Figures

Figure 4.1: Protocol duration, time frame for CRS-R, and frequency of interventions. 146

Figure 4.2: NET logo outlining four bases of NET protocol. 150

Figure 4.3: Meridian Access Points (MAPs). 153

Figure 4.4: Simplified NET™ Master Chart outlining MAPs, emotions, vertebral sequences, 15-step flowchart and pulse corrections. 154

Figure 4.5: The spinal column with the vertebral segments. 161

Figure 5.1: Flow of participants through study 176

Figure 5.2: Flow of participants through study to care providers 177

Figure 5.3a: CPRS-R:L graph of differences between baseline and month 1 score mean decreases for subscales H, K, L, M, and N for Sham, NET and Control groups..... 187

Figure 5.3b: CPRS-R:L graph of differences between baseline and month 7 score mean decreases for subscales H, K, L, M, and N for Sham, NET and Control groups..... 187

Figure 5.4a: CTRS-R:L graph of differences between baseline and month 1 score mean decreases for subscales H, K, L, M, and N for Sham, NET and Control groups..... 188

Figure 5.4b: CTRS-R:L graph of differences between baseline and month 7 score mean decreases for subscales H, K, L, M, and N for Sham, NET and Control groups..... 188

Figure 5.5a: Graph of mean scores of CPRS-R:L subscale H for Sham, NET, and Control groups for baseline, months 1 and 7. 205

Figure 5.5b: Graph of mean scores of CPRS-R:L subscale K for Sham, NET, and Control groups for baseline, months 1 and 7. 206

Figure 5.5c: Graph of mean scores of CPRS-R:L subscale L for Sham, NET, and Control groups for baseline, months 1 and 7. 206

Figure 5.5d: Graph of mean scores of CPRS-R:L subscale M for Sham, NET, and Control groups for baseline, months 1 and 7. 207

Figure 5.5e: Graph of mean scores of CPRS-R:L subscale N for Sham, NET, and Control groups for baseline, months 1 and 7. 207

Figure 5.6a: Graph of mean scores of CTRS-R:L subscale H for Sham, NET, and Control groups for baseline, months 1 and 7. 208

Figure 5.6b: Graph of the mean scores of CTRS-R:L subscale K for Sham, NET and Control groups for baseline, months 1 and 7. 209

Figure 5.6c: Graph of the mean scores of CTRS-R:L subscale L for Sham, NET and Control groups for baseline, months 1 and 7. 209

Figure 5.6d: Graph of the mean scores of CTRS-R:L subscale M for Sham, NET and Control groups for baseline, months 1 and 7. 210

Figure 5.6e: Graph of the mean scores of CTRS-R:L subscale N for Sham, NET and Control groups for baseline, months 1 and 7. 210

List of Appendices

Appendix A: International Classification of Diseases (ICD-10) 10th Edition Diagnostic Criteria for Hyperkinetic Disorders 282

Appendix B: Common rating scales for AD/HD not listed in Table 2.3. 283

Appendix C: Table of stimulant medications for AD/HD 285

Appendix D: Table of non-stimulant and other medications for AD/HD 287

Appendix E: Outlining of CAM therapy surveys 288

Appendix F: Survey list of top 15 techniques used by chiropractors in Australasia and North America 290

Appendix G: Jadad five-point scale used to score studies 291

Appendix H: Modified CONSORT checklist 292

Appendix I: Summary of intervention studies for chiropractic care for paediatric AD/HD from peer-reviewed journals 293

Appendix J: Summary of intervention studies for chiropractic care for paediatric AD/HD from non-peer-reviewed journals 295

Appendix K: Macquarie University Human Ethics Approval 296

Appendix L: State Education Research Approvals Process 297

Appendix M: Australian and New Zealand Clinical Trials Registry (ANZCTR) 298

Appendix N: Definition of the comorbid disorders in inclusion criteria according to the DSM-IV-TR 299

Appendix O: The Conners' Parent Rating Scales-Revised: Long Version (CPRS-R:L) 301

Appendix P: Conners' Teacher Rating Scales-Revised: Long Version (CTRS-R:L) 303

Appendix Q: Advertisement recruiting for participants 305

Appendix R: Telephone screening form 306

Appendix S: Cover note to parents of Groups A and B 307

Appendix T: Cover note to parents of Group C 308

Appendix U: Participant's Medical History Questionnaire 308

Appendix V: Consent Forms 314

Appendix W: Diagnostic form 316

Appendix X: Cover note to principal of participants 318

Appendix Y: Cover note to teacher of participants 319

Appendix Z: NET brochure 321

Appendix AA: NET Protocol for Practitioners 324

Appendix AB: Sham Group A Protocols..... 326

Appendix AC: Form for practitioners to keep records 339

Appendix AD: Conners' Parent Rating Scales (CPRS-R:L) scores from raw dataset 341

Appendix AE: Conners' Teacher Rating Scales (CTRS-R:L) scores from raw dataset..... 346

Appendix AF: Comorbid disorders in Sham, NET and Control groups for the enrolled sample 353

Appendix AG: Profile of the different types of comorbid disorders for the enrolled sample with comorbid disorders..... 353

Appendix AH: Types of medications used by randomised sample 355

Appendix AIa: ANCOVA for Conners' ADHD Index subscale H for the CPRS-R:L months 1 and 7 complete case analysis..... 357

Appendix AIb: ANCOVA for Conners' Global Index subscale K for the CPRS-R:L months 1 and 7 complete case analysis..... 358

Appendix AIc: ANCOVA for DSM-IV:Inattentive subscale L for the CPRS-R:L months 1 and 7 complete case analysis..... 359

Appendix AId: ANCOVA for DSM-IV:Hyperactive/Impulsive subscale M for the CPRS-R:L months 1 and 7 complete case analysis..... 360

Appendix AIe: ANCOVA for DSM-IV:Total subscale N for the CPRS-R:L months 1 and 7 complete case analysis. 361

Appendix AJa: ANCOVA for Conners' ADHD Index subscale H for the CTRS-R:L months 1 and 7 complete case analysis..... 362

Appendix AJb: ANCOVA for Conners' Global Index subscale K for the CTRS-R:L months 1 and 7 complete case analysis..... 363

Appendix AJc: ANCOVA for DSM-IV:Inattentive subscale L for the CPRS-R:L months 1 and 7 complete case analysis..... 364

Appendix AJd: ANCOVA for DSM-IV:Hyperactive/Impulsive subscale M for the CPRS-R:L months 1 and 7 complete case analysis..... 365

Appendix AJe: ANCOVA for DSM-IV:Total subscale N for the CPRS-R:L months 1 and 7 complete case analysis. 366

Appendix AK: Numbers and reasons for participants dropping out of study..... 367

Appendix AL: Excluded participants and reasons for exclusion..... 368

Appendix AM: Reasons randomised participants never started the study 369

Appendix AN: Answers to Q1 "Which group did you think your child was in?"..... 370

Appendix AO: Answers to Q2 "Would you like to be involved in a similar study in the future?"..... 370

Appendix AP: Number of effects and effect sizes (ES) across all outcomes relating to the type of treatment 371

Appendix AQ: Thesis-related activities and publications 372

Master's Summary

This thesis is an investigation of chiropractic management for paediatric Attention-Deficit/Hyperactivity Disorder (AD/HD). The aim of this thesis was to answer two questions: Q1: Does chiropractic care have a role to play in the management of paediatric AD/HD? and Q2: Does the emotional component of the Neuro Emotional Technique (NET) [a technique used by some chiropractors] have a role to play in the management of paediatric AD/HD? Traditionally AD/HD is managed by paediatricians, developmental and behavourial health specialists, clinical psychologists and allied health professionals. However, as complementary and alternative medicine gains popularity, more parents seek alternative care for their children diagnosed with AD/HD.

A review of the AD/HD literature was conducted in order to update current understanding on the subject matter. Furthermore, a systematic review of the chiropractic literature was undertaken in order to construct a thorough profile of chiropractic care for paediatric AD/HD to answer the first research question. This systematic review found a paucity of published articles in the area and conclusions drawn that there was insufficient evidence to support the efficacy of chiropractic care for paediatric AD/HD. As a result of these findings, a unique pilot study in the form of a randomised controlled trial (RCT) was conducted on the biopsychosocial principles of NET, following the Consolidated Standards of Reporting Trials (CONSORT) checklist. This RCT was designed and undertaken in order to answer the second research question of whether the emotional component of NET can affect outcomes in paediatric AD/HD by decreasing the symptoms of inattention, hyperactivity and impulsivity.

This study was a multi-centre study with four chiropractors (certified in NET) providing interventions for sixty-nine children. The children underwent an intense one-month management program of two sessions per week followed by another six sessions administered monthly. The parents of the participants and their teachers were the informants used throughout the study reporting on the children's behaviours, in two different contexts. The Conners' Parent and Teacher Rating Scales (CPRS-R:L and CTRS-R:L) were used as the outcome measures for this study. The results were interesting but not unusual, according to the literature. Conflicting results between the parent and teacher observations were found at months one and seven (i.e. at the conclusion of the study). The complete case analysis for the CPRS-R:L revealed statistically significant results and clinically meaningful changes in some outcome variables. Participants who were unmedicated and did not have comorbid disorders demonstrated greater improvements than the other participants. Furthermore, the intention-to-treat (ITT) analysis revealed significant results for all outcomes by the end of the study. The reliability of the teachers' observations were raised by the author and as a result, the validity of the CTRS-R:L remains uncertain. Accordingly, conclusions were drawn from the parent observations. Findings suggest that the tested aspect of NET therapy may have some role to play in the management of paediatric AD/HD.

It is important to note that only one aspect of the NET protocol (i.e. emotional components) was examined. A study involving all aspects of the NET protocol (i.e. emotional, chemical, and physical/structural) would be needed in order to test the effectiveness of NET therapy in a clinical setting for paediatric AD/HD. Despite the limitations of this study (i.e. CRS-R low inter-rater reliability, uneven randomisation between groups and high attrition rates), the results suggest that (the emotional component of) NET therapy has some promising outcomes that may be effective in reducing some of the symptoms for some of the children with AD/HD. Definitive recommendations cannot be made about the intervention studied at this time. Despite the difficulties associated with carrying out clinical research in multiple sites and with challenging children over a long period of time, the study has provided a foundation for continuing research in the area of NET therapy for paediatric AD/HD.

Statement of Candidate

I certify that the work in this thesis entitled "A Clinical Investigation of Chiropractic Neuro Emotional Technique (NET) for Attention Deficit/Hyperactivity Disorder (AD/HD) in Children" has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee, reference number: HE26AUG2005-M04261 on 7th April, 2006.

Signature……Date……..

Name: ….Fay Karpouzis……Student ID:…40661857……

This thesis also includes three publications that have been co-authored with my supervisors.

Karpouzis K, Bonello R, Pollard H. Chiropractic care for paediatric attention-deficit/hyperactivity disorder (AD/HD): a systematic review. Chiropractic and Osteopathy. 2010, 18:13.

Concept: FK 60% RB 20% HP 20%
Data collection: FK 90% RB 5% HP 5%
Data analysis: FK 80% RB 10% HP 10%
Writing: FK 80% RB 10% HP 10%

Karpouzis F, Pollard H, Bonello R. A randomised controlled trial of the Neuro Emotional Technique (NET) for childhood attention deficit hyperactivity disorder (ADHD): a protocol. Trials. 2009;10(6).
Concept: FK 80% HP 10% RB 10%
Data collection: N/A
Data analysis: N/A
Writing: FK 80% HP 10% RB 10%

Karpouzis F, Pollard H, Bonello R, Graham P. Short term effects of the Neuro Emotional Technique (NET) for paediatric Attention-Deficit/Hyperactivity Disorder (ADHD): A randomised controlled trial. Journal of Alternative and Complementary Medicine. 2010, In press
Concept: FK 80% HP 10% RB 10%
Data collection: N/A
Data analysis: FK 75% RB 5% PG 20%
Writing: FK 85% HP 5% RB 5% PG 5%

Dedication

To my late father Kontantino (affectionately known as Con), who always believed in me and called me his ‘little doctor’. His unwavering faith and belief that I could be anything I wanted to be in my life has given me the determination to be whatever I choose to be! I’m one step closer to my PhD dad!

To my mother, Konstantina (affectionately known as Dina) who epitomises unconditional love, and who has always been there supporting me through every chapter of my life (including this one!). She has been the most amazing role model for me, her strength, her courage, her dedication to her family, her selflessness, her honesty, her spirit and her loving nature have been a huge inspiration to me.

Both of my parents, despite their inability to attain an education during World War II, instilled in me the importance of an education, and from that I developed a natural love of learning and an insatiable need to acquire more knowledge. For that I am eternally grateful.

To my two beautiful daughters, Georgia and Connie, for their love and for putting up with mum and her never-ending thesis! To my ‘number one girl’, Georgia, for being a hyperactive, impulsive and exuberant child, which led me to my interest in AD/HD! Without you, I certainly would not be writing this thesis! To my ‘special girl’, Connie, for being the most delightful easy-going child and for having the patience to help mum with proof-reading, editing, referencing, formatting tables and graphs throughout the last few years!

You have all been there for me, and I shall always be grateful for your love and support. I love you all more than I can say!

Acknowledgments

To my principal supervisor, Associate Professor Rod Bonello, who was always there with a patient ear to listen, guide and advise me in his logical manner. Who allowed me the time and safe space to run all my ideas by him, and for validating those ideas when I doubted myself. Who provided much needed encouragement during the challenges of conducting clinical trials, publishing and writing and submitting this thesis. Your comments were always insightful and gratefully acknowledged.

To my associate supervisor, Associate Professor Henry Pollard, for his guidance and support throughout the project. His challenging critiques have helped to develop my writing and research skills. For his belief that I could always work it out on my own, even when I thought I needed to hear the answer from him! Your challenging comments were useful and gratefully received.

To the Department of Chiropractic (Faculty of Science, Macquarie University) for providing support and facilities throughout my candidature.

To Macquarie University for awarding me the Post Graduate Research Fund (PGRF) grant and an international travel grant enabling me to present some of the research findings at international medical conferences.

To the Deputy Vice Chancellor of Research (MQU) for awarding me a Commendation Award in recognition of my successful acquisition of PGRF for the purpose of presenting this research project to the International Centre for the Study of Psychiatry and Psychology in the USA.

To Macquarie University for the Commercialisation Training Scholarship (CTS) for teaching me how to commercialise my intellectual property and for funding part of my research project.

To the four chiropractors who donated time and services to provide the study protocols for the study participants at no cost — Gerald Vargas, Allison Griffiths, Bill Stathoulis, Rick Schlederer — thank you all, as without your generosity the clinical trial would not have been possible.

To Peter Bablis for his expertise and advice in NET protocols, and for his encouragement to start a research project.

To Scott Walker (the chiropractor who created NET) for his expertise and advice in NET.

To Steve Osborne (NET Inc. Australia) for providing the NET brochures that explain NET in layman's terms for the parents of the participants at no cost.

To Frances Gibson (from MQU Institute of Early Childhood), who is a lecturer in developmental psychology at Macquarie University, for her time and advice on psychological matters.

To Petra Graham (from MQU Statistics Department), Professor Mick O'Neill and Professor Dave Grayson who offered their services and provided helpful guidance and instruction with regard to statistical advice.

To Tamara Gray (Psychologist at MQU) for assisting in the scoring of the Conners' Rating Scales.

To the International Centre for the Study of Psychiatry and Psychology in the USA for the K. McCready Memorial Research Grant.

Thank you to all the participants, their parents, and teachers that were willing to take part in this research project — without them this project would not have been possible.

Finally, to all my family and friends, who supported me during my candidature, it is greatly appreciated.

Abbreviations

Acronym	Description
AACAP	American Academy of Child and Adolescent Psychiatry
AAP	American Academy of Pediatrics
AD/HD	Attention-Deficit/Hyperactivity Disorder
AD/HD-C	Attention-Deficit/Hyperactivity Disorder-Combined subtype
AD/HD-H/I	Attention-Deficit/Hyperactivity Disorder-Hyperactive/Impulsive subtype
AD/HD-I	Attention-Deficit/Hyperactivity Disorder-Inattentive subtype
ADD	Attention Deficit Disorder
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
ANX	Anxiety Disorders
ASD	Autistic Spectrum Disorder
ATX	Atomoxetine
BI	Behavioural Interventions
BPS	Biopsychosocial
BPT	Behavioural Parent Training
CAM	Complementary and Alternative Medicine
CBM	Cognitive Behaviour Modification
CBT	Cognitive Behavioural Therapy
CD	Conduct Disorder
CI	Confidence Interval
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CONSORT	Consolidated Standards of Reporting Trials
CPRS-R:L	Conners' Parent Rating Scale-Revised: Long Version
CRS	Conners' Rating Scale
CRS-R	Conners' Rating Scale-Revised
CTRS-R:L	Conners' Teacher Rating Scale-Revised: Long Version
DCD	Developmental Coordination Disorder
DD	Depressive Disorders
DEX	Dexamphetamine
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders 4th Edition
DSM-IV:H/I	DSM-IV:Hyperactive-Impulsive
DSM-IV:I	DSM-IV:Inattentive
DSM-IV:T	DSM-IV:Total
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders 4th Edition Text Revision
EBT	Evidence-Based Treatment
EEG	Electroencephalogram
EFA	Essential Fatty Acids
EMG	Electromyogram
EPOC	Cochrane Effective Practice and Organization of Care Collaborative Review Group
ES	Effect Size
fMRI	functional Magnetic Resonance Imaging
Group A	Sham Group (or Sham-NET group or placebo group)
Group B	Treatment Group (or NET Therapy group)
Group C	Control Group (Existing treatment)
ICD-10	International Classification of Diseases 10th Revision
IQ	Intelligence Quotient
ITT	Intention-to-Treat
LA	Long Acting
LD	Learning Disorders
MAPs	Meridian Access Points
MCID	Minimally Clinically Important Difference

Acronym	Description
MD	Mood Disorders
MPH	Methylphenidate
MRI	Magnetic Resonance Imaging
MTA	Multimodal Treatment Study of Children with AD/HD
MTP	Muscle Testing Procedure
NEC	Neuro Emotional Complex
NET	Neuro Emotional Technique
NHMRC	National Health and Medical Research Council
NHS	National Health Service
NICE	National Institute for Health and Clinical Excellence
ODD	Oppositional Defiant Disorder
PET	Positron Emission Tomography
POMs	Primary Outcome Measures
QEEG	Quantitative Electro-Encephalogram
QoL	Quality of Life
RACP	Royal Australasian College of Physicians
RCT	Randomised Controlled Trial
SA	Short Acting
sEMG	Surface Electromyography
SOMs	Secondary Outcome Measures
SSRIs	Selective Serotonin Reuptake Inhibitors
WISC-III	Wechsler Intelligence Scale for Children, version 3 (Wechsler, 1991)