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EVIDENCE-BASED NEURO LINGUISTIC PSYCHOTHERAPY: A META-ANALYSIS

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SUMMARY

Background: *Neuro Linguistic Programming (NLP) Framework has enjoyed enormous popularity in the field of applied psychology. NLP has been used in business, education, law, medicine and psychotherapy to identify people's patterns and alter their responses to stimuli, so they are better able to regulate their environment and themselves. NLP looks at achieving goals, creating stable relationships, eliminating barriers such as fears and phobias, building self-confidence, and self-esteem, and achieving peak performance. Neuro Linguistic Psychotherapy (NLPt) encompasses NLP as framework and set of interventions in the treatment of individuals with different psychological and/or social problems. We aimed systematically to analyse the available data regarding the effectiveness of Neuro Linguistic Psychotherapy (NLPt).*

Subjects and methods: *The present work is a meta-analysis of studies, observational or randomized controlled trials, for evaluating the efficacy of Neuro Linguistic Programming in individuals with different psychological and/or social problems.*

The databases searched to identify studies in English and German language:

- *CENTRAL in the Cochrane Library;*
- *PubMed;*
- *ISI Web of Knowledge (include results also from Medline and the Web of Science);*
- *PsycINFO (including PsycARTICLES);*
- *Psyndex;*
- *Deutschsprachige Diplomarbeiten der Psychologie (database of theses in Psychology in German language),*
- *Social SciSearch;*
- *National library of health and two NLP-specific research databases: one from the NLP Community (http://www.nlp.de/cgi-bin/research/nlprdb.cgi?action=res_entries) and one from the NLP Group (http://www.nlpgrup.com/bilimselarastirmalar/bilimsel-arastirmalar-4.html#Zweig154).*

Results: *From a total number of 425 studies, 350 were removed and considered not relevant based on the title and abstract. Included, in the final analysis, are 12 studies with numbers of participants ranging between 12 and 115 subjects. The vast majority of studies were prospective observational. The actual paper represents the first meta-analysis evaluating the effectiveness of NLP therapy for individuals with social/psychological problems. The overall meta-analysis found that the NLP therapy may add an overall standardized mean difference of 0.54 with a confidence interval of CI=[0.20; 0.88].*

Conclusion: *Neuro-Linguistic Psychotherapy as a psychotherapeutic modality grounded in theoretical frameworks, methodologies and interventions scientifically developed, including models developed by NLP, shows results that can hold its ground in comparison with other psychotherapeutic methods.*

Key words: *Neuro Linguistic Programming – Neuro Linguistic Psychotherapy - treatment effectiveness - meta-analysis - systematic review*

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INTRODUCTION

Neuro-Linguistic Programming (NLP) originated in California around 1974. In the initial group consisted of a number of Master Degree and Ph.D. students leaded by the forefront figures of the linguist John Grinder, Ph.D., the psychology student Richard Bandler and teacher and psychologist Frank Pucelik. The intention was to create a methodology for modelling that would lead to a set of intervention models and techniques. NLP quickly became popular because many of its practitioners believed the techniques to be extremely efficient and applicable in different life contexts. An aggressive marketing was used to help it spread. NLP had repeatedly been criticized for its partly unethical and self-referential claims, its lack of well regulated, while at the same time very often commercialized, training structures and lack of proof of valid results.

A number of studies tested the general claims of NLP and reports different levels of validity scientific structure (Witkowski 2009, Wake et al. 2012). NLP started as a method studying and coding in an accessible format the patterns of very efficient ways of thinking and communication processes. The collected samples of the behavior of the most successful people seen from the perspective of the system theory and cybernetics give as an output a better interventional strategy. Then those results allow to be then easily replicated in the

work of practitioners with the clients. The early literature promoted approaches generated by NLP methodologies with demonstrable impact as a rapid form of psychological therapy. An NLP Practitioner will primarily use words to manipulate thoughts and inner sensory processes in a psychotherapeutic setting. These kind of interventions are used and accepted in various psychotherapeutic settings. Cognitive Behavioural Therapy (Dryden & Golden 1986), Rational Emotive Therapy (Ellis & Grieger 1977) or Acceptance and Commitment Therapy (Hayes & Strosahl 2004) are among them.

As a psychotherapy modality, NLPt is based primarily on neurobiological, phenomenologically-systemic and metatheoretical considerations. It can be defined as a systemic imaginative method of psychotherapy with an integrative cognitive approach (Schuetz et al. 2001). NLPt draws on the principles and techniques of NLP, with a standard EAP referenced the curriculum for psychotherapeutic education (see www.eanlpt.org) and a professional code of ethics www.europsyche.org).

Regarding the use of Neuro-Linguistic Psychotherapy for clients with psychological difficulties and perceived quality of life, Stipancic et al. 2010 showed that NLPt is an efficient intervention. Another study was performed in with claustrophobic patients who required MRI (magnetic resonance imaging); NLPt also proved to be was effective in reducing the need for general anaesthesia (Bigley et al. 2010). Krugman et al. 1985 indicated that the NLP single-session treatment for phobias compared with an intervention of self-control desensitization of equal duration, or a waiting-list control condition was less efficient in reducing public speaking anxiety. Also, they mentioned that the perceived rapid effectiveness of NLP, which was reported by Bandler and Grinder 1979, was possibly an artefact of changes that is possibly present without the interventions that they describe. For this reason, it is still not clear if there is an efficacy of NLPt in reducing different social or/and psychological problems.

AIM AND OBJECTIVE

This meta-analysis aims to evaluate all available data regarding the effectiveness of Neuro Linguistic Psychotherapy (NLPt) and Neuro Linguistic Programming (NLP) for the treatment of individuals with different psychological and/or social problems.

SUBJECTS AND METHODS

Inclusion and exclusion methodology

A literature search selected all randomized controlled trials, cohort studies (with or without a comparison group), comparative and case-control studies. It evaluated the relationship between NLPt and effectiveness as described by the authors (with any prespecified tools included) and survival/mortality.

Types of participants

Individuals selected are suffering from phobias, anxiety disorders, morning sickness, depression, allergy.

Types of intervention

The search included the following measurement:

NLP interventions: visualization, anchoring techniques, the visual-kinesthetic dissociation;

Measures of outcomes assessment: Spielberger`s State-Trait Anxiety Inventory, Personal Report of Confidence as a Speaker, Structured clinical interviews for DSM-IV Personality Disorders, Beck Depression Inventory.

Types of outcome measures

The searched outcome was the efficacy of NLPt as reported by the authors.

Searching Strategy

For purposes of our search in biographic databases we used certain strategies to retrieve studies that contained combined medical subject headings and text words for NLP and NLPt. We did not apply any methodological filters or put any restriction on language. The search strategies are available to read in Table 1.

The studies identified for inclusion in this review, in July 2014, were searched in:

- CENTRAL in the Cochrane Library;
- MEDLINE from 1950;
- EMBASE from 1980;
- PsychINFO from 1967;
- Reference lists of textbooks;
- Review studies;
- Relevant articles.

In order to to identify any further studies not retrieved by electronic search we checked the reference lists of all potentially worthy studies as full reports. We also obtained full reports of review articles retrieved by the search and checked these for other relevant citations.

Checking of the methodological quality

The quality of the included studies was evaluated by the authors. The Newcastle-Ottawa Scale (NOS) for assessing quality of non-randomized studies was used (www.lri.ca).

Extraction of data

The authors extracted data from the studies, using a data extraction form. Each author double-checked data extraction and data entry independently, and any discrepancies between authors were resolved by discussion.

Table 1. Search Strategies

Database	Search terms used
▪ CENTRAL in the Cochrane Library ▪ MEDLINE from 1950 ▪ EMBASE from 1980 ▪ PsychINFO from 1967	▪ *Neurolinguistic Programming ▪ Neurolinguistic Programming ▪ *Psycholinguistics ▪ *Psycholinguistics ▪ *NLP ▪ *Psychotherapy ▪ psychotherap* ▪ NLPt* ▪ NLP* ▪ Neuro$linguistic ▪ neurolinguistic.mp. (mp=ti, ab, tx, ct, sh, ot, nm, hw, kf, px, rx, an, ui) ▪ NLP.mp. (mp=ti, ab, tx, ct, sh, ot, nm, hw, kf, px, rx, an, ui) ▪ neurolinguistic programming.mp. (mp=ti, ab, tx, ct, sh, ot, nm, hw, kf, px, rx, an, ui) ▪ psychotherap* near nlp.mp. (mp=ti, ab, tx, ct, sh, ot, nm, hw, kf, px, rx, an, ui) ▪ psychotherap* near programming.mp. (mp=ti, ab, tx, ct, sh, ot, nm, hw, kf, px, rx, an, ui)

Data analysis

The overall effect size was calculated using Cohen's d in a random-effect model that is more comparable to real-world data than a fixed-effect model (Hedges & Vevea 1998). Sensitivity analysis was performed by omitting each study once and calculating the overall effect size again. The publication bias computed using several methods. The inspection of the funnel plot was done visually. Rosenthal's and Orwin's Fail-safe N was computed. Begg and Mazumdar's r. rank correlation, as well as Egger's regression test, was performed, and finally a trim-and-fill analysis (Duval & Tweedie 2000) was inspected. For all computations, CMA (Comprehensive Meta-Analysis v2.2.057) was used.

Effect size calculation

It was decided to use a mean difference expressed in standard deviation units (Cohen's d) for calculation since the therapy effect was considered to be measured best using this kind of index.

RESULTS

Inclusion-exclusion criteria (Figure 1)

We identified a total number of 425 studies of which 350 were removed and considered not relevant based on title and abstract. We did find three other records through searching additional sources or any unpublished data.

We identified 76 potentially relevant citations that were full-text reviewed. 64 studies we further excluded for the following reasons:

- Not the right population: studies conducted on healthy individuals with social/psychological problems (n=19);
- Not the right intervention (n=17): studies conducted in healthy individuals with social/psychological problems (n=8), depression (n=5), other (n=4);
- Not the good outcome: studies carried out in healthy individuals with social/psychological problems (n=17);
- Excluded based on study design (n=11): review, editorial, comment letter, study design protocol.

Overall, we finally included 12 studies with a total number of individuals of 658 (studies that analysed different subgroups from the same population). On average, the numbers of participants in each study was small, ranging between 12 and 115 subjects (see Table 2, Figure 1).

A study (Bigley et al. 2010) measured the level of anxiety in 50 participants with claustrophobia using Magnetic Resonances Investigation. The selected subjects were 24 males, 26 females with a median age of 52 years. The result showed that the anxiety scores significantly reduces after NLP sessions during the MRI examination. The MR radiographer (therapist) attended a 20 days training in NLP techniques (accredited by the International NLP Trainers Association). The main NLP technique used was "Clare`s fast phobia cure", and applied in one-hour duration. The patient`s level of anxiety was assessed with Spielberger`s State – Trait Anxiety Inventory.

In another study, Krugman et al. included a number of 55 undergraduate students (28 male and 27 female) with anxiety in public speaking situations. NLP single-session treatment for phobias was not giving better results in reducing public speaking anxiety than another psychotherapeutic interventions (Krugman et al. 1985). The therapists were three graduate students trained in NLP treatment for phobias. The therapists used kinaesthetic anchoring techniques and visualization in one single session. Before the subjects began their speeches, they rated their anxiety level, using a 12 items questionnaire derived from the Report of Confidence as a Speaker, developed by Gilkinson, 1942. Also, during their speeches, three trained observers rated the subjects` behavioural anxiety using Paul`s (1966) Behavioral Checklist- 10-point scale. After speech delivery, the subjects indicated the level of anxiety using the same Report of Confidence as a Speaker.

Table 2. Baseline characteristics of the included studies

Study (reference)	Type of study	No	Age (mean)	Gender	Psychological and/or social problem
Allen 1982	Randomized Controlled Trial	36		32 F 4 M	Snake phobia
Bigley et al. 2010	Prospective observational	50	Median age 52 (range 17-75)	24 M 26 F	Claustrophobic subjects who failed a previous MR examination
Genser-Medlitsch & Schutz 2004	Prospective observational	115 (55 therapy clients, 60 nontherapeutic persons)	NS	NS	Therapy clients and persons of a no treatment waiting list participated
Huflejt-Lukasik	Prospective observational	19	Range age 21-46 y	12 F 7 M	Subjects with difficulty in social interaction, family, marital and relationship problems, low self-esteem, depressive symptoms, anxiety disorders, phobic problems, efficiency and concentration.
Krugman et al. 1985	Randomized Controlled Trial	55	Data not shown	27 F 28 M	Undergraduate students with anxiety in public speaking situations
Liberman 1984	Prospective observational	12	Data not shown	Data not shown	Subjects diagnosed with Simple Phobia (DSM III criteria)
Ojanen 2004	Prospective observational	62	Range age 18-54	50 F 12M	Subjects with work exhaustion, anxiety, depression, low self-esteem, phobic problems, insomnia
Pourmansour 1997	Randomized, controlled, parallel-group clinical trial	42	Range 18-47	21 F 21M	Patients with fear of dental procedures
Reckert 1999	Randomized Controlled Trial	50	Mean age 39.7 years	36M 14F	40 specific phobias, 10 social phobias
Rogers 1993	Randomized Controlled Trial	38	Data not shown	38M	Post Traumatic Stress Disorder
Stipancic et al. 2010	RCT	106	20 to 61 years	22 M 78 F	Psychotherapy clients
Witt 2003	Prospective observational	73	Median age 41 years (range 18-66 y)	Data not shown	Subjects allergic to birch pollen

Study (reference)	NLP interventions	Applied measures	Results
Allen 1982	NLP Phobia Technique	Behavior Avoidance Test Fear Thermometer	No significant effects of NLP treatment on subject's fear of snakes
Bigley et al. 2010	Clare`s fast phobia cure. One session of one hour	Spielberger`s State Trait Anxiety Inventory for assessing the anxiety level.	30 subjects (76%) completed the MR examination. Nine subjects went on the scanner bed, but were obtained unusable images, and three didn`t consider going into the scanner.
Genser-Medlitsch & Schutz 2004	General individual complaints, clinical symptoms, coping strategies, locus of control tendencies 3 sessions	Standardised psychological questionnaire on individual complaints, clinical symptoms, coping strategies, locus of control tendencies	NLPt group registered significantly improvements and lasting effects than the control group
Huflejt-Lukasik	Short-term NLP therapy 1 session/week, 5 months, min. 1 month	SKNS (measures the level of self-focused attention) CISS (measures the way one deals with stress in some dimensions) SCL-90 (diagnoses behaviors (symptomatic dementia).	NLPt is effective method of receiving positive changes. During therapy they registered a decrease in public self-consciousness, emotion-orientation in dealing with stress, and in psychopathological symptoms.
Krugman et al. 1985	NLP phobia intervention&self desensitization treatments (kinaesthetic anchoring Techniques, visualization) Single session.	Personal Report of Confidence as a Speaker Scale. Paul`s Modified Behaviour Checklist	Overall, the findings of this study indicate that the NLP single-session treatment for phobias was no more effective in reducing public speaking anxiety than a self-control desensitization intervention of equal duration or a waiting-list control condition.

Table 2. Continues

Study (reference)	NLP interventions	Applied measures	Results
Liberman 1984	Visualisation, anchoring. Two sessions, each lasting less than an hour.	Fear Thermometer, Symptom Checklist 90 (SCL-90R) Fear Survey Schedule (FSS III)	NLP treatments was effective in reducing phobic behavior and in reducing fear, discomfort and the intensity of a wide range of symptoms.
Ojanen 2004	NS	SWB(Subjective Well-Being) – consisting 7 DVAS (Descriptive visual analogue scales) TWB – Therapist Rated Well Being PE – Total Problem Experience	The ratings of the clients about the therapy were very positive, they changed into better. The therapeutic relationships were highly positive.
Pourmansour 1997	One two-hour Collapse-Anchors session	State-Fear-Questionnaire	Significant positive effect of NLP treatment, reduction of fear of dental procedures
Reckert 1999	NLP Phobia Techniques, 2 sessions	Beck Anxiety Inventory (BAI) State-Trait-Anxiety Inventory (STAI)	For clients with light phobias no significant effects were found; for client with severe phobias there was a significant effect on reduction of fear response
Rogers 1993	NLP Three Place Visual Kinesthetic Dissociation, 3 sessions	Mississipi Scale for Combat Related PTDS (MISS) Sleep Self-Report Symptom Severity Index (SSI) Betts Questionnaire of Mental Imagery (QMI) Vividness of Imagery Scale Combat Stress Index (CSI)	The addition of NLP sessions did not significantly enhance the effects of the PTSD program
Stipancic et al. 2010	NLP therapy on a number of psychology difficulties and perceived quality of life (QoL) 1 session*60 min/week Average number of sessions = 20; (range 10-40 sessions)	Structured Interview for DSM IV Personality Disorder Croatian Scale of Quality of Life (KVZ)	In the therapy group, there was a significant decrease of clinical symptoms and increase in QoL
Witt 2003	The Hildesheim Health Training – for the mental handling of allergies 8 meetings (2 per week). 2 hours – individual conditioning, psychological factors and believe system + 25 min. relaxation	The Skin Prick Test Krampen-AT-Symptomscale Rehabilitation Psychological Diagnostic System	NLPt has an effect on allergic sensitivity. It was in strong combination with Psychological Items, Aliments and Medication.

Stipancic et al. 2010 examined in 106 subjects (22 males and 84 females) the short-term and long-term effects of NLPt on a number of psychological difficulties and perceived quality of life. Patients were set to a therapy group (assessment prior to and immediately after therapy, and at a five-month follow-up session) or to a control group (assessment at pre-test, simultaneously by the treatment group and 3 months later). One session of 60 minutes took place weekly, and the number of sessions per subject differed from each participant, according to the individual need of each of them. The average number of sessions was 20 (range: 5-65, with 89% of participants in the range 10-40) and the effectiveness of NLPt assessed during the individual therapy sessions. To measure the clinical symptoms are used the Structured Clinical Interview for DSM-IV (SCID I) and Structured Clinical Interview for DSM-IV Personality Disorders (SCID II). To determine the quality of life the Croatian Scale of Quality of Life (KVZ) was applied. Seven psychotherapists, with 10 to 20 years' experience in NLPt, participated in the study. The therapy group presented a significant improvement in having fewer psychological difficulties and better-perceived quality of life, than the control group.

The overall standardized mean difference was d=0.51 with a confidence interval of CI=[0.20; 0.82]. Figure 2 displays the forest plot for the analysis. Effect sizes for each study are available in Table 3. Sensitivity analysis showed no significant influence of omitting every single study once. The point estimate varied between d=0.42 and d=0.61.

In two articles, relevant data were neither described in the paper nor could be determined via contacting the authors. In these two cases, a conservative approach was chosen, according to Lipsey and Wilson 2001. No information about the effect could found in Allen (1982). Therefore, the effect size was fixed at d=0. Bigley (2010) reported significant results but gave no further numerical information.

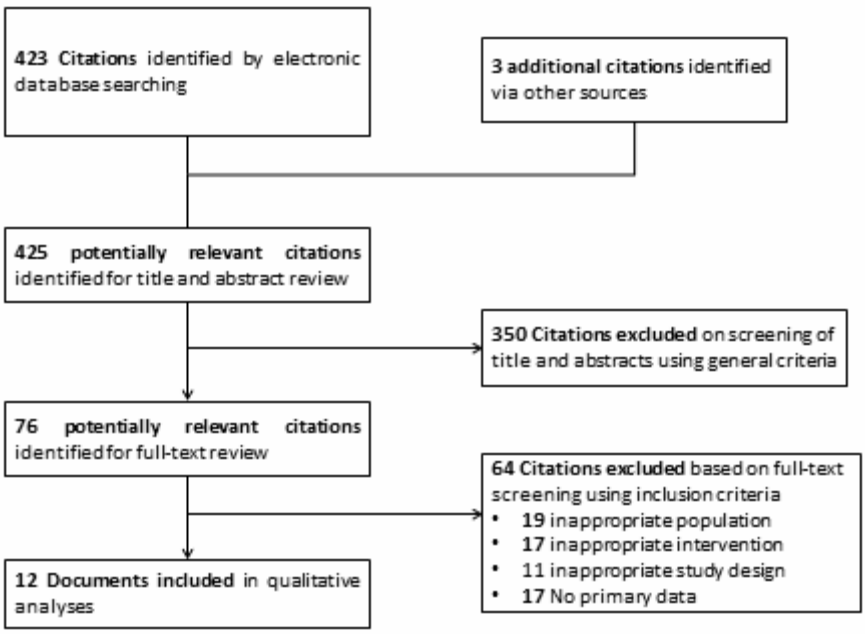

Figure 1. Flow chart for process of screening electronic databases and inclusion of trials in the study

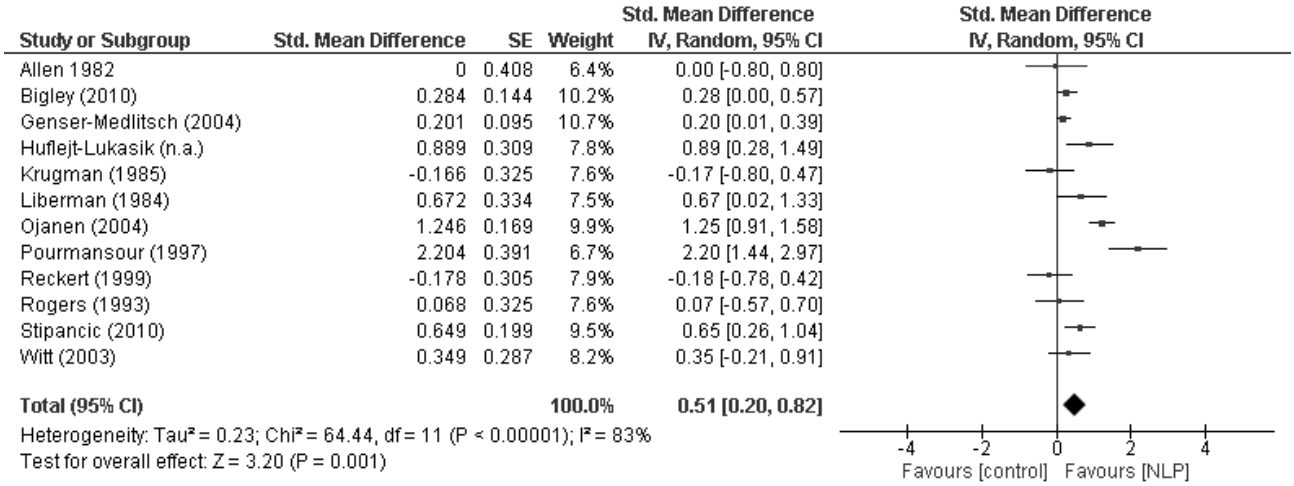

Figure 2. The overall effect of NLP intervention (standardized mean difference with a confidence interval)

Table 3. Risk of bias quality assessment

	Study characteristics			Quality coding										
	Therapist= author	Therapist= NLP professional	Sample= only students	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q percent
Allen 1982	n.a.	n.a.	yes	1	1	0	1	1	0	1	1	0	1	70
Bigley et al. 2010	Yes	partly	no	1	0	0	n.a.	1	0	1	1	0	n.a.	50
Genser-Medlitsch & Schütz 2004	No	Partly	no	0	1	0	0	1	1	0	1	0	1	50
Huflejt-£ukasik (n.a.)	Yes	Yes	no	0	1	0	1	0	1	0	1	0	1	50
Krugman et al. 1985	n.a.	Partly	yes	0	1	0	1	0	0	1	1	1	1	60
Liberman 1984	Yes	n.a.	no	1	1	0	1	1	0	1	1	0	0	60
Ojanen 2004	No	Yes	no	0	1	1	n.a.	1	1	0	1	0	n.a.	62.5
Pourmansour 1997	Yes	n.a.	no	0	1	0	1	1	0	1	1	0	1	60
Reckert 1999	Yes	Yes	no	1	1	0	1	0	1	1	1	0	1	70
Rogers 1993	yes	No	no	1	1	0	1	1	1	1	1	0	1	80
Stipancic et al. 2010	n.a.	Yes	no	0	1	0	1	0	1	1	1	0	1	60
Witt 2003	n.a.	n.a.	no	1	0	0	0	1	1	1	1	1	1	70

Across the twelve studies, only in four studies the therapist was a professional practitioner (Huflejt-Łukasik, Reckert 1993, Ojanen et al 2004, Stipancic et al. 2010). In other two studies, the participants were students (Allen 1982, Krugman et al. 1985). Main problems reported by subjects were anxiety and phobias. Of the twelve studies selected, in five studies the outcome was fear and in four studies the outcome was psychological symptoms. Two studies are assessing the quality of life and one study the allergy symptoms. Most of the studies were based on a prospective design.

Therefore the smallest effect size possible considering the given sample size and an assumed significance level of á=0.05 was chosen for analysis. Since this method is very conservative, it can cause a downward bias in the final mean effect size.

Risk of bias

Ten of the total number of studies (12) used correct method of selection of persons (Q2). In nine studies, intervention was described sufficiently (Q7). In seven studies, the follow-up period was long enough for outcomes to occur (Q6). In all twelve studies, criteria for measuring outcomes was clearly defined (Q8) (see Table 2).

Publication bias

The visual inspection of the funnel plot as depicted in Figure 2 showed no asymmetry. Rosenthal's Fail-safe N indicated that 174 studies with a null effect would be needed to reach non-significance of the current analysis. Orwin's Fail-safe N showed that 30 studies with an effect of d=0.1 would be necessary to reduce the overall impact to a trivial d=0.2. Neither Begg and Majumdar's rank correlation nor Egger's regression test was significant (p=0.73 and p=0.45, respectively), which indicates no publication bias. Trim-and-fill analysis (Duval & Tweedie 2000) showed no effects to be missing.

DISCUSSION

Summary of main results

The effects of NLP interventions were compared in 12 trials involving 658. Of the twelve studies selected, only one study had a large number of participants (N=115 psychotherapy clients). In that randomly controlled trial, the NLP therapy group showed a significant improvement and longer lasting effects of psychotherapy than the control group (Genser-Medlitsch & Schutz 2004).

An experimental study showed that NLPt influenced the allergic immune function in birch pollen allergic humans and the participants experienced significant improvement in all psychological symptoms (Witt 2003). In another study with a small sample size (12 participants) diagnosed with Simple Phobia, with a pre-test and post-test control group design. NLP treatment seemed to be effective in reducing phobic behaviour, fear, and discomfort (Liberman). In one study, Krugman et al. 1985 indicated that a single session of NLP was not effective in reducing anxiety in public speaking situations.

Summary consideration of research quality

Overall, the quality of the studies was judged as good enough. The most common reasons for occasional inferior quality were the small number of participants and the publication vintage on some studies. Also, in one study no information about the effect could be found and in another one, significant results were reported but no further numerical information was available.

Strengths and limitation of this study

That study represents the first meta-analysis evaluating the effectiveness of NLP therapy for individuals with social/psychological problems. Another advantage of this review includes the searching of conference proceedings. Also the inclusion of unpublished data to provide a comprehensive analysis of all available evidence. A plus is the rigorous assessment of proof quality which has been incorporated into review conclusions using standard methods. Potential limitations in primary observational studies contributing to this study, however, limit confidence in the conclusions that might draw from the available evidence for NLP modalities.

Implications for further research

Although many studies are aimed to determine the efficacy of NLPt, there is a major lack of high-quality data from observational, experimental studies or randomized trials on this field. Up until now there is insufficient data to recommend this form of therapy strongly in reducing some psychosocial problems.

CONCLUSION

Our meta-analysis review found evidence to support the positive effects of this form of psychotherapy. However, further investigations are needed to confirm the effectiveness of Neuro-Linguistic Therapy on individual's outcomes since most of the evidence is available from smaller observational studies only.

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Conflict of interest: None to declare.

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