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Evidence of the efficacy of occupational therapy in different conditions: an overview of systematic reviews

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Objective: To summarize the research evidence available from systematic reviews of the efficacy of occupational therapy (OT) for practitioners, researchers, purchasing organizations and policy-makers

Data source: The search for systematic reviews was conducted in PubMed and the Cochrane Library (October 2004)

Methods: The reviews included were those that utilized a systematic search for evidence with regard to OT for specific patient groups. Data were summarized for patient group, interventions, outcome domains, type of study designs included, method of data synthesis and conclusions

Results: Fourteen systematic reviews were included. Three reviews related to rheumatoid arthritis, four reviewed stroke and four focused on elderly people

Reviews of Parkinson's disease, multiple sclerosis, Huntington's disease, cerebral palsy and mental illnesses were also identified. The reviews of rheumatoid arthritis, stroke and elderly people showed evidence of the efficacy of OT in increasing functional abilities. Positive results were presented for quality of life and social participation in elderly people and stroke respectively. The efficacy of OT in all other patient groups is unknown due to insufficient evidence

Conclusion: This summary shows that elderly people and people with stroke or rheumatoid arthritis can expect to benefit from comprehensive OT. Evidence of the efficacy of specific interventions is sparse and should be addressed in future research. The evidence that does exist should be incorporated into OT practice

BACKGROUND

The main aim of occupational therapy (OT) is to maintain, restore or create a match beneficial to the individual between the abilities of the person, the demands of his or her occupations and the demands of the environment.[1] Clients referred for OT can be of all ages, with physical, mental and/or social impairments, and/or learning disabilities. These clients often suffer from a chronic condition that affects their performance of daily activities and social participation.[2] Activity and participation limitations typically diminish health and wellbeing.[3] As a result, improvement of functional abilities,

improvement of participation in society and an increased quality of life are important outcomes of OT treatment. Many patients receive OT as part of a multidisciplinary programme.

Decisions on the provision and reimbursement of health care are increasingly based on the available evidence. Thus, purchasing organizations and policy-makers in health care are in need of information on the efficacy of interventions, such as OT. Similarly, occupational therapists and researchers are in need of this information, in order to improve clinical practice and to set priorities for research, respectively. Evidence on the efficacy of OT is available in the literature, but a concise overview of this information is lacking. Therefore, this paper presents an overview of the available systematic reviews of the efficacy of OT. Implications for practice and research will be discussed.

METHODS

The search for systematic reviews of the efficacy of OT was conducted in PubMed (1966 - October 2004; keywords: Occupational therapy [MESH], Review [Publication type]), the Cochrane Database of Systematic Reviews (CDSR), and the Database of Reviews of Efficacy (DARE) (Cochrane Library, Issue 4, 2004; keyword 'Occupational Therapy').[4]

Reviews were eligible if the following criteria were fulfilled: (1) they evaluated the efficacy of OT interventions (e.g., interventions that can be part of an OT treatment plan and are aimed at enhancing performance of daily activities), and (2) they reported a systematic electronic search of the literature for a defined period of time. Reviews of interventions in other health care disciplines and multidisciplinary interventions were excluded.

The characteristics of the original reviews are described for patient group, OT interventions, outcome domains, type of research design included, methods of data analysis applied, data synthesis and conclusions. The selection of reviews and the extraction of data were performed by the first author.

A variety of interventions can be applied within the comprehensive OT process. Therefore, intervention categories were distinguished to enable to formulate conclusions for specific interventions. The eight specific categories were as follows: training of sensory-motor functions; training of cognitive functions; training of skills; counselling; instruction on joint protection and/or energy conservation; advice and instruction on the use of assistive devices; provision of splints; education of primary caregiver. This classification was utilized in five systematic reviews of the efficacy of OT.[7,11,14,16,19] These five reviews showed that all interventions, recognized as OT interventions by a panel of four experienced occupational therapists, could be categorized in these eight intervention categories or in the category of comprehensive OT (e.g., when reviews evaluated the efficacy of the therapy process including more than one specific intervention category).

Inconsistencies in conclusions between reviews were analysed for differences in inclusion criteria applied, for the assessment of methodological quality, and for the methods for data synthesis used. Conclusions from reviews that assessed methodological quality and incorporated the methodological quality of studies in the synthesis of data were assumed to be more valid than conclusions from reviews that were not clear on these issues. Furthermore, adequate quantitative pooling of data in reviews (e.g., when criteria of heterogeneity and diversity are met, in accordance with the guidelines of the Cochrane collaboration[5]) was regarded as more valid than a qualitative data synthesis approach. A description of predefined decision rules was preferred[6] when qualitative data synthesis procedures were applied.

RESULTS

The search for systematic reviews identified 466 references in PubMed, 84 references for Cochrane reviews and 31 reviews in DARE in issue 4 2004 of the Cochrane Library. Most reviews concerned multidisciplinary interventions, physical therapy or drugs interventions and were excluded. A total of 15 systematic reviews of the efficacy of occupational therapy[7 - 21] were identified. One review[21] was excluded because no information about a systematic search of eligible studies was presented. One review[10] reported efficacy of OT for three separate patient groups (stroke, rheumatoid arthri- tis and elderly people). Six other reviews included studies of OT interventions and interventions from other disciplines.[22 - 27] One of these studies focused on the efficacy of multidisciplinary rehabilitation practice.[22] The OT studies were not analysed separately and no conclusions about the efficacy of OT

could therefore be stated in these reviews. Table 1 presents the results per patient group of the reviews included.

Elderly people or patients diagnosed with stroke or rheumatoid arthritis were most often the subjects of OT research and several reviews were identified for these patient groups. In general, these reviews focused on the efficacy of comprehensive OT. Specific intervention categories were addressed in six of the reviews[7,9,11,12,14,15] relating to these patient groups.

[TABLE 1]

Stroke

Functional ability is the main outcome domain in reviews relating to stroke.[7 - 10] All reviews concluded that comprehensive OT improves functional ability. Evidence of the efficacy of specific interventions on functional ability was shown in one review of training of skills[7] and weak evidence of the ineffectiveness of training of sensory-motor functions and training of cognitive functions was also presented.[7]

The outcome domain of participation was reported in two reviews that presented different conclusions.[7,8] Steultjens *et al* .[7] performed a metaanalysis of randomized controlled trials (RCTs) of high methodological quality and presented a statistically significant pooled mean effect, whereas Trombly and Ma[8] performed an analysis without explicitly predefined decision rules and concluded that there was insufficient evidence.

Outcomes with regard to the arm - hand functions domain, cognitive functions domain and the efficacy of splinting on muscle tone reduction were evaluated in two reviews.[7,9] On the basis of a predefined qualitative best-evidence synthesis, Steultjens *et al* .[7] reported evidence of ineffectiveness of training of sensory-motor functions and training of skills on arm - hand function, and insufficient evidence for provision of splints on muscle tone. Ma and Trombly[9] reported improved co-ordination in arm - hand function and evidence of ineffectiveness of splinting on decreasing muscle tone, based on an analysis without explicitly predefined decision rules. The conclusions relating to arm - hand function in the Ma and Trombly review were also based on RCTs evaluating underlying mechanisms of OT interventions that were excluded from the Steultjens *et al* . review. Both reviews[7,9] reported indications of the improvement of cognitive functions.

Thus the evidence would support the premises that OT improves functional ability and participation in stroke patients. The efficacy for outcomes of arm - hand function, decreasing muscle tone and cognitive functions is less evident.

Rheumatoid arthritis

Functional ability was the main outcome domain in two reviews,[10,11] both of which concluded that there was evidence for the efficacy of comprehensive OT. One review[11] showed evidence of the efficacy of joint protection on functional ability, while weak evidence of the ineffectiveness of training of motor functions on functional ability was also presented.[11]

Participation was reported in one review of rheumatoid arthritis, which concluded that there was insufficient evidence.[11]

The outcome domains of pain, dexterity, grip strength and range of motion were evaluated in two reviews of provision of splints. Egan *et al* .[12] reported insufficient evidence for the efficacy of wrist and hand splints on all outcomes, whereas Steultjens *et al* .[11] reported indications of evidence of decreasing pain, of increasing grip strength, and of decreasing dexterity. Steultjens *et al*. included pre-experimental designs and applied a best-evidence synthesis, whereas Egan *et al*. (who only included RCTs) did not make use of explicitly predefined decision rules.

Thus the evidence would support the premise that OT improves functional ability in rheumatoid arthritis patients. The efficacy of OT on other outcomes is unclear.

Elderly people

Functional ability was the main outcome in three reviews of the efficacy of comprehensive OT in elderly people;[10,13,14] all three concluded improved outcome on functional ability. Evidence of the

efficacy of specific interventions was presented for training of skills and advice on assistive devices.14 One review15 reported insufficient evidence for the predischarge home visits intervention.

Two reviews measured participation.[13,14] Steultjens *et al* .[14] assessed the methodological quality, applied a qualitative best-evidence synthesis and concluded improved participation with comprehensive OT for community-dwelling elderly people. Carlson *et al* .[13] did not assess the methodological quality of the original studies and performed a meta-analysis on heterogeneous studies that included both community-dwelling and institutionalized elderly people. They decided that the evidence on participation was inconclusive. Well-being was evaluated in two reviews[13,14] that presented improved outcomes for comprehensive OT.

Two reviews included incidence of falls as an important outcome domain.[10,14] Both reported prevention of falls after 'advice and instruction on assistive devices'.

Thus the evidence would support the premises that OT improves functional ability, participation, and well-being, and decreases the incidence of falls in elderly people.

Cerebral palsy

One review examined the efficacy of OT in children with cerebral palsy, including 17 original studies.[16] Studies were identified for all intervention categories distinguished. Methodological flaws in the original studies and the small number of patients included meant that no conclusions could be stated regarding whether OT is effective in increasing functional ability, social participation, quality of life, and balance, or in decreasing muscle tone.

Progressive neurological diseases and mental illnesses

No conclusions could be stated on whether OT is effective in improving outcomes for patients with progressive neurological diseases (Huntington's disease,[17] Parkinson's disease[18] and multiple sclerosis[19]) and for patients with mental illnesses.[20] All reviews included a small number of studies with a small number of patients included and concluded that there was insufficient evidence on all the outcome domains of functional ability, social participation and quality of life.

DISCUSSION

This state-of-the-art summary, based on evidence from systematic reviews, shows that elderly people and patients with the diagnoses of stroke or rheumatoid arthritis can benefit from occupational therapy. Evidence of maintaining or increasing functional abilities is established for these patient groups. In addition, there are promising results on participation (for stroke and elderly people) and quality of life outcomes for elderly people. It is not possible to confirm or refute the efficacy of OT in patients with progressive neurological diseases, cerebral palsy or mental illnesses. Major methodological flaws and the small numbers of patients examined in only a few studies characterize this field of efficacy research.

The established evidence relates mainly to comprehensive OT and suggests that the unique occupational therapy process, characterized by a problem-solving approach to the individual's occupational performance disabilities,[1] is an effective one. The evidence for the specific intervention categories is sparse. Occupational therapists should take a critical look at their practices with the objective of incorporating effective interventions and abandoning ineffective ones. This summary showed evidence of the efficacy of joint protection for rheumatoid arthritis, strategy training for apraxia following stroke, and training of skills, and advice and instruction on assistive devices for elderly people. Weak evidence of ineffectiveness was reported for training of sensory- motor functions in rheumatoid arthritis and stroke, and for provision of splints to reduce muscle tone in stroke.

The limited conclusions on the efficacy of specific intervention categories highlight the need to establish evidence for the efficacy of specific interventions applied in OT[28,29] and priorities in future research should therefore focus on the efficacy of specific interventions. The efficacy of training of skills interventions and the efficacy of advice and instruction on assistive devices could be of high priority, because these interventions are the most frequently applied in OT.[30,31]

This overview of reviews focused on the efficacy of OT, defined as a therapy process with enhancing occupational performance as its core business. Reviews included were assessed for the description of OT to minimize the inclusion of interventions that are shared with other rehabilitation professions. We are aware that this overlap exists in practice and also that variations among organisations and countries exists. But by focussing on interventions that reflect the specific focus of OT, valid information about the efficacy of this allied health care profession is now available.

CLINICAL MESSAGES

- Systematic reviews show that occupational therapy increases functional ability and/or social participation in elderly people and in patients with stroke or rheumatoid arthritis.
- For patients with progressive neurological diseases, cerebral palsy or mental illnesses the efficacy of occupational therapy is still unclear because high-quality studies are lacking.

This overview only reflects the knowledge on the efficacy of a monodisciplinary intervention. The results are not straightforwardly generalizable to the efficacy of multidisciplinary rehabilitation because of the specific characteristics of this process.[32,33] The interaction of effects from the interventions of different professions within the coordinated team work of rehabilitation is as important to the efficacy of rehabilitation as is the efficacy of interventions applied by a specific profession. Both elements are of interest to raise the quality of the rehabilitation process and both should be addressed in research. Evidence exists for the efficacy of multidisciplinary rehabilitation including OT.[22] Our study adds the available information of the efficacy of the specific part of OT.

A limitation of our summary is that the reviews included were not assessed for their methodological rigour. The independence of the assessors could not be guaranteed, as we included five reviews from our own research group. However, eight of the 14 reviews included were Cochrane reviews or used the same methodology as Cochrane reviews[7,11,12,14,16,18 - 20] and others were included in DARE in the Cochrane Library. Since the Cochrane Collaboration sets the standards for high quality research synthesis, we believe we have included mainly valid systematic reviews.

In conclusion, evidence of the efficacy of OT is established for comprehensive OT in patients with rheumatoid arthritis or stroke and in older people. As a consequence patients with activity limitations referred to OT can expect improvements in functional abilities. Recommendations are made for occupational therapists to incorporate the existing evidence on the efficacy of specific interventions into their treatment plans, and for researchers to focus on the efficacy of specific interventions for stroke, rheumatoid arthritis and elderly people or to focus on high methodological quality studies of the efficacy of comprehensive OT for the other treated patient groups in OT.

TABLES

Table 1 Characteristics and results of systematic reviews included

Reference	Objectives of review	Designs included (*N*)	Methods of analyses	Conclusions of review as stated by authors
Stroke				
Steultjens[7] 2003	Efficacy of 7 OT intervention categories including comprehensive OT for all types of stroke	RCT (18) CCT (6) OD (8)	Search (until June 2002) Methodological quality assessed Categories analysed separately Best-evidence synthesis	*Comprehensive OT*: functional ability +, participation + *Training of sensory-motor function*: functional ability −, participation −, arm–hand function − *Training of cognitive function*: functional ability −, cognitive functions ± *Training of skills*: functional ability +, participation?, arm–hand function − *Assistive devices*: all outcomes? *Provision of splints*: muscle tone? *Education primary caregiver*: all outcomes?
Trombly[8] 2002 Ma[9] 2002	Effectiveness of OT interventions and underlying mechanisms. No distinction of intervention categories. All types of stroke	RCT (20) CCT (9) OD (3) *N* = 1 (1)	Search (1980–2000) Threats internal validity assessed Agregated weighted effect size	*Comprehensive OT*: functional ability +, participation?, arm–hand function +, cognitive and psycho-social functions ± *Provision of splints*: muscle tone −
Wilkins[10] 2003	Effectiveness of functional training for older adults (age ≥ 65 years) with stroke	RCT (10) OD (1)	Search (1980–2000) Methodological issues assessed Descriptive analyses	*Comprehensive OT*: functional ability (ADL) + *Comprehensive OT*: functional ability (Leisure) −
Rheumatoid arthritis				
Egan[12] 2003	Efficacy of working and resting splints for RA patients (age ≥ 18 years) with wrist and hand problems	RCT (10) CCT (1) Cohort studies (1)	Search (until January 2002) Methodological quality assessed Descriptive analyses for types of splint separately	*Provision of splints*: pain?, dexterity?
Steultjens[11] 2002, 2004	Efficacy of 7 OT interventions including comprehensive OT for adult RA patients	RCT (16) CCT (6) OD (16)	Search (until December 2002) Methodological quality assessed Categories analysed separately Best-evidence synthesis	*Comprehensive OT*: functional ability +, participation?, quality of life? *Training motor function*: functional ability −, compliance −, grip strength −, range of motion − *Training of skills*: all outcomes? *Joint protection*: functional ability +, pain −, participation? *Counselling*: all outcomes? *Assistive devices*: all outcomes? *Provision of splints*: pain ±, dexterity ±(negative effect), grip strength ±
Wilkins[10] 2003	Effectiveness of functional training for older adults (age ≥ 65 years) with rheumatoid arthritis	RCT (1)	Search (1980–2000) Methodological issues assessed Descriptive analyses	*Comprehensive OT*: functional ability +

Elderly people				
Carlson[13] 1996	Overall effectiveness of OT for older people (mean age ≥60 years). No distinction of intervention categories	RCT (6) CCT (1) OD (6) *N* = 1 (2)	Search (1979–1994) Mean effect size calculated	*Comprehensive OT*: functional ability+, well-being+, participation?, physical health?
Patterson[15] 1998	Effectiveness of predischarge home visits for hospitalized older people	Surveys (5)	Search (1966–1998) descriptive analyses	*Predischarge home visits*: all outcomes?
Steultjens[14] 2004	Efficacy of 6 OT intervention categories including comprehensive OT for community dwelling older people (age ≥60 years)	RCT (10) CCT (2) OD (5)	Search (until July 2002) Methodological quality assessed categories analysed separately Best-evidence synthesis	*Comprehensive OT*: functional ability+, participation+, well-being+ *Training sensory-motor functions*: all outcomes? *Training cognitive functions*: all outcomes? *Training of skills and assistive devices*: functional ability+, incidence of falls+ *Counselling caregiver*: functional ability? (dementia)
Wilkins[10] 2003	Effectiveness of functional training for older adults (age ≥65 years)	RCT (4) OD (1)	Search (1980–2000) Methodological issues assessed Descriptive analyses	*Comprehensive OT*: functional ability+, prevention of falls+
Progressive neurological diseases				
Bilney[17] 2003	Efficacy OT interventions for Huntington's disease. No distinction of intervention categories	*N* = 1 (2) Descriptive (1)	Search (until November 2001) Methodological quality assessed Descriptive analyses	*Comprehensive OT*: functional ability?, participation?, emotional status?, movement?, cognitive functions?
Dean[18] 2001	Efficacy of OT interventions for Parkinson's disease. No distinction of intervention categories	RCT (2)	Search (until 2001) Methodological quality assessed Descriptive analyses	*Comprehensive OT*: functional ability?, participation?, quality of life?
Steultjens[19] 2003	Efficacy of 7 OT intervention categories including comprehensive OT for multiple sclerosis	RCT (1) CCT (1) OD (1)	Search (until December 2002) Methodological quality assessed categories analysed separately Best-evidence synthesis	*All intervention categories*: functional ability?, participation?, quality of life?, fatigue?
Cerebral palsy				
Steultjens[16] 2004	Efficacy of 6 OT intervention categories for children (age <19 years) with cerebral palsy	RCT (7) CCT (1) OD (9)	Search (until June 2003) Methodological quality assessed Categories analysed separately Best-evidence synthesis	*All intervention categories*: functional ability?, participation?, quality of life?, muscle tone?, balance?
Mental illnesses				
Nicol[20] 2001	Effectiveness of life skills programmes for people (age range 16–65 years) with chronic mental illness	RCT (2)	Search (until 1998) Methodological quality assessed Descriptive analyses	*Training of skills*: functional ability?, participation?, quality of life?

OT, occupational therapy; RCT, randomized controlled trial; CCT, controlled clinical trial; OD, pre-experimental designs (pre-post tests); +, improved outcome; ±, indications for improvement; −, evidence of ineffectiveness; ?, insufficient evidence.

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