Making the jump -
The translation of research evidence into clinical occupational therapy practice
For reasons of consistency within this thesis, some terms have been standardized throughout the text. As a consequence the text may differ in this respect from the articles that have been published.

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Making the jump -
The translation of research evidence into clinical occupational therapy practice

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Not me anymore

I'm breaking
I can feel it inside
Something's taking over my mind
Causing page after page of memories to fade
Into nothing

I'm losing more of me everyday
It's confusing I feel lost and betrayed
As places and things, faces, and names
Fade into nothing

I'm not me anymore
Not who I used to be, anymore
There's a thief running loose in my head
A thief who won't rest till I'm dead
Stealing my mind one cell at a time
Till I'm nothing

I hate this
I can't run, I can't fight
I can't take this
I feel buried alive
I don't know who I am
Just a shell of some man
Left with nothing

I'm not me anymore
Not who I used to be, anymore
There's a thief running loose in my head
A thief who won't rest till I'm dead
Stealing my mind one cell at a time
Till I'm nothing
Just nothing
Nothing

Music & Lyrics: Jerry Lansdowne
# Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>General introduction</td>
<td>9</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>A new combined strategy to implement a community occupational therapy intervention: designing a cluster randomized controlled trial. <em>BMC Geriatrics 2011; 11:13.</em></td>
<td>41</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Effectiveness of a multifaceted implementation strategy on physicians' referral behavior to an evidence-based psychosocial intervention in dementia: a cluster randomized controlled trial. <em>BMC Family Practice 2013; 14:70.</em></td>
<td>57</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Effectiveness of a training package for implementing a community-based occupational therapy program in dementia: a cluster randomized controlled trial <em>Clinical Rehabilitation 2014; December, epub ahead of print.</em></td>
<td>73</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Determinants for the effectiveness of implementing an occupational therapy intervention in routine dementia care. <em>Implementation Science 2013; 8:131.</em></td>
<td>99</td>
</tr>
<tr>
<td>Chapter 7</td>
<td>Summary and general discussion</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td>Samenvatting</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Dankwoord</td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>Curriculum Vitae</td>
<td>173</td>
</tr>
</tbody>
</table>
Chapter 1

Introduction and outline
INTRODUCTION

Ms. Jones is a 79-year old lady and is living in a two-story house with her husband, Mr. Jones, who is 81 years old. Three years ago Ms. Jones suffered from a stroke resulting in decreased mobility. Recently, she was diagnosed with vascular dementia, which causes problems in her short term memory and episodic memory. In the past year, Ms. Jones gained more and more problems with orientation in time and place. Due to this, Mr. Jones cannot leave her unattended anymore. Ms. Jones used to be a very independent, active, and social woman who enjoyed travelling, biking, and hiking. However, in the past year she started to take less initiative than she used to. Now, she is sitting inside most of the day and only goes outside accompanied by her husband when they have to get their groceries. She feels trapped in her own home and is scared to be placed in a nursing home. Mr. Jones is taking care of her. He is also experiencing limitations in daily life due to Rheumatoid Arthritis and because he feels like he needs to stay with his wife 24 hours a day. He is overburdened as the care he needs to provide has substantially increased over the past year, due to the progressive nature of the dementia.

The number of people with dementia is growing rapidly\(^1\) causing serious challenges for both people with dementia, caregivers, and healthcare systems worldwide. Various psychosocial interventions have proven to be effective in increasing self-sufficiency of people with dementia and in decreasing caregiver burden. One of these interventions is the Community Occupational Therapy in Dementia (COTiD) program. However, due to various barriers the uptake of COTiD in clinical practice is limited. Implementation strategies targeting specific barriers may accelerate the uptake of interventions. Therefore, a new implementation strategy was developed to increase the uptake of COTiD in clinical practice and to increase the number of people with dementia and caregivers that can benefit from this intervention. This leads to the main research question discussed in this thesis, namely: Is the newly developed multifaceted and multidisciplinary implementation strategy more effective than the usual post-graduate course in improving occupational therapists' adherence to COTiD and in improving client and caregiver treatment outcomes?

Dementia

In 2010 the number of people with dementia was estimated to be 35.6 million worldwide. This number is expected to grow to 115.4 million in 2050\(^1\). A similar trend is expected in the Netherlands where the number of people with dementia is expected to grow from 235.000 in 2010 to 565.000 in 2050. About 70% of people with dementia live at home\(^2\) and are cared for by informal caregivers, which are mostly family members\(^3\).
Dementia causes major problems related to a persons’ memory, perception, reasoning, and actions. The progress of the disease often is slow and in most cases already ongoing for several years when people are diagnosed. Depending on the stage of the disease, performance of daily activities and participation in social activities become increasingly harder. Family caregivers are also affected by the consequences of the disease. They play a crucial role in the care for people with dementia regarding preventing or postponing admittance to long-stay facilities. An evaluation among 1513 Dutch dementia caregivers showed that 18 percent felt a little burdened, 64 percent felt slightly burdened, and that 18 percent felt severely burdened. As a consequence, many dementia caregivers suffer from depression, burn-out, and/or stress.

Psychosocial interventions in dementia
Currently there is still no cure for dementia. It is therefore essential to develop interventions that are effective in increasing the quality of life of people with dementia and their informal caregiver(s). Psychosocial interventions aim to improve or maintain the quality of life of the client and/or caregiver. Psychosocial interventions focus on a clients’ behavior, emotions, and cognition and are provided by various professionals such as occupational therapists, physical therapists, specialized nurses, psychologists, and psychiatrists. Various psychosocial interventions have proven to be successful in increasing or maintaining the quality of life of people with dementia and/or decreasing caregiver burden. Successful psychosocial interventions are those that are individualized, flexible, and that focus on individual needs and preferences. In addition, these interventions use feasible goals that are tailored to both the client and caregiver in their individual context. Moreover, using cognitive reframing with caregivers (reframing maladaptive self-defeating thoughts about their performance as a caregiver), proved to be an effective element as well. Recommendations regarding psychosocial interventions are included in various European dementia guidelines including one Dutch guideline that specifically states that non-pharmacological interventions are generally preferred over pharmacological treatment as the side effects tend to be less. In spite of the availability of effective psychosocial interventions and the inclusion of such psychosocial interventions in dementia care guidelines, problems remain regarding its implementation.

Community Occupational Therapy in Dementia
The community occupational therapy in dementia (COTiD) program is one of the effective psychosocial interventions. COTiD is a client-centered, evidence-based intervention which aims to improve the autonomy, participation in meaningful activities, and the quality of life of both the person with dementia and the caregiver. It focuses on the needs and abilities of the client and caregiver and on the possibilities of the environment. The program consists of 10 one-hour sessions that take place at the client’s home. The program was developed and tested using the MRC framework for complex interventions. A randomized controlled trial in the Netherlands
showed that community occupational therapy improved the daily functioning, mood, health status and quality of life of community dwelling people with dementia and their caregivers\textsuperscript{11,12}. Moreover, the sense of competence of the caregivers increased, their burden of care decreased and costs were saved\textsuperscript{10}.

Since the results are very relevant for community dwelling people with dementia and their caregivers, there is a need to promote and effectively implement this intervention in clinical practice in the Netherlands. This implementation warrants sufficient attention to make sure that the essential active elements of COTiD are preserved in clinical practice. Essential elements in the randomized controlled setting were motivated clients and caregivers, motivated and experienced therapists, good treatment fidelity of therapists, and motivated referring physicians and managers. The importance of these elements is illustrated by a German study to the effectiveness of the COTiD program. This study was conducted parallel to the study described in this thesis and did not find significant effect of COTiD in a German sample\textsuperscript{27}. The process evaluation of this study showed that essential components of the COTiD program were poorly executed by the therapists\textsuperscript{28}. The authors state that one of the reasons for this was that the German therapists had less experience, performed less treatments during the study, and received less training than the therapists in the Dutch trial\textsuperscript{28}. Additionally, the people in the German sample had less need for assistance at baseline making improvement on this outcome difficult. However, cognitive functioning and problems in daily functioning were comparable to the Dutch group. The authors therefore state that the difference in effectiveness between the German and Dutch study may in part be caused by cultural difference.

Evidence-based practice

The uptake and integration of effective interventions, such as the COTID intervention, relies on the extent to which social systems, organizations, and individual healthcare professionals work according to the principles of evidence-based practice. Evidence-based practice (EBP) refers to making clinical decisions based on a combination of professional expertise, the best available evidence, and the values and preferences of the client\textsuperscript{29}. Sackett et al.\textsuperscript{29} state that evidence-based practice is important as it helps to establish a therapeutic alliance that optimizes the quality of life of clients\textsuperscript{29}. Communicating the evidence to clients also is an essential part of the EBP process\textsuperscript{30,31} as it enables clients to make informed decisions about their treatment and to evaluate if the proposed assessments or interventions match their values and preferences\textsuperscript{30}.

In spite of the importance of EBP in increasing the quality of healthcare, studies have shown that many patients do not receive the best quality of care and that there is a lot of room for improvement\textsuperscript{32}. There are many factors preventing professionals from optimally using EBP principles in clinical practice. Barriers to use these principles may be related to the professional, the organization, the innovation, and/or the social context. Examples of barriers are a lack of time (e.g.\textsuperscript{33-35}), a lack of understanding research evidence\textsuperscript{32}, and a lack of access to research information\textsuperscript{36}. These are only a few of the many barriers that can occur and may prevent
healthcare professionals from implementing evidence and integrating this evidence with their clinical experience and the clients' preferences.

Implementation of innovations
Effective implementation is a widely recognized problem in improving the quality of healthcare. Figure 1 shows the implementation process based on the existing literature on implementation and was extracted from an article by Fleuren et al.\textsuperscript{37} It shows the innovation process, which runs from dissemination to continuation, and illustrates that this process can be interrupted at any time by factors related to the intervention, the user of the intervention, the organization, the socio-political context\textsuperscript{37-39}, and factors related to the implementation strategy\textsuperscript{37}.

**Figure 1. Framework representing the innovation process and related categories of determinants (extracted from Fleuren et al.\textsuperscript{37})**

To increase the speed with which innovations are implemented, researchers have developed and tested various strategies. Grol and Wensing\textsuperscript{38} developed a model that guides implementers and researchers in developing implementation strategies. The model consists of six steps (see Figure 2).
Step 1 represents the development of a proposal for change. Step 2 and 3 involve the actual use of the innovation and identifying determinants for change. In the subsequent step (step 4), an implementation strategy tailored to the determinants is developed. This implementation strategy needs to be executed, evaluated (step 5), and improved (step 6).

Although many studies have been conducted regarding implementation, only a limited number of studies have been conducted in the area of allied healthcare and the implementation of psychosocial interventions. In addition, studies have been conducted on evidence-based practice among allied healthcare professionals (e.g.,), but there was no information on evidence-based practice among Dutch occupational therapists.

**Implementation of the Community Occupational Therapy in Dementia (COTiD) program**

The COTiD program was proven effective and cost-effective as described in Section 3 of this introduction. However, utilization of the program in clinical practice, as assessed in 2007 in The
Netherlands, was limited. Therefore, an implementation strategy was developed and tested according to the implementation model of Grol and Wensing (2006). How the various steps of the implementation model were applied is discussed in the following paragraphs.

**Development of the COTiD program (Step 1)**
The COTiD program (proposal for change) was developed and tested using the MRC framework (see Figure 3)\(^{25,41}\). This elaborate process included the following phases:

- **Theory/preclinical phase:** in this phase a thorough search of literature and theories was conducted. Opinions of expert and clinicians were collected. Consensus on the content of the program was reached using Delphi rounds. Consequently, the program was tested regarding eligibility and feasibility\(^{24,42}\).
- **Phase 1:** To uncover the underlying mechanism and relevant components of the intervention, the context, content, and process were studied using case study analyses\(^{43}\).
- **Phase 2:** In this exploratory phase a pilot study was conducted using an uncontrolled before and after study to evaluate the feasibility of the research design, the possible effect of COTiD on client and caregiver outcome measures and the feasibility of these measurement instruments\(^{44}\).
- **Phase 3:** Evaluation of the effectiveness and cost-effectiveness of the program using a randomized, controlled trial\(^{11,12,45}\).
- **Phase 4:** Evaluation of the implementation of the intervention outside the research setting.

This thesis focuses on the last phase (phase 4) of the MRC framework in which the effectiveness of the intervention is evaluated outside the research setting.

**Actual utilization & barriers and facilitators to the implementation of the COTiD program (steps 2 and 3)**
As part of step 2 and 3 of the implementation model of Grol and Wensing, Van ’t Leven and colleagues evaluated the utilization rate of the program\(^{46}\) as well as barriers and facilitators of the implementation of COTiD\(^{46}\). These studies showed that only 20% of the occupational therapists who were trained in using the program actually used the program or parts of it in clinical practice\(^{46}\).

Focus groups with occupational therapists (n=17) and interviews with physicians (n=10) and managers (n=4) were used to collect data on barriers and facilitators to the implementation of the COTiD program\(^{47}\). Main barriers that caused the low degree of utilization were a lack of knowledge of physicians about the content, effectiveness, and reimbursement of the COTiD program. This resulted in limited referrals of people with dementia to occupational therapy services. This lack of referrals resulted in a low feeling of competence of occupational therapists when using the COTID program. In addition, occupational therapists experienced difficulties in uncovering the essential elements of this complex intervention and experienced a lack of role
models. Finally, managers had limited or no knowledge of either the COTiD program or occupational therapy in general\textsuperscript{47} which may have limited optimal facilitation.

\textbf{Figure 3. MRC framework for the development and evaluation of complex interventions\textsuperscript{25,26}}

\begin{center}
\begin{tabular}{|c|c|c|c|c|}
\hline

\textbf{Theory} & \textbf{Modelling} & \textbf{Exploratory trial} & \textbf{Definitive Randomized controlled trial} & \textbf{Long Term Implementation} \\
\hline

Guideline & Qualitative study & Pilot study & Effectiveness and Cost-effectiveness study & Pilot study & Implementation study \\
\hline

\textbf{Preclinical} & \textbf{Phase 1} & \textbf{Phase 2} & \textbf{Phase 3} & \textbf{Phase 4} \\
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\textbf{Development of a multifaceted training package (step 4)}

Based on theoretical considerations, an intensive multifaceted training package for the implementation of the COTiD program was developed. A multifaceted training package was chosen because previous studies had shown that these strategies were more likely to result in positive effects on professional behavior\textsuperscript{48-50} compared to the sole use of educational strategies. To address all barriers identified by Van ‘t Leven et al. (2011) the multifaceted training package was aimed at occupational therapists, physicians, and managers as they are all involved in the utilization of the COTiD program\textsuperscript{51}. In developing the multifaceted training package, we used the barriers and facilitators identified by occupational therapists, physicians, and managers as a starting point. The overall aim of the multifaceted training package was to 1) increase the number of referrals of people with dementia and caregivers to occupational therapy according to COTiD and 2) to increase adherence of occupational therapist to the COTiD program and therewith improve client and caregiver treatment outcomes.

Occupational therapists felt incompetent in using the program which seemed to be related to a lack of referrals, a lack of knowledge on dementia, a lack of role models and feedback, and insufficient knowledge about the program\textsuperscript{47}. The interventions planned were based on cognitive
theories (providing information about the effectiveness of the program through the website) and educational and motivational theories (educational meetings and outreach visits to address individual problems and motivate people to implement by addressing professionals' intrinsic motivation).

Managers and physicians were found to be either unaware of the COTiD program and/or have a lack of knowledge about the program. An educational website and telephone calls were intended to increase this awareness and knowledge and were intended to persuade these professionals of the usefulness of the COTiD program (cognitive and educational theories). Telephone calls and newsletters to physicians were intended to motivate them to refer patients to the program and address their individual questions. Telephone calls and newsletters to managers were meant to encourage them to optimize facilitation of the COTiD program and to address individual questions (educational and motivational theories).

The multifaceted training package as originally designed prior to our implementation study is described in Table 1. This description is based on the framework of Hulscher et al. (2003).\textsuperscript{52,53}

Table 1. Description of the intended multifaceted training package based on the framework of Hulscher et al. (2003)

1. Global typing of the implementation strategy
   
   \textit{Interventions orientated towards occupational therapists}
   
   (a) Dissemination of educational materials using a website.
   
   (b) Educational meetings (including regional network meetings).
   
   (c) Outreach visits.
   
   \textit{Interventions orientated towards physicians and managers}
   
   (a) Dissemination of educational materials using a website and newsletters.
   
   (b) Telephone calls serving as reminders and providing professionals an opportunity to ask questions about the intervention and the implementation.
   
   \textit{Organizational interventions}
   
   Change in the patient-reporting system by offering a web-based reporting system structured according to the steps of the COTiD program.
   
   \textit{Regulatory interventions}
   
   Accreditation for occupational therapists who are exposed to the obligatory parts of the implementation strategy.

2. Target group / participants
   
   \textit{Professional status}
   
   The intervention is developed for occupational therapists working in private practices, nursing homes, hospitals, and mental health organizations. The multifaceted intervention is developed to reach different types of physicians including general practitioners, nursing home physicians, neurologists, and geriatricians. Finally, the intervention aims to reach different types of managers including direct managers (i.e. managers of the occupational therapy department or managers of allied healthcare services) and non-direct managers (i.e. cluster or unit managers).
   
   \textit{Interaction between participants}
   
   Components of the implementation strategy are aimed at the individual disciplines. However, it is assumed that each professional is part of a functional unit existing of at least two occupational therapists, one physician, and one manager. Especially the interventions toward occupational therapists are intended to encourage therapists to interact with the managers and physicians within their functional unit. In addition, occupational therapists within the same region are encouraged to interact with each other using regional network meetings.
**Size of the target group**
The target groups of the implementation strategy are 36 occupational therapists, 36 physicians, and 20 managers. Educational meetings will be offered in two groups (approximately 18 per group), and regional meetings are offered in three regions (approximately 12 OTs per region). Each educational outreach visit is offered to all occupational therapists within one functional unit at the same time (which is assumed to be two OTs per functional unit). The website is targeted at the entire group of professionals and telephone calls will be offered to the individual physicians and managers.

**Motivation for participation**
Accreditation points can be obtained for both participation in the study and for completing the minimum required components of the implementation strategy (minimum requirements: two educational meetings, three regional meetings, and five coaching sessions). This is done to motivate occupational therapists. Participation of all professionals is voluntarily.

3. The "Implementers"

**Professional status**
All components of the implementation strategy aimed at occupational therapists are executed by two "implementers", who are expert occupational therapists in executing the COTId program as well as in teaching about the COTId program. Both are educated in using motivational interviewing as a coaching technique.
A third "implementer" executes the implementation strategies toward managers and physicians. She has a background in occupational therapy and is the primary researcher of this study. She is also trained in using motivational interviewing.

**Opinion leaders**
We suspect that the "implementers" providing the strategies toward the OTs are perceived as opinion leaders and role models as they contributed to the development and testing of the COTId program. The "implementer" providing the strategies toward physicians and managers is not likely to be considered an opinion leader.

**Authority**
The researcher who developed and tested the COTId program initiated the implementation by requesting funding for this implementation. The funding agency (Zorg Onderzoek Nederland en Medische Wetenschappen; ZonMw) is therefore also initiator of the implementation.

4. Frequency

**Occupational therapists**
1) Two educational meetings (eight hours each) are provided at the start of the intervention period with an interval of eight weeks between meetings.
2) Outreach visits (90 minutes each): five to seven sessions depending on the individual needs. These sessions start after the two training days with intervals between sessions depending on individual needs (approximately six to eight week intervals).
3) Regional network meetings (2,5 hours each): four meetings in each of the three regions are provided with intervals of approximately 12 weeks between meetings.

**Physicians and managers**
1) Telephone calls (duration will vary per individual): one or two telephone calls within a one year period.
2) Newsletters: four newsletters with intervals of approximately 12 weeks.
The website is continuously available from the start of the intervention.

5. Information about the innovation

**Type of information about the innovation or guideline**
A prerequisite for occupational therapists for starting the implementation strategy is to complete a postgraduate course on the COTId program. During this course all OTs are provided with information on the entire COTId program.
Information on the innovation for occupational therapists

1) Educational meetings:
   - Information and skills regarding the COTiD program: practicing communication skills (role-playing)
   - Information and skills regarding implementation of the program: inventorize barriers, elevator pitch, product description, promoting the program to physicians and managers (role-playing), and instructions on using the web-based reporting system and discussion forum.

2) Outreach visits: variation is possible, but the content of the sessions is a mix of improving skills to practice according to the COTiD program and skills to implement / promote the COTiD program.

3) Regional network meetings: variation is possible, the meetings are intended to discuss cases and difficulties experienced in using the COTiD program and promoting the program.

Information on the innovation for physicians and managers

1) Telephone calls: content can vary depending on needs of physicians and managers.

2) Newsletters: include information on experiences with the COTiD program of various types of professionals.

Information on the innovation for all professionals

Website: provides information on the COTiD program and publications on the effects of the program.

Presentation form and medium

Occupational therapists

1) Educational meetings: a mixture of lectures, discussion, and role-playing.

2) Outreach visits: variation is possible depending on the needs of the participants.

3) Regional network meetings: lectures and discussions.

Physicians and managers

1) Newsletters: newsletters are sent by email to managers and physicians.

6. Information about target group management/performance

Occupational therapists are provided with verbal feedback on their performance after role-playing during the educational training days. During the educational outreach visits performance and achievements are discussed regarding both skills in executing the COTiD program and promoting the COTiD program (by addressing the number of referrals). Physicians and managers are provided with feedback on the number of referrals that have been made in the preceding period during the telephone calls.

No information is provided that enables participating professionals or organizations to compare their achievements with others.
AIMS AND OUTLINE OF THIS THESIS
The main subject of this thesis is step 5 of the implementation model of Grol and Wensing which concerns the execution and evaluation of the multifaceted training package. Below the aims and research questions are described in more detail.

Research questions regarding evidence-based practice among Dutch occupational therapists in general
As a preparatory study, we first executed a study to identify the state of affairs regarding evidence-based practice among Dutch occupational therapists in general.
1) How do Dutch occupational therapists perceive the principles of evidence-based practice?
2) Which sources of evidence do Dutch occupational therapists use in making clinical decisions?
3) Which barriers do Dutch occupational therapists experience when implementing the principles of evidence-based practice?

Research questions regarding barriers and attitudes at baseline of evaluating the multifaceted training package
1) What barriers did occupational therapists experience at baseline with regard to the implementation of the COTiD program?
2) What attitudes did occupational therapists have at baseline regarding the COTiD program and its implementation?

Research questions regarding the effect of the multifaceted training package
1) Is the multifaceted training package more effective in increasing the number of referrals to the COTiD program per cluster compared to the usual post-graduate course?
2) Is the multifaceted training package more effective in increasing occupational therapist adherence to the COTiD program compared to the usual post-graduate course?
3) Is the multifaceted training package more effective in improving client and caregiver treatment outcomes compared to the usual post-graduate course?
4) What was the effect of the multifaceted training package on physicians’ knowledge of the COTiD program?

Research questions regarding the process evaluation
1) How did the execution of the multifaceted training package deviate from the strategy as planned?
2) How did occupational therapists, physicians, and managers experience the multifaceted training package?
Outline of this thesis

In chapter 2 the results of a cross-sectional study on evidence-based practice among Dutch occupational therapists are described. This study provides information on the current situation regarding attitudes of occupational therapists towards EBP, the sources of evidence that are used in clinical practice, and the barriers that occupational therapists experience. Chapter 3 describes the study design and protocol developed to test the effectiveness of the multifaceted training package. The effectiveness was evaluated using a cluster randomized controlled trial. Consequently, chapter 4 and 5 describe the results of the effectiveness study. Chapter 4 describes the effect of the implementation strategy on the number of referrals to the COTiD program per cluster as well as the effect on physicians' knowledge. Chapter 5 outlines the effect of the multifaceted training package on occupational therapist adherence and client and caregiver treatment outcomes. Finally, chapter 6 reports the results of a process evaluation. This chapter provides information on factors that may have influenced the success and/or failure of the multifaceted training package. In chapter 7 all findings reported in this thesis are discussed including their relevance and implications for research and practice.
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Chapter 2

A survey of evidence-based practice among Dutch occupational therapists

Carola Döpp
Esther Steultjens
Jeff Radel

ABSTRACT
This study explored how evidenced-based practice (EBP) is perceived by Dutch occupational therapists (OTs), what sources of (research) information are used to make clinical decisions, and what barriers OTs experience in implementing EBP principles.
A self-administered, pre-tested, questionnaire was distributed through an email survey and postal mail among 200 OTs that were randomly selected out of a total population of 2,019 Dutch OTs. Analyses of data comprised descriptive statistics of all variables and test statistics to evaluate differences based on demographic characteristics.
Results showed that Dutch OTs have a very positive attitude toward EBP. Barriers experienced are mostly related to a lack of skills needed to implement EBP and to the characteristics of the work environment. Overall, the attitudes, experiences and barriers are similar to research findings in other countries or professions. A unique barrier to the implementation of EBP found in this study was that Dutch OTs perceived evidence written in a foreign (non-Dutch) language as a barrier to using evidence in non-Dutch languages.
The results of the study, derived from a partly representative group of working OTs, implicate universal problems regarding the effective implementation of the EBP principles. Solutions to increase the implementation of these principles from an international point of view are called for and need to be evaluated.
INTRODUCTION

Evidence-based practice (EBP) became a topic of discussion within the occupational therapy (OT) profession starting around 1997 when one of the earlier articles on the use of EBP in OT was written. EBP refers to the clinical decision making based on a combination of knowledge from current research evidence, the clinical expertise of occupational therapists and the knowledge regarding values and preferences of the client. EBP establishes a treatment alliance that optimizes clinical outcomes and the quality of life for clients. Sources of evidence vary in the degree of credibility, with randomized controlled trails providing the best source of evidence regarding the efficacy of interventions and opinions of experts or peers being the least robust source of evidence. Communicating about the evidence with clients also is an essential part of the EBP process in OT.

Studies evaluating the use of EBP among OTs in different countries have documented a variety of factors related to characteristics of the workplace, of professionals, of the research evidence and/or the accessibility and presentation of evidence.

A survey conducted among OTs from seven different National Health Service (NHS) trusts in the UK was completed by 66 OTs (response rate from 78%) and showed that the barriers experienced by most of the respondents included workload pressure, insufficient staff resources and a lack of understanding the research evidence. Two additional survey studies on EBP among UK therapists were conducted. Curtin and Jaramazovic reported the results of a survey completed by 500 OTs (response rate: 76.6%). They found that a lack of appropriate resources, a lack of good quality research, a large workload, insufficient staff turnover and a lack of training and knowledge to implement EBP were the most important barriers. A survey completed by the 125 members of the National Association of Neurological Occupational Therapists in the UK (response rate 62.5%) showed that a large proportion of the OTs perceived a lack of relevance of the evidence to be a major barrier. All UK studies reported that a lack of time was a major barrier in implementing EBP.

A study among 105 Scottish healthcare professionals working in stroke rehabilitation included 27 OTs of which 26 responded to a survey on EBP. The results showed that the majority of the OTs had a need for further training in critical appraisal of the evidence and experienced difficulty in both keeping up to date with the literature in combination with patient care and transferring research findings to clinical practice. In addition, OTs were not confident about the reliability of research findings and indicated that interventions studied were not described clearly in research papers.

Dysart and Tomlin sent a survey on EBP to 400 randomly selected members of the American Occupational Therapy Association which was returned by 209 therapists. The main barriers to EBP were a lack of time to access research information, difficulty in using electronic databases, high enrolment costs for attending continuing education and a lack of conveniently available electronic databases. Furthermore, one-third of the respondents or more perceived research results to be unclear and difficult to understand, believed that research results did not translate
to individual clients, and perceived it as difficult to base clinical decisions on research because of conflicting conclusions\textsuperscript{11}.

Finally, a survey sent to a purposive sample of 85 Australian OTs was completed by 67 therapists\textsuperscript{12}. The most common barriers experienced by these Australian therapists were a lack of time, a high workload and a lack of skills in searching and appraising the evidence. This short overview of barriers to EBP in different countries shows that there are many similarities. Especially a lack of time, a high workload and a lack of skills in either appraising the evidence or applying it to practice seem to be major barriers in the different countries. Similar studies of allied healthcare professions such as physical therapists\textsuperscript{13,14}, nurses\textsuperscript{15,16} or healthcare professionals in general\textsuperscript{17-19} found similar barriers to using EBP principles. Some of these similarities are the experienced lack of time\textsuperscript{13,14,17} and experiencing an inability to transfer research findings to the treatment of individual clients\textsuperscript{13,14}.

Although similarities exist among countries, differences can also be found. These may be caused by differences in healthcare systems and differences in the mission or involvement of professional organizations. Another factor might be that previous studies related to EBP among OTs have all been conducted in English-speaking countries. However, previous studies among nurses in countries where English is not the official language reported that publication of research in a foreign language was an important barrier to implementing EBP\textsuperscript{16,20} and that evidence-based journals written in English were used least frequently\textsuperscript{15}. This language barrier may also be a problem for occupational therapists from countries where English is not the primary language.

Both the Dutch Association of Occupational Therapy (Ergotherapie Nederland; EN)\textsuperscript{21} and the Dutch government\textsuperscript{22} recognize the significance of EBP for the profession. The available literature, however, suggests that EBP is not implemented optimally among OTs\textsuperscript{7-12,23} and other allied health professions\textsuperscript{15-17,19}. Information on barriers to EBP specific to Dutch OTs is necessary to increase integration of the EBP principles into clinical practice. Therefore, the present study addressed how Dutch OTs perceive EBP, which sources of evidence Dutch OTs use in making clinical decisions, and which barriers Dutch OTs experience when implementing EBP.

**METHODS**

**Participants**

Dutch OTs employed by a Dutch organization and members of the Dutch Association of Occupational Therapy (EN) at the time of the study were eligible to participate in the study. Out of 2,019 eligible OTs (December 2007), 200 Dutch OTs were sent a survey. Ten percent of the eligible OTs did not have an email address associated with the membership information. To prevent biased results due to a lack of internet access\textsuperscript{24}, those with no email address purposely were included and received a paper version of the questionnaire by mail. Stratified random sampling was used to select 200 participants, of which 90% (n=180) had an email address and 10% (n=20) had no email address. As a minimum of 100 responses was desired, 200 OTs were
selected as a 50% response rate was assumed. A sample size of 200 OTs is justifiable because the total population is relatively small and homogeneous.

**Instrumentation**

A Dutch-language questionnaire consisting of both positive and negatively stated items was developed to evaluate the research questions. Topics and questions addressed in previous studies addressing EBP among health care professionals\(^7,11,17\) were used as a basis to develop a questionnaire suitable for evaluating EBP among Dutch OTs. First, the participants were asked to rate how often they used 19 different sources using a rating-scale of "daily", "weekly", "monthly", "biannually", "annually", "never" and "I have no access to this source". Second, the therapists were requested to rate 21 statements on barriers to implementing EBP and 11 statements evaluating their attitude toward EBP. The participants were provided with a 5-point Likert scale ("agree", "somewhat agree", "neither agree nor disagree", "somewhat disagree", "disagree") to rate these statements. Last, therapists answered 15 demographic questions.

The format and content of the questionnaire was evaluated during two pilot tests, with a total of six practising OTs. A paper version of the questionnaire, mailed to 10% (n=20) of the selected participants, was adjusted to match the format and content of the online version of the survey. The online survey was created using VOVICI'S web survey software (Vovici Corp., 2008).

**Procedures**

Data were collected from May through July of 2008. An invitation to participate was distributed to 180 therapists through email and to 20 therapists through traditional mail. An informed consent document was not required, as respondents who completed and submitted a questionnaire provide their approval through their participation (per Kansas University Medical Center's Human Subjects Committee). Data was collected and analyzed in an anonymous manner. Non-respondents participating through email received a reminder messages after 2 and/or 4 weeks. After 6 weeks, the target response rate of 50% or higher was not obtained. Therefore, all non-respondents received an additional request to participate in the study.

**Data analysis**

The reliability of the concepts within the questionnaire was assessed after data collection. Internal consistency was evaluated using the Cronbach's alpha procedure (not acceptable=α 0.6 or lower, acceptable=α 0.6–0.7, good=α 0.7–0.8, very good=α 0.8–0.9, excellent=α 0.9 or higher). Descriptive statistics were calculated for all variables. Differences between several demographic groups were evaluated using analyses of variance (F) (ANOVA), the Kruskal–Wallis (H) or Mann–Whitney U test (U). In order to evaluate more specific which groups were significantly different from each other, the Fisher's least significant difference served as a post-hoc test when the ANOVA assumptions were not violated\(^25\). The Games–Howell post-hoc procedure was used when the assumption of equal variances was violated\(^26\). Relations between variables related to
frequency of resource use, perceived barriers and attitude to EBP were evaluated using the Pearson’s product moment correlation coefficient (r). An alpha level of 0.05 was used for all tests. All data were analyzed using the Statistical Package for the Social Sciences 27.

RESULTS
Respondents
Out of the 200 selected OTs, 183 turned out to meet the eligibility criteria. A final response rate of 54.6% was reached with 100 valid responses out of these 183 eligible OTs. The demographic information of this group of respondents is stated in Table 1.
The study participants represented the total population of interest (working OTs who are members of the EN) with regard to age ($\chi^2 [6, 100]=11.720, p>0.05$) and gender ($\chi^2 [1, 99]=0.100, p>0.05$). However, the participants worked on average significantly more hours per week compared with the total population of interest ($\chi^2 [6, 100]=18.476, p<0.01$).

Table 1. Demographic information on the group of respondents

<table>
<thead>
<tr>
<th></th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, M 35 – 39 years old</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>25–29</td>
<td>27 (27%)</td>
</tr>
<tr>
<td>30–34</td>
<td>21 (21%)</td>
</tr>
<tr>
<td>35–39</td>
<td>13 (13%)</td>
</tr>
<tr>
<td>40–44</td>
<td>6 (6%)</td>
</tr>
<tr>
<td>45–49</td>
<td>7 (7%)</td>
</tr>
<tr>
<td>50–54</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>55–59</td>
<td>10 (10%)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>2 (2%)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>92 (92.9%)</td>
</tr>
<tr>
<td>Male</td>
<td>7 (7.1%)</td>
</tr>
<tr>
<td><strong>Occupational Therapy degree</strong></td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>97 (97%)</td>
</tr>
<tr>
<td>Master</td>
<td>3 (3%)</td>
</tr>
<tr>
<td><strong>Work setting</strong></td>
<td></td>
</tr>
<tr>
<td>Nursing home</td>
<td>30 (30%)</td>
</tr>
<tr>
<td>Rehabilitation center</td>
<td>33 (33%)</td>
</tr>
<tr>
<td>Academic hospital</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Non-academic hospital</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>Psychiatric organization</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Organization for people with a mental disability</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Private practice</td>
<td>11 (11%)</td>
</tr>
<tr>
<td>Special education</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (5%)</td>
</tr>
</tbody>
</table>
A survey of evidence-based practice among Dutch occupational therapists

Reliability and validity of the questionnaire

The Cronbach's alpha procedure was used to evaluate the internal consistency of the three different constructs of the questionnaire. Tables 2 and 3 show the six variables excluded from data analysis because of their limited contribution to measuring the overall concepts (item-to-total correlation lower than 0.10) (Personal communications B.J. Gajewski, September 11, 2008). A good internal consistency was found for all measured constructs (use of sources: \( \alpha = 0.789 \); barriers: \( \alpha = 0.795 \); attitude toward EBP: \( \alpha = 0.783 \)). Face validity for the questionnaire was supported by expert opinion, sought from both academic experts and practising OTs.

Table 2. Positively phrased statements excluded from data analysis

<table>
<thead>
<tr>
<th>Statement (n)</th>
<th>M ± SD</th>
<th>A n (%)</th>
<th>SA n (%)</th>
<th>N n (%)</th>
<th>SD n (%)</th>
<th>D n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My employer provides enough time to attend continuing education courses (workshops etc.). (99)*</td>
<td>3.68 ± 1.227</td>
<td>26 (26.3)</td>
<td>44 (44.4)</td>
<td>8 (8.1)</td>
<td>13 (13.1)</td>
<td>8 (8.1)</td>
</tr>
<tr>
<td>Research outcomes are relevant to my practice. (99)*</td>
<td>3.77 ± 1.058</td>
<td>28 (28.3)</td>
<td>35 (35.4)</td>
<td>24 (24.2)</td>
<td>9 (9.1)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>A=agree, SA=somewhat agree, N=neither agree nor disagree, SD=somewhat disagree, D=disagree, n=number of respondents. *n=&lt;100 because of missing data and/or &quot;not-applicable&quot; answers. Scoring system: 5=agree / 4=somewhat agree / 3=neither agree nor disagree / 2=somewhat disagree / 1=disagree.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Negatively phrased statements excluded from data analysis

<table>
<thead>
<tr>
<th>Statement (n)</th>
<th>M ± SD</th>
<th>A n (%)</th>
<th>SA n (%)</th>
<th>N n (%)</th>
<th>SD n (%)</th>
<th>D n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment costs prevent me from attending important continuing education courses (workshops etc.) (99) *</td>
<td>3.15 ± 1.424</td>
<td>9 (9.1)</td>
<td>36 (36.4)</td>
<td>15 (15.2)</td>
<td>9 (9.1)</td>
<td>30 (30.3)</td>
</tr>
<tr>
<td>There is little research that applies to my practice. (99) *</td>
<td>2.91 ± 1.238</td>
<td>15 (15.2)</td>
<td>21 (21.2)</td>
<td>35 (35.4)</td>
<td>14 (14.1)</td>
<td>14 (14.1)</td>
</tr>
<tr>
<td>A=agree, SA=somewhat agree, N=neither agree nor disagree, SD=somewhat disagree, D=disagree, n=number of respondents. *n=&lt;100 because of missing data and/or &quot;not-applicable&quot; answers. Scoring system: 1=agree / 2=somewhat agree / 3=neither agree nor disagree / 4=somewhat disagree / 5=disagree.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Attitude toward evidence-based practice

Table 4 shows that the participating Dutch OTs viewed EBP as a positive concept overall. Even so more than half (53%) of the participants perceived that it requires too much effort to use evidence in clinical practice (see Table 4). This may prevent OTs from utilizing the EBP principles in practice.

The overall perception on EBP of OTs working in academic hospitals (F [8, 91]=3.004, p<0.01) was significantly more positive compared with OTs working at any other workplace except for those working in psychiatric organizations. OTs with more OT colleagues in their workplace were likely to disagree more that EBP is a temporary trend (r=0.306, df=89, p<0.005) suggesting an increase in the number of colleagues correlated with a more positive attitude toward EBP.

<table>
<thead>
<tr>
<th>Attitude statement (n)</th>
<th>M ± SD A n (%)</th>
<th>SA n (%)</th>
<th>N n (%)</th>
<th>SD n (%)</th>
<th>D n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It takes too much effort to use evidence in clinical practice. (100) †</td>
<td>2.55 ± 1.058 15 (15)</td>
<td>38 (38)</td>
<td>29 (29)</td>
<td>13 (13)</td>
<td>5 (5)</td>
</tr>
<tr>
<td>It is too difficult to use research evidence in clinical practice. (100) †</td>
<td>2.75 ± 1.114 11 (11)</td>
<td>38 (38)</td>
<td>22 (22)</td>
<td>23 (23)</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Research evidence helps me to make clinical decisions. (99)*</td>
<td>3.95 ± .973 31 (31.3)</td>
<td>43 (43.4)</td>
<td>16 (16.2)</td>
<td>7 (7.1)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>I would like to work according to the evidence-based practice principles. (100)</td>
<td>3.96 ± .840 29 (29)</td>
<td>41 (41)</td>
<td>28 (28)</td>
<td>1 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Evidence-based practice is a temporary trend. (99)* †</td>
<td>3.99 ± 1.102 1 (1)</td>
<td>11 (11.1)</td>
<td>21 (21.2)</td>
<td>21 (21.2)</td>
<td>45 (45.5)</td>
</tr>
<tr>
<td>More occupational therapists should use evidence to guide their practice. (100)</td>
<td>4.01 ± .810 32 (32)</td>
<td>38 (38)</td>
<td>29 (29)</td>
<td>1 (1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Evidence-based practice has a negative effect on the profession. (99)* †</td>
<td>4.22 ± .932 1 (1)</td>
<td>4 (4)</td>
<td>16 (16.2)</td>
<td>29 (29.3)</td>
<td>49 (49.5)</td>
</tr>
<tr>
<td>Research and clinical experience are equally important. (100)</td>
<td>4.29 ± .977 54 (54)</td>
<td>31 (31)</td>
<td>7 (7)</td>
<td>6 (6)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Research helps to build a scientific knowledge base for clinical practice. (100)</td>
<td>4.50 ± .718 60 (60)</td>
<td>32 (32)</td>
<td>7 (7)</td>
<td>0 (0)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Research is essential to the occupational therapy profession. (100)</td>
<td>4.77 ± .446 78 (78)</td>
<td>21 (21)</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

A = agree, SA = somewhat agree, N = neither agree nor disagree, SD = somewhat disagree, D = disagree
Scoring system: 5 = agree / 4 = somewhat agree / 3 = neither agree nor disagree / 2 = somewhat disagree / 1 = disagree. n = number of respondents *n < 100 due to missing data
† Statement was phrased negatively: reversed scoring system applies.

Use of sources

Human sources

Human sources were used most frequently (Table 5) with 79% of the respondents using their OT colleagues weekly or more often and 82.8% using information from non-occupational therapy colleagues weekly or more often. OTs with less experience were more likely to use their OT colleagues more frequently as a source for clinical decision-making (r=0.336, df=99, p<0.005).
### Table 5. Frequency of sources used by participating occupational therapists in making clinical decisions

<table>
<thead>
<tr>
<th>Sources (n)</th>
<th>M ± SD</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Biannually</th>
<th>Annually</th>
<th>Never</th>
<th>No access †</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Experience (100)</td>
<td>6.94 ± .239</td>
<td>94 (94)</td>
<td>6 (6)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Client (100)</td>
<td>6.67 ± .711</td>
<td>77 (77)</td>
<td>16 (16)</td>
<td>5 (5)</td>
<td>1 (1)</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Non-occupational therapy colleagues (99)*</td>
<td>6.02 ± .808</td>
<td>23 (23.2)</td>
<td>59 (59.6)</td>
<td>16 (16.2)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Occupational therapy colleagues (100)</td>
<td>5.97 ± .771</td>
<td>23 (23)</td>
<td>56 (56)</td>
<td>16 (16)</td>
<td>5 (5)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Family and friends of the client (100)</td>
<td>5.85 ± .809</td>
<td>19 (19)</td>
<td>53 (53)</td>
<td>23 (23)</td>
<td>4 (4)</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Internet websites (100)</td>
<td>4.98 ± 1.155</td>
<td>4 (4)</td>
<td>31 (31)</td>
<td>40 (40)</td>
<td>15 (15)</td>
<td>4 (4)</td>
<td>6 (6)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Textbooks (100)</td>
<td>4.47 ± .969</td>
<td>1 (1)</td>
<td>9 (9)</td>
<td>42 (42)</td>
<td>37 (37)</td>
<td>7 (7)</td>
<td>3 (3)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Occupational therapy guidelines (100)</td>
<td>4.39 ± 1.270</td>
<td>4 (4)</td>
<td>16 (16)</td>
<td>25 (25)</td>
<td>34 (34)</td>
<td>13 (13)</td>
<td>7 (7)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Other guidelines (100)</td>
<td>3.99 ± 1.314</td>
<td>3 (3)</td>
<td>9 (9)</td>
<td>22 (22)</td>
<td>32 (32)</td>
<td>20 (20)</td>
<td>12 (12)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Workshops (98)*</td>
<td>3.49 ± .976</td>
<td>1 (1)</td>
<td>4 (4.1)</td>
<td>5 (5.1)</td>
<td>30 (30.6)</td>
<td>53 (54.1)</td>
<td>2 (2)</td>
<td>3 (3.1)</td>
</tr>
<tr>
<td>Conferences (100)</td>
<td>3.43 ± .832</td>
<td>0 (0)</td>
<td>3 (3)</td>
<td>5 (5)</td>
<td>31 (31)</td>
<td>55 (55)</td>
<td>5 (5)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>In-service education (100)</td>
<td>3.23 ± 1.196</td>
<td>1 (1)</td>
<td>2 (2)</td>
<td>11 (11)</td>
<td>20 (20)</td>
<td>47 (47)</td>
<td>9 (9)</td>
<td>10 (10)</td>
</tr>
<tr>
<td>Post-graduate education (100)</td>
<td>3.23 ± 1.309</td>
<td>4 (4)</td>
<td>6 (6)</td>
<td>3 (3)</td>
<td>8 (8)</td>
<td>60 (60)</td>
<td>13 (13)</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Abstracts from electronic databases (96)*</td>
<td>2.90 ± 1.373</td>
<td>0 (0)</td>
<td>6 (6.3)</td>
<td>8 (8.3)</td>
<td>15 (15.6)</td>
<td>18 (18.8)</td>
<td>39 (40.6)</td>
<td>10 (10.4)</td>
</tr>
<tr>
<td>Articles from the EN journal (100)</td>
<td>4.12 ± .868</td>
<td>0 (0)</td>
<td>2 (20)</td>
<td>34 (34)</td>
<td>42 (42)</td>
<td>18 (18)</td>
<td>4 (4)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Articles from other professional journals in Dutch (100)</td>
<td>2.96 ± 1.082</td>
<td>0 (0)</td>
<td>7 (7)</td>
<td>27 (27)</td>
<td>29 (29)</td>
<td>29 (29)</td>
<td>8 (8)</td>
<td></td>
</tr>
<tr>
<td>Articles from other professional journals in English (100)</td>
<td>2.86 ± 1.255</td>
<td>0 (0)</td>
<td>3 (3)</td>
<td>8 (8)</td>
<td>22 (22)</td>
<td>14 (14)</td>
<td>45 (45)</td>
<td>8 (8)</td>
</tr>
</tbody>
</table>

EN, Ergotherapie Nederland.

Scoring system: Daily= 7 / Weekly= 6 / Monthly = 5 / Biannually= 4 / Annually = 3 / Never = 2 / No access = 1

n = number of respondents *n = <100 due to missing data

†This answer option was treated as missing in all bivariate analyses.
Robust sources of evidence

The participants used sources of more robust quality, such as journal articles and abstracts from electronic databases, least frequently to guide clinical practice (Table 5). OTs working at academic hospitals used articles in English significantly more than OTs working at nursing homes, rehabilitation centers, non-academic hospitals and organizations for people with mental disabilities (H [8]=24.320, p<0.005).

Other sources of evidence

Beside OT and non-OT colleagues, most OTs used information gained from guidelines, workshops, conferences and in-service education to make clinical decisions (Table 5).

Barriers to evidence-based practice

Skills of the occupational therapist

Difficulty in evaluating the quality of evidence was the single greatest barrier experienced by the Dutch OTs (see Table 6). Those experiencing this difficulty (67.4%) were less likely to understand statistical analyses and were less likely to think that research is written in a way easy to understand (see Table 7). More than half of the participants (56.2%) did not think research is written in an understandable manner. Younger OTs (<25 years old) felt the quality of evidence was more easily determined than did therapists from all other, older age groups (F [8, 86]=2.463, p<0.05).

A substantial proportion of the Dutch respondents (42.9%) reported difficulties in using evidence written in a foreign language (see Table 6). Therapists experiencing this barrier were significantly less likely to use articles from journals written in English (r=0.569, df=88, p<0.000001) and abstracts from electronic databases (r=0.511, df=82, p<0.000001) relative to OTs who did not report difficulties with evidence written in a foreign language.

Table 7. Pearson correlation coefficients between barriers to evidence-based practice

<table>
<thead>
<tr>
<th></th>
<th>1. I find it difficult to determine if evidence is of good quality</th>
<th>2. I understand the statistical analyses in research articles</th>
<th>3. Research in written in a way that is easy to understand</th>
<th>4. I am able to critically appraise research evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>0.456**</td>
<td>0.305**</td>
<td>0.483**</td>
</tr>
<tr>
<td>df</td>
<td>95</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>0.671**</td>
<td>0.520**</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>94</td>
<td>98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td>0.354**</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**p< 0.01 (results are significant at an alpha level lower than 0.01)

df = degrees of freedom (number of participants minus 2)

Work setting

Support from management (r=0.449, df=96, p<0.00001), support of OT colleagues (r=0.363, df=96, p<0.001) and support of colleagues from other disciplines (r=.359, df=95, p<.001) were all
associated with an increased perceived capability to make changes in treatments using research evidence. OTs working at academic hospitals felt the most capable of incorporating changes in therapeutic procedures based on research evidence (F [8, 89]=2.258, p<0.05). Dutch therapist feeling more capable of changing therapeutic procedures based on research evidence were more probable to have more occupational therapy colleagues within their workplace (r=0.372, df=88, p<0.001). Last, unique to this study was that perceived support of management was likely to increase the use of several (robust) sources of evidence (see Table 8).

Table 8. Pearson correlations coefficients between management support and the use of resources in practice

<table>
<thead>
<tr>
<th>Management support experienced by OTs</th>
<th>Management support experienced by OTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>df</td>
<td>df</td>
</tr>
<tr>
<td>1. Use of information obtained from in-service education to make clinical decisions</td>
<td>0.360**</td>
</tr>
<tr>
<td>df</td>
<td>86</td>
</tr>
<tr>
<td>2. Use of information from abstracts from electronic databases to make clinical decisions</td>
<td>0.409**</td>
</tr>
<tr>
<td>df</td>
<td>83</td>
</tr>
<tr>
<td>3. Use of information from scientific articles in English to make clinical decisions</td>
<td>0.402**</td>
</tr>
<tr>
<td>df</td>
<td>88</td>
</tr>
</tbody>
</table>

**p< 0.01 (results are significant at an alpha level lower than 0.01)
df = degrees of freedom (number of participants minus 2)

DISCUSSION

The results of the study provide more information about the use of evidence in clinical practice and the barriers experienced by Dutch OTs. The participants of the study were not completely representatives for the total population of interest and this cross-sectional survey only shows data concerning one point in time. However, the results do show that there still are a lot of barriers concerning EBP that require improvement. These findings are consistent with findings of studies on EBP among OTs in other countries. Although some barriers might be related specifically to the Dutch situation, there is much overlap in the barriers experienced in different international settings.

Attitude toward evidence-based practice

The positive attitude regarding EBP held by the Dutch OTs was similar to the attitudes reported in the previous studies among OTs from the UK and the United States. This positive attitude is essential before OTs will actually implement the EBP method in practice. Even if a positive attitude prevails, however, there is no guarantee that the EBP principles will be implemented because of constraints imposed by the presence of barriers.

Use of resources

Studies on the use of resources by OTs in clinical practice (including the present study) report that colleagues were used as sources of evidence at a high frequency. Colleagues are relatively easy to access. However, EBP requires information from colleagues to be evaluated
critically before being used in practice and that colleague-derived information is then complemented with information from more robust sources of evidence, such as research results published in peer-reviewed articles. The present study and a study among Australian OTs\textsuperscript{30} both found that therapists with the least experience were more likely to seek information from OT colleagues in order to make clinical decisions. Because OT programs worldwide are integrating more EBP theory in their curricula, new graduates are expected to use EBP methods and robust sources of evidence more routinely. However, a new graduate may be discouraged from pursuing the EBP principles if these principles are absent or are only partly utilized by senior colleagues. A new therapist might feel that they do not have the skills or authority to change the way of practice, or may not possess the self-confidence to do so. This illustrates the importance of the work environment in supporting the use of EBP. The least frequent source of information used by Dutch OTs to support clinical decisions in this study were the more robust sources of evidence. Descriptive comparison suggested that the American OTs\textsuperscript{11,28} used robust sources more frequently compared with the Dutch participants in the current study. A higher percentages of therapists (29% and 36.3% compared with 3% in this study) in the American studies who possessed a master's degree\textsuperscript{11,28} may be a factor explaining this difference, as having a postgraduate degree is associated with increased use of current research literature\textsuperscript{30}. This suggests that advanced education may be an important factor in increasing the use of research literature in practice.

**Barriers to implementing evidenced-based practice**

In the current study, the participants identified "determining the quality of evidence" to be the single greatest barrier preventing implementation of EBP. One American study found that 33% of the participants felt confident to appraise the quality of the evidence critically\textsuperscript{11} compared with 15.8% of the Dutch participants who perceived no difficulty in determining the quality of evidence. Again, an advanced degree or additional training may increase the skills of the Dutch OTs to determine quality of evidence seeing that Bennett et al.\textsuperscript{30} found having higher academic qualifications or previous EBP training was associated with an increased confidence in EBP skills. Determining the quality of research is an essential skill for deciding which evidence is appropriate for treatment of individual clients.

A lack of skill and limited knowledge regarding statistical and research methodologies may be factors underlying the finding that more than half of the respondents believed that research is not written in an understandable manner. Irrespective of a clinician’s aptitude related to these research skills, researchers must be critical regarding the way research reports are written and must facilitate translation of research findings to clinical practice. Describing findings in a practical context will encourage implementation of research in everyday OT practice.

The Dutch OTs who reported language as a barrier (42.9%) also were less likely to use articles written in languages other than Dutch. English is the most common publication language, so the Dutch OTs (and possibly OTs from other non-English speaking countries) must develop strategies
to collect information from research reported in English in order to obtain the widest perspective on evidence available to guide clinical decisions. To make evidence in English more accessible for non-English speaking OTs and make evidence in other languages more accessible for English speaking OTs, Ilott et al.\textsuperscript{31} suggest that evidence should be translated into the six official languages of the WHO and add comments to this for the interpretation of the evidence for specific cultures and countries\textsuperscript{31}. Language as a barrier to implementation of EBP has been noted as a factor among non-English speaking nurses\textsuperscript{15,16,20} but was not identified previously as a barrier among OTs. Although short summaries (Critically Appraised Papers and Critically Appraised Topics ) published in Dutch are available which do include results of foreign-language articles, this level of detail is not sufficient as a sole basis for making clinical decisions. One solution is for the National Occupational Therapy Associations (of non-English speaking countries) to subsidize translations and then make these translations accessible to association members.

No major barriers were found regarding the access to resources. A discrepancy, however, was found between having access to the internet (100%) and reported access to abstracts from electronic databases (90%). This may indicate a lack of knowledge about where evidence may be found and how it can be retrieved rather than a lack of access, because several electronic databases (e.g., OTseeker, Pubmed, and TRIPdatabase) provide free access to abstracts from full-text articles. Although abstracts alone are not sufficient to provide a basis for clinical decisions, this strategy provides a good overview of available evidence. It is important that OTs also have easy access to full text articles related to their area of endeavor. Dysart and Tomlin\textsuperscript{11} made a similar observation in their study among American OTs.

**Conclusion**

Evidence-based practice is essential in order to keep improving OT practice in the Netherlands, by combining the latest evidence with the therapist's experience and the client's values. Many barriers continue to exist impeding the effective use of this method of practice. Implementation of the EBP principles seems to be a global problem as many barriers are similar for OTs in different countries. Therefore, cooperation between countries might be most effective in decreasing or eliminating these barriers.
REFERENCES

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Chapter 3

A new combined strategy to implement a community occupational therapy intervention: designing a cluster randomized controlled trial

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Maud Graff
Steven Teerenstra
Eddy Adang
Ria Nijhuis-van der Sanden
Marcel Olde Rikkert
Myrra Vernooij-Dassen

ABSTRACT

Background: Even effective interventions for people with dementia and their caregivers require specific implementation efforts. A pilot study showed that the highly effective community occupational therapy in dementia (COTiD) program was not implemented optimally due to various barriers. To decrease these barriers and make implementation of the program more effective a multifaceted training package was developed. In our study we will compare the effectiveness of this multifaceted training package with the usual educational (ED) strategy.

Methods: In this cluster randomized, single-blinded, controlled trial, each cluster consists of at least two occupational therapists (OTs), a manager, and a physician working at Dutch healthcare organizations that deliver community occupational therapy. Forty-five clusters, stratified by healthcare setting (nursing home, hospital, mental health service), have been allocated randomly to either the intervention group (multifaceted training package) or the control group (ED strategy). The study population consists of the professionals included in each cluster and community-dwelling people with dementia and their caregivers. The primary outcome measures are the use of community OT, adherence of OTs to the COTiD program, and the cost effectiveness of implementing the COTiD program in outpatient care. Secondary outcome measures are patient and caregiver outcomes and knowledge of managers, physicians and OTs about the COTiD program.

Discussion: Implementation research is fairly new in the field of occupational therapy, making this a unique study. This study does not only evaluate the effects of the multifaceted training package on professionals, but also the effects of professionals’ degree of implementation on client and caregiver outcomes.
BACKGROUND
Dementia is associated with a major decrease in quality of life of clients and their caregivers due to a loss of independence, autonomy, and social participation. In addition, dementia is a major driver of costs in health care. These costs increased by 34% between 2005 and 2009. In the Netherlands, nearly 1% of people aged 65 years old suffer from dementia and 40% of people aged 90 and over. The number of dementia patients will increase substantially in the years to come. This stresses the importance of effective interventions which aim at increasing the quality of life of people with dementia and their caregivers and implementation of these interventions in practice.

Two recent pilot studies showed that strategies currently used to implement the COTiD program are not effective. It was evaluated if a post-graduate course on working with community occupational therapy in dementia (COTiD) program was sufficient in establishing implementation in practice. Although the COTiD program was proven to be an effective and cost effective intervention, only 20% of the trained OTs used the program completely or partly due to existing barriers. These findings are in agreement with previous studies reporting on the ineffectiveness of post-graduate courses and workshops with regard to the use of new knowledge in practice.

To make sure patients with dementia and their caregivers are able to receive and benefit from occupational therapy according to the COTiD program, a multifaceted training package was developed addressing the existing barriers to implementation. A multifaceted strategy was created as previous studies found this to be most effective in changing professional's behavior. The multifaceted training package exists of various strategies intended to improve OT adherence to the COTiD program, increase community OT use, and to increase managers' and physicians' knowledge and attitudes regarding the COTiD program.

The current study aims to compare the effectiveness of the multifaceted training package with the effectiveness of the usual educational (ED) strategy in increasing both OT adherence to the COTiD program and the use of community OT. In addition, the cost-effectiveness of the multifaceted training package is compared to the cost-effectiveness of the ED-strategy. In this article, the design of this cluster randomized trial is described according to the latest CONSORT guidelines of randomized controlled trials on non-pharmacological interventions.

METHODS/DESIGN
Trial design
A single blinded, cluster randomized controlled design is used to compare the effectiveness and cost-effectiveness of the two implementation strategies. An independent statistician stratified the clusters by type of setting (hospital, nursing home, and mental health services) and randomized them to either the control (educational strategy) or experimental group (the multifaceted training package) (see Figure 1). Clusters were randomized using a 2 to 1 (control vs. experimental) ratio, as it is expected that physicians in the experimental group will refer more
clients for this community occupational therapy intervention than those in the control group. This assumption implies that more clusters are needed in the control group to collect data from a sufficient number of client-caregiver couples. At the time of randomization 45 organizations agreed to participate in the study. Three research assistants blinded for group allocation collected all data. Client-caregiver couples are not aware of the group allocation of their healthcare professionals (physician and occupational therapist). A complete double blinded trial is not possible as the participating professionals are aware of the implementation strategy they received.

Participants

Healthcare professionals

A cluster consists of occupational therapists, managers, and physicians working at a healthcare setting which delivers community occupational therapy (outpatient service general hospital, outpatient treatment from nursing home & outpatient community mental health services). Clusters were preferably formed out of professionals working at the same organization. However, in several cases professionals from different organizations formed a cluster as these were the usual networks in current clinical practice. Clusters were approached between January and December of 2009 and asked to participate in the study.

Eligibility criteria for clusters were:
1. Clusters consist of at least two OTs, one physician, and one manager
2. Outpatient occupational therapy treatment is provided by the cluster
3. Each cluster is able to include at least 8 client-caregiver couples in the study
4. OTs within a cluster completed the post-graduate course on the COTiD program before the start of the study.

Client-caregiver couples

Clients with dementia and their caregiver are enrolled during the first year of the study. They are approached to participate in the study by physicians of one of the study clusters.

Eligibility criteria for client-caregiver couples:
1. The client has mild to moderate dementia (MMSE score 10-24, DSM IV criteria for dementia)
2. Clients are referred to an occupational therapist participating in the study
3. The client lives at home at the time of inclusion
4. The informal caregiver takes care of the client at least two times a week
5. The client is not diagnosed with depression (Geriatric Depression Scale 30 >12)
6. The client has no severe behavioral or psychological symptoms (BPSD)
7. The client has no severe illness preventing participation
8. The caregiver has no severe illness preventing participation
9. Both client and caregiver consent to participate
Participation of client-caregiver couples is discontinued when severe BPSD develops, the client is permanently admitted to an institution, or the client or caregiver no longer wish to participate.

Figure 1. Flow chart of the study design

Interventions

The Educational Strategy

Occupational therapists, physicians, and managers do not receive any intervention during the study period. Occupational therapists only received the basic three-day post-graduate course before the start of the study. This course provides background and theory on the COTiD program, and is mainly focused on skill training. Skills are trained by role-playing and homework assignments that involve video-taping actual OT sessions. In addition, OTs are asked to complete reading assignment between class meetings. The experimental strategy is offered to the control group after completion of the study.
The multifaceted training package

The multifaceted training package is a multifaceted strategy that, beside the post-graduate course for OTs, consists of additional interventions toward OTs and interventions toward physicians and managers:

1. Implementation training days. The training days focus on refreshing and/or increasing professional skills regarding execution of the COTiD program and skills regarding promotion of the COTiD program.

2. Coaching on the job. Coaching sessions are held to address individual problems experienced by occupational therapists regarding the implementation of the COTiD program. Between five and seven coaching sessions are scheduled depending on the OTs individual needs.

3. Regional meetings. These meetings are provided to create an opportunity for OTs to discuss practice issues with OT colleagues from the same region. Four regional meetings are organized during one year.

4. Web-based reporting system and discussion forum. An electronic reporting system was developed to guide OTs through the steps of the COTiD program. Treatment reports can be created for every client-caregiver couple. In addition, a link to a discussion platform is provided through which OTs are able to share experiences and exchange helpful resources.

5. Website and newsletters. Information on the COTiD program, its effectiveness, and cost-effectiveness is provided to physicians, managers, and OTs. The information is presented through a website and four newsletters. Information is adjusted for each group of professionals, to meet the specific needs of the group.

6. Telephone calls. Managers and physicians are contacted by phone at least once to evaluate if they have questions on the COTiD program and the implementation in practice. The goal is to provide more insight in the COTiD program and to motivate managers to facilitate the program and motivate physicians to refer clients to treatment according to the COTiD program. The ultimate goal is to increase the number of referrals to community OT.

Two OTs who are experienced teachers, have extensive experience in using the COTiD program, and are trained in motivational interviewing provide the implementation training, coaching, and organize the regional meetings.

The elements of the multifaceted training package are selected to meet the barriers found during the pilot study. To meet the need for feedback and guidance expressed by OTs in the pilot study, the two training days and coaching on the job were included. Guidance and structure in using the COTiD program is also offered by providing access to the web-based reporting system. The training days and the regional meetings are opportunities to meet colleagues and create a network, which can be used for guidance and feedback both during and after the intervention.

Both managers and physicians are part of the organizational structure in healthcare. They have an important role in the facilitation of occupational therapy. Managers of occupational therapy services need to facilitate the conditions to be able to offer OT according to the COTiD program.
Physicians are needed to get eligible clients referred to occupational therapy services. However, one of the pilot studies found that managers and physicians had a lack of knowledge about the COTiD program or even occupational therapy in general\(^7\). Therefore, strategies focused on these professionals such as the educational website, newsletters, and personal phone calls were included in the multifaceted training package.

The interventions toward managers and physicians have an educational nature. Although educational strategies are only slightly effective in changing behavior\(^6\), acquiring knowledge is essential before making a decision to change behavior or not\(^7\). Beside the educational interventions managers and physicians are motivated during the phone calls.

**Outcome measures**

Data are collected from professionals (OTs, managers, and physicians) and client-caregiver couples. Data from professionals are gathered at baseline (T0), 6 months (T1), and 12 months (T2) (Table 1). Information from client-caregiver couples is collected at baseline (T0), 3 months (T1), 6 months (T2), 9 months (T3), and 12 months (T4) (Table 2).

**Table 1. Overview of outcome measures on professional level**

<table>
<thead>
<tr>
<th>Variable</th>
<th>PO</th>
<th>SO</th>
<th>EE</th>
<th>BG</th>
<th>Instrument / Source</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
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<tbody>
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PO = primary outcome; SO = secondary outcome; EE = economic evaluation; BG = background; T0 = baseline measure; T1 = 6 month follow-up measure; T2 = 12 month follow-up measure; CAQ = COTiD Adherence Questionnaire; SPs = strategy providers; OTs = occupational therapists; MGs = managers; MDs = medical doctors * Referrals are collected in the one year period between T0 and T2.

**Primary outcome measures**

*Use of community OT* is defined as the number of clients with dementia referred to community OT according to the COTiD program (either specific or nonspecific) compared to the total number of referrals of people with dementia to community OT services. Specific referrals are those in which the name of the program is mentioned (e.g. OT according to the COTiD program). Non-specific referrals contain a referral question in which the physicians requests evaluation, therapy, or advice concerning daily activities in the home environment of the client and/or caregiver. Referrals concerning only advice regarding an aid (singular questions) are only included in the total number of referrals collected.
Table 2. Overview of client-caregiver outcome measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>SO</th>
<th>EE</th>
<th>BG</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>Problems in daily life</td>
<td>✓</td>
<td></td>
<td></td>
<td>COPM</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Depression</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>CES-D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Healthcare costs</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>RUD lite basic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Healthcare costs</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>RUD lite follow-up</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

SO = secondary outcome; EE = economic evaluation; BG = background; T0 = baseline measure; T1 = 3-month follow-up measure; T2 = 6-month follow-up measure; T3 = 9-month follow-up measure; T4 = 12-month follow-up measure; GDS = Geriatric Depression Scale; MMSE = Mini Mental State Exam; Dqol = Dementia Quality of Life Scale; AMPS = Assessment of Motor and Processing Skills; EQ-5D = EuroQol 5D; COPM = Canadian Occupational Performance Measure; IDDD = Interview for Deterioration of Daily Activities in Dementia; SCQ = Sense of Competence Questionnaire; CES-D = Center for Epidemiologic Studies Depression Scale; RUD Lite basic = Resource Utilisation in Dementia – Baseline questionnaire; RUD Lite follow-up = Resource Utilisation in Dementia – follow-up questionnaire.

Data on referrals are collected by requesting participating OTs from each cluster to send copies of all referrals concerning community OT for people with dementia and/or their caregiver to the research team.

Adherence of OTs to the COTiD program is defined as 'the degree to which OTs intent to treat clients with dementia and their caregivers according to the COTiD program'. The use of Standardized Patients (SP) can be seen as the golden standard to measure adherence, however, this is a costly method. Closed-ended questionnaires are commonly used to gather data, but are likely to evoke socially desirable answers. In addition, respondents tend to overestimate their behavior. Therefore, we will use vignettes, which seems a more valid method compared to questionnaires and more feasible than SPs. Vignettes are simulations of realistic events used to obtain participants' knowledge, attitudes, or opinions on how they would behave in a theoretical situation. Previous studies showed that vignettes provide sufficiently valid data to measure adherence. In addition, they were found to be sensitive to variation in setting and suitable for creating a sufficient case-mix.

Two vignettes were created and reviewed by an expert panel. Open-ended questions are used to avoid overestimation of adherence due to cues in the questions. The same questions were used
for both vignettes. All questions are based on quality indicators that are based on the COTiD program and defined by experts and consensus rounds of OT’s (Döpp and Graff, unpublished). In order to evaluate change in adherence over time and change between research-groups, data gained through the vignettes are quantified using a standardized scoring system. This system will assist in producing an adherence percentage between 0% (no adherence) and 100% (complete adherence). The content of the scoring system is based on quality indicators and was reviewed by an expert panel. Inter-rater reliability of the scoring system will be evaluated prior to data analysis.

As the use of vignettes is fairly new an additional closed-ended questionnaire is developed to gather data on adherence to the COTiD program. The questionnaire contains questions on the frequency OTs perform different activities. OTs are asked to rate the frequency of these activities on a five-point scale from "never" to "always". Data gathered through this questionnaire as well as data provided by the web-based system will be used for validation purposes. Both the vignettes and the closed-ended questionnaire were formatted in an electronic survey system. Participants were provided with a personal link through e-mail to get access to these questionnaires.

Secondary outcome measures on professional level

Healthcare professionals' knowledge about the COTiD program is measured using a close-ended electronic questionnaire. The focus of each questionnaire is adapted to the knowledge required for each group of professionals (OTs, managers, and physicians). The questionnaires were evaluated by an expert panel.

Secondary outcome measures on client-caregiver level

To evaluate the effect of the multifaceted training package on client-caregiver couples, treatment outcomes are measured. Table 2 shows which information is collected. Demographic information collected concerns age, marital status, education, (previous) profession, disease, disabilities, and relationship between client and caregiver. Data collection takes place at the client and/or caregivers home environment.

Sample size and power calculations

We developed a cluster randomized trial, with randomization at institute level. Adherence of OTs to the COTiD program and the use of community OT are both primary endpoints. We hypothesize that the experimental intervention will increase OT adherence to the COTiD program from 20% to 50% and increase the use of community OT from 5% to 25%. Per institute, two OTs are included and on average at least 10 clients are expected to be eligible for community OT. The Intra cluster Correlation Coefficient (ICC) of OT within institutes (with respect to adherence) and the ICC of clients within institutes (with respect to OT use) is assumed to be 0.05. Corrected for the clustering of OTs within institutes, the ‘effective’ sample size of each cluster (institute) with
respect to adherence is 1.9 OTs (\( = \frac{n}{1+(n-1) \times ICC}\), where \( n \) is the number of OTs per institute (i.e. 2) and ICC is the intra cluster correlation of OTs within an institute (i.e. 0.05)). Corrected for clustering of clients within institutes, the effective sample size of clusters with respect to community OT use is 6.8 clients (\( n = 10, \ ICC = 0.05 \)). Therefore, randomizing 30 clusters to control and 15 to intervention provides the same power for adherence as an individually randomized trial of 57 (\( = 30 \times 1.9 \)) subjects on control versus 29 (\( = 15 \times 1.9 \)) subjects on intervention, where the subjects are independent (not correlated within clusters). Thus, this cluster randomized trial provides 80% power to detect an increase from 20% to 50% in adherence. Similarly, this trial provides the same power for use of community OT as an individually randomized trial of 204 (\( = 30 \times 6.8 \)) subjects on control and 102 subjects on intervention. Thus, this cluster randomized trial provides 99% power to detect an increase from 5% to 25% in community OT use. The combined power for both endpoints then is at least \( 0.8 \times 0.99 = 79\% \).

**Informed consent and ethical approval**

In the Netherlands studies involving human subjects need to undergo a medical ethics review if they are subject to the Medical Research Involving Human Subjects Act (WMO). Studies involving completing questionnaires do not generally bring a study within the scope of this Act. To be sure the research team did submit materials to the Human Subjects Committee of the region Nijmegen/Arnhem. This committee decided that the questionnaires in our study were not too burdensome for participants including the people with dementia and their caregivers. Therefore, the study was exempt from further review by the Human Subjects Committee. All participants were requested to sign a consent form prior to data collection. Professionals and client-caregiver couples are participating voluntarily and can stop participation at any time.

**Statistical methods**

Random effects regression models will be used to evaluate differences in adherence and in use of community OT between the experimental and control group. Baseline scores will be used as covariates and type of setting and OT will be used as random factors. Differences in knowledge between professionals (occupational therapists, physicians, and managers) in the experimental and control group will be evaluated using t-tests, unless data have a substantially skewed distribution in which case non-parametric tests are used. Random effect regression models for repeated measures will be used to evaluate differences in knowledge at different times of measurement within each group and between groups. The influence of several characteristics of the professionals on their knowledge level will be evaluated using ANOVA (e.g. sex) and linear regression (e.g. age, years of professional experience).

Random effects regression models will be used for analyses of covariance of the outcome measures at client and caregiver level (AMPS process\textsuperscript{24}, IDDD performance\textsuperscript{25}, DQOL\textsuperscript{26}, SCQ\textsuperscript{27}, EQ-5 D\textsuperscript{28} at 6 and 12 months (see Table 2)) based on an intention-to-treat analysis of all available data. Treatment differences between baseline and 6 months and baseline and 12 months will be
computed by analysis of covariance, with age, sex, relation to patient, and baseline scores on the co-morbidity, MMSE scores, GDS scores, and outcome variable at baseline as covariates. For all tests significance will be tested using two-sided tests with an alpha level of 0.05.

**Economic evaluation**
One of the primary questions of this study concerns the difference in cost-effectiveness between the multifaceted training package and the ED-strategy strategy regarding adherence of OTs to the COTiD program. Secondary, the study is designed to evaluate the difference in cost-effectiveness between the implementation strategies with regard to the quality of life of clients with dementia and their caregiver. To evaluate these questions an economic evaluation will be executed from a societal viewpoint. This implies that both costs within and outside the healthcare system, are included in the evaluations\(^{29,30}\).

**Costs**
Table 3 displays data collected on costs of the implementation strategies. All costs made for the execution and development of the two strategies are registered. Developmental costs are calculated using the annuitization procedure\(^{29}\). Because of the unbalanced design (more clusters are randomly assigned to the control group) the calculation of costs will not be protocol driven. This prevents differences in costs between groups due to an unequal number of OTs, physicians, managers and/or clients.

Healthcare costs made by client-caregiver couples are collected using the Lite version of the resource utilization in dementia instrument (RUD Lite)\(^{31}\). The RUD Lite is used every 3 months during a one year period. Data on both the caregiver and client are provided by the informal caregiver. Caregivers are asked to provide information about the preceding month as retrieving information over a longer period is often unreliable. An algorithm will be used to get a reliable estimate for the total period of three months. If available, market prices are used to calculate costs. If these are not available standard cost-prices are used as identified in the Dutch manual for costs in economic evaluations\(^{32}\).

**Cost-effectiveness and cost-utility analysis**
In order to evaluate the cost-effectiveness of the two implementation strategies regarding OT adherence to the COTiD program, incremental cost-effectiveness ratios are determined expressed as cost per extra percentage adherence.

The cost-utility with regard to the treatment effects of the two implementation strategies is evaluated by determining incremental cost-utility ratios. These are expressed as cost per patient quality adjusted life year (QALY) gained and cost per caregiver QALY gained. QALYs are calculated using the scores on the EQ-5 D\(^{28}\). The EQ-5 D scores are converted to QALYs using the EQ-5 D health tariffs for the Dutch population\(^{33}\). For both analyses parametric uncertainty is handled by presenting acceptability curves resulting from bootstrap replications on the original sample.
Deterministic uncertainty is covered by sensitivity analyses on the range of extremes of uncertain parameters.  

Table 3. Cost data collected on the implementation strategies

<table>
<thead>
<tr>
<th>Costs / Time</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Occupational Therapists (OTs)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spend on post-graduate course</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spend on the implementation training</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on coaching on the job</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on regional meetings</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Physicians</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spend on reading newsletters</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on reading on the website</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on motivational phone calls</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Managers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spend on reading newsletters</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on reading on the website</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Time spend on motivational phone calls</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Development &amp; execution</strong> *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-graduate course - developmental &amp; execution costs</td>
<td></td>
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<tr>
<td>Implementation training - developmental &amp; execution costs</td>
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</tr>
<tr>
<td>Regional meetings - developmental &amp; execution costs</td>
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<td></td>
</tr>
<tr>
<td>Coaching on the job - developmental &amp; execution costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web-based system – developmental costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COTID-program website - developmental costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newsletters - preparation costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivational phone calls - preparation &amp; execution costs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T0 = baseline measure; T1 = 6 month follow-up measure; T2 = 12 month follow-up measure / * All development and execution costs are registered throughout the entire study period

Process evaluation

The process evaluation is executed to explain the success or failure of the multifaceted training package. In order to answer this overall question we evaluate (1) the exposure of healthcare professionals to the multifaceted training package and (2) identify factors for success and failure of the multifaceted training package as identified by the healthcare professionals.

**Exposure to the multifaceted training package**

Actual exposure of healthcare professionals to the multifaceted training package is evaluated using a variety of methods. Attendance and exposure to all parts of the multifaceted training package is registered for each healthcare professional. The characteristics of all interventions (e.g. frequencies, duration, medium, content etc.) were registered on recording forms. The research team has unlimited access to the web-based-system and discussion platform to collect data on the frequencies these systems are used. Exposure to the website and newsletters was evaluated using a close-ended questionnaire. This questionnaire addresses the frequency participants visited the educational website and the number of newsletters read.
Actions undertaken by the research team regarding both the multifaceted training package and the research process are registered in a research log.

**Factors of success and failure of the multifaceted training package**

Factors for success and failure as experienced by the healthcare professionals will be identified using qualitative methods. OTs are asked to participate in a focus group discussion. Two focus groups are organized with each between 8 and 12 participants. All OTs from the experimental group will be requested to participate to make sure there are enough OTs participating in the focus groups.

Ten managers and 15 physicians will be asked to participate in a telephone interview. Participants will be selected using purposive sampling to create a balanced mixture of professionals based on setting, age, knowledge, and referral rates. A topic list will be used to guide the focus groups and interviews. Both will be audio taped (after consent) and written out verbatim. The data are analyzed with Atlas.ti.

**DISCUSSION**

**Strengths**

Implementation research is fairly new in the field of occupational therapy, making this a unique study. The strength of this implementation study is that not only a thorough evaluation is executed on the effects of the multifaceted training package on professional practice, but that the effects on client and caregiver treatment outcomes are evaluated as well. Creating change in client-caregiver outcomes is most important as change solely on a professional level does not necessarily improve healthcare.

**Limitations**

The multifaceted training package is a multifaceted strategy as previous literature shows that combining two or more strategies is most effective. Because more than one strategy is used the results of this study will only show the effect of the entire package of strategies offered. We will not be able to tell in a quantitative way which strategy was more effective than another strategy. We do try to evaluate this using interviews and focus group discussion with participating professionals.
REFERENCES


A new combined strategy to implement a community occupational therapy intervention


Chapter 4

Effectiveness of a multifaceted training package on physicians' referral behavior to an evidence-based psychosocial intervention in dementia: a cluster randomized controlled trial

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Maud Graff
Steven Teerenstra
Ria Nijhuis-van der Sanden
Marcel Olde Rikkert
Myrra Vernooij-Dassen

BMC Family Practice 2013; 14:70.
ABSTRACT

Objective: To evaluate the effectiveness of a multifaceted training package on physicians' referral rate and knowledge on the community occupational therapy in dementia program (COTiD program).

Methods: A cluster randomized controlled trial with 28 experimental and 17 control clusters was conducted. Clusters included a minimum of one physician, one manager, and two occupational therapists. In the control group physicians and managers received no interventions and occupational therapists received a postgraduate course. In the experimental group physicians and managers had access to a website, received newsletters, and were approached by telephone and physicians were offered one outreach visit. In the experimental group occupational therapists received the postgraduate course, training days, outreach visits, regional meetings, and access to a reporting system. Main outcome measure was the number of COTiD referrals received by each cluster which was assessed at 6 and 12 months after the start of the intervention. Referrals were included from both participating physicians (enrolled in the study and received either the control or experimental intervention) and non-participating physicians (not enrolled but of whom referrals were received by participating occupational therapists). Mixed model analyses were used to analyze the data. All analyses were based on the principle of intention-to-treat.

Results: At 12 months experimental clusters received significantly more referrals with an average of 5.24 referrals (SD 5.75) to the COTiD program compared to 2.07 referrals in the control group (SD 5.14). The effect size at 12 months was 0.58. Although no difference in referral rate was found for the physicians participating in the study, the number of referrals from non-participating physicians (t = -2.55/43/0.02) differed significantly at 12 months.

Conclusion: Passive dissemination strategies are less likely to result in changes in professional behavior. The amount of physicians exposed to active strategies was limited. In spite of this we found a significant difference in the number of referrals which was accounted for by more referrals of non-participating physicians in the experimental clusters. We hypothesize that the increase in referrals was caused by an increase in occupational therapists' efforts to promote their services within their network.
INTRODUCTION

In 2040 the number of people with dementia is expected to be 81.1 million worldwide\(^1\). In the Netherlands 70% of these people live in the community\(^2\). Several psychosocial interventions have proven to be effective in increasing the quality of life of people with dementia and/or their caregivers\(^3\)\^-\(^12\). Implementation of these interventions is necessary to improve the quality of health care. Physicians have an important role in the implementation of these interventions as they serve as gatekeepers that provide people with access to other healthcare services. In spite of growing attention for implementation in the area of psychosocial interventions for people with dementia\(^13\)\^-\(^14\) no studies have evaluated the effect of implementation strategies on physicians' referral behavior regarding psychosocial interventions for people with dementia living in the community.

The community occupational therapy in dementia (COTiD) program is an example of a psychosocial intervention. COTiD is a client-centered and family-based intervention that consists of 10 one-hour sessions in the clients' home environment\(^15\). The intervention aims to increase or maintain functional independence, social participation, and quality of life of both the person with dementia and the caregiver\(^15\). The program was proven to be (cost) effective in improving the clients' daily functioning and in improving the quality of life, general health, and mood of both the client and caregiver. In addition, a significant increase in caregivers' sense of competence was found\(^6\)\^-\(^6\),\(^16\). In spite of these positive effects, only 20% of the occupational therapists educated in using the program utilized it in clinical practice\(^17\). One of the main barriers was a lack of referrals due to insufficient knowledge of physicians about the COTiD program, not experiencing psychosocial interventions to be part of their frame of reference, and experiencing a lack of contact with occupational therapists in their network\(^17\). The lack of referrals and therewith the lack of experience resulted in a low feeling of competence of the occupational therapists\(^17\). These barriers were used as a basis to create an implementation strategy aimed to decrease these barriers and increase the utilization of the COTiD program in clinical practice.

Multifaceted implementation strategies are more likely to result in change in professional behavior compared to educational strategies\(^18\)\^-\(^22\). As physicians, managers, and occupational therapists are responsible for care delivery according to the COTiD program we developed a multifaceted training package that targets these professionals. The overall aim of the package was to increase the number of referrals to this intervention and to increase occupational therapists' adherence to the program. This paper reports on the results of a cluster randomized controlled trial regarding the effect of the multifaceted training package on the number of referrals of people with dementia to occupational therapy according to the COTiD program per cluster and on physicians' knowledge of the COTiD program. Effects of the implementation strategy on occupational therapists' knowledge and adherence, managers knowledge, client and caregiver treatment outcomes, and cost-effectiveness will be reported elsewhere. This article is written according to the latest CONSORT guidelines of randomized controlled trials.
METHODS
Design and participants
A single blinded cluster randomized controlled study with 45 clusters was conducted between January 2009 and December 2011. A cluster was defined as a functional unit delivering outpatient occupational therapy services. The eligibility criteria for clusters was that for each cluster at least one physician, one manager, and two occupational therapists were able to participate in the study. In order to prevent contamination, each professional was only allowed to participated in one cluster. Clusters were recruited between January and October 2009 from hospitals, nursing homes, and mental health services that delivered community occupational therapy in one of three regions in the Netherlands (Nijmegen, Amsterdam, and Rotterdam). Occupational therapists were required to complete a post-graduate course on the COTiD program prior to the study. No specific type of physician was targeted, however we only included physicians who reported they were able to include at least eight clients-caregiver couples eligible for the COTiD program (people with mild to moderate dementia living at home and their caregiver). Last, we only included managers that were responsible for directly or indirectly facilitating occupational therapy at home for people with dementia. Eligibility of clusters was checked by two research assistants. Eligible clusters were stratified by type of setting and randomly assigned to the control or experimental group in a 2:1 ratio by an independent statistician. This ratio was chosen because of data collection at client and caregiver level. It was expected that we needed twice as much control clusters to recruit a sufficient amount of client and caregiver couples in this group. The following criteria were used for the inclusion of client and caregiver couples: 1) the client needed to be diagnosed with mild or moderate dementia (MMSE 10 – 24), 2) the client was not diagnosed with depression or severe behavioral problems as judged by the referring physician, 3) the client needed to live in the community, and 4) the client had a caregiver that provided care at least twice a week. More comprehensive information on the methods used to evaluate client an caregiver outcomes are reported elsewhere. All participants were requested to complete a consent form.

Interventions
Control group
Physicians and managers did not receive any intervention. Occupational therapists received a 3-day post-graduate course, mainly consisting of lectures, discussions on the content of the COTiD program, and homework assignments including reading and one practical assignment.

Experimental group
The multifaceted training package targeted physicians, managers, and occupational therapists involved in the delivery of care to people with dementia and their caregiver living in the community. The complete package is described in a previous publication. The role of the physicians is to refer eligible patients to the COTiD program for which awareness and knowledge is necessary. Managers regulate the supply and demand of occupational therapy care and need
to facilitate this service. For this purpose sufficient knowledge on the COTiD program is necessary. To increase knowledge and awareness physicians and managers were provided with access to an educational website and were sent four newsletters. In addition, physicians were contacted by phone at least once and were offered an outreach visit in which the COTiD program was more thoroughly explained. As collaboration between professionals may enhance implementation occupational therapists were offered two training days and five to seven outreach visits in which extensive time was spend on improving occupational therapists skills in promoting the COTID program among physicians and their skills in working together with their network. All interventions were offered during a one-year period.

**Measurement instruments**

**Referral rate – primary outcome**

Data on referrals were collected at cluster level. Occupational therapists sent depersonalized copies of all community occupational therapy referrals of people with dementia to the research team. Referrals were included from both participating and non-participating physicians. We defined participating physicians as those physicians that were enrolled in the study and received either the control or experimental intervention. Non-participating physicians were those physicians that were not enrolled but of whom referrals were received by the participating OTs. Referrals were included in the analysis if they referred to community occupational therapy and it concerned a person diagnosed with dementia. For each referral information was collected on the date of birth, gender, diagnosis, and MMSE score of the client. In addition, data were collected on the date of referral, the referral question, and on the type of physician. During the study period reminders were sent to all participating occupational therapists. Referrals were categorized as referring to the COTiD program or not referring to the COTiD program. Referrals to the COTiD program needed to specifically mention the program or needed to specify that therapy or advice was requested regarding daily activities in the home environment of the client and caregiver. Referrals that did not meet these criteria were categorized as "not referring to the COTiD program". Referrals were categorized independently by two of the authors (CD, MG). One of the assessors (MG) was blinded for group allocation. Results were compared and discussed until 100% consensus was reached.

**Knowledge of physicians on the COTiD program – secondary outcome**

An electronic close-ended questionnaire was developed to assess physicians' knowledge of the COTiD program. A personal link to the questionnaire was provided by email at baseline and at 6 and 12 months follow-up. The questionnaire consisted of eight questions. The first question included eight short case descriptions for which physicians needed to indicate if the clients in these descriptions were eligible for treatment according to the COTiD program. Additional questions related to physicians' knowledge of the effectiveness, cost-effectiveness, and general content of the COTiD program. The remaining questions concerned the reimbursement of the
COTiD program, facilitation of the program in clinical practice, and the effectiveness of pharmacological versus non-pharmacological interventions. Face validity was obtained during an expert panel meeting with expert occupational therapists. The score range per question is displayed in Table 2. Higher knowledge scores indicate greater knowledge.

Blinding
The study was single blinded: the research assistant who acquired the data (IM) was blinded for group allocation. It was not possible to blind professionals for group allocation.

Sample size
An average of 30 patients per year per institute was expected to be available for referral to community occupational therapy services based on statements of physicians of different settings (25 patients per year in nursing homes, 35 patients per year in general hospitals, and 25 patients per year in mental health services). Furthermore, the availability of two occupational therapists per institute is reasonable. We decided to recruit 30 control clusters and 15 experimental clusters on the base of the following reasoning. Given an ICC of 0.20, the effective sample size per cluster is (cluster size)/design effect=30/6.8= 4.5. Thus the effective sample size of experimental clusters is 68 versus 135 in the control clusters. This produces a power of 97% to detect a difference of 0.25 versus 0.05 for the number of referrals.

Data analysis
Baseline characteristic of occupational therapists, physicians, and managers between groups were compared using t-tests for parametric data and chi-square tests for non-parametric data. A two-sided significance level of 0.05 was used for all statistical tests.

Referral rate – primary outcome
Chi-square tests were executed to assess the difference between groups regarding the number of clusters that did not receive any referrals. Mixed model analysis was used to evaluate the difference between groups regarding the number of referrals to the COTiD program. The mixed model accounted for clustering of times of measurement and for the interaction between time of measurement and the type of implementation strategy. The effect size was calculated using Cohen’s d. Covariate analyses using multilevel analyses were conducted to uncover factors that had the most influence on the number of COTiD referrals. Based on the research teams’ expectations of their possible influence on the referral rate six covariates were used for further analysis. As referrals were measured at the cluster level we were only able to include covariates that were also measured at the cluster level. Covariates were: the number of participating physicians, managers, and occupational therapists in each cluster, whether or not occupational therapists in one cluster worked at the same organization, the mean number of coaching sessions received by each cluster, and the type of organization. To
prevent overfitting the number of variables in the model needed to be limited to nine. Four variables were already included in the basic model to account for clustering of times of measurement and interaction between time of measurement and the type of implementation strategy. Therefore we were only able to include an additional five (out of six) covariates. To select the model(s) with the best fit, 15 sets of eight or nine variables were prepared. The fit of these models was compared based on the information criteria (IC) (-2 log likelihood).

**Physicians knowledge – secondary outcome**
Differences between groups regarding physicians’ knowledge on the COTiD program were analyzed using mixed model analyses. Clustering of professionals and the interactions between time of measurement and type of implementation strategy were taken into account as fixed effects. Each question on the questionnaire was analyzed separately.

**Ethical approval**
The research team submitted materials to the Human Subjects Committee of the region Nijmegen/Arnhem. This committee decided that further evaluation by the committee was not required as the data reported in this manuscript was collected from healthy healthcare professionals using low burden questionnaires. Prior to data collection all participants were asked to complete a consent form.

**RESULTS**
**Baseline characteristics**
The required 45 clusters were recruited. A total of 80 physicians, 48 managers, and 94 occupational therapists participated at baseline. Cluster characteristics and the flow of participants through the trial are displayed in Figure 1. Baseline characteristics of physicians and occupational therapists (Table 1) showed no significant differences between groups. Physicians were either general practitioners or medical specialists. Medical specialists included geriatricians, neurologists, and nursing home physicians. At baseline only a significant difference was found in the average working experience of managers, which was twice as much in the control group (13.8 SD 8.96 versus 7.7 SD 3.8). Blinding was revealed for four clusters of which one control cluster and three experimental clusters.
Figure 1. Flow of participants through the trial (OT=occupational therapist; MD = physician)

Assessed for eligibility: **143 clusters**
- not eligible/refuse participation: **98 clusters**
  - 28 clusters did not meet inclusion criteria
  - 70 clusters refused to participate

Stratified: **45 clusters**
- (94 OTs / 80 MDs / 48 managers)

Randomized (45 clusters)
- 30 nursing homes
- 13 hospitals
- 2 mental health services

Control group (28 clusters: 8 hospitals, 19 nursing homes, 1 mental health service)
- Average cluster = 2.07 OTs (range 1-3), 1.54 MD (range 1-6), 1 manager (range 0-2)
- **Total number of participants:** 58 OTs / 44 MDs / 28 managers

Experimental group (17 clusters: 5 hospitals, 11 nursing homes, 1 mental health service)
- Average cluster size = 2.12 OTs (range 1-3), 2.18 MD (range 1-6), 1.18 manager (range 0-4)
- **Total number of participants:** 36 OTs / 36 MDs / 20 managers

Lost to follow up (6 months)
- 1 OT: job change
- 1 MD: late response to participate in the study

**Professionals added:**
- 1 OT; added:
  - to participate in the study

**New cluster demographics:**
- 28 clusters, 57 OTs (range 1-3), 44 MDs (range 1-6), 28 managers (range 0-2)

Lost to follow up (12 months)
- 1 cluster; drop-out of OTs and MD
- 3 OTs; high workload (2), job change (1)
- 4 MD; difficulty including patients (1); high workload (1); job role modification (1); unknown (1)

**Added professionals:**
- 1 MD: job role modification of previous participant

**New cluster demographics:**
- 27 clusters, 54 OTs (range 1-3), 41 MDs (range 1-6), 28 managers (range 0-2)

Analyzed – intention to treat
- 28 clusters

Lost to follow up (6 months)
- 2 OTs; job change (1), management decision (1)
- 4 MDs; job role modification (2), high workload (2)
- 2 manager; job change (2)

**Professionals added:**
- 2 MDs; replacement for MDs lost,
  - 1 manager; replacement for manager lost

**New cluster demographics:**
- 17 clusters, 34 OTs (range 1-3), 34 MD (range 1-6), 19 manager (0-4)

Lost to follow up (12 months)
- 0 clusters 1 OT; illness
- 2 MDs; job role modification (1); high work load (1)
- 2 managers; job change (2)

**Added professionals:**
- 1 MD; replacement for MD lost to follow-up
- 2 managers; replacement for managers lost to follow-up (2)

**New cluster demographics:**
- 17 clusters, 33 OTs (range 1-3), 33 MDs (range 1-6), 19 manager (0-4)

Analyzed – intention to treat
- 17 clusters
Effectiveness of a multifaceted training package on physicians’ referral behavior

Table 1. Baseline characteristics of participating physicians and occupational therapists

<table>
<thead>
<tr>
<th>Physicians</th>
<th>Experimental group</th>
<th>Control group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of physician</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General practitioner, n (%)</td>
<td>11 (30.6%)</td>
<td>13 (29.5%)</td>
<td>0.92</td>
</tr>
<tr>
<td>Medical specialist, n (%)</td>
<td>25 (69.4%)</td>
<td>31 (70.5%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>49.7 (7.5) (n=29)</td>
<td>48.6 (8.0) (n=38)</td>
<td>0.60</td>
</tr>
<tr>
<td>Range</td>
<td>36-63</td>
<td>26-61</td>
<td></td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>17 (47.2%)</td>
<td>17 (38.6%)</td>
<td>0.44</td>
</tr>
<tr>
<td>Active as MD (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>22.0 (7.1) (n=27)</td>
<td>20.74 (7.1) (n=35)</td>
<td>0.50</td>
</tr>
<tr>
<td>Range</td>
<td>10-34</td>
<td>6-35</td>
<td></td>
</tr>
<tr>
<td>Experience dementia (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>17.1 (6.6) (n=27)</td>
<td>17.2 (7.1) (n=33)</td>
<td>0.98</td>
</tr>
<tr>
<td>Range</td>
<td>5-30</td>
<td>5-31</td>
<td></td>
</tr>
<tr>
<td>Specialization in geriatrics, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>11.8 (7.4) (n=32)</td>
<td>11.6 (7.7) (n=41)</td>
<td>0.94</td>
</tr>
<tr>
<td>Range</td>
<td>3-24</td>
<td>1-26</td>
<td></td>
</tr>
</tbody>
</table>

Occupational therapist (OT)

| Age (years) |                     |               |         |
| Mean (SD) | 38.5 (10.7) (n=36) | 35.8 (9.9) (n=54) | 0.23 |
| Range | 22-58 | 22-57 | |
| Women, n (%) | 36 (100%) | 54 (93.1%) | 0.11 |
| Qualified (years), mean (SD) |                     |               |         |
| Mean (SD) | 13.7 (8.9) (n=34) | 13.4 (10.1) (n=44) | 0.90 |
| Active as OT (years), mean (SD) |                     |               |         |
| Mean (SD) | 13.7 (8.5) (n=35) | 13.2 (9.4) (n=44) | 0.96 |
| Range | 1-120 | 1-101 | |
| Post-graduate completed (months) |                     |               |         |
| Mean (SD) | 13.0 (21.8) (n=34) | 13.7 (23.1) (n=43) | 0.90 |
| Experience dementia (years), mean (SD) |                     |               |         |
| Mean (SD) | 7.5 (6.2) (n=35) | 7.8 (7.1) (n=43) | 0.81 |
| Cases according to COTiD, n (%) |                     |               |         |
| 0 | 8 (22.9%) | 12 (27.3%) | 0.25 |
| 1-5 | 21 (60%) | 29 (65.9%) | |
| 6-10 | 3 (8.6%) | 3 (6.8%) | |
| 11-15 | 3 (8.6%) | 0 (0%) | |
| 16-20 | 0 (0%) | 0 (0%) | |
| More than 20 | 0 (0%) | 0 (0%) | |

Referral rate

During a one-year period 411 referrals of people with dementia to occupational therapy services were collected. Based on the eligibility criteria 307 referrals were included in the analysis of which 111 of the control group and 196 of the experimental group. The number of referrals per cluster ranged from 0 to 17 in the control group and from 0 to 13 in the experimental group. Referrals were categorized independently by two researchers resulting in an initial inter-rater agreement of 94.5%. After discussion 100% consensus was reached.

Number of clusters receiving referrals

The number of clusters that did not receive any referrals to community occupational therapy services was significantly higher in the control group at both 6 months ($\chi^2 = 9.27; 1; p = .002$) and
12 months ($\chi^2 9.94; 1; p=.002$). At 12 months 16 (57.1%) of the control clusters still did not receive any community occupational therapy referrals compared to none of the experimental clusters.

**Number of COTiD referrals**
At 6 months there was no significant difference between the number of COTiD referrals between groups (difference in change from baseline to 6 months: 1.2, 95%-CI from -1.42 to 3.90). However, at 12 months the mean number of COTiD referrals per cluster was significantly higher in the experimental group (difference in change from baseline to 12 months: 3.2, 95%-CI from 0.50 to 5.8) with an average of 2.07 referrals (SD 5.14) in the control group and 5.24 referrals (SD 5.75) in the experimental group. The effect size at 12 months was 0.58 which is considered a medium effect. Covariate analysis showed that none of the models was better than the basic model. This means that none of the covariates included had a significant influence on the number of COTiD referrals.

**Participating versus non-participating physicians**
As referrals were analyzed per cluster, referrals of both physicians participating in the study and those of non-participating physicians were collected. We therefore conducted an additional analysis to evaluate the difference between groups regarding the number of referrals of participating physicians and regarding the number of referrals from non-participating physicians. This analysis showed that there was no difference between groups in referrals from participating physicians at 12 months ($t$ -1.27/43/0.21). However, there was a significant difference at 12 months regarding the number of referrals from non-participating physicians ($t$ -2.55/43/0.02) with more referrals of non-participating physicians in the experimental group.

**Knowledge of the COTiD program**
The response to the knowledge questionnaire was 52.5% (42/80) at baseline, 67.9% (53/78) at 6 months, and 59.5% (44/74) at 12 months. The number of non-responders was significantly higher in the control group at 6 months ($\chi^2 5.08; 1; p = .024$). Overall knowledge of most subjects was moderate. Knowledge on the cost-effectiveness of the COTiD program was low in both groups (Table 2). No significant differences between groups were found regarding physicians’ knowledge on the COTiD program at 6 and 12 months follow-up (Table 3).
Table 2. Mean scores and group differences regarding physicians' knowledge on the COTiD program

<table>
<thead>
<tr>
<th>Score range</th>
<th>Baseline</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental Mean (SD)</td>
<td>Control Mean (SD)</td>
<td>Group Diff</td>
</tr>
<tr>
<td>1 - Eligibility of clients</td>
<td>0-8</td>
<td>5.65 (1.12)</td>
<td>5.92 (1.08)</td>
</tr>
<tr>
<td>2 - Effect on client</td>
<td>0-9</td>
<td>4.35 (2.09)</td>
<td>4.52 (1.78)</td>
</tr>
<tr>
<td>3 - Effect on caregiver</td>
<td>0-9</td>
<td>4.24 (1.95)</td>
<td>5.28 (2.05)</td>
</tr>
<tr>
<td>4 - General content</td>
<td>0-4</td>
<td>2.53 (0.87)</td>
<td>3.08 (0.86)</td>
</tr>
<tr>
<td>5 - Pharmacological vs. non-pharmacological</td>
<td>0-4</td>
<td>2.24 (1.09)</td>
<td>2.00 (1.12)</td>
</tr>
<tr>
<td>6 - Facilitation</td>
<td>0-3</td>
<td>2.06 (0.90)</td>
<td>2.36 (0.70)</td>
</tr>
<tr>
<td>7 - Cost-effect</td>
<td>0-3</td>
<td>0.0 (0.0)</td>
<td>0.04 (0.20)</td>
</tr>
<tr>
<td>8 - Reimbursement</td>
<td>0-5</td>
<td>3.88 (1.45)</td>
<td>3.54 (1.33)</td>
</tr>
</tbody>
</table>

Table 3. Results of the multivariate analyses regarding the difference in physicians' knowledge per question

<table>
<thead>
<tr>
<th>Question</th>
<th>Difference between group in change from baseline to 6 months</th>
<th>Difference between groups in change from baseline to 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>95% Confidence Interval</td>
</tr>
<tr>
<td>1 - Eligibility of clients</td>
<td>0.35</td>
<td>-0.37 to 1.08</td>
</tr>
<tr>
<td>2 - Effect on client</td>
<td>-0.37</td>
<td>-1.25 to 0.52</td>
</tr>
<tr>
<td>3 - Effect on caregiver</td>
<td>-0.53</td>
<td>-1.69 to 0.63</td>
</tr>
<tr>
<td>4 - General content</td>
<td>-0.12</td>
<td>-1.42 to 1.18</td>
</tr>
<tr>
<td>5 - Pharmacological vs. non-pharmacological</td>
<td>-0.27</td>
<td>-0.79 to 0.26</td>
</tr>
<tr>
<td>6 - Facilitation</td>
<td>0.03</td>
<td>-0.42 to 0.48</td>
</tr>
<tr>
<td>7 - Cost-effect</td>
<td>0.05</td>
<td>-0.12 to 0.22</td>
</tr>
<tr>
<td>8 - Reimbursement</td>
<td>0.77</td>
<td>-0.21 to 1.75</td>
</tr>
</tbody>
</table>
Exposure of physicians to the multifaceted training package

A total of 11 physicians dropped out of the study (see Figure 1). Their replacements were requested to participate in the study. Those in the experimental group were provided with newsletters sent prior to their participation and with the link to the educational website. More than half (67.5%) of the physicians in the experimental group were contacted by phone. However, almost a third of the physicians could not be reached (including physicians that dropped out) even after multiple attempts during a one-year period. The mean time spent on telephone contact with those physicians that could be reached was 15.15 minutes (SD 6.98). Six of the 36 physicians contacted by phone agreed to meet with the interventionist and the clusters’ occupational therapist to discuss the COTiD program in person. Additional data on exposure to the implementation strategy are displayed in Table 4. Analysis showed no relation between exposure to the different interventions and the number of COTiD referrals.

Table 4. Exposure of physicians in the experimental group to the multifaceted training package

<table>
<thead>
<tr>
<th>Nr of telephone calls, M (SD)</th>
<th>Frequency</th>
<th>Percentage</th>
<th>n</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 times, n (%)</td>
<td>13 (0.93)</td>
<td>32.5%</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>1 time, n (%)</td>
<td>12</td>
<td>30%</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>2 times, n (%)</td>
<td>13</td>
<td>32.5%</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>3 times, n (%)</td>
<td>2</td>
<td>5%</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time per telephone call, M (SD)</th>
<th>Frequency</th>
<th>Percentage</th>
<th>n</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visited website ≥ 1 n (%)</td>
<td>10.23 (9.17)</td>
<td>60%</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Read ≥ 1 newsletters n (%)</td>
<td>23</td>
<td>92%</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Physicians visited by the interventionist n (%)</td>
<td>6</td>
<td>15%</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

DISCUSSION

The results show that our experimental multifaceted training package is more effective in increasing the number of referrals to occupational therapy according to the COTiD program compared to the standard post-graduate course that only focused on occupational therapists. In spite of the large and increasing amount of community dwelling people with dementia cared for by informal caregivers, the number of referrals was still relatively low in both groups and needs further attention. No differences between groups were found regarding physicians knowledge of the COTiD program.

A review on outpatient referral behavior\textsuperscript{25} and findings of the general implementation literature\textsuperscript{20,26,27} state that passive dissemination strategies are less likely to result in changes in professional behavior. Although we offered both passive and active strategies only a limited amount of physicians was exposed to the active strategies. In spite of this we found a significant difference in the number of referrals. This may be explained by the subgroup analysis that showed that this significant increase in the number of referrals was not the effect of the
Interventions aimed at the participating physicians but was fully accounted for by more referrals of the non-participating physicians in the experimental clusters compared to the non-participating physicians in the control clusters. Also, we did not find a significant difference between groups regarding physicians' knowledge which was only moderate in both groups. We hypothesize that our efforts to increase occupational therapists' skills to promote community occupational therapy services were the effective component of the experimental strategy. Although we did not record the actions undertaken by the occupational therapists to promote the COTiD program, it is likely that occupational therapists in the experimental group put more effort into promoting occupational therapy within their network. Zwarenstein et al. (2009) report that better and more intensive inter-professional collaboration may positively affect healthcare outcomes\textsuperscript{24}. In other words, further improvement of the collaboration between physicians and occupational therapists may lead to an increase in the amount and appropriateness of referrals and therewith clients' access to community occupational therapy services.

**Strengths and limitations**

In spite of the importance of referral behavior for implementation of effective interventions only few studies evaluated the effect of implementation strategies on physicians' outpatient referral behavior\textsuperscript{25}. Our study contributes to this limited knowledge on effective strategies to change referral behavior. As we evaluated a multifaceted strategy and due to the chosen study design we cannot state with certainty which component(s) of the strategy caused the increased referral rate in the experimental group. Further process analysis is recommended to explain the study results by evaluating physicians, managers, and occupational therapists' experiences.

The lack of effect regarding physicians' knowledge could be the result of our recruitment method. To convince physicians to participate in the study we used publications on the effect of the COTiD program. In addition, this recruitment method may have led to a limited feeling of necessity to receive additional information through the website, newsletters, telephone calls and outreach visits. Last, the difficulty to reach physicians suggests that barriers exist that relate to the attitude of the physician regarding psychosocial interventions such as the COTiD program and/or practical barriers such as workload pressure.

For data collection on the number of referrals we relied on the participating occupational therapists. Therefore it is likely that we missed data. However, to decrease the amount of missing data we sent occupational therapists of both groups several reminders. Physicians' knowledge on the COTiD program was based on a close-ended questionnaire. Face validity was established using an expert panel, but reliability of the questionnaire was not assessed. At six months there was a significant difference in the response rate to this knowledge questionnaire which may have caused bias. During the study several physicians changed jobs or their role within the organization changed. Although their replacements received access to the website and were provided with the previously sent newsletters, they had less time to change their referral behavior. However, these situations occur in daily practice and the results therefore show the
actual benefit of the implementation strategy in clinical practice. Patient characteristics may have influenced whether or not physicians referred people to occupational therapy, however our analysis did not allow to correct for these type of characteristics as they were not at the cluster level.

The multifaceted training package aimed to stimulate occupational therapists to promote the COTiD program. Although this may have contributed to the increased number of referrals a more direct approach to stimulate collaboration may result in even better outcomes. Several studies showed that including an inter-professional training component was successful in improving care (e.g. \textsuperscript{28}) or in improving inter-professional attitudes and self-reported team skills \textsuperscript{29}.

**Implications**

Psychosocial interventions have shown to have positive effects and the use of these interventions in dementia care are included in European dementia guidelines \textsuperscript{30} including two Dutch guidelines\textsuperscript{31,32}. Physicians serve as gatekeepers and are in the position to provide clients and caregivers with access to psychosocial services using referrals. Increasing the number of referrals to evidence-based psychosocial interventions is a first step to implementation. Our study showed that the number of referrals can be improved using a multi-professional approach. The results suggest that the use of passive dissemination strategies such as websites and newsletters were not effective, but that encouraging occupational therapists to promote their services within their network did contribute to the increased number of referrals. Establishing close inter-professional collaboration within the professionals' network may further increase the number of referrals. We therefore encourage physicians and clinicians providing psychosocial interventions to more actively collaborate in order to gain a better understanding of each other's services and improve clients' access to care. Healthcare managers have an important task in facilitating this collaboration.

As there are still a limited number of studies, future studies to implementation of evidence-based psychosocial interventions should include referral behavior as an outcome measure. Although we only included the number of referrals the quality of referrals is an important aspect as well that should be considered in future research. As different interventions and professionals come with different barriers the degree to which the results of the study can be generalized is limited and implementation strategies should always be adapted to barriers experienced by the specific target group.
References


28. Perry M. Development and evaluation of a dementia training programme for primary care. Radboud University Nijmegen Medical Centre, Department of Geriatric Medicine, 2011.


Chapter 5

Effectiveness of a multifaceted training package for implementing a community-based occupational therapy program in dementia: a cluster randomized controlled trial

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Myrra Vernooij-Dassen

Clinical Rehabilitation; December 2014.
ABSTRACT

Objective: Evaluate the effectiveness of a training package to implement a community occupational therapy program for people with dementia and their caregiver (COTiD).

Design: Cluster randomized controlled trial.

Subjects: Forty-five service units including 94 occupational therapists (OTs), 48 managers, 80 physicians, treating 71 client-caregiver couples.

Interventions: Control intervention: a postgraduate course for OTs only. Experimental intervention: a training package including the usual postgraduate course, additional training days, outreach visits, regional meetings, and access to a reporting system for OTs. Physicians and managers received newsletters, had access to a website, and were approached by telephone.

Main measures: Primary outcome: The intended adherence of therapists to the COTiD program. This was assessed using vignettes. Secondary outcomes: clients' daily functioning, caregivers' sense of competence, quality of life and self-perceived performance of daily activities of both clients and caregivers. Between-group differences were assessed using multilevel analyses with therapist and intervention factors as covariates.

Results: No significant between-group differences between baseline and 12 months were found for adherence (1.58, 95% CI -0.10 to 3.25), nor for any client or caregiver outcome. A higher number of coaching sessions and higher self-perceived knowledge of dementia at baseline positively correlated with adherence scores. In contrast, experiencing more support from occupational therapy colleagues or having conducted more COTiD treatments at baseline negatively affected adherence scores.

Conclusion: The training package was not effective in increasing therapist adherence and client-caregiver outcomes. This study suggests that coaching sessions and increasing therapist knowledge on dementia positively affect adherence.
INTRODUCTION
Dementia causes a major burden on clients and their caregivers. Worldwide the number of people with dementia is expected to increase to 135 million people in 2050\(^1\,^2\). Several psychosocial interventions are available and proven effective in increasing the quality of life of people with dementia and their caregivers in research settings\(^3\,^4\). One of these interventions is the community-based occupational therapy (OT) program for people with dementia and their caregiver (COTiD program)\(^5\). This is a client-centered and home-based intervention for people with mild or moderate dementia and their caregiver\(^6\). A Dutch study showed that the intervention was effective in improving clients' daily functioning, improving the caregivers sense of competence and in increasing the quality of life, general health, and mood of both client and caregiver\(^5\,^7\).

Therefore, in the Netherlands a large number of OTs were trained through a 3-day post-graduate course consisting of COTiD theory and skills, which aimed to implement COTiD in the Netherlands. However, it appeared that only 20% of the trained Dutch OTs used the COTiD program (or parts of it) in clinical practice\(^8\).

To detect the main barriers for implementing the COTiD program, Van 't Leven and colleagues\(^9\) conducted a qualitative study. One of the main barriers found was the lack of knowledge of the COTiD program among physicians and managers, which resulted in a lack of referrals. This limited OTs to gain experience with delivering the program. Another barrier was the lack of role models as perceived by OTs\(^9\).

To increase the adoption of the COTiD program in clinical practice, we therefore anticipated that an effective training strategy should not only focus on the OT but also on managers and physicians within organizational units. Consequently, we designed a multifaceted training package aimed at OTs, physicians, and managers\(^10,11\). This paper reports on the effectiveness of this training package regarding OT adherence to the COTiD program and the effects on client and caregiver outcomes.

METHODS
Design and participants
A cluster randomized controlled trial was conducted between January 2009 and December 2011. Figure 1 provides a picture of the research design. Eligibility of service units and client-caregiver couples was checked by two research assistants. Service units delivering outpatient dementia care were included in the study if they met the following inclusion criteria:

- Availability of at least two OTs who completed the standard post-graduate course prior to the start of the study,
- availability of one manager,
- and the availability of one physician who was able to recruit at least eight client-caregiver couples for participation in the study.
Figure 1. Study design

Interventions

- Multifaceted
  - Occupational therapists
    - a. additional training days
    - b. coaching on the job
    - c. regional meetings
    - d. web-based report system
    - e. discussion platform
  - Physicians & managers
    - a. educational materials
    - b. telephone call(s)

Service units

- Physician
- Occupational therapists
- Manager

Outcome measures

- Adherence vignettes
- Client/caregiver outcomes
  - clients' daily functioning
  - clients' need for assistance
  - clients' satisfaction and performance of meaningful activities
  - quality of life of client and caregiver
  - sense of competence of the caregiver

Randomization

Standard education for OTs

No intervention for managers and physicians
Service units were first stratified by the setting the OT worked at (hospital, nursing home, or mental health organizations). Subsequently, an independent statistician randomly assigned service units to either the usual post-graduate course or the new training package. A 2:1 ratio (control versus experimental group) was used (see the flowchart in Figure 2) as it was assumed that physicians in control clusters would refer less client-caregiver couples. Therefore, more control clusters were needed to collect data from a sufficient number of client-caregiver couples. Client-caregiver couples were included if they met the following inclusion criteria:

1. The client was diagnosed with mild or moderate dementia (MMSE 10–24).
2. The client was not diagnosed with depression and/or severe behavioral problems (as judged by the referring physician).
3. The client lived in the community.
4. The client had an informal caregiver (relative or friend) that cared for or assisted the client at least twice a week.
5. Couples were withdrawn from the study when the client with dementia was permanently admitted to an institution.

**Training strategies**

**Control group: the usual 3-day post-graduate course**

OTs in the control group completed the usual 3-day post-graduate course prior to the start of the study. This course consisted of lectures on the background and content of the COTiD program. In addition, communication skills were trained using role playing, and therapists needed to complete homework assignments including videotaping of the application of COTiD skills in clinical practice. Managers and physicians in the control group did not receive any training or information.

**Experimental group: the multifaceted training package**

OTs in the experimental group also completed the usual 3-day post-graduate course prior to the study. In addition, service units received the interdisciplinary training package. This package was developed based on various implementation theories and the implementation barriers assessed prior to this study. The primary aim of the training for OTs was to increase their adherence to the program. Training components targeting physicians focused on increasing the number of referrals to create the opportunity for OTs to get more experienced with the program. Training components targeting managers aimed to increase the number of referrals and to improve appropriate support for OTs in implementing COTiD in clinical practice.

OTs could opt to receive accreditation points for the Dutch professional quality registry. Therefore, the training package consisted of both obligatory and optional parts. For OTs this training package consisted of: 1) two additional training days providing knowledge on promoting COTiD and more in depth knowledge on COTiD (obligatory), 2) five to seven coaching-on-the-job sessions led by a COTiD expert (role model) who was trained in using motivational interviewing
(obligatory), 3) four regional network meetings (obligatory attendance at three meetings) 4) access to a discussion platform (optional), and 5) access to an electronic reporting system (optional).

For physicians and managers the strategy consisted of four components: 1) access to an educational website including information on the evidence and content of the COTiD program and on referral and insurance options 2) four newsletters reporting experiences of physicians, managers, and other professionals with COTiD, and 3) at least one phone call to address individual problems and/or questions of physicians and managers. For physicians and managers all interventions were optional.

**Outcome measures**

**Primary outcome: adherence to the COTiD program**

OTs' intended adherence to the COTiD program was assessed using vignettes. Two vignettes were developed which both included a case description based on a real case. Both vignettes included the same eight open-ended questions. One vignette described a case of average difficulty and a second vignette described a more complex case. As an example, vignette 1 and the scoring form for this vignette are included in Supplemental file 1.

A standardized scoring form was developed to quantify the data. The form included the most essential elements of the COTiD program. Scores for vignette 1 (average difficulty) ran from 0 to 68 and scores for vignette 2 (difficult case) ran from 0 to 67. Higher scores indicate better adherence. Therapists were provided with a personal link by e-mail to get access to these vignettes at baseline, 6 and 12 months, respectively.

The vignettes and scoring form were developed based on literature and expert consultation (n=4). Inter-rater reliability of the scoring system was assessed prior to the analyses. A total of twenty completed vignettes were scored independently by two assessors. Pearson’s product moment correlation coefficient was calculated to assess the strength of the inter-rater reliability.

**Secondary outcomes - Client and caregiver treatment outcomes**

The clinical state of client-caregiver couples treated by the service units was assessed at baseline and 6 and 12 months after the start of the occupational therapy treatment. The daily functioning of clients was assessed using the Assessment of Motor and Process Skills (AMPS) and the performance part of the Interview for Deterioration of Daily Activities in Dementia (IDDD). The Canadian Occupational Performance Measure (COPM) was used to assess the self-perceived performance in meaningful daily activities of both client and caregiver. Quality of life was assessed for both client and caregiver using the Dementia Quality of Life Instrument (DQOL). Finally, the Sense of Competence Questionnaire (SCQ) was used to assess the level of caregiver competence. All assessments were performed at the client’s home.
Blinding
Research assistants who collected the data from professionals and client-caregiver couples were blinded for group allocation. Vignettes were made anonymous for the researcher who scored the answers to the open-ended questions. It was not possible to blind professionals within the service units for group allocation. Professionals were requested not to inform their clients about their own group allocation to ensure blinding of client-caregiver couples.

Informed consent and ethical approval
This study was conducted in accordance with the Helsinki declaration and the study protocol was reviewed by the ethical committee of the region Nijmegen/Arnhem, which approved the study and decided that further approval conform the Medical Research Involving Human Subjects Act (WMO) was not necessary. All participants signed a consent form prior to data collection. Participants participated voluntarily and were able to quit at any time.

Sample size
The sample size calculation was based on two primary outcomes: therapist adherence and referral rate\(^27\). A comprehensive description of the sample size calculation can be found in another publication\(^18\).

In summary, taking into account the effect of clustering, a power of 80% would be obtained for the outcome adherence when including 15 experimental service units (with 8 client-caregiver couples) and 30 control service units (with 1.5 client-caregiver couples). A power of 97% would be obtained for referral rate when including 4.5 client-caregiver couples per service unit (a total of 68 experimental versus 135 control clients-caregiver couples). The combined power to see both an effect on adherence and referral equals the product of the power per outcome (i.e. 80% x 97%= 78%).

Data analyses
Baseline characteristics of therapists, clients, and caregivers were compared between groups using t-tests for parametric data and chi-square tests for non-parametric data. A significance level of 0.05 was used for all statistical tests.

Intention-to-treat analysis with multiple imputation for missing data were performed. Mixed model analysis was used to evaluate group differences with respect to OT adherence and group differences with respect to client and caregiver outcomes. These accounted for clustering of professionals within a service unit, for repeated measures, and/or for clustering of client-caregiver couples within one therapist using random effects. The time points of the follow-up measurements (6 and 12 months) were included as fixed effects.

Covariate analyses were conducted to evaluate what factors influenced OT adherence to COTiD. A total of 14 covariates were included in the analyses (see Table 1).
Table 1. Covariates used for secondary analysis on OTs’ adherence

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Covariate related to....</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intensity of the treatment as perceived by the OT.</td>
<td>the COTid program</td>
</tr>
<tr>
<td>2. Guidance provided by COTid program as perceived by the OT.</td>
<td>the COTid program</td>
</tr>
<tr>
<td>3. Year the OT completed the post-graduate course on COTid.</td>
<td>the OT</td>
</tr>
<tr>
<td>4. Number of years since graduation as an OT.</td>
<td>the OT</td>
</tr>
<tr>
<td>5. Number of treatments conducted according to COTid (self‐perceived).</td>
<td>the OT</td>
</tr>
<tr>
<td>6. OTs’ self‐perceived knowledge on dementia.</td>
<td>the OT</td>
</tr>
<tr>
<td>7. OTs’ sense of competence in using COTid.</td>
<td>the OT</td>
</tr>
<tr>
<td>8. Total number of coaching sessions received by the OT.</td>
<td>the training strategy</td>
</tr>
<tr>
<td>9. Whether or not the OTs within one service unit worked at the same location.</td>
<td>the service unit</td>
</tr>
<tr>
<td>10. Whether the focus of the organization was on intra or extramural care.</td>
<td>the service unit</td>
</tr>
<tr>
<td>11. The type of setting the OT worked at.</td>
<td>the service unit</td>
</tr>
<tr>
<td>12. Management support for implementation as perceived by the OT.</td>
<td>the service unit</td>
</tr>
<tr>
<td>13. Support of OT colleagues for implementation as perceived by the OT.</td>
<td>the service unit</td>
</tr>
<tr>
<td>14. Support from physician for COTid as perceived by the OT.</td>
<td>the service unit</td>
</tr>
</tbody>
</table>

OT = occupational therapist, COTid = community occupational therapy in Dementia

Covariates related either to the COTid program, the OT, the training strategy, or the service unit. How data on these covariates were collected is described elsewhere. As a benchmark to determine the best possible fit to the data, we used a 'saturated' model which included all 14 covariates. After this, different sets with a maximum of five covariates were added as fixed effects to the basic mixed model. Models were compared using the difference in -2 log likelihood. The set of covariates that produced a fit closest to the benchmark was considered the best predictive model. This process was repeated for each imputed dataset. The best predictive set of covariates was the set that had the best results in most of the imputed datasets.

RESULTS

Figure 2 shows the flow of service units through the study. At baseline, experimental and control units did not differ based on characteristics of OTs (Table 2) or physicians. Managers in control service units had significantly (p = 0.007) more working experience [13.8 years (SD 8.96) versus 7.7 years (SD 3.8)]. Blinding of the research assistant who collected the data was compromised for four service units (1 control and 3 experimental).
Figure 2. Flow of participants through the trial (OT=occupational therapist; MD = physician)

Assessed for eligibility: **143 clusters**

not eligible/refuse participation: **98 clusters**
28 clusters did not meet inclusion criteria
70 clusters refused to participate

Stratified: **45 clusters**
(94 OTs / 80 MDs / 48 managers)

30 nursing homes
13 hospitals
2 mental health services

Randomized (45 clusters)

Control group (28 clusters: 8 hospitals, 19 nursing homes, 1 mental health service)
Average cluster = 2.07 OTs (range 1-3), 1.54 MD (range 1-6), 1 manager (range 0-2)
**Total number of participants:**
58 OTs / 44 MDs / 28 managers

Lost to follow up (6 months)
1 OT: job change
**Professionals added:**
1 MD: late response to participate in the study
**New cluster demographics:**
28 clusters, 57 OTs (range 1-3), 44 MDs (range 1-6),
28 managers (range 0-2)

Experimental group (17 clusters: 5 hospitals, 11 nursing homes, 1 mental health service)
Average cluster size = 2.12 OTs (range 1-3), 2.18 MD (range 1-6), 1.18 manager (range 0-4)
**Total number of participants:**
36 OTs / 36 MDs / 20 managers

Lost to follow up (6 months)
2 OTs; job change (1), management decision (1)
4 MDs; job role modification (2), high workload (2)
2 manager; job change (2)
**Professionals added:**
2 MDs; replacement for MDs lost,
1 manager; replacement for manager lost
**New cluster demographics:**
17 clusters, 34 OTs (range 1-3), 34 MD (range 1-6),
19 manager (0-4)

Lost to follow up (12 months)
1 cluster; drop-out of OTs and MD
3 OTs; high workload (2), job change (1)
4 MD; difficulty including patients (1); high workload (1); job role modification (1); unknown (1)
**Added professionals:**
1 MD: job role modification of previous participant
**New cluster demographics:**
27 clusters, 54 OTs (range 1-3), 41 MDs (range 1-6),
28 managers (range 0-2)

Lost to follow up (12 months)
0 clusters 1 OT; illness
2 MDs; job role modification (1); high work load (1)
2 managers; job change (2)
**Added professionals:**
1 MD; replacement for MD lost to follow-up
2 managers; replacement for managers lost to follow-up (2)
**New cluster demographics:**
17 clusters, 33 OTs (range 1-3), 33 MDs (range 1-6),
19 manager (0-4)

Analyzed – intention to treat
28 clusters

Analyzed – intention to treat
17 clusters
### Table 2. Baseline characteristics of participating OTs

<table>
<thead>
<tr>
<th></th>
<th>Experimental group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>38.5 (10.7)</td>
<td>35.8 (9.9)</td>
<td>0.23</td>
</tr>
<tr>
<td>Range</td>
<td>22 - 58</td>
<td>22 - 57</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>36</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women, N (%)</td>
<td>36 (100%)</td>
<td>54 (93.1%)</td>
<td>0.11</td>
</tr>
<tr>
<td><strong>Qualified (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>13.7 (8.9)</td>
<td>13.4 (10.1)</td>
<td>0.90</td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td><strong>Postgraduate course completed (months)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>13.0 (21.8)</td>
<td>13.7 (2.1)</td>
<td>0.90</td>
</tr>
<tr>
<td>Range</td>
<td>1 - 120</td>
<td>1 - 101</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td><strong>Experience with dementia (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>7.5 (6.2)</td>
<td>7.8 (7.1)</td>
<td>0.81</td>
</tr>
<tr>
<td>N</td>
<td>35</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td><em><em>Cases according to COTiD</em>, N (%)</em>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>8 (22.9%)</td>
<td>12 (27.3%)</td>
<td>0.25</td>
</tr>
<tr>
<td>1-5</td>
<td>21 (60%)</td>
<td>29 (65.9%)</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>3 (8.6%)</td>
<td>3 (6.8%)</td>
<td></td>
</tr>
<tr>
<td>11-15</td>
<td>3 (8.6%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
</tbody>
</table>

*As perceived by the OT

Baseline data of 71 client-caregiver couples was collected (44 experimental and 27 control). These data were included in the analyses. Between baseline and 12 months 38 couples dropped out (23 experimental and 15 control). The main reason for drop-out was overburdening of the caregiver and involvement of too many healthcare professionals. In spite of the high drop-out rate of 53.5% (38 out of 71) no differences were found between drop-outs and non-drop outs with respect to the primary and secondary outcomes. Baseline characteristics of client-caregiver couples (see Table 3) indicated no major between-group differences. In both groups eight clients had not been officially diagnosed with (but were suspected of) dementia. Analyses without these participants did not lead to different conclusions.

**Occupational therapist adherence**

The response to the vignettes used to measure adherence was 77% (72/94) at baseline, 75.5% (69/91) at 6 months, and 74.7% (65/87) at 12 months. The response rate was 60% or higher at all times of measurement in both groups. However, the number of non-responders was significantly higher in control services at 6 months ($\chi^2 13.35; df 1; p = .000$) and 12 months ($\chi^2 16.05; df 1; p = .000$). Overall, nine therapists did not fill out any of the vignettes. Pearson Product-Moment Correlation showed a good inter-rater reliability for the vignettes ($r = .88$).
Table 3. Baseline characteristics of people with dementia and their caregiver treated by OTs participating in the study

<table>
<thead>
<tr>
<th>Client characteristics</th>
<th>Experimental Group, N = 44</th>
<th>Control Group, N = 27</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>77.3 (6.6)</td>
<td>78.1 (5.7)</td>
</tr>
<tr>
<td>Range</td>
<td>61 – 94</td>
<td>66 – 91</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women, N (%)</td>
<td>22 (50%)</td>
<td>10 (37%)</td>
</tr>
<tr>
<td><em><em>Highly educated</em>, N (%)</em>*</td>
<td>10 (22.7%)</td>
<td>5 (18.5%)</td>
</tr>
<tr>
<td><strong>MMSE score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>21 (4.1)</td>
<td>20.4 (4.5)</td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td><strong>GDS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>9.77 (5.29)</td>
<td>9.0 (5.4)</td>
</tr>
<tr>
<td>N</td>
<td>43</td>
<td>27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caregiver characteristics</th>
<th>N = 44</th>
<th>N = 27</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>69.0 (12.0)</td>
<td>68.8 (11.1)</td>
</tr>
<tr>
<td>Range</td>
<td>41 – 89</td>
<td>42 – 81</td>
</tr>
<tr>
<td>N</td>
<td>42</td>
<td>26</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women, N (%)</td>
<td>25 (56.8%)</td>
<td>19 (70.4%)</td>
</tr>
<tr>
<td><strong>Highly educated, N (%)</strong></td>
<td>13 (30.2%)</td>
<td>6 (22.2%)</td>
</tr>
<tr>
<td>N</td>
<td>43</td>
<td>27</td>
</tr>
<tr>
<td><strong>Relationship with client, N (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner</td>
<td>33 (75%)</td>
<td>21 (77.8%)</td>
</tr>
<tr>
<td>Child</td>
<td>10 (22.7%)</td>
<td>6 (22.2%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2.3%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nr of sessions</strong></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>5.6 (3.3)</td>
</tr>
<tr>
<td>Range</td>
<td>0 – 15</td>
</tr>
<tr>
<td>N</td>
<td>37</td>
</tr>
</tbody>
</table>

*completed a bachelor degree or higher

Mean adherence scores remained the same over time in both groups (Table 4). No significant between-group differences were found for adherence ($p = 0.07$). Difference in change from baseline to 12 months between groups was 1.58, with a 95% Confidence Interval of -0.10 to 3.25. In general, therapists scored significantly lower on vignette two, which concerned a more complex case. Difference between vignette 1 and 2 was -8.67, with a 95% Confidence Interval of -9.59 to -7.74.
Table 4. OT adherence scores and percentages per group for each time of measurement

<table>
<thead>
<tr>
<th></th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vignette 1 (0-67)</td>
<td>Vignette 2 (0-68)</td>
</tr>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>36.4 (6.5)</td>
<td>24.9 (4.9)</td>
</tr>
<tr>
<td>%</td>
<td>54.3%</td>
<td>37.2%</td>
</tr>
<tr>
<td>6 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>33.3 (4.4)</td>
<td>25.1 (3.7)</td>
</tr>
<tr>
<td>Range</td>
<td>25 - 41</td>
<td>18 - 33</td>
</tr>
<tr>
<td>%</td>
<td>49%</td>
<td>37.4%</td>
</tr>
<tr>
<td>12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>31.7 (4.8)</td>
<td>24.2 (4.1)</td>
</tr>
<tr>
<td>Range</td>
<td>22 - 41</td>
<td>16 - 34</td>
</tr>
<tr>
<td>%</td>
<td>46.6%</td>
<td>36.2%</td>
</tr>
</tbody>
</table>

% mean percent adherence

Covariate analyses showed that therapists who received more coaching sessions were more likely to have a higher adherence score (Table 5). In addition, adherence scores were more likely to be higher when therapists experienced their knowledge on dementia at baseline to be sufficient (Table 5). Oddly enough, therapists who experienced more support from occupational therapy colleagues in working with COTiD (at baseline) were more likely to have a lower adherence score. Moreover, therapists who conducted more COTID treatments (as self-reported at baseline) were also more likely to have a lower adherence score (see Table 5).

Table 5. Results of the multilevel analyses to identify factors influencing OT adherence

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support from occupational therapy colleagues$^a$ (original statement: &quot;I do not feel supported in using the COTID program by occupational therapy colleagues at my workplace&quot;)</td>
<td>-1.4</td>
<td>1.4</td>
<td>0.37</td>
<td>-4.88 to 2.11</td>
</tr>
<tr>
<td>Knowledge of dementia$^a$ (original statement: &quot;I have insufficient knowledge of dementia to work with the COTiD program&quot;)</td>
<td>0.2</td>
<td>0.4</td>
<td>0.55</td>
<td>-0.59 to 1.03</td>
</tr>
<tr>
<td>NR of coaching sessions</td>
<td>0.3</td>
<td>0.2</td>
<td>0.03</td>
<td>0.03 to 0.62</td>
</tr>
<tr>
<td>NR of treatments according to COTiD$^a$ (original question: &quot;Approximately how many people with dementia have you treated according to the COTID program?&quot;)</td>
<td>-0.9</td>
<td>0.4</td>
<td>0.03</td>
<td>-1.69 to -0.07</td>
</tr>
</tbody>
</table>

$^a$ Data only collected at baseline; NR = number

Client and caregiver treatment outcomes

No significant differences in favor of the experimental group were found for client and caregiver outcomes. Mean scores for all outcome measures are reported in Table 6.
<table>
<thead>
<tr>
<th>Client outcomes</th>
<th>Range</th>
<th>Baseline Mean (SD)</th>
<th>Control Mean (SD)</th>
<th>Group Diff Mean (SD)</th>
<th>6 months</th>
<th>Control Mean (SD)</th>
<th>Group Diff Mean (SD)</th>
<th>12 months</th>
<th>Control Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N=44</td>
<td>N=27</td>
<td>N=30</td>
<td>N=17</td>
<td>N=21</td>
<td>N=12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMPS process</td>
<td>-3 - 4</td>
<td>0.8 (0.7)</td>
<td>0.9 (0.4)</td>
<td>-0.1</td>
<td>0.8 (0.9)</td>
<td>1.0 (0.4)</td>
<td>-0.2</td>
<td>1.0 (0.5)</td>
<td>0.9 (0.4)</td>
</tr>
<tr>
<td>AMPS motor</td>
<td>-3 - 4</td>
<td>1.4 (0.7)</td>
<td>1.5 (0.5)</td>
<td>0.1</td>
<td>1.5 (0.6)</td>
<td>1.4 (0.5)</td>
<td>0.1</td>
<td>1.6 (0.5)</td>
<td>1.4 (0.5)</td>
</tr>
<tr>
<td>IDDD performance</td>
<td>0 - 44</td>
<td>17.2 (9.6)</td>
<td>13.9 (9.4)</td>
<td>3.3</td>
<td>17.5 (10.8)</td>
<td>14.2 (9.4)</td>
<td>3.3</td>
<td>17.8 (7.7)</td>
<td>14.8 (7.6)</td>
</tr>
<tr>
<td>COPM performance</td>
<td>1 - 10</td>
<td>5.6 (1.6)</td>
<td>5.8 (1.5)</td>
<td>-0.2</td>
<td>5.5 (1.7)</td>
<td>6.0 (1.6)</td>
<td>-0.5</td>
<td>5.2 (1.6)</td>
<td>5.7 (1.8)</td>
</tr>
<tr>
<td>COPM satisfaction</td>
<td>1 - 10</td>
<td>5.7 (1.7)</td>
<td>6.4 (1.7)</td>
<td>-0.7</td>
<td>5.9 (1.8)</td>
<td>6.2 (1.4)</td>
<td>-0.3</td>
<td>5.9 (1.3)</td>
<td>6.2 (1.9)</td>
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<tr>
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<td>1 - 5</td>
<td>3.4 (0.9)</td>
<td>3.3 (0.9)</td>
<td>0.1</td>
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<td>3.3 (0.8)</td>
<td>-0.3</td>
<td>3.1 (0.9)</td>
<td>3.4 (0.7)</td>
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<tr>
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<td>5 - 25</td>
<td>17.5 (3.7)</td>
<td>17.3 (3.4)</td>
<td>0.2</td>
<td>15.5 (3.5)</td>
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<tr>
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<td>5 - 30</td>
<td>18.2 (4.0)</td>
<td>21.1 (3.6)</td>
<td>-2.9</td>
<td>20.0 (4.0)</td>
<td>19.2 (5.3)</td>
<td>0.8</td>
<td>20.3 (4.3)</td>
<td>21.8 (3.0)</td>
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<tr>
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<td>21.4 (7.1)</td>
<td>19.6 (4.1)</td>
<td>1.8</td>
<td>20.7 (4.8)</td>
<td>19.6 (4.0)</td>
<td>1.7</td>
<td>21.6 (6.3)</td>
<td>20.5 (3.8)</td>
</tr>
<tr>
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<td>5 - 20</td>
<td>12.9 (2.7)</td>
<td>14.5 (2.5)</td>
<td>-1.6</td>
<td>13.1 (2.8)</td>
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<td>13.4 (2.3)</td>
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<tr>
<td>DQOL Feelings of belonging</td>
<td>5 - 15</td>
<td>10.2 (2.3)</td>
<td>11.1 (1.6)</td>
<td>-0.9</td>
<td>10.1 (2.4)</td>
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<td>0.7 (0.3)</td>
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<table>
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<tr>
<th>Caregiver outcomes</th>
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<th>Baseline Mean (SD)</th>
<th>Control Mean (SD)</th>
<th>Group Diff Mean (SD)</th>
<th>6 months</th>
<th>Control Mean (SD)</th>
<th>Group Diff Mean (SD)</th>
<th>12 months</th>
<th>Control Mean (SD)</th>
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<tr>
<td>SCQ</td>
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<td>94.3 (12.0)</td>
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<td>1 - 10</td>
<td>5.3 (1.3)</td>
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<td>4.9 (1.3)</td>
<td>5.1 (1.4)</td>
<td>-0.2</td>
<td>5.6 (1.7)</td>
<td>6.3 (1.1)</td>
<td>-0.7</td>
<td>5.4 (1.6)</td>
<td>5.8 (1.6)</td>
</tr>
<tr>
<td>DQOL Overall</td>
<td>1 - 5</td>
<td>3.8 (0.7)</td>
<td>3.7 (0.9)</td>
<td>0.1</td>
<td>3.7 (0.8)</td>
<td>3.6 (0.6)</td>
<td>0.1</td>
<td>3.5 (0.8)</td>
<td>3.6 (0.7)</td>
</tr>
<tr>
<td>DQOL Aesthetics</td>
<td>5 - 25</td>
<td>16.5 (4.1)</td>
<td>17.8 (3.1)</td>
<td>-1.3</td>
<td>17.0 (3.1)</td>
<td>16.6 (3.8)</td>
<td>0.4</td>
<td>17.2 (2.9)</td>
<td>18.4 (3.8)</td>
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<tr>
<td>DQOL Positive affect</td>
<td>5 - 30</td>
<td>21.7 (3.0)</td>
<td>22.1 (3.7)</td>
<td>-0.4</td>
<td>21.6 (3.6)</td>
<td>21.9 (3.0)</td>
<td>-0.3</td>
<td>20.4 (4.9)</td>
<td>22.5 (3.3)</td>
</tr>
<tr>
<td>DQOL Negative affect</td>
<td>5 - 55</td>
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<td>22.0 (7.1)</td>
<td>-1.1</td>
<td>20.9 (5.3)</td>
<td>21.5 (5.8)</td>
<td>-0.6</td>
<td>21.5 (6.1)</td>
<td>21.2 (5.2)</td>
</tr>
<tr>
<td>DQOL Self esteem</td>
<td>5 - 20</td>
<td>15.0 (2.4)</td>
<td>15.3 (2.4)</td>
<td>-0.3</td>
<td>14.9 (1.9)</td>
<td>15.9 (1.6)</td>
<td>-1.0</td>
<td>15.3 (2.6)</td>
<td>14.6 (2.6)</td>
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<td>DQOL Feelings of belonging</td>
<td>5 - 15</td>
<td>11.5 (1.9)</td>
<td>11.8 (1.8)</td>
<td>-0.2</td>
<td>11.8 (1.9)</td>
<td>11.9 (1.8)</td>
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<td>11.8 (2.2)</td>
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</tr>
<tr>
<td>EQ-5D utility scores*</td>
<td>0 - 1</td>
<td>0.8 (0.2)</td>
<td>0.8 (0.3)</td>
<td>0.1</td>
<td>0.8 (0.2)</td>
<td>0.8 (0.3)</td>
<td>0.0</td>
<td>0.8 (0.2)</td>
<td>0.8 (0.2)</td>
</tr>
</tbody>
</table>

MF = multifaceted; SCQ = Sense of Competence Questionnaire; COPM = Canadian Occupational Performance Measure; DQOL = Dementia Quality of Life Scale; AMPS = Assessment of Motor and Processing Skills; IDDD = Interview for Deterioration of Daily Activities in Dementia – 11 questions in a 5-point Likert scale; EQ-5D = EuroQol 5D; *Utility scores were based on health tariffs of the Dutch population.
DISCUSSION
Our study showed that the multifaceted training package was not more effective in increasing OT adherence compared to the existing post-graduate course. Overall, therapist adherence was low in both groups which is in agreement with previous studies 28-30. In line with this, no differences between groups were found regarding client and caregiver outcomes. However, the multifaceted training package was more effective in increasing the number of COTID referrals as reported in another publication27.

The covariate analyses assessing factors influencing therapist adherence showed that more coaching sessions positively affected adherence scores. This finding is in line with a Cochrane review stating that interventions including educational outreach visits showed slightly better outcomes31. A more surprising finding was that adherence scores were negatively affected when therapists perceived more support for using COTID from occupational therapy colleagues at baseline. Additionally, therapists who stated to have executed more treatments according to COTID at baseline were also more likely to have lower adherence scores.

Although we conducted a process evaluation to assess what factors determined the effect of the training package17 no explanations were found for these correlations in our data. We hypothesize that therapists who do not experience support from colleagues need to find their own way of working and may tend to seek more guidance in the actual COTID program. People who receive more support may rely more on their colleagues expertise (who were not trained in the program) and therefore deviate more from the actual program. This may explain the negative effect of colleague support on adherence scores. The negative effect of having conducted more COTID treatments on adherence scores could be explained by the fact that these therapists may have deviated more from the original program as they developed their own habits in familiarizing themselves with the program. Therapists with habits that deviate from the COTID program are much harder to influence than therapists with no or limited experience who did not develop these habits yet. However, it must be noted that these statements are merely conjectural at this stage and further investigation is required to warrant their merit.

The results of this study contribute to the growing body of knowledge in this area. Although researchers are starting to pay more attention to the translation of effective interventions into clinical practice, the current knowledge on this subject in allied healthcare, rehabilitation32, and in the area of psychosocial services for people with dementia33-37 is limited.

This study suffered from several limitations. One of these limitations is that the intended adherence was measured instead of the actual observed adherence. This may have led to a difference in adherence rate compared to the actual performance. However, studies have shown that vignettes are a more objective alternative compared to self-perceived measures38 and therefore decrease the chance of providing overestimated results. This is illustrated by a study among physical therapists which showed that only 38.5% of the therapists had a realistic perception of their actual performance39. Vignettes are a less time consuming and a more feasible alternative to golden standard approaches such as standardized patients and
observations. Even though vignettes are less time consuming than observations they do require quite some time to fill out. This might have affected the response rate. Our vignettes were newly developed but showed good inter-rater reliability ($r = 0.88$). The significant difference in scores between vignette 1 and 2 suggests sufficient sensitivity. Bias may have occurred as more OTs in the experimental group filled out the vignettes. Even so, at all measurement instances the response rate was always 60% or more in both groups.

In addition, the lack of effectiveness on adherence may be the result from a lack of confidence of OTs in the effectiveness of COTiD. However, even though the degree of confidence in COTiD was not specifically assessed, it did not arise as a result from our process evaluation. Although there are authors discussing how much evidence is sufficient to warrant implementation in clinical practice, there is no consensus on this subject.

A limitation in measuring client and caregiver outcomes was the high drop-out rate of more than 50%. Both the already high burden on clients and caregivers as well as our method of recruitment (through healthcare professionals) may have contributed to this high drop-out rate. As we were not able to recruit the number of couples required, the study was underpowered for the secondary outcome measures. Therefore, these results should be interpreted carefully.

In conclusion, the new training package was not effective in increasing therapist adherence. Adherence was low in both groups. This study did find that more coaching on the job sessions and a better knowledge of therapists about dementia positively affect adherence. In addition, no differences were found in client-caregiver outcomes. However, these results should be interpreted carefully as the number of client-caregiver couples in the study was not sufficient.
REFERENCES

Supplemental file 1: Vignette 1 – questions and scoring form

Mrs Jones, part 1
Mrs Jones is 79 years old and experiences difficulty in daily living due to vascular dementia and limitations in her mobility. She is living together with her husband who also is limited in executing daily activities due to Rheumatoid Arthritis. They have a daughter that lives a half-an-hour drive away and a son, who is living in the same city.

The Geriatrician referred Mrs Jones to an OT to address the problems experienced in executing daily activities. After you received this referral you find the following information in Mrs Jones' medical file:
- She suffered from a (left hemisphere) stroke 10 years ago which resulted in mobility problems.
- She experiences limitations regarding her short term memory and episodic memory.
- She takes less initiative than she used to.
- She is slightly paranoid.
- Her overall mood has not changed.
- Orientation in time and place decreased.

Question 1: What else would you want to know about Mrs and Mr Jones and how would you obtain this information (how would you approach this)?

Mrs Jones, part 2
During a conversation, Mrs Jones tells you that she is sad that she and her husband are not able to go where they want anymore (due to their limitations). She elaborates extensively and with a lot of passion about all the traveling they used to do together with their caravan and about all the things that they had seen. Mrs Jones used to do everything by bicycle, but she is afraid to get on a bicycle now. Mrs Jones does hardly get out of the house anymore, only when she is going to get groceries with her husband. She takes care of her own breakfast and executes easy household tasks (e.g. making the bed and making coffee). She is able to execute self-care activities on her own, her husband only assists her with putting on her elastic stockings. Mrs Jones also tells you that she is reading much and she enjoys it when people are visiting her, even though she cannot always follow the conversation anymore.

Mrs Jones tells you that she used to work as a volunteer at nursing homes and at homeless shelters. She loved to do this work as she liked to be in touch with different types of people and because she wanted to contribute to society. As she is experiencing more and more limitations she believes she is not able to contribute to anything anymore to her satisfaction, not even to the household. She is frustrated by this and mentions several times that her best days are behind her. She misses the many social connection she had due to her work as a volunteer. Mrs Jones
elaborates extensively on several topics during the conversation and she has difficulty to focus on the subject at hand.

Mr Jones initially keeps his distance when you visit them. However, you explain to him that it is important to also hear his side of the story and consider this during the treatment. During the conversation that you have with Mr Jones he tells you that he is experiencing problems with bicycling and walking. When they walk to the grocery store (400 meters from their house) he has to sit down on a bench to rest at least once. He also tells you that he is insecure about the way he needs to assist his wife by tasks such as making coffee and breakfast. He states that she often needs instructions and that it varies per day if she is able to complete the tasks. Taking care of his wife and the household is a major burden and he is not sure how much longer he is able to do this.

Mr Jones used to relax by going outside. In spite of his limitations he would love to be outside more often. However, the last few years it is hard to motivate his wife to join him. This change is hard on him because they both used to be people who loved to be in nature. Mr Jones also loved driving his car, especially when they were on road trips. His world is getting smaller and smaller and this frightens him.

**Question 2:** You take over the treatment of Mrs Jones from a colleague. Your colleague provides you with the information described in part 2 (description above). Would you like to collect more information before determining the treatment goals with Mr and Mrs Jones? If so, what information?

**Mrs Jones, part 3**

In addition to the information you received from you colleague about Mr and Mrs Jones, you collected the following information:

While observing Mrs Jones during the task of coffee making you see that Mrs Jones receives many instructions from her husband. Although a part of these instructions are necessary to successfully complete the task of coffee making, Mr Jones tends to intervene too quickly. The biggest problem during coffee making seems to be that Mrs Jones does not remember where all the required ingredients and materials are placed in the kitchen. In addition, Mrs Jones has difficulty focusing on the task at hand and easily starts another activity while the first is not yet finished. Her husband reminds her where she was working on.

You also collected more information about the environment of Mr and Mrs Jones. They possess several aids such as a stair lift and handles in the toilet and shower needed for the limitations that both Mr and Mrs Jones experience. People in their environment (e.g. their children), offer a lot of assistance/support but they do not want to take this assistance. Especially Mr Jones finds it important that they can take care of their own business. They do not receive professional help (such as home help) and they do not want to either.
To be able to answer the following questions the information of Mrs Jones, part 2 is repeated.

**Questions 3:** The physician who referred Mrs Jones to you requests an update report to get insight in the treatment of Mrs Jones and on what the treatment entailed up to now. What information would you provide in this report (you only have to mention the type of information you would provide)?

**Question 4:** You scheduled a session with Mr and Mrs Jones to determine the treatment goals. How would you approach this process of determining the treatment goals (what steps do you take)?

**Question 5:**
a. Based on the information we provided, make a prediction of the goals that are set during the goal determination session with Mr and Mrs Jones.
b. Why did you choose these goals?

**Question 6:** You start with the treatment phase. On what basis would you choose the strategies you use in your treatment?

**Question 7:** At the end of the treatment you send a final report to the geriatrician who referred Mrs Jones to you. What information would you provide in this report (you only have to mention the type of information you would provide)?
Scoring form – vignet 1 (case of average difficulty)

Below you find the scoring sheet that was used to quantify the answers to the open-ended questions of vignette 1. For each answer it was evaluated if the essential elements were part of the answer. For each element the OT could obtain 1 point unless states otherwise in the scoring sheet. OTs could obtain a maximum of 68 points for vignette 1.

**Question 1**
What else would you want to know about Mrs and Mr Jones and how would you obtain this information (how would you approach this)?

<table>
<thead>
<tr>
<th>Element number</th>
<th>Element</th>
<th>Check if the element was mentioned in the answer</th>
<th>Maximum score for this element</th>
</tr>
</thead>
<tbody>
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<td><strong>Element 1 a: Information about Mrs Jones:</strong></td>
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<tr>
<td>1_a_1</td>
<td>Past roles and activities</td>
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</tr>
<tr>
<td>1_a_2</td>
<td>Current roles and daily routines</td>
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<td></td>
</tr>
<tr>
<td>1_a_3</td>
<td>Interests, norms, and values</td>
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<td></td>
</tr>
<tr>
<td>1_a_4</td>
<td>Important life events</td>
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<td></td>
</tr>
<tr>
<td>1_a_5</td>
<td>Problems in daily activities</td>
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<td></td>
</tr>
<tr>
<td>1_a_6</td>
<td>The client’s skills</td>
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</tr>
<tr>
<td><strong>Element 1 b: Information about Mr Jones:</strong></td>
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<td></td>
</tr>
<tr>
<td>1_b_1</td>
<td>Current roles and activities</td>
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<td></td>
</tr>
<tr>
<td>1_b_2</td>
<td>Norms and values</td>
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<tr>
<td>1_b_3</td>
<td>Problems experienced by the caregiver</td>
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<tr>
<td>1_b_4</td>
<td>Problems of the client as experienced by the caregiver</td>
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<tr>
<td>1_b_5</td>
<td>The caregiver’s knowledge about dementia</td>
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</tr>
<tr>
<td>1_b_6</td>
<td>The caregiver’s burden and strength</td>
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<td>1_b_7</td>
<td>Motivation and incentives to provide care</td>
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<td>1_b_8</td>
<td>Strategies used by the caregiver to support the client</td>
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<td><strong>Element 1 c: Information about both:</strong></td>
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<td><strong>Element 1 d: Information about the environment:</strong></td>
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<td>1_d_2</td>
<td>Social environment (e.g. social support, professional support / assistance)</td>
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<td><strong>Element 1 e: Procedure:</strong></td>
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<td>1_e_3</td>
<td>Observation of the client during a daily activity</td>
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<tr>
<td>1_e_4</td>
<td>Observing the client and caregiver together during a daily activity</td>
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<td>1_e_5</td>
<td>All sessions takes place at the couple’s home</td>
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**TOTAL SCORE QUESTION 1:**

5
Question 2
You take over the treatment of Mrs Jones from a colleague. Your colleague provides you with the information described in part 2 (description above). Would you like to collect more information before determining the treatment goals with Mr and Mrs Jones? If so, what information would you like to collect?

<table>
<thead>
<tr>
<th>Element number</th>
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<th>Check if the element was mentioned in the answer</th>
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<tr>
<td>2_2</td>
<td>Information on the communication / interaction between Mr and Mrs Jones.</td>
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</tr>
<tr>
<td>2_3</td>
<td>Information on the strategies used by Mr Jones to support his wife.</td>
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<td>1</td>
</tr>
<tr>
<td>2_4</td>
<td>Information on the physical environment</td>
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</tr>
<tr>
<td>2_5</td>
<td>Information on the social environment</td>
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</table>

TOTAL SCORE QUESTION 2:

Question 3
The physician who referred Mrs Jones to you requests an update report to get insight in the treatment of Mrs Jones and on what the treatment entailed up to now. What information would you provide in this report (you only have to mention the type of information you would provide)?

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<tr>
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<tbody>
<tr>
<td>3_1</td>
<td>Motivation and incentives of the client (interests of the client)</td>
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</tr>
<tr>
<td>3_2</td>
<td>Motivation and incentives of the caregiver (interests of the caregiver)</td>
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<td>1</td>
</tr>
<tr>
<td>3_3</td>
<td>Goals / priorities of the client for the treatment</td>
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<tr>
<td>3_4</td>
<td>Goals / priorities of the caregiver for the treatment</td>
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<tr>
<td>3_5</td>
<td>Limitations and skills of the client</td>
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<tr>
<td>3_6</td>
<td>Limitations and skills of the caregiver</td>
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<tr>
<td>3_7</td>
<td>Activities meaningful to the client</td>
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<tr>
<td>3_8</td>
<td>Activities meaningful to the caregiver</td>
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<tr>
<td>3_9</td>
<td>Observations / interpretations of the OT (OT diagnosis)</td>
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TOTAL SCORE QUESTION 3:
**Question 4**
You scheduled a session with Mr and Mrs Jones to set the treatment goals. How would you approach this goal determination session (what steps do you take)?

<table>
<thead>
<tr>
<th>Element number</th>
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<th>Check if the element was mentioned in the answer</th>
<th>Maximum score for this element</th>
</tr>
</thead>
<tbody>
<tr>
<td>4_1</td>
<td>OT gives a summary of the most important problems and priorities as provided by the client and caregiver in the diagnostic phase.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4_2</td>
<td>Goals are set <em>together</em> with both Mr and Mrs Jones.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4_3</td>
<td>The OT makes sure that both the client and the caregiver provide their own priorities for the treatment.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4_4</td>
<td>Goals are adjusted to the (estimated) skills of Mr and Mrs Jones.</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL SCORE QUESTION 4:**

5
**Question 5**

a) based on the information we provided, make a prediction of the goals that are set during the goal determination session with Mr and Mrs Jones.

<table>
<thead>
<tr>
<th>Element number</th>
<th>Element</th>
<th>Check if the element was mentioned in the answer</th>
<th>Maximum score for this element</th>
</tr>
</thead>
<tbody>
<tr>
<td>5_a_1</td>
<td>The goals need to be aimed at one or more of the following subjects:</td>
<td>Points obtained:</td>
<td>Starting point of scoring is 5 points. For each goal that does not match one of the five mentioned subjects, 1 point is subtracted from the total.</td>
</tr>
<tr>
<td></td>
<td>- Improving Mrs Jones' skills.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The guidance that Mrs Jones needs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Coping skills of Mr Jones.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Skills of Mr Jones to support his wife.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Use of aids.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(when scoring this element what is important is the focus of the goal, not the content of the goal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5_a_2</td>
<td>The goals need to meet the needs, interests, roles, activities, values, and norms of Mrs Jones as described in the information provided. Problem areas addressed by Mrs Jones were:</td>
<td>Points obtained:</td>
<td>Starting point of scoring is 5 points. For each goal that does not match with one of the five problem areas, 1 point is subtracted from the total.</td>
</tr>
<tr>
<td></td>
<td>- Mobility problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Travelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Bicycling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Lack of / need for social contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Feeling useless / not contributing to society.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(when scoring the goals the focus is on the content of the goals)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5_a_3</td>
<td>The goals need to meet the needs, interests, roles, activities, values, and norms of Mr Jones as described in the information provided. Problem areas addressed by Mr Jones were:</td>
<td>Points obtained:</td>
<td>Starting point of scoring is 6 points. For each goal that does not match with one of the six problem areas, 1 point is subtracted from the total.</td>
</tr>
<tr>
<td></td>
<td>- Mobility problems (walking / bicycling) / getting out more</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Travelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Driving the car</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Hard to take care of his wife / not accepting support</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Not sure how he can support his wife in executing daily activities (e.g. household tasks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Lack of initiative of his wife.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(when scoring the goals the focus should be on the content of the goals)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 5**

**b) Why did you choose these goals?**

<table>
<thead>
<tr>
<th>Element number</th>
<th>Element</th>
<th>Check if the element was mentioned in the answer</th>
<th>Maximum score for this element</th>
</tr>
</thead>
<tbody>
<tr>
<td>5_b_1</td>
<td>The goals meet the needs, interests, roles, tasks, values and/or norms of Mrs Jones.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5_b_2</td>
<td>The goals meet the needs, interests, roles, tasks, values and or norms of Mr Jones.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5_b_3</td>
<td>The goals are tailored to the skills of Mrs Jones (feasible goals).</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5_b_4</td>
<td>The goals are tailored to the skills of Mr Jones (feasible goals).</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL SCORE QUESTION 5:**

**Question 6**

You start with the treatment phase. On what basis would you choose the strategies you use in your treatment?

<table>
<thead>
<tr>
<th>Element number</th>
<th>Element</th>
<th>Check if the element was mentioned in the answer</th>
<th>Maximum score for this element</th>
</tr>
</thead>
<tbody>
<tr>
<td>6_1</td>
<td>Based on the preferences of the client and caregiver.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6_2</td>
<td>Based on the skills / strengths (compensation strategies) of the client and caregiver.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6_3</td>
<td>Based on the habits (in learning/learning strategies) of the client and caregiver.</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL SCORE QUESTION 6:**
Chapter 6

Determinants for the effectiveness of implementing an occupational therapy intervention in routine dementia care

Carola Döpp
Maud Graff
Marcel Olde Rikkert
Ria Nijhuis-van der Sanden
Myrra Vernooij-Dassen

Implementation Science 2013; 8: 131
ABSTRACT

Background: A multifaceted implementation (MFI) strategy was used to implement an evidence-based occupational therapy program for people with dementia (COTiD program). This strategy was successful in increasing the number of referrals, but not in improving occupational therapists' (OTs) adherence. Therefore, a process evaluation was conducted to identify factors that influenced the effectiveness of the MFI strategy.

Methods: A mixed-method approach of qualitative and quantitative research was used to evaluate the implementation process. The MFI strategy as planned and as executed were reported and evaluated based on the framework of Hulscher et al. (2003, 2006). Data on OTs' attitudes and expected barriers were collected at baseline from 94 OTs using a 19-item questionnaire. Data on the experiences were collected after finishing the implementation using focus groups with OTs and telephone interviews with physicians and managers. For quantitative data, frequencies and correlations were calculated and qualitative data was analyzed using inductive content analysis.

Results: The implementation strategy as executed had a stronger focus than planned on increasing OTs' promotional skills due to an initial lack of referrals. This resulted in less attention for increasing OTs' skills in using the COTiD program as initially intended. At baseline, OTs had a positive attitude toward the program, however, 75% did not feel experienced enough and only 14.3% felt competent in using the program.

Focus groups and interviews revealed various determinants that influenced implementation. Most managers were positive about the program. However, the degree of operational support of managers for OTs regarding the implementation was not always adequate. Managers stated that a well-defined place for occupational therapy within the dementia-care network was lacking although this was perceived necessary for successful implementation. Several physicians perceived psychosocial interventions not to be in their area of expertise or not their responsibility. All professionals perceived inter-professional collaboration to be a facilitator for effective implementation, and general practitioners were perceived as key partners in this collaboration. However, collaboration was not always optimal. OTs indicated that increasing the referral rate was most effective when promoting OT via other disciplines within a physician's network.

Conclusion: Our data suggests that a first step in successful implementation should be to make sure that individual and organizational barriers are resolved. In addition, implementation should be network-based and encourage inter-professional collaboration. Initial promotion of COTiD should focus on physicians that have a positive attitude toward non-pharmacological interventions.
INTRODUCTION

There are many innovations that have been proven effective in the research setting. However, these beneficial effects often do not reach clinical practice due to existing barriers in knowledge transfer\textsuperscript{1,2} and implementation\textsuperscript{3}. An example is the community occupational therapy program for people with dementia and their caregivers (COTiD). This is a client-centered, program that includes 10 one-hour home-based sessions that aims to increase or maintain independence, participation, and quality of life of people with dementia and their caregiver\textsuperscript{4}. This intervention was found to be effective in a Dutch sample regarding clients' daily functioning, caregiver competence and the quality of life, general health, and mood of both the client and caregiver\textsuperscript{5-7}. Up to now, occupational therapists (OTs) have been trained in using the COTiD program through a 3-day post-graduate course including lectures, role playing, and feedback on videotaped cases\textsuperscript{8}. Upon evaluation only 20% of the trained OTs used the COTiD program or parts of it in practice [Van Uden & Graff, 2007 unpublished observations].

As a first step to increase the uptake of COTiD, barriers and facilitators to its implementation in clinical practice were evaluated\textsuperscript{9}. Barriers found were 1) a lack of knowledge on the COTiD program in all professionals, 2) a lack of referrals, 3) a lack of experience of OTs in using the program, and 4) a perceived lack of role models and feedback for OTs\textsuperscript{9}.

Based on these barriers and facilitators\textsuperscript{9}, a one-year multifaceted implementation (MFI) strategy was developed, aimed at OTs, physicians, and managers which are essential stakeholders in the delivery of the COTiD program\textsuperscript{9}. Training days, outreach visits, regional meetings, and access to a web-based discussion platform and reporting system were offered to OTs in addition to the post-graduate course. Physicians and managers received information about COTiD through an educational website, newsletters, and at least one phone call.

A cluster randomized controlled trial (CRCT) comparing the effectiveness of the MFI strategy with the 3-day post-graduate course was conducted. Data were collected at baseline, 6 months, and 12 months\textsuperscript{8}. Clusters were functional units offering home-based care for people with dementia and included at least two OTs, one physician, and one manager. Although the MFI strategy resulted in significantly more COTiD referrals\textsuperscript{10}, no significant difference was found between groups regarding the degree to which OTs intended to treat clients according to COTiD (OT adherence) as measured using vignettes\textsuperscript{11}. In addition, no differences were found between groups on client and caregiver treatment outcomes\textsuperscript{11}.

Aims and objectives

To identify factors that affected the effectiveness of the MFI strategy we conducted a process evaluation. Research questions were:

1) How was the MFI strategy executed in practice and how did it deviate from the strategy as planned?

2) What were the attitudes and barriers experienced by OTs' at baseline regarding COTiD and its implementation?
3) How did OTs, physicians, and managers experience the MFI strategy?

**METHODS**

The process evaluation was conducted alongside the CRCT. Qualitative and quantitative methods were used to monitor the MFI strategy as executed. Quantitative methods were used to evaluate OTs’ baseline attitudes and expected barriers and the exposure of professionals to the implementation strategy. Qualitative methods were used to uncover experiences of OTs, managers, and physicians with the MFI strategy.

**The multifaceted implementation strategy**

The model of Grol & Wensing\(^\text{12}\) was used to develop the multifaceted implementation strategy. A multifaceted strategy was chosen as literature suggests that these strategies are more likely to result in positive effects on professional behavior\(^\text{13,14}\) compared to the sole use of educational strategies. The strategy was based on the barriers and facilitators identified in a previous study\(^\text{9}\). The implementation strategy as initially developed is described in Table 1 according to the implementation process evaluation framework of Hulscher et al.\(^\text{15,16}\).

**Table 1. Description of the intended multifaceted implementation strategy based on the framework of Hulscher et al.\(^\text{15,16}\)**

1. **Global typing of the implementation strategy**
   - **Interventions orientated towards occupational therapists**
     - (a) Dissemination of educational materials using a website.
     - (b) Educational meetings (including regional network meetings).
     - (c) Outreach visits.
   - **Interventions orientated towards physicians and managers**
     - (a) Dissemination of educational materials using a website and newsletters.
     - (b) Telephone calls serving as reminders and providing professionals an opportunity to ask questions about the intervention and the implementation.
   - **Organizational interventions**
     Change in the patient-reporting system by offering a web-based reporting system structured according to the steps of the COTiD program.
   - **Regulatory interventions**
     Accreditation for occupational therapists who are exposed to the obligatory parts of the implementation strategy.

2. **Target group / participants**
   - **Professional status**
     The intervention is developed for occupational therapists working in private practices, nursing homes, hospitals, and mental health organizations. The multifaceted intervention is developed to reach different types of physicians including general practitioners, nursing home physicians, neurologists, and geriatricians. Finally, the intervention aims to reach different types of managers including direct managers (i.e. managers of the occupational therapy department or managers of allied healthcare services) and non-direct managers (i.e. cluster or unit managers).
   - **Interaction between participants**
     Components of the implementation strategy are aimed at the individual disciplines. However, it is assumed that each professional is part of a functional unit existing of at least two occupational therapists, one physician, and one
manager. Especially the interventions toward occupational therapists are intended to encourage therapists to interact with the managers and physicians within their functional unit. In addition, occupational therapists within the same region are encouraged to interact with each other using regional network meetings.

Size of the target group
The target groups of the implementation strategy are 36 occupational therapists, 36 physicians, and 20 managers. Educational meetings will be offered in two groups (approximately 18 per group), and regional meetings are offered in three regions (approximately 12 OTs per region). Each educational outreach visit is offered to all occupational therapists within one functional unit at the same time (which is assumed to be two OTs per functional unit). The website is targeted at the entire group of professionals and telephone calls will be offered to the individual physicians and managers.

Motivation for participation
Accreditation points can be obtained for both participation in the study and for completing the minimum required components of the implementation strategy (minimum requirements: two educational meetings, three regional meetings, and five coaching sessions). This is done to motivate occupational therapists. Participation of all professionals is voluntarily.

3. The "Implementers"
Professional status
All components of the implementation strategy aimed at occupational therapists are executed by two "implementers", who are expert occupational therapists in executing the COTiD program as well as in teaching about the COTiD program. Both are educated in using motivational interviewing as a coaching technique. A third "implementer" executes the implementation strategies toward managers and physicians. She has a background in occupational therapy and is the primary researcher of this study. She is also trained in using motivational interviewing.

Opinion leaders
We suspect that the "implementers" providing the strategies toward the OTs are perceived as opinion leaders and role models as they contributed to the development and testing of the COTiD program. The "implementer" providing the strategies toward physicians and managers is not likely to be considered an opinion leader.

Authority
The researcher who developed and tested the COTiD program initiated the implementation by requesting funding for this implementation. The funding agency (Zorg Onderzoek Nederland en Medische Wetenschappen; ZONMW) is therefore also initiator of the implementation.

4. Frequency
Occupational therapists
1) Two educational meetings (eight hours each) are provided at the start of the intervention period with an interval of eight weeks between meetings.
2) Outreach visits (90 minutes each): five to seven sessions depending on the individual needs. These sessions start after the two training days with intervals between sessions depending on individual needs (approximately six to eight week intervals).
3) Regional network meetings (2,5 hours each): four meetings in each of the three regions are provided with intervals of approximately 12 weeks between meetings.

Physicians and managers
1) Telephone calls (duration will vary per individual): one or two telephone calls within a one year period.
2) Newsletters: four newsletters with intervals of approximately 12 weeks.
The website is continuously available from the start of the intervention.

5. Information about the innovation
Type of information about the innovation or guideline:
A prerequisite for occupational therapists for starting the implementation strategy is to complete a postgraduate course on the COTiD program. During this course all OTs are provided with information on the entire COTiD program.
Information on the innovation for occupational therapists

1) Educational meetings:
   - Information and skills regarding the COTiD program: practicing communication skills (role-playing)
   - Information and skills regarding implementation of the program: inventorize barriers, elevator pitch, product description, promoting the program to physicians and managers (role-playing), and instructions on using the web-based reporting system and discussion forum.
2) Outreach visits: variation is possible, but the content of the sessions is a mix of improving skills to practice according to the COTiD program and skills to implement/promote the COTiD program.
3) Regional network meetings: variation is possible, the meetings are intended to discuss cases and difficulties experienced in using the COTiD program and promoting the program.

Information on the innovation for physicians and managers

1) Telephone calls: content can vary depending on needs of physicians and managers.
2) Newsletters: include information on experiences with the COTiD program of various types of professionals.

Information on the innovation for all professionals:
Website: provides information on the COTiD program and publications on the effects of the program.

Presentation form and medium
Occupational therapists

1) Educational meetings: a mixture of lectures, discussion, and role-playing.
2) Outreach visits: variation is possible depending on the needs of the participants.
3) Regional network meetings: lectures and discussions.

Physicians and managers

1) Newsletters: newsletters are sent by email to managers and physicians.

6. Information about target group management/performance
Occupational therapists are provided with verbal feedback on their performance after role-playing during the educational training days. During the educational outreach visits performance and achievements are discussed regarding both skills in executing the COTiD program and promoting the COTiD program (by addressing the number of referrals). Physicians and managers are provided with feedback on the number of referrals that have been made in the preceding period during the telephone calls.
No information is provided that enables participating professionals or organizations to compare their achievements with others.

Literature on implementation and knowledge translation was used to select strategies that would decrease existing barriers. This included a comprehensive overview of implementation theories and on the development and selection of strategies to establish change. As implementation is a complex process which cannot be based on a single theory, our MFI strategy was based on the body of thought of a group of theories.
The most important barriers identified were 1) a lack of knowledge on the program in all professionals, 2) a lack of referrals, 3) a lack of experience of OTs in using the COTiD program, and 4) a perceived lack of role models and feedback. Cognitive theories state that professionals need sufficient knowledge to assist them in decision making regarding implementation. Educational theories state that professionals are more likely and motivated to change their behavior when using their own problems as a starting point and literature on knowledge transfer shows that there is not one implementation strategy that fits all. Based on these assumptions knowledge for OTs was incorporated into the two training days, combined with skill training. A website and newsletters were offered to physicians and managers as an easy, not-
time-consuming way to gain knowledge. To address individual problems we offered telephone calls to physicians and managers. Five to seven outreach visits were offered to OTs and were led by experienced OTs (role models) who were trained in motivational interviewing. Outreach visits were chosen as this was reported to be a successful element in implementation strategies.

To facilitate discussion with colleagues and create sustainable support, regional meetings were organized and access to a discussion platform was provided. An electronic reporting system was developed to guide OTs through the steps of the COTiD program.

Successful implementation of the COTiD program was found to be influenced by the contact between OTs and physicians, we planned to encourage OTs throughout the implementation process to promote COTiD among physicians using face-to-face contact. The importance of such relationships between professionals within a network is also stressed by social network theories.

Recruitment and sampling
Data on attitudes and barriers were collected from all 94 OTs who participated in the CRCT. Comprehensive information on the recruitment, inclusion, and exclusion criteria of these participants are reported elsewhere.

At the end of the trial, qualitative data on the experiences of professionals with the MFI strategy were collected from a purposive sample of OTs, physicians, and managers who received the MFI strategy. OTs (n=36) were requested to participate in a focus group discussion by email. For recruitment purposes the names of 36 physicians and 20 managers were ordered using random number generation. According to these lists professionals were approached until 12 physicians and 10 managers were willing to participate. These numbers were chosen as we expected to need around ten interviews to reach saturation. We checked saturation during the analysis by investigating whether new codes were still coming up and whether there was a variety of codes covering the problem of implementing COTiD.

Evaluating deviations from the implementation strategy as planned
The strategy as initially developed is described in Table 1. The actual execution of the MFI strategy was monitored using the framework of Hulscher et al. that requires both qualitative and quantitative data. The implementers registered quantitative data regarding the frequency with which each component of the strategy was offered and the attendance of OTs. The research team had unlimited access to the web-based system and discussion platform to collect data on the actual use of these systems by OTs. Exposure to the newsletters and website of professionals was evaluated by adding questions on the frequency of exposure to the questionnaires of the CRCT at 6 and 12 months follow-up. Qualitative data on the type of strategies offered, the medium used, and the type of information provided during the various components of the strategies were registered by the implementers.
Attitudes and barriers
At baseline of the CRCT, quantitative data were collected on OTs' attitudes and expected barriers concerning the implementation of COTiD. A web-based questionnaire including 19 statements was used. Statements were based on the previously identified barriers\(^9\) and on statements used in a study to evidence-based practice among Dutch OTs\(^{22,23}\). OTs were asked to rate the statements on a 5-point scale running from total disagreement (1) to total agreement (5). A reminder was sent two weeks after the original request.

Experiences of health care professionals
Qualitative methods were used to collect data on the experiences of professionals with the MFI strategy. Data were collected after completion of the CRCT on December 31\(^{st}\) 2010. Data collection was guided by topic lists (see additional file 1). All data was audio-taped and transcribed verbatim.

Experiences of occupational therapists
Focus groups were chosen to collect data on the experiences of the group as a whole\(^{24}\) and as it provided an opportunity for participants to interact with each other in depth. Two semi-structured focus groups were held in February, 2011 which were led by an experienced and independent moderator. To verify the content the moderator summarized the discussion at the end of the discussion.

Experiences of physicians and managers
Between March and May, 2011 semi-structured telephone interviews with physicians and managers were held to collect data on their experiences in a non-time-consuming way. All interviews were performed by the same independent researcher.

Informed consent and ethical approval
This study was conducted conform the Helsinki declaration and reviewed by the ethical committee of the Nijmegen/Arnhem region, which approved the study and decided that further approval conform the Medical Research Involving Human Subjects Act (WMO) was not necessary. All participants signed a consent form prior to data collection and audio-taping. Participants participated voluntarily and were able to quit at any time.

Data analysis
Concepts were derived from the attitude-and-barriers questionnaire using factor analysis in an exploratory manner. Internal consistency of concepts was calculated using Cronbach’s alpha (α). Relationships between variables were assessed using Pearson’s product moment correlation coefficient (r). An alpha level of 0.05 was used for all quantitative tests.
The qualitative data were analyzed using inductive content analysis\textsuperscript{25} using Atlas.ti version 7. Two researchers independently coded all transcripts through line-by-line analysis using open coding. Final codes were established by comparison of the codes of both researchers and by discussing its content until consensus was reached. One of the researchers grouped the final codes into categories and verified these categories with the other researcher. Subsequently, the categories were grouped into themes. The development of these themes was guided by existing literature that states that factors influencing implementation can relate to the innovation, the user, the organization, and the socio-political context\textsuperscript{12,19,26,27} and the implementation strategy.

RESULTS

**Characteristics of participants who received the multifaceted implementation strategy**

A total of 17 clusters received the MFI strategy, including 36 OTs, 36 physicians, and 20 managers. All OTs were women and the average age was 38.5 years (SD 10.7). OTs had been qualified for an average of 13.7 years (SD 8.9). Almost half (47.2\%) of the physicians were woman. General practitioners (GPs) took up 30.6\% of the group and 69.4\% were medical specialists. The mean age of physicians was 49.7 years (SD 7.5). Their average experience was 22 years (SD 7.1) and 53.1\% had a specialization in geriatrics. Sixty percent of the managers were female. Managers had an average age of 47.8 (SD 7.06) years. More details on the study sample are reported elsewhere\textsuperscript{10}.

**Deviations from the strategy as planned**

**Interventions offered**

Although not originally planned, we decided during the study to offer physicians a one-time outreach visit with the aim to increase involvement in the implementation process and visibility of the OT. In addition, the use of the web-based system as an alternative to the OTs' current reporting system was so problematic that coaches did not encourage its use as originally planned.

**Target group**

Although we intended to include two OTs within each functional unit, thereby making them able to support each other, two functional units included only one OT. Three functional units did not include a manager. In addition, the combination of people within 19 functional units (eight control clusters and 11 experimental clusters) varied over time\textsuperscript{10}. Interaction between professionals within a functional unit was encouraged using all components of the MFI strategy. Actual interaction between professionals was not monitored, however, interviews with managers revealed that OTs did seek collaboration with physicians to promote COTiD. Managers mentioned that the amount of energy it took depended on the physicians (lack of) pre-existing knowledge, the type of physician, and the physicians' target group.
**Frequency and exposure**

The number of educational and regional meetings for OTs were offered as planned (see Table 1). Educational meetings were held in two groups (group 1: 15 OTs / group 2: 21 OTs). For efficiency reasons, regional meetings were held in two instead of three regions. All OTs were offered seven outreach visits and the average number of OTs per visit was two, as planned (range 1-3). The average interval between sessions was eight weeks as planned. However, great variation existed between clusters with interval periods varying from two to 30 weeks. Table 2 shows the actual exposure of OTs to the various components of the MFI strategy.

Table 2. Exposure of occupational therapists to components of the implementation strategy

<table>
<thead>
<tr>
<th>Component</th>
<th>N (%) (n=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Training days</strong></td>
<td></td>
</tr>
<tr>
<td>0 days</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>1 day</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>2 days</td>
<td>31 (86.1%)</td>
</tr>
<tr>
<td><strong>Coaching on the job</strong></td>
<td></td>
</tr>
<tr>
<td>0 sessions</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>2 sessions</td>
<td>1 (2.8%)</td>
</tr>
<tr>
<td>3 sessions</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>4 sessions</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>5 sessions</td>
<td>7 (19.4%)</td>
</tr>
<tr>
<td>6 sessions</td>
<td>9 (25%)</td>
</tr>
<tr>
<td>7 sessions</td>
<td>11 (30.6%)</td>
</tr>
<tr>
<td><strong>Regional meetings</strong></td>
<td></td>
</tr>
<tr>
<td>0 meetings</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>1 meeting</td>
<td>1 (2.8%)</td>
</tr>
<tr>
<td>2 meetings</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>3 meetings</td>
<td>15 (41.7%)</td>
</tr>
<tr>
<td>4 meetings</td>
<td>16 (44.4%)</td>
</tr>
<tr>
<td><strong>Discussion platform</strong></td>
<td></td>
</tr>
<tr>
<td>Made use of this medium:</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (44.4%)</td>
</tr>
</tbody>
</table>

We were able to reach 27 physicians (67.5%) and 18 managers (78.3%) by telephone. The average duration of telephone contacts was 15 minutes for both physicians (SD 7.0) and managers (SD 4.7). Newsletters were sent as planned. A total of 23 physicians (n=25) and 14 managers (n=15) read at least one newsletter. The website was visited at least once by 12 physicians (n=20) and 13 managers (n=16). Finally, six physicians (15%) agreed to an outreach visit which took between 30 and 60 minutes.

**Information about the intervention**

The educational meetings and outreach visits focused more on promoting OT within the OTs' network than initially planned. This was caused by a lack of referrals in most functional units and the difficulties that OTs experienced in promoting their services. Due to this shift of focus, little time was spent on improving OTs' skills to work with the COTiD program.
Telephone conversations with physicians mainly focused on the inclusion of people with dementia in the trial. The outreach visits for physicians were provided depending on physicians’ preference: 1) the physician invited multiple colleagues and the researcher gave a presentation on COTiD, followed by a discussion (n=2), or 2) the OT and the researcher met only with the physician and presented and discussed COTiD (n=4).

**Attitudes and barriers of OTs at baseline**
The attitudes and expected barriers of OTs at baseline of the CRCT are shown in Table 3. Three concepts were found: 1) attitude toward COTiD (α = 0.72), 2) experience, skills, and self-efficacy of the OT (α = 0.72), and 3) support from the professional environment (α = 0.50).

**Attitude of OTs**
Overall the attitude of OTs toward the COTiD program at baseline was positive. Most respondents (67.8%) agreed that the program offered sufficient guidance to treat people with dementia and their caregivers (see Table 3).

**Knowledge, skills, and self-efficacy**
Most OTs (58.9%) found they had sufficient knowledge about dementia to work with the COTiD program. However, 75% of the respondents did not think they had sufficient experience with the program and only 14.3% felt competent in using the program. OTs who felt they had sufficient experience with COTiD felt more competent in using the program (r=0.55; p<0.001) and were more likely to feel capable in justifying using the program toward physicians (r=0.37; p<0.01).

**Support**
More than half of the OTs missed the presence of a role model (53.5%), 79.1% felt supported by their OT colleagues at work, and 67.9% felt supported by their management. Opinions varied regarding the other statements (see Table 3).

**Relations between statements of different concepts**
We found several significant correlations between items of the three concepts. OTs who agreed that they had sufficient experience with the COTiD program were less likely to experience the COTiD program to be too intensive for clients (r=0.49; p<0.001) and caregivers (r=0.45; p<0.001). OTs who did perceive the program to be too intensive for the client and caregiver also tended to experience difficulties in changing old habits in the diagnostic phase (r=0.43; p=0.001 and r=0.48; p=0.0001). In addition, OTs who felt they had sufficient experience were less likely to miss role models (r=0.38; p<0.01). Finally, perceived management support positively correlated to the perceived ability to justify working according to the COTiD program toward physicians (r=0.36; p<0.01) and OTs who missed role models were more likely to find it difficult to change old habits (r=0.44; p=0.001).
Table 3. Attitudes and barriers of occupational therapists regarding the implementation of COTiD

<table>
<thead>
<tr>
<th>Statement</th>
<th>M (SD)</th>
<th>Totally agree N (%)</th>
<th>Agree N (%)</th>
<th>Not agree or disagree N (%)</th>
<th>Disagree N (%)</th>
<th>Totally disagree N (%)</th>
<th>V / M</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude toward the COTiD program (α = 0.72)</strong>†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It takes too much time to familiarize myself with the working method of the COTiD program. ‡</td>
<td>3.18 (0.77)</td>
<td>1 (1.8)</td>
<td>9 (16.1)</td>
<td>25 (44.6)</td>
<td>21 (37.5)</td>
<td>0 (0)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>It takes too much time to treat clients according to the COTiD program. ‡</td>
<td>3.22 (0.83)</td>
<td>0 (0)</td>
<td>13 (23.6)</td>
<td>18 (32.7)</td>
<td>23 (41.8)</td>
<td>1 (1.8)</td>
<td>55 / 39</td>
</tr>
<tr>
<td>I find treatment according to the COTiD program too intensive for my clients. ‡</td>
<td>3.42 (0.69)</td>
<td>0 (0)</td>
<td>3 (5.5)</td>
<td>29 (52.7)</td>
<td>20 (36.4)</td>
<td>3 (5.5)</td>
<td>55 / 39</td>
</tr>
<tr>
<td>I find treatment according to the COTiD program too intensive for caregivers. ‡</td>
<td>3.52 (0.69)</td>
<td>0 (0)</td>
<td>2 (3.6)</td>
<td>27 (48.2)</td>
<td>23 (41.1)</td>
<td>4 (7.1)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>The program provides sufficient guidance to treat people with dementia and their caregivers.</td>
<td>3.68 (0.77)</td>
<td>5 (8.9)</td>
<td>33 (58.9)</td>
<td>13 (23.2)</td>
<td>5 (8.9)</td>
<td>0 (0)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>The intensive diagnostic phase of the program enables me to better shape the treatment.</td>
<td>3.85 (0.62)</td>
<td>6 (10.9)</td>
<td>36 (65.5)</td>
<td>12 (21.8)</td>
<td>1 (1.8)</td>
<td>0 (0)</td>
<td>55 / 39</td>
</tr>
<tr>
<td><strong>Experience, skills, and self-efficacy of the occupational therapist (α = 0.72)</strong>‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have sufficient experience with the COTiD program.</td>
<td>2.07 (0.87)</td>
<td>1 (1.8)</td>
<td>2 (3.6)</td>
<td>11 (19.6)</td>
<td>28 (50)</td>
<td>14 (25)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I feel competent in using the COTiD program.</td>
<td>2.64 (0.82)</td>
<td>0 (0)</td>
<td>8 (14.3)</td>
<td>24 (42.9)</td>
<td>20 (35.7)</td>
<td>4 (7.1)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I find it difficult to change my old habits concerning the diagnostic phase. ‡</td>
<td>3.02 (0.95)</td>
<td>1 (1.9)</td>
<td>19 (35.8)</td>
<td>12 (22.6)</td>
<td>20 (37.7)</td>
<td>1 (1.9)</td>
<td>53 / 41</td>
</tr>
<tr>
<td>I find it difficult to change my old habits concerning the treatment phase. ‡</td>
<td>3.27 (0.84)</td>
<td>0 (0)</td>
<td>13 (23.2)</td>
<td>16 (28.6)</td>
<td>26 (46.4)</td>
<td>1 (1.8)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I feel capable of changing the procedures regarding dementia occupational therapy care at my place of work.</td>
<td>3.71 (0.78)</td>
<td>5 (8.9)</td>
<td>36 (64.3)</td>
<td>9 (16.1)</td>
<td>6 (10.7)</td>
<td>0 (0)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I find it difficult to justify the use of the COTiD program toward physicians. ‡</td>
<td>3.5 (1.03)</td>
<td>1 (1.8)</td>
<td>12 (21.4)</td>
<td>8 (14.3)</td>
<td>28 (50)</td>
<td>7 (12.5)</td>
<td>56 / 38</td>
</tr>
<tr>
<td><strong>Knowledge of occupational therapists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have insufficient knowledge about dementia to be able to work with the COTiD program. ‡</td>
<td>3.45 (1.03)</td>
<td>2 (3.6)</td>
<td>10 (17.9)</td>
<td>11 (19.6)</td>
<td>27 (48.2)</td>
<td>6 (10.7)</td>
<td>56 / 38</td>
</tr>
<tr>
<td><strong>Support from the professional environment (α = 0.50)</strong>†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role models are lacking. ‡</td>
<td>2.70 (1.06)</td>
<td>5 (8.9)</td>
<td>25 (44.6)</td>
<td>10 (17.9)</td>
<td>14 (25)</td>
<td>2 (3.6)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I have sufficient opportunities to ask for feedback.</td>
<td>3.0 (0.97)</td>
<td>0 (0)</td>
<td>17 (30.4)</td>
<td>13 (23.2)</td>
<td>17 (30.4)</td>
<td>3 (5.4)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I do not feel supported in using the COTiD program by occupational therapists at my workplace. ‡</td>
<td>3.98 (1.04)</td>
<td>2 (4.2)</td>
<td>3 (6.3)</td>
<td>5 (10.4)</td>
<td>22 (45.8)</td>
<td>16 (33.3)</td>
<td>48 / 46</td>
</tr>
<tr>
<td>I feel supported in using the COTiD program by occupational therapy colleagues in my region.</td>
<td>2.8 (1.26)</td>
<td>3 (5.4)</td>
<td>18 (32.1)</td>
<td>12 (21.4)</td>
<td>11 (19.6)</td>
<td>12 (21.4)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>Management at my workplace supports working according to the COTiD program.</td>
<td>3.66 (0.72)</td>
<td>3 (5.4)</td>
<td>35 (62.5)</td>
<td>15 (26.8)</td>
<td>2 (3.6)</td>
<td>1 (1.8)</td>
<td>56 / 38</td>
</tr>
<tr>
<td>I feel supported in using the COTiD program by physicians.</td>
<td>2.84 (0.91)</td>
<td>2 (3.6)</td>
<td>11 (19.6)</td>
<td>21 (37.5)</td>
<td>20 (35.7)</td>
<td>2 (3.6)</td>
<td>56 / 38</td>
</tr>
</tbody>
</table>

† Internal consistency of the concept based on Cronbach's alpha; ‡ Negatively stated items: reversed scoring system applies; V/M = valid and missing responses; M = mean; SD=standard deviation
Experiences of health care professionals
In the focus groups 16 female OTs participated (3 hospital (h), 10 nursing home (nh), 2 private practice (pp), and 1 mental health organization (mh)). In the telephone interviews 12 physicians participated (2 h, 5 nh, 3 general practice, and 2 mh) of which 8 were woman. Finally, 10 managers participated in the interviews (3 h, 5 nh, and 2 mh) including 4 women. Initially the main question was to solely collect data on the experiences of OTs, physicians, and managers with the MFI strategy. However, the interviewed professionals also provided valuable information on their experiences with the implementation of the COTiD program in general. As this was considered useful data in explaining the effectiveness of the MFI strategy, all data were included in the analysis and presented in this paper.
As no new codes were found and as codes covered all predefined themes, data saturation was judged to be sufficient. An overview of the categories, codes, and representative quotes within each theme are provided in additional file 2 to 4. Additional file 5 includes an overview of the determinants per professional group.

Theme I - Factors related to the implementation strategy
Method of dissemination
We used three methods to disseminate information: website, email with newsletter, and telephone contact. Although some physicians and managers preferred the use of email, others stated that an overflow of emails in general caused them not to read the newsletters. A benefit of email mentioned by managers was the ability to easily forward information to other professionals.
The website was perceived as useful, although both physicians and managers mentioned that it required an active attitude, which was a barrier to visit the website. Managers stated that the continuous availability of the website positively influenced its use.
Telephone calls were perceived as successful by physicians because they increased involvement and because of their ability to meet individual needs. Managers also experienced the contact moments by telephone to be positive, as it gave them an opportunity to ask questions. Planned telephone conversations were preferred. In general, physicians preferred personal contact either by phone or during face-to-face meetings.
Almost all managers and physicians perceived the emails, newsletters, and telephone calls as reminders. Most physicians reported that the reminders made sure occupational therapy stayed on their minds when exploring a clients' options for further treatment. Managers thought the combination of different methods worked as a reminder and encouraged them to act on it.

Organizational factors of the implementation strategy
For some OTs it was unclear what to expect of the components of the MFI strategy, due to poor communication between the implementers and the OTs. Another experience was the extensive amount of travel time required to attend the two training days and the regional network
meeting. Some suggested that future participation of OTs in regional meetings would depend on the added value of these meetings. Finally, OTs felt that the implementation period of the study should have been longer. They state that only after the study was finished the number of referrals started to increase and that they could start focusing on improving their skills.

**Usability of the web-based system and discussion platform**

OTs hardly used the web-based reporting system as it was not compatible with the way of reporting within their organizations, resulting in additional work. Even so, some OTs used the system as a training tool offering them guidance in using the COTiD program. Also, technical difficulties were experienced when working with the web-based reporting system and the discussion platform, due to flaws in the system and OTs' poor computer skills. Finally, some OTs reported that they had doubts about the security of client information when inserted into the web-based system.

**Focus of the implementation strategies**

OTs reported that outreach visits mainly focused on improving their skills to promote the COTiD program due to an initial lack of referrals. Because of this lack OTs felt they were not able to optimally benefit from the outreach visits. OTs felt positive about the combined focus on both promotional and treatment skills and the focus of coaching on individual problems. OTs valued the educational and regional meetings most because of the opportunity to hear about experiences of OT colleagues. According to some physicians the telephone calls were mainly focused on the inclusion of clients in the study and other matters related to the trial.

**Added value of the implementation strategy**

Managers' opinions on the added value of the newsletters varied from clear, informative, and relevant to being of little additional value, lack of news value, and too general. They perceived the information on the website as helpful to clarify differences between OTs and other disciplines, such as case management. However, some managers missed information about the current situation regarding the nationwide implementation. One manager mentioned that not all information was relevant as his background was not in healthcare. Although managers and physicians thought telephone contact was beneficial, some managers mentioned that it did not provide new information with additional value.

"**The big stick**"

OTs perceived the implementation strategy to be "the big stick". Outreach visits and regional meetings ensured that OTs maintained an active attitude toward the implementation process. However, some OTs felt the implementation strategy did not contain enough obligatory aspects, which made it too easy not to work on changing their behavior. One of the suggestions made was to use the web-based system as an obligatory training tool.
Theme II – Factors related to the COTiD program

*Added value of OT services*

It was not clear to physicians and managers how services offered by OTs differ from services offered by other professionals such as case managers, psychologists, and/or social workers. Managers especially perceived overlap with regard to interventions aimed at the caregiver. They stated that this overlap may result in competition because some organizations receive a predefined budget to spend on services with a particular aim. When deciding on this, OTs and case managers have to compete with each other. The final decision depends on the added value of occupational therapy related to other disciplines.

Theme III – Factors related to the professional

*OTs’ experiences with the COTiD program*

OTs perceived that experience in executing the program is essential for successful implementation. Most OTs felt they needed more time to gain sufficient experience and perceived the implementation period as being too short.

*Familiarity of physicians with occupational therapy*

Physicians stated that familiarity with OT was a facilitator in increasing the chance of referrals. Several physicians that were familiar with OT prior to the study stated that this was a reason for them not to visit the educational website or perceive the telephone calls to be useful.

*Physicians’ exposure to the COTiD population*

Some physicians stated that a barrier to sending more referrals was a lack of a population eligible for treatment according to the COTiD program. The reason given most often was having a relatively young population.

*Role of the physician within the system*

Several physicians stated that they have limited knowledge and expertise regarding psychosocial interventions. One physician said that the role of physicians in dementia care is limited to referring. Some physicians referred all people with dementia to a case management organization as they think the case manager is more qualified to refer people to other services. One physician mentioned that making physicians aware of the effectiveness and usefulness of non-pharmacological interventions is a necessary facilitator for successful implementation.

*Degree of involvement and support of managers*

Most managers mentioned that OTs in their organization did not require support regarding implementation. Managers relied on the input of OTs in their decision making concerning the content of the COTiD program. Managers indicated various barriers to providing sufficient support. These barriers were OTs being more experienced, the managers’ self-perceived lack of
knowledge on the content of OT, managers' perception of OTs as being independent and self-steering, managers' faith in the knowledge and commitment of OTs, the lack of problems in the implementation, managers having many priorities, and managers having a great number of people and departments to support.

**Managers' attitude toward the COTiD program**
Various managers were proponents of home-based OT and/or the COTiD program, as they perceived it as particularly useful for the treatment of people with dementia and their caregivers. This motivated managers to facilitate care according to this program.

**Self-perceived role of managers**
The roles of facilitator, advocate, and discussion partner were identified. Most managers perceived that their task was to facilitate OT according to the COTiD program by providing time, secretarial support, and other means necessary to make sure OTs are able to do their work. Managers mentioned that they have a role in advocating OT. This could be within the organization itself toward other managers or when negotiating with insurance companies. Finally, some managers took on the role of discussion partner during the implementation process by brainstorming with OTs on methods for implementing or promoting the COTiD program.

**Managers' needs**
In addition to the information provided by the implementation strategies, managers felt the need for additional or other information such as information about the development of the implementation at a national level, practical tools for the implementation process (e.g. brochure on the COTiD program), and facts and figures on the implementation to help promote OT. In addition, they felt a need for information from the OTs or their organization, such as information on the progress of the implementation, on the size of the target group of the innovation, and information on the implementation in their region.

**Factors related to professionals influencing exposure to the implementation strategy**
OTs reported that commitment positively influenced their attendance to regional meetings. However, barriers to their participation in or use of the implementation strategy were a lack of familiarity with the implementation tools and having other meetings to attend. OTs' preference for discussing problems with their colleagues within the same organization appeared to be a barrier for using the discussion platform.
Most physicians and managers read the newsletters and website quickly. A barrier for physicians to visit the website and read newsletters was existing familiarity with OT. Facilitators for managers to visit the website were a felt need for guidance on promoting the program and feeling the need to stay informed about the activities of the OTs. If managers had questions about the COTiD program this also facilitated the use of the website. Barriers for managers to
visit the website were the limited involvement in the content of OT services, no perceived need for additional information, no questions about the implementation, and having other priorities.

**Theme IV – Factors related to the organization**

**Balance between cost and benefits**
A major barrier mentioned by OTs and managers for all aspects of the implementation strategy was the pressure of the organization to preserve a certain balance between direct time (patient care) and indirect time (e.g. reporting, meetings, and education). This barrier was experienced by both OTs working within an organization and OTs owning a private practice.

**Available capacity**
The available capacity for providing home-based OT influenced the implementation of the COTiD program. One manager mentioned that due to promotion of the COTiD program they received more referrals to OT overall. This led to a fear of too many referrals than could be handled and slowed down further promotional activities. Managers reported that there are several factors that determine the available number of hours of home-based OT according to the COTiD program. These factors were the available budget, available number of trained OTs, the size of the region a department needs to cover, the demand for OT, the focus of the organization, attitude toward COTiD of other managers in the organization, effect of the intervention, and the balance between cost and benefits in clinical practice. A facilitator in several organizations was the fact that dementia was a primary area of interest of the organization and/or the region. Several managers reported that the organizations provided OTs with additional time to participate in the study, resulting in sufficient capacity. However, this capacity tended to decrease again after completion of the study and created a lack of capacity for executing home-based OT after completion of the study.

**Degree of collaboration between professionals**
Managers perceived collaboration between professionals and departments within the organization as important. They also stated that the presence of OTs at multidisciplinary meetings, in which cases were discussed, was found to be helpful in increasing the number of referrals.

**Factors related to the organization influencing exposure to the implementation strategy**
OTs reported a high workload and a lack of a calm working environment as barriers preventing them from using the web-based system. Similarly, physicians did not visit the website and did not read the newsletters due to a lack of time and high work load. Some managers reported that they did not visit the website or read the newsletters because they were sufficiently informed by the OTs within their organization.
Theme V – Factors related to the social system

Referral structure and local network

OTs mentioned that the lack of physicians with a sufficient amount of clients with mild to moderate dementia negatively influenced the number of referrals. Also, OTs mentioned that promoting OT using other disciplines within the physicians' network (e.g. case managers, district nurses, and physician assistants) was more effective in increasing the number of referrals than directly targeting physicians.

Contact between physicians and occupational therapists

In most cases there was no frequent contact between professionals, because it was not perceived to be necessary. However, physicians who met face-to-face with OTs said this had a positive effect on their knowledge and increased awareness of the product 'occupational therapy'.

Position of OTs within regional dementia care networks

Dementia care networks consist of healthcare organizations within a specific region that collaborate with the aim to synchronize care and improve the quality of care in the region. Managers said the position of the OT in these networks needs to be well-assessed when creating a regional dementia network. Moreover, it needs to be clear what OTs can offer and what their areas of expertise are. One manager stated that OTs are often consulted too late and that it would be more beneficial to get involved in an earlier stage of the disease. Connections between the managers' own organization and OTs from private practices were also seen as beneficial when the organization did not have enough OTs available to answer the demand.

Degree of collaboration with general practitioners/physicians in the region

Managers perceived GPs as the most important professionals in the implementation process, especially with the Dutch healthcare system shifting from hospital-based care to more community-based care. Some managers stated that promoting occupational therapy among GP's resulted in closer working relationships and a better comprehension of each other's work. The use of face-to-face contact and content driven arguments in promoting OT was perceived as most useful by managers. Suggestions for further implementation were to inform other professionals within the GPs' network, such as the home health professional, nurse practitioners, case managers, and physical therapists and to use success stories to promote OT according to the program.

Finances and reimbursement

Reimbursement of home-based OT was not uniformly organized in the various types of organizations. Although in general clients can get 10 hours of home-based OT reimbursed, some organizations made separate arrangements with insurance companies. Costs of OT according to
the COTiD program and especially the balance between cost and benefits were used to base final decisions on regarding the implementation. An additional barrier to implementation mentioned by managers was that the reimbursement for home-based OT was perceived to be too low to cover 100% of the cost.

**Perceived benefits of the multifaceted implementation strategy**

OTs reported an increase in awareness of the importance of promotional activities, an increase in knowledge of the COTiD program, and an increase in their motivation, energy, and execution of the program. Physicians reported an increased awareness and knowledge of the COTiD program. One physician included OT as a standard item on a checklist for further treatment options while in another organization OTs were now involved in the multidisciplinary meetings. Finally, managers stated that the telephone calls encouraged them to undertake actions such as informing healthcare professionals (including physicians) about the COTiD program and discussing the implementation process with the OTs.

**An overview of determinants on the implementation of the COTiD program**

Upon evaluation of all data regarding the implementation of COTiD, various connections between determinants and between effects and determinants were found. Figure 1 through 4 provide a quick overview of these findings. Exposure to the implementation strategy is a prerequisite for the strategy to have any effect. Figure 1 shows that we found various determinants that affected this exposure.
Figure 1. Graphical overview of factors influencing the exposure of professionals to the implementation strategy as identified through qualitative methods

Legend: (+) = positive influence; (-) = negative influence; Varied = direction of influence varied per individual; OT = occupational therapist; MD = physician; M = manager

Having sufficient experience with as well as sufficient adherence to the COTiD program are assumed to be essential to establish effective implementation. Figure 2 and 3 show how various determinants affect experience and adherence. The hours of occupational therapy made available may also influence the degree of implementation. Figure 4 summarizes our finding that factors regarding the innovation, the organization, and the social system may affect the available hours of OT.

Figure 2  Graphical overview of factors determining the degree of occupational therapists’ adherence to the COTiD program as identified in the effect study.

Legend: (+) = positive influence on hours OT; (-) = negative influence on hours OT
Determinants for the effectiveness of implementing an occupational therapy intervention

Figure 3. Graphical overview of the role of experience in the implementation process and factors affecting the (self-perceived) experience

![Graphical overview](image)

**Characteristics of the manager**
- Faith in OTs knowledge (-)
- Perceived independence of OTs (-)
- Presence of implementation problems (+)
- Number of priorities (-)
- Number of employees (-)

**Characteristics of the innovation**
- Effect of the intervention / additional value (+)
- Balance between cost and effects (-)

**Characteristics of the social system**
- Demand for treatment according to COTiD (+)
- Reimbursement (+)

(-) = positive relationship; (+) = inverse relationship; dashed line = qualitative data; arrows = quantitative data;

Figure 4. Graphical overview of factors influencing the hours of community occupational therapy an organization has available.

![Graphical overview](image)

**Characteristics of the organization**
- Focus areas of the organization (+)
- Available means (+)
- Opinion of other managers
- Size of the region that needs to be covered (+)

**Characteristics of the social system**
- Demand for treatment according to COTiD (+)
- Reimbursement (+)

(-) = positive influence on adherence; (+) = negative influence on adherence; dashed line = qualitative data
DISCUSSION
Implementation of effective interventions into the healthcare system is complex. Our process evaluation showed that the main focus on increasing OTs promotion and network skills may both explain the significant increase in the number of referrals in the intervention group and the lack of effect on OT adherence and client and caregiver treatment outcomes. However, both OT adherence and the referral rate were still low. Additional determinants identified in this process evaluation provide guidance to improve the MFI strategy. These determinants also provide useful guidance for the development and implementation of other complex interventions within healthcare. This study contributes to strengthening the body of knowledge on implementation in the area of allied healthcare where only a limited number of implementation studies have been conducted.

**Essential components of implementation strategies**

**Organizational prerequisites**
Before an individual professional can adopt an innovation the organization needs to adopt it first. Organizations should evaluate the feasibility of implementation for the organizations itself and for the individual professionals. The focus areas of the organization, the available means, and the demand for the program should be considered at organizational level. The number of referrals, the number of specialties and the requirements regarding patient-related time should be taken into account regarding the feasibility of OT for the organization. Also, a competent leader who provides sufficient leadership support is essential in creating an effective team and is associated with a higher quality of care. However, most managers we interviewed provided their OTs with a lot of freedom and limited support. To facilitate implementation in the long run, the development of an organizational structure to facilitate and monitor implementation of evidence-based interventions is recommended.

**Collaboration and contact between professionals**
Collaboration between professionals was found to be an important element which is in line with a review that found that interdisciplinary collaboration may positively affect professional behavior. This process evaluation showed that especially interpersonal contact helped to increase physicians' knowledge and awareness of OT. This is in agreement with previous literature suggesting that interpersonal contact is important, especially with people who are less open to change. In our MFI strategy we only indirectly encouraged OTs to collaborate with physicians in their region and the exposure of physicians and managers to interpersonal communication seemed limited. Studies regarding multifaceted implementation strategies suggest that a multidisciplinary and network-based approach is both feasible and effective in improving attitudes, knowledge, and behavior. This indicates that a more prominent place for interdisciplinary collaboration within our strategy might have been necessary to kick-start collaboration and networking. Future implementation studies should also look into the role of
interpersonal contact and include the frequency and content of interpersonal contact as an outcome measure.

**Position within a regional network and selection of partners**

Collaboration within a regional network was found to be important. Managers and physicians stated that it was not always clear to them how occupational therapy differed from services offered by other professionals. This indicates that it is important that professionals clearly communicate about their services and its additional value to professionals within their network. In addition, our results suggest that careful selection of physicians to collaborate with may enhance implementation. Based on our findings we recommend that OTs focus their promotional efforts on physicians who fall under the categories "early adopters" and "early majority" as they can be used to increase the speed of implementation\(^{19}\). These physicians should have a sufficient number of clients and have a positive attitude toward psychosocial interventions. This approach may limit broad-based implementation, but can be seen as an initial step to establish short term implementation. To establish a more broad-based implementation in the long run a next step could be to identify and use opinion leaders from the group of professionals from the first step. However, even though this seems a promising method of implementation, more studies should be conducted to the use and effects of local opinion leaders as concluded by Flodgren et al.\(^{42}\). Managers perceived GPs to be the most important professionals to focus implementation efforts on. This is in agreement with the opinion of the Dutch College of GPs, which assigns the GP a primary role in dementia care management\(^{43}\). To ensure implementation of effective interventions this role requires additional support for GPs. An example of effective support strategies are the use of pre-approved referrals\(^{44}\) or the use of automated referrals\(^{45}\).

**Strengths and limitations**

We identified various factors that contributed to the success and failure of the implementation of a complex intervention that are useful for research and practice. A limitation is that the initial goal of the interviews was to solely reflect on the experiences with the MFI strategy. However, other relevant factors to the implementation process were identified and reported. As the interviews were not prepared based on this broader goal the overview of determinants may not be exhaustive. Finally, most OTs were of the opinion that the implementation period (one year) was too short to establish change in the number of referrals as well as their skills in using the program. Future studies should carefully select the intervention and study period. A balance should be found between providing sufficient time and maintaining momentum\(^{12}\).
CONCLUSION
Implementation of effective innovations is complex. Our MFI strategy was effective in increasing the number of referrals to the COTiD program. However, it was not effective in increasing OT adherence. The feasibility of implementation for both the organization and individual professionals should be evaluated first. To facilitate the implementation process a competent managers and an organizational structure that facilitates implementation and monitoring are necessary. When continuing the implementation process, collaboration between professionals within a regional network is important and preferably takes place through interpersonal contact. Physicians to collaborate with should be selected based on sufficient number of eligible clients and their attitude toward the intervention.
REFERENCES

10. Döpp CME, Graff MJL, Teerenstra S, Nijhuis-van der Sanden MWG, Olde Rikkert MGM, Vernooij-Dassen MJFJ. Effectiveness of a multifaceted implementation strategy on physicians’ referral behavior to an evidence-based psychosocial intervention in dementia: a cluster randomized controlled trial. BMC Fam Pract 2013;14:70.
22. Döpp CME. Evidence-Based Practice among Dutch Occupational Therapists: Barriers, Perceptions, and Use of Resources. Kansas City: University of Kansas Medical Center, 2009.
34. Rutten GJM. Setting and keeping the professional system in motion: Using Intervention Mapping to develop a programme to improve guideline adherence in physical therapy. Nijmegen: Radboud University Nijmegen Medical Center, 2012.
Additional file 1: Topic guides for focus groups and telephone interviews

1. Topic guide for focus groups with occupational therapists

- Experiences with the educational meetings
  (E.g.: duration, usefulness, ability to meet needs, organization and coordination, execution of the meetings, additional value for clinical practice)
- Experiences with the outreach visits
  (E.g.: duration, usefulness and effect on daily practice, number of sessions, ability to meet needs, organization and coordination, execution, relation with coaches)
- Experiences with the web-based reporting system
  (E.g. used or not?, compatibility with current method of reporting, user-friendliness, additional value)
- Experiences with the regional meetings
  (E.g. content of the meetings, meet professional needs, usefulness of the information and discussions, opportunity for networking, frequency, organization, execution, duration)
- Experiences with the discussion platform
  (E.g. user-friendliness, usefulness, additional value, reasons for using or not using the discussion platform)
- Additional value of the multifaceted implementation strategy compared to the postgraduate course.
  (E.g. what was the additional value? What strategies contributed most to personal development of the professional? Was it worth the time investment?)
- Suggestions for improving the multifaceted implementation strategy.
  (E.g. what would you change regarding the implementation strategy? What should stay the same?)
2. **Topic guide for telephone interviews with physicians**

- **General information**
  - How is the contact between you and the occupational therapists that participated in the study?
  - Do you have patients that are eligible for treatment according to the COTiD program? [people with dementia and their caregiver who are living at home]

- **Experiences with the educational website**
  - Opening question: Did you visit the website on the COTiD program?
  - If not, ask the physician what the reason was for not visiting the website.
  - If the website was visited: What did you think about the website? (i.e. usefulness of the information, degree to which needs are met, relevance of the different subjects discussed, lay-out, user-friendliness)
  - What effect did the information from the educational website have on your knowledge about occupational therapy for people with dementia and your professional behavior? (i.e. the number of people you refer or the type of people you refer?)

- **Experiences with the newsletters**
  - Opening question: Did you read one or more newsletters?
  - If not, ask what the reason was for not reading the newsletter.
  - If newsletters were read: What did you think about of the newsletters? (i.e. degree to which needs are met, influence on (referral) behavior, number of newsletters, method of disseminating newsletters, lay-out)
  - What effect did the information from the newsletters have on your knowledge about occupational therapy for people with dementia and your professional behavior? (E.g. the number of people you refer or the type of people you refer?)

- **Experiences with the telephone contacts?**
  - Opening question: Did the researcher contact you by telephone at least once?
  - If so, what did you think about these contact moments? (i.e. satisfaction with answers to questions, number of contact moments, effect on (referral) behavior, effect on knowledge of occupational therapy for people with dementia)
  - What effect did the telephone contacts have on your knowledge about occupational therapy for people with dementia and your professional behavior? (E.g. the number of people you refer or the type of people you refer?)

- **Additional value of the multifaceted implementation strategy for daily practice**
  - What strategy / components of the implementation strategy had the least effect on your knowledge and daily practice? And why?
  - What strategy / components of the implementation strategy had the most effect on your knowledge and daily practice? And why?

- **Suggestions for improving the multifaceted implementation strategy**
  - What suggestions do you have for improving the website, newsletters and telephone contact?
  - What should be done to (further) increase your knowledge or to change your referral behavior?
3. Topic guide for telephone interviews with managers

- **General information**
  - What is your relationship with the occupational therapists that participated in the study? [operational manager or cluster/unit manager]
  - To what extent do you have influence on making OT according to the COTID program available in your organization? [In other word: are you in a position to facilitate OT according to the COTID program?]

- **Experiences with the educational website**
  - Opening question: Did you visit the website on the COTID program?
  - If not, ask the manager what the reason was for not visiting the website.
  - If the website was visited: What did you think about the website? (I.e. usefulness of the information, degree to which needs are met, relevance of the different subjects discussed, lay-out, user-friendliness)
  - What effect did the information from the educational website have on your knowledge about occupational therapy for people with dementia and your professional behavior? (I.e. the way you supported the OTs in their work?)

- **Experiences with the newsletters**
  - Opening question: Did you read one or more newsletters?
  - If not, ask what the reason was for not reading the newsletter.
  - If newsletters were read: What did you think about of the newsletters? (I.e. degree to which needs are met, influence on behavior, number of newsletters, method of disseminating newsletters, lay-out)
  - What effect did the information from the newsletters have on your knowledge about occupational therapy for people with dementia and your professional behavior? (I.e. the way you supported the OTs in their work?)

- **Experiences with the telephone contacts?**
  - Opening question: Did the researcher contact you by telephone at least once?
  - If so, what did you think about these contact moments? (I.e. satisfaction with answers to questions, number of contact moments, effect on behavior, effect on knowledge of occupational therapy for people with dementia)
  - What effect did the telephone contacts have on your knowledge about occupational therapy for people with dementia and your professional behavior? (I.e. the way you supported the OTs in their work?)

- **Additional value of the multifaceted implementation strategy for daily practice.**
  - What strategy / components of the implementation strategy had the least effect on you knowledge and daily practice? And why?
  - What strategy / components of the implementation strategy had the most effect on you knowledge and daily practice? And why?

- **Suggestions for improving the multifaceted implementation strategy**
  - What suggestions do you have for improving the website, newsletters and telephone contact?
  - What should be done to (further) increase the implementation of occupational therapy at home for people with dementia and their caregivers and what is your role in this implementation process?
Additional file 2 - Themes, categories, and codes from the focus groups with occupational therapists

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors related to the implementation strategy</td>
<td>Focus of the implementation strategy</td>
<td>Focus on referrals; focus on barriers regarding skills; focus on individual barriers; good mix of content and promotion; when more referrals focus shifts to content; little to discuss due to lack of referrals; RM_recognition and affirmation; RM_exchange experiences; EM_recognition of experiences other OTs; EM_affirmation of practice</td>
</tr>
<tr>
<td>&quot;The big stick&quot;</td>
<td></td>
<td>Active attitude; not enough obligations; refresher</td>
</tr>
<tr>
<td>Usability of the web-based system and discussion platform</td>
<td></td>
<td>Not compatible with existing system; privacy client; technical issues; not broadly applicable; efficiency in sharing information; workload pressure</td>
</tr>
<tr>
<td>Organizational factors of the implementation strategy</td>
<td></td>
<td>Communication on the goal of the implementation strategies; travel time; collaboration within the region; duration of the implementation period</td>
</tr>
<tr>
<td>Factors related to the occupational therapist</td>
<td>Experience with the innovation</td>
<td>Experience prerequisite for implementation; insecure due to lack of experience</td>
</tr>
<tr>
<td>Factors related to professionals influencing exposure to the implementation strategy</td>
<td></td>
<td>Commitment of OT; OT_lack of familiarity with tools; OT_treating a variety of client populations</td>
</tr>
<tr>
<td>Factors related to the organization</td>
<td>Balance between cost and benefits</td>
<td>Requirements production influence time for implementation activities; participation in courses increases work load pressure; implementation course takes up a lot of indirect hours; monitoring the balance between direct and nondirect time; course selection selective due to production requirements</td>
</tr>
<tr>
<td>Factors related to the organization influencing exposure to the implementation strategy</td>
<td></td>
<td>High workload pressure; lack of calm working environment</td>
</tr>
</tbody>
</table>
**Representative Quotes**

"...a lot to do with how to get these referrals, it had a lot to do with that. How to get in touch, how to get people to come to you, what do you have to do to refer the right patients. And concerning treatment, indeed some confirmation but personally I didn't get down to the treatment a lot."

"For me a very positive thing was the combination of a focus on content and on PR, referrals, logistics, that kind of thing and that is the kind of combination you need, to get something started, it was a very good thing that there was a focus on both these things."

"Of course it was also a question of made-to-measure and it was very much focused on how you do that kind of thing, and that was fantastic and it also helped me a great deal."

"The coaching on the job was very good because it really gives you a sparring moment, and I always had some questions to ask but it was also always a bit noncommittal. That is also partly my own doing, but if we were told that it was an assignment you have to do that for the next meeting, well then I think you will prepare yourself better. You do need the big stick."

"Oh well, it was a nice start, really. For us the post graduate training was some time ago so for me it was a good way to brush up my knowledge so that it would become more vivid again"

"...I notice that I don't apply it [refers to the web-based system] in practice because then you have to use it alongside the usual electronic patient file and the usual reporting, it does not serve as a replacement so you would need to spend extra time on it and there is no time for that really."

"I mostly used it in the beginning [refers to the web-based system] for the structure of the treatment, what steps to take, what information."

"I did study it a few times at the beginning but to be honest, I'm really not into computers. We do have a laptop for primary care, so that we can report straight away when we are at the client's home and I did manage to make myself familiar with that but apart from that, the internet and that kind of thing..."

"I was actually hoping to learn new things but that didn't happen [refers to the educational training days]. I went over there all enthusiastic, thinking this is great, learning new things but it wasn't new at all. I thought that was a real pity. Perhaps if the word 'consolidate' was used at an earlier stage it would have put us on the right track a little sooner."

"It should really take longer, you know. There are two parts in the research, and the first part was easy to comply with, the multiplication of clients and PR but then, proving that your ability had improved, well yes, that was complicated."

"Which made me think at some point, alright, that means that I'll have to travel for two hours for a regional meeting lasting two hours and then I'll have to travel back for two hours. For me that did stand a bit in the way rather."

"You want to implement that guideline, partly because of the coaching, am I doing it right and how, how do I market it. But it is also routine, practicing it a lot."

"In my opinion, you decided to join this so then you go for it. So for me the production was not at first a reason to say that I wouldn't be joining them."

"I would really have to think very seriously about what things I am going to make an effort for, because we've got this primary care group, we've got the ParkinsonNet, which is six times a year. Which makes me think at some point: when do I get to see my patients?"

"We put up quite extensive reports, which takes up a lot of reporting time. And when you are doing an AMPS (assessment of motor and process skills), that also takes up a lot of indirect time. At one point you get a sort of imbalance, how much direct and indirect time did we spend on it. It's a continuous search."

"You do have to consider that because you have to achieve your production, you have to consider which meeting you will attend and which you won't attend."

"We put up quite extensive reports, also for the geriatrician, which takes up a lot of reporting time. And when you are doing an AMPS, that also takes up a lot of indirect time. At one point you get a sort of imbalance, how much direct and indirect time did we spend on it. It's a continuous search."
### Theme | Category | Codes
--- | --- | ---
Factors related to the socio-political context | Referral structure and local network | Promotion via other disciplines; referral via physician is a barrier; implementation via primary care; unsuitable physician; difficulties in referral from an organization to primary care services; variation in referral structure between settings; PR difficult due to changes of assistant physicians

### Additional file 3 - Themes, categories, and codes from the interviews with physicians

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors related to the implementation strategy</td>
<td>Method of dissemination</td>
<td>Electronic most effective; preference for email; email efficient; preference for mail; read quickly due to full email inbox; too much email in general; preference for information on paper; method of dissemination influences exposure; newsletter suitable for general information; website requires active attitude; prefers verbal information; phone calls more forceful; phone calls increase involvement; phone calls and email complementary; phone calls most effect on knowledge and skills; preference for face-to-face contact; phone calls better fits need for information; outreach visit most effective; phone calls least effective.</td>
</tr>
<tr>
<td>Focus of the strategies</td>
<td>Telephone contact mainly focused on recruitment of clients; website: good overview of OT services</td>
<td></td>
</tr>
<tr>
<td>Factors related to the innovation</td>
<td>Added value of OT services</td>
<td>Perceived overlap OT and psychologist and social worker; perceived overlap between OT and social work; OT most suitable for making a snapshot of patient functioning; OT more relevant with the shift of services to the home-environment</td>
</tr>
<tr>
<td>Factors related to the physician</td>
<td>Role of the physician within the system</td>
<td>OT outside medical domain; OT not in medical domain and therefore not in physicians’ mind; prerequisite implementation: awareness of usefulness non-pharmacological interventions; role limited to referring; non-pharmacological interventions do not belong to the physicians’ stock; case managers more suitable for referring people</td>
</tr>
<tr>
<td>Familiarity of physicians with occupational therapy</td>
<td></td>
<td>Read literature before start of the study; used to working with OT; little contact with OT prior to study</td>
</tr>
</tbody>
</table>
Representative Quotes

"Well, in my own hospital it was also an issue that it was thought that eventually it [refers to the COTiD program] should not take place in the hospital, this care, but from primary care from a nursing home."

"the really useful people are counselors and district nurses who visit people at home, perhaps the GPs"
"every three months there was a different assistant physician at the memory outpatient clinic, so that was no help either."

OT = occupational therapist; RM = regional meetings; EM = educational meetings

Representative Quotes

"....it is more a case of receiving so much email that I really have to be critical in what to read and what not, because my inbox is always filled to overflowing, which is why it is not high on my list of priorities"
(physician, female, mental health organization)

"....the website really is the place where all the information can be found. Anything you want to know, you can find it there. But it is something that you have to do yourself, actively. And the other things [refers to newsletter and telephone contact] will come to you automatically"
(physician, female, nursing home)

"....I was pleased that she [the researcher] was able to inform our team about it [the COTiD program]. Last year I indicated that I took part in the study in my team. But well, at that time you don’t know all the ins and outs yet."
(physician, female, mental health organization)

"It [the contact by telephone] is probably a more direct link to your need for information."(general practitioner, male)

"I think it [telephone contact] was more a discussion on how to include clients" (general practitioner, female)

"Well alright, again I do perceive a certain kind of overlap between the role of case management where it concerns influencing the system or advising, supporting, counseling or instructing the informal caregiver, which leads me to think who does what exactly."
(physician, male, hospital)

"The role of case management is to counsel, to explain the clinical picture and to give advice in dealing, and to support people with emotional behavioral problems. That does indeed cause overlap with OTs, who also aspire to this. So we don’t approach ET for that kind of thing."
(physician, male, nursing home)

"So it isn’t at the forefront of your mind at all and then there is a last complicating factor which is the nature of occupational therapy, I mean it’s allied to medicine and not medical. It’s not an immediate concern in the perception of the physician, which makes it also a more intangible thing" (physician, male, hospital)

"...a prerequisite for that would have to be to try and make people like me and in my position more aware of the relative value of such a thing [OT according to COTiD]. Doctors are after all simply doctors. What they like to do most is give medication or apply plasters and talk to the patient. All those kinds of behavioral therapy or modalities, they are not really part of a physician’s stock, and before a doctor is ready to start attending to or using this very broad arsenal, well I think that will take quite some time." (physician, male, hospital)

"Doctors tend to think in doctor’s terms, doctor’s illnesses, doctor things and doctor’s performances, and interventions that are aimed at a type of psycho education, well those are more outside the medical domain. Of course you can feel that it is perhaps a good thing and a useful thing. And if that is really the case and all, but well, as I said it’s rather outside our cognitive domain." (physician, male, hospital)

"And I also think that it is better done through case management or those docteams which we are using now, I mean nursing home physicians or geriatricians who primarily visit and counsel people at their homes. I think they will be more receptive to the possibilities of such an approach." (physician, male, hospital)

"Well yes, it’s in, it’s part of my framework so to speak, in my frame of mind. It’s just that, whenever it is needed an OT always comes to mind because I am used to working with OTs." (physician, female, mental health organization)
### Chapter 6

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians’ exposure to the COTID population</td>
<td>Patient population not suitable for COTID; not enough eligible patients</td>
<td></td>
</tr>
<tr>
<td>Factors of the professionals influencing exposure to the implementation strategy</td>
<td>Setting priorities; website not visited; only visited website at the start; rough view of website; read newsletter; did not read newsletter; roughly read the newsletters; took a quick look at the newsletters; did not use website_familial with OT</td>
<td></td>
</tr>
<tr>
<td>Factors related to the organization</td>
<td>Workload pressure; did not visit website due to workload pressure; did not read newsletters due to work load pressure; workload pressure suppresses active attitude; no need for phone calls due to work load pressure; website no priority; setting priorities; newsletter no priority</td>
<td></td>
</tr>
<tr>
<td>Factors related to the socio-political context</td>
<td>Good collaboration; contact OT most effective for implementation; contact through mail; contact moments limited; contact with OT positive effect on knowledge; used to working with OTs; frequent contact not necessary; visit of OTs positive effect on referrals; enthusiasm of OTs inspiring</td>
<td></td>
</tr>
</tbody>
</table>

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### Additional file 4 - Themes, categories, and codes from the interviews with managers

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors related to the implementation strategy</td>
<td>Added value of the strategy</td>
<td>NL_superficial; NL_boring; NL_informative; NL_clear; NL_information no additional value; NL_little additional value; NL_most relevant for informing manager; website makes NL needless; NL_nice and compact way to provide information; information difficult for layman; website: clarified difference between OT and other professions.</td>
</tr>
<tr>
<td>Method of dissemination</td>
<td>Too much email in general; preference for electronic dissemination; preference for email; preference for mail; website continuously available; website good as a reference; website suitable for information that does not change often; telephone calls are invasive; telephone contact creates space for managers to contact the interventionist; website requires active attitude; telephone calls makes managers less focused; interventions work as reminder</td>
<td></td>
</tr>
</tbody>
</table>
Representative Quotes

"...my practice consists of rather younger patients." (general practitioner, female)

"What I have been doing now is mainly trying to refer patients from the geriatric day care clinic. What I noticed especially was that a number of people were declining cognitively and did not fit into the treatment anymore, or that relatives indicated that there were so many healthcare professionals working there that they don’t want any more people involved. So in practice it turned out to be quite difficult to really find people to refer." (physician, female, nursing home)

"I just think at the time I need it then I think of OT because I’m used to working with OTs. So I don’t really need to visit the website to find out if it would be suitable or not. I’ve just never found a good reason to visit the website." (V99)

"I really don’t have the time for that, I really can’t fit that into my working schedule." (answer to the question whether she visited the website) (physician, female, mental health organization)

"With all this workload pressure you’re not likely to actively visit a website." (physician, female, nursing home)

"I think it’s to do with pressure of work as well. I think it will be good when there will be time and space for it in your daily structure." (physician, female, mental health organization)

"We had a visit from two OTs. They introduced themselves and told us what it is they do. At least that gave us a chance to get to know them by name and by face, and also to get familiar with the product. As a result, we are much more aware of occupational therapy when we are making treatment plans." (physician, male, nursing home)

"Discussing things with the occupational therapist [in answer to the question: what turned out to be most effective]. This is what we are doing at the moment and this is what we have on offer and yes, reading about it. I think that whenever a colleague is talking very enthusiastically to you about something, then it will encourage you to broaden your knowledge about it." (physician, female, nursing home)

"We are in touch with each other but we don’t talk to each other on a regular basis, I think we meet up once a year, although we do run into each other in for example a nursing home. Whenever I fax something they get to work on it and they inform me about it in a pleasant way. It is really not necessary to have frequent contact. It’s all running smoothly really." (general practitioner, female)

OT = occupational therapist; COTiD = Community Occupational Therapy in Dementia

Representative Quotes

"I didn’t think the newsletter had a very high additional value for me." (Manager, male, mental health organization)

"I think the newsletter rather competes with the website. If the information on the website is appropriate and it is a project that has been running for a number of years, then you can ask yourself what is the value of the information in the newsletter. A good thing about the newsletter though is that it focuses attention on matters." (Manager, male, mental health organization)

"By being able to find the guideline on the website, and being able to get information it’s easier for me to determine the position between those two [refers to OT and case management], we noticed some conflicting interests." (Manager, male, mental health organization)

"...it does give you partly a learning moment, it is a good thing to reread things every now and then, to let it sink in more. Just reading it or hearing it once, well, that is likely to subside in the multitude of things you are dealing with. So being momentarily alerted to it does lead to remembering it." (Manager, female, hospital)

"For me that doesn’t work as well as getting it via the post, because I receive more than fifty mails every day." (Manager, female, hospital)

"Yes, that was an excellent way of dissemination. In fact, all information sent digitally is better processed than when it is sent by post." (manager, male, nursing home)
<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors related to the innovation</td>
<td>Added value of OT services</td>
<td>Competition between OT and case managers; overlap between OTs and case managers; difference between OT and case manager minimal; OT additional value compared to case management; resistance of case managers</td>
</tr>
<tr>
<td>Factors related to the manager</td>
<td>Degree of involvement and support of managers</td>
<td>OTs do not need support; limited guidance_experienced OTs; OTs self-steering; OTs independent; OTs did not communicate any problems; manager trusts / relies on OT regarding implementation; manager has many employees</td>
</tr>
<tr>
<td>Self-perceived role of managers</td>
<td>Role of facilitator; allow home-based treatment; manager needs to be aware of what OTs are working on; support_promoting OT; support_advocate for OT; support_provide OTs with time; support_money; determine target areas for policy; sparring partner</td>
<td></td>
</tr>
<tr>
<td>Managers' needs</td>
<td>Website_lacked updates on national implementation; Website_PR toolkit was lacking; need for information on success implementation within cluster; need for regional information; need for knowledge exchange with other clusters</td>
<td></td>
</tr>
</tbody>
</table>


Representative Quotes

"Actually ambulatory occupational therapy is a bit at odds with what we are developing now regionally for people with dementia, which is case management. You see, the aids are not done through case management but a number of things such as unburdening everyday practice for informal caregivers and also, making sure that they know about everything, that does give some overlap." (Manager, male, mental health organization)

"Well, we have to make a choice at that point, what type of professional will we use for home counseling for the patient with dementia or and/or the informal caregiver, and yes, an occupational therapist could very well be the right person for that. Although it could just as well be a case manager, so the additional value in relation to each other can only be indicated when you really do need more adaptations than just the counseling" (Manager, male, mental health organization)

"These people have been working as professionals for more than 25 years, there’s no need to add anything to that. Of course, when an OT has only just started working, we’ll have to give more intensive guidance obviously, but that was not the case here at all." (Manager, male, hospital)

"...you see if the OT had indicated that he or she had difficulties with certain things, whether it be an aspect of time or other things to do with content, well then I would have to know about it so I can act upon it but that hasn’t occurred yet. These are all very experienced OTs, so no, I didn’t play a role in that at all." (Manager, male, hospital)

"I get my information through the OTs and that’s what we discuss. So I don’t for instance study the articles, I gladly leave that to the OT, they say this is what you can or should do from the management. They can really assess it on content and they can see whether it really fits into the choices that we make here as occupational therapy group, because you can’t do everything, you can’t excell in everything you know, especially where developments are concerned so what choices do we make, what will we do and what not and also the usual care, well we always go along with that of course." (Manager, male, hospital)

"If I were an operational manager, well then I would obviously communicate more about that. I would have really immersed myself into the subject but because I am a more indirect manager I am in a relationship based on mutual trust with the team. I left a lot to the occupational therapy teams and adopted a more supportive role, which was why I was not able to answer very detailed questions, questions dealing with content." (Manager, male, nursing home)

"But because we have quite a large group of allied healthcare professionals, I don’t always see the people very often. So I do my managing from a distance." (Manager, male, nursing home)

"...the content is on the employees’ desk. And to support them when needed, where it concerns means and materials so that they can indeed do their job properly, not only within their project but also within care. You see, information that is important for me is, but that has to come from the hospital itself, the size of the target group and what type of effort is required here, and then it’s my turn to move and do I have those means at my disposal or not and if not how, how do I get them, how do I try to acquire those means. That is especially my part you know, staff and means." (Manager, male, hospital)

"It’s all about whether the managers who are involved actually bring up the subject or whether the insurer or the care administration office brings up the subject. That’s a subject I could bring up." (Manager, male, mental health organization)

"No, that is my most important role, to support them as much as possible in that and to brainstorm together on how to deal with this and whom to approach, yes we do that together." (Manager, male, nursing home)

"For instance when making the brochure, we’re all actually re-inventing the wheel which is really a shame, it leads to delays.......a complete PR toolkit would have been handy or at the very least a brochure, but also for instance a standard text that you could use for a newspaper article, which we ended up writing ourselves, which could be put in the newspaper, those kind of things make me realize well, that would be good if you could just take that from the newspaper, such a press report, well you can send that in such a way." (Manager, female, nursing home)

"Well you see, if you really want to know then the information you want to get is how things go when OTs do home visits, how are OTs treated and another thing is just, do you succeed in convincing referring professionals and other professionals of the importance" (Manager, male, nursing home)

"...so I need regional information, I need information on how things are going in our area, well that always needs to originate from personal contact with the OTs themselves, for it to be successful you especially want to have experience from your own region." (Manager, male, nursing home)
<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers' attitude toward the COTID program</td>
<td>Need for home-based interventions; positive about COTID; proponent home-based interventions; enthusiasm manager important for implementation</td>
<td></td>
</tr>
<tr>
<td>Factors related to professionals influencing exposure to the implementation strategy</td>
<td>NL_read globally; Website_visited when questions arose; visited website several times; website not visited; visited website at the start of the study; visits to website limited_little involvement in implementation; visited website _curious; webiste_not visited_no questions; webiste_not visited_well-informed by OTs</td>
<td></td>
</tr>
<tr>
<td>Factors related to the organization</td>
<td>Available capacity home-based OT</td>
<td>Fear of too many referrals; OT limited capacity for home-based treatment; finances determine number of hours for home-based treatment; lack of trained OT to cover field of activity; realistic capacity determines choice between OT or other professional; dementia point of attention of organization; implementation COTID in annual planning; maintaining functioning at home point of attention in the region; awareness of management of importance OT essential for implementation</td>
</tr>
<tr>
<td>Degree of collaboration between professionals</td>
<td>Collaboration with other OTs in primary care; collaboration between organization and private practice possibility</td>
<td></td>
</tr>
<tr>
<td>Factors related to the organization influencing exposure to the implementation strategy</td>
<td>Website not visited_sufficient information provided by OT</td>
<td></td>
</tr>
<tr>
<td>Factors related to the socio-political context</td>
<td>Position of OTs within dementia care networks</td>
<td>OTs get involved too late; presence of OT in multidisciplinary meetings increases referrals; determine position of OT in dementia care network</td>
</tr>
</tbody>
</table>
Representative Quotes

"Well yes, it obviously has added value and you do see every time that it really helps clients and informal caregivers, that’s really great of course." (Manager, female, nursing home)

"...in any case when there was a reason for it, for instance when we were asked questions or when we wanted to look something up." (Manager, female, hospital)

"...whenever you have questions, you want to know how something works, what is it I can do here, well then of course you want to visit a website to get more information. I never had those questions." (M30)

"We have a dementia center for diagnosis and case management here, where OTs gave a presentation, which always leads to more referrals in other fields as well. So well, that’s why you cannot give too much attention to it because it just leads to too many referrals." (Manager, female, hospital)

"Well, to find out its added value and whether its availability is realistic. I mean, it’s not exactly realistic when for instance results show that occupational therapy is really the best option in ambulatory care for people with dementia, but we only have one occupational therapist available for that kind of care." (Manager, male, mental health organization)

"The occupational therapists and I can assess the interests and the use of it ourselves, and subsequently management will have to see whether we can and should adjust the hours of occupational therapy in our formation. And in that my influence is limited. In fact, money is the decisive factor here." (Manager, female, mental health organization)

"The issue of dementia is something that is paid attention to not only within the whole organization, but also within our region. Also, reinforcing the possibility of continuing to live at home is an important factor." (Manager, male, nursing home)

"...a doctor who chairs our multidisciplinary meetings has also received information and is aware of the study. We also discussed with our therapist, our occupational therapist, the idea behind it and what she would like to do and so on, and for some time our occupational therapist also took part in our meetings to keep the subject to the fore. But when she stopped taking part in it the interest quickly died down, so I can influence it but only often at some distance" (Manager, male, mental health organization)

"But it’s really because of the independence of my therapists and their fantastic know-how that I received all the information I needed, without having to look for further information." (Manager, male, nursing home)

"What we notice is that we get involved in it too late, and we feel that we should have been involved much earlier on, now patients are at the verge of being admitted and that makes you think that that could have been prevented if we had been involved right from the beginning." (Manager, female, nursing home)

"In the coming years a care network will be developed, resulting in an agreement between now and the end of 2012. Well, that is the moment to concentrate on the position of occupational therapy in that care network." (Manager, male, mental health organization)

"So gradually we are establishing our presence here and we are succeeding in covering the region, but the question remains who in this target group is specialized in what. And I notice that some occupational therapists are quite good at indicating their speciality, for instance fall prevention" (Manager, female, hospital)
<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of collaboration with physicians in the region</td>
<td></td>
<td>GP_important group of physicians; PR GPs important due to shift to primary care; Increase implementation_inform physicians via other disciplines; increase implementation_increase knowledge of people within GPs’ network; increase implementation_discuss succesful cases; suggestion implementation_focus on informing physicians</td>
</tr>
<tr>
<td>Finances and reimbursement of the COTiD program</td>
<td></td>
<td>Production agreement with insurance_default reimbursement not applicable; organization determines which means are used to achieve aims; finances do not limit home-based treatment; possibility of home-based treatment determined by cost/benefits; after study no capacity for home-based treatment; balance between patient and non-patient time; rate home-based OT too low; available capacity home-based OT depends on demand</td>
</tr>
</tbody>
</table>

NL = newsletter; OT = occupational therapist; COTiD = Community Occupational Therapy in Dementia; GP = General Practitioner
Representative Quotes

"You see, general practitioners are of course an important, a very important group." (Manager, male, nursing home)

"General practitioners are the focal points. Especially with the current government aiming to transfer care from the hospital to people’s neighborhoods, and if you cannot make it very clear what you have on offer, well then a GP is really not going to take you into consideration." (Manager, female, hospital)

"Which means that the approach from home care is very important, meaning incorporating health professionals in primary care, home care with case managers, that I think is an ideal breeding ground for occupational therapy in dementia care. I also think that physiotherapists should focus a lot more on occupational therapy." (Manager, male, nursing home)

"Also the communication between GPs and OTs has really improved because of that [refers to PR campaigns aimed at GPs], shorter lines yes, also there is more mutual understanding so that they know where to find each other, yes I’m quite convinced of that." (Manager, male, nursing home)

"If you bother GPs by saying for instance we are occupational therapists and we’ll be taking this up, what often happens is that the GPs have an aversion toward it. But we used substantive arguments to bring it to their attention and that appealed to a lot of GPs." (Manager, male, nursing home)

"And it is always the case in primary care that a successful referral leads to more referrals, but if you never had such a successful referral, well then you are leaving out a large area." (Manager, male, nursing home)

"...so we will be evaluating whether our occupational therapist could be assigned more hours to work on that, so we will have to find out to what extent the demand in the past period and in the coming period will increase. So the demand by clients, the number of applications." (Manager, female, mental health organization)

"another aspect is the rate for home-based OT, I think that is really substandard, it’s an investment in time and I think that insurers should fully reimburse it." (Manager, male, hospital)
Additional file 5 – Overview of factors that may have influenced the implementation of the COTiD program using the multifaceted implementation strategy

**Factors related to the implementation strategy**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent change in the combination of people within a functional unit</td>
<td>OT</td>
</tr>
<tr>
<td>Degree of interaction between people within a functional unit</td>
<td>All</td>
</tr>
<tr>
<td>Interval periods between coaching sessions</td>
<td>OT</td>
</tr>
<tr>
<td>Exposure to the implementation strategy</td>
<td>OT, MD, M</td>
</tr>
<tr>
<td>Communication about the goal of the implementation strategies</td>
<td>OT</td>
</tr>
<tr>
<td>Strong focus on promotional skills</td>
<td>OT, cluster</td>
</tr>
<tr>
<td>Double role of the implementer</td>
<td>MD, M</td>
</tr>
<tr>
<td>Positive about combined focus on skills and promotion</td>
<td>OT</td>
</tr>
<tr>
<td>Focus on individual problems</td>
<td>OT, MD</td>
</tr>
<tr>
<td>Exchanging experiences with colleagues</td>
<td>OT</td>
</tr>
<tr>
<td>Degree to which intervention is a stick behind the door</td>
<td>OT</td>
</tr>
<tr>
<td>Compatibility of strategy with existing way of working</td>
<td>OT, MD</td>
</tr>
<tr>
<td>Doubts about the security of the web-based system</td>
<td>OT</td>
</tr>
<tr>
<td>Travel time required / size of the region</td>
<td>OT</td>
</tr>
<tr>
<td>Added value of the strategy (e.g. regional meetings; newsletters)</td>
<td>OT, MD, M</td>
</tr>
<tr>
<td>Duration of the implementation period too short</td>
<td>OT</td>
</tr>
<tr>
<td>Focus of telephone conversation on recruitment</td>
<td>MD, M</td>
</tr>
<tr>
<td>Method of dissemination (preference varied)</td>
<td>MD, M</td>
</tr>
<tr>
<td>Reminder function of the strategy</td>
<td>MD, M</td>
</tr>
</tbody>
</table>

**Factors related to the innovation**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived overlap with OT and other services (-)</td>
<td>MD, M</td>
</tr>
<tr>
<td>Additional value of OT / effect of the intervention (varied)</td>
<td>MD, M</td>
</tr>
<tr>
<td>Balance between cost and effects (varied)</td>
<td>M</td>
</tr>
</tbody>
</table>

**Factors related to the professionals**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to the implementation strategy</td>
<td>OT, MD, M</td>
</tr>
<tr>
<td>Background of physician</td>
<td>MD</td>
</tr>
<tr>
<td>Presence of eligible clients</td>
<td>MD</td>
</tr>
<tr>
<td>Willingness to receive outreach visit</td>
<td>MD</td>
</tr>
<tr>
<td>Need for information / type of information needed</td>
<td>MD</td>
</tr>
<tr>
<td>Familiarity with occupational therapy</td>
<td>MD</td>
</tr>
<tr>
<td>Attitude toward psychosocial interventions</td>
<td>MD</td>
</tr>
<tr>
<td>Self-perceived role in dementia care</td>
<td>MD</td>
</tr>
<tr>
<td>Initial lack of referrals</td>
<td>OT</td>
</tr>
<tr>
<td>Lack of experience with the program</td>
<td>OT</td>
</tr>
<tr>
<td>Technical skills (linked to exposure the web-based system and discussion platform)</td>
<td>OT</td>
</tr>
<tr>
<td>Number of client groups / number of specialties</td>
<td>OT</td>
</tr>
<tr>
<td>Degree to which OT was promoted through personal contact</td>
<td>OT</td>
</tr>
<tr>
<td>Perception intensity of the program for clients / caregivers</td>
<td>OT</td>
</tr>
<tr>
<td>Perceived management support</td>
<td>OT</td>
</tr>
<tr>
<td>Self-perceived knowledge of dementia</td>
<td>OT</td>
</tr>
<tr>
<td>Need for information / type of information needed</td>
<td>M</td>
</tr>
<tr>
<td>Background and type of manager</td>
<td>M</td>
</tr>
<tr>
<td>Degree to which informed by OTs</td>
<td>M</td>
</tr>
<tr>
<td>Degree of involvement in the implementation</td>
<td>M</td>
</tr>
<tr>
<td>Number of priorities</td>
<td>M</td>
</tr>
<tr>
<td>Degree and type of support provided</td>
<td>M</td>
</tr>
<tr>
<td>Self-perceived role</td>
<td>M</td>
</tr>
<tr>
<td>Attitude toward COTiD</td>
<td>M</td>
</tr>
</tbody>
</table>
**Factors related to the organization**
- Work load pressure: MD
- Focus areas of the organization: NA
- Available means: NA
- Opinion of other managers of related fields within the organization: NA
- Circulation of professionals: NA
- OT capacity: NA
- Balance between direct and indirect time: OT, M
- Perception of OT by other colleagues: NA

**Factors related to the social system**
- Type of reimbursement construction: NA
- Degree to which OT is reimbursed: NA
- Collaboration with other professionals and organizations: NA
- Perception of OT by other colleagues: NA
- Number of referrals: NA
- Availability of role models: OT

**Characteristics of client / caregivers**
- Difficulty of a case (more difficult vignette lower adherence): OT

\[ +/− = \text{positive or negative influence on implementation} \]

OT = occupational therapist; MD = physician; M = manager
NA = not applicable
Chapter 7

Summary and general discussion
In this chapter a summary is provided regarding the research described in previous chapters of this thesis. The summary per chapter is followed by a general discussion.

**SUMMARY**

**Chapter 1 – Introduction**
The number of people with dementia is growing rapidly causing serious challenges for both people with dementia, caregivers, and healthcare systems worldwide. Various psychosocial interventions have proven to be effective in increasing self-sufficiency of people with dementia and in decreasing caregiver burden. One of these interventions is the Community Occupational Therapy in Dementia (COTiD) program. However, due to various barriers the uptake of COTiD in clinical practice was limited. Implementation strategies targeting specific barriers may accelerate the uptake of interventions. Therefore, a new implementation strategy (multifaceted training package) was developed to increase the uptake of COTiD in clinical practice and to increase the number of people with dementia and caregivers that can benefit from this intervention. This leads to the main research question discussed in this thesis, namely: Is the newly developed multifaceted training package more effective than the usual post-graduate course in increasing the number of referrals to COTiD, in improving occupational therapist (OT) adherence to COTiD and in improving client and caregiver treatment outcomes?

**Chapter 2 – Evidence-based practice among Dutch occupational therapists**
Evidence-based practice (EBP) principles should be used by OTs to make clinical decisions. Evidence-based practice refers to making clinical decisions based on a combination of the clinical expertise of professionals, the best available (research) evidence, and the values and preferences of the client and/or caregiver. To investigate how OTs perceive EBP, what sources of evidence they use, and what barriers they experience in using the EBP principles, a cross-sectional study was conducted.

A questionnaire was distributed through email and postal mail among 200 OTs randomly selected out of a total population of 2.019 Dutch OTs.

The results of the study showed that Dutch OTs have a very positive attitude toward EBP. Colleagues were used most frequently as a source of information to base clinical decisions on and more robust sources of evidence were used to a much lesser extent. A notable finding was that OTs with the least experience were more likely to seek information from OT colleagues instead of using literature. Barriers experienced mostly related to a lack of skills needed to implement evidence (e.g. difficulty to determine the quality of the evidence including a lack of skills and knowledge of research methodology and statistical methods) and characteristics of the work environment. Support from management, OT colleagues, and colleagues from other disciplines were found to positively affect EBP. Overall, the attitudes, experiences, and barriers of Dutch OTs were similar to research findings regarding EBP in other countries and other professionals.
unique barrier to EBP found in this study was that Dutch OTs who perceived evidence written in a foreign language as a barrier were less likely to use this evidence in their own practice. The results of the study implicate the important role of the work environment, which should encourage and support the use of research evidence (e.g. the COTiD program) and the EBP principles. In addition, advanced education may be necessary to improve OTs' skills in determining the quality of evidence and translating the evidence to a practical setting. However, to support practitioners, researchers should more clearly describe their methods and results and provide suggestions for the use of these results in practice.

**Chapter 3 - 5 – Evaluation of the effectiveness of a multifaceted strategy to implement the COTiD program**

COTiD is an evidence-based intervention for people with dementia and their caregiver that was proven effective in the research setting. To accelerate the uptake of COTiD in clinical practice a multifaceted training package was developed. The strategy was based on previously identified barriers and aimed at OTs, managers, and physicians. Components aimed at OTs intended to increase the number of physician referrals to COTiD to make sure more people can benefit from the COTiD program. In addition, these components aimed to increase OT adherence to COTiD and therewith attempt to increase the chance at successful treatment outcomes for the person with dementia and their caregiver. Various components of the multifaceted training package targeted physicians and managers. These components were aimed at increasing the number of referrals and at improving appropriate support for OTs in implementing COTiD in clinical practice. To establish these goals, the multifaceted training package for OTs consisted of two educational meetings, five to seven coaching on the job sessions, four regional meetings, in addition to the usual postgraduate course. OTs were also provided with access to a discussion platform and a web-based reporting system. Moreover, physicians and managers were given access to an educational website, received newsletters, and were approached by telephone. In Chapter 3 to 5 a detailed description of the multifaceted training package is provided.

A cluster randomized, single-blinded, controlled trial was conducted to evaluate if the newly developed multifaceted training package was more effective than the usual post-graduate course. Clusters were functional units that delivered community occupational therapy and included a minimum of two OTs (OTs), one manager, and one physician. Physicians were asked to include a minimum of eight people with dementia and their caregiver into the study. Experimental clusters received the multifaceted training package. In the control clusters OTs only received the post-graduate course. Physicians and managers received no interventions.

Forty-five clusters were stratified by type of setting (nursing home, hospital, mental health service) and randomized to either the control or experimental group in a 2 to 1 ratio. These clusters included a total of 94 OTs, 80 physicians, and 48 managers. Of this group 28 clusters (58 OTs, 44 physicians, 28 managers) were assigned to the control group and 17 (36 OTs, 36 physicians, 20 managers) to the experimental group. A total of 71 client-caregiver dyads were
included (27 control and 44 experimental). Chapter 3 provides a comprehensive description of the study design.

In chapter 4 the effectiveness of the multifaceted training package on referral rate and physicians' knowledge is discussed. In the experimental group physicians and managers had access to a website, received newsletters, and were approached by telephone. In addition, physicians were offered one outreach visit. The main outcome measure was the number of COTiD referrals received by each cluster which was assessed at 6 and 12 months after the start of the implementation strategy. Referrals were included from both participating physicians (enrolled in the study and received either the control or experimental strategy) and non-participating physicians (not enrolled but of whom referrals were received by OTs participating in the study). Mixed model analyses were used to analyze the data. All analyses were based on the principle of intention-to-treat. As a secondary outcome physicians knowledge on COTiD was assessed at 6 and 12 months after the start of the study. An electronic questionnaire with close-ended questions was used to collect these data.

The study showed that after 12 months clusters that received the multifaceted training package received significantly more referrals to the COTiD program when compared to clusters where OTs only received the post-graduate course. This increase in referrals was explained by a significant increase in referrals from non-participating physicians. No significant difference between groups was found for physicians' knowledge of the COTiD program.

These results suggest that passive dissemination strategies are less likely to result in changes in professional behavior. The amount of physicians exposed to active strategies was limited. In spite of this we found a significant difference in the number of referrals which was accounted for by more referrals of non-participating physicians in the experimental clusters. We hypothesize that the increase in referrals was caused by an increase in occupational therapists' efforts to promote their services within their network.

In chapter 5 the effectiveness of the multifaceted training package on OT adherence and client and caregiver treatment outcomes are reported. OT adherence to the COTiD program was measured using clinical vignettes (case descriptions with open ended questions). Data was collected at baseline and at 6 and 12 months after the start of the study. Secondary outcomes were clients' daily functioning, caregivers' sense of competence, quality of life and self-perceived performance of daily activities of both clients and caregivers. These data were collected at baseline, 6 and 12 months after the start of the occupational therapy treatment. The intention-to-treat principle was applied and mixed model analysis were used to analyze the data.

No significant between-group differences between baseline and 12 months were found for adherence, nor for any client or caregiver outcome. Overall adherence was still low at 12 months with 44.5% in the experimental group and 41.7% in the control group. Greater adherence was associated with a higher number of coaching sessions, a lower number of self-reported COTiD
treatments at baseline, a higher self-perceived knowledge of dementia at baseline, and experiencing less support from OT colleagues.

In conclusion, the multifaceted training package was not effective in increasing therapist adherence and client-caregiver outcomes. The study suggests that coaching sessions and increasing therapist knowledge on dementia positively affect adherence.

Chapter 6 – Evaluating the process of implementing the COTID program

In chapter 6 the results of a process evaluation conducted alongside the effect study are described. The aim of the process evaluation was to explain the success (increase in the number of referrals) and failure (lack of effect on OT adherence and client and caregiver outcomes) of the new multifaceted training package.

To uncover what factors influenced the effectiveness of the multifaceted training package various types of data were collected. Data on the multifaceted training package as planned and as executed were registered based on a standardized framework. Data on OTs' attitudes towards the COTID program and possible barriers with respect to the implementation of the COTID program were collected at baseline of the randomized controlled trial from all 94 participating OTs. For this purpose, a 19-item questionnaire was used and frequencies and correlations for these data were calculated. Focus groups with OTs and telephone interviews with physicians and managers were executed to collect data on experiences with the multifaceted training package. These data were analyzed using inductive content analysis.

The process evaluation revealed that the multifaceted training package as executed had a stronger focus than planned on increasing OTs promotional skills due to an initial lack of referrals. This resulted in less attention for increasing OTs' skills in using the COTID program as initially intended. At baseline, OTs had a positive attitude toward the program, however, 75% did not feel experienced enough and only 14.3% felt competent in using the program. Focus groups and interviews revealed various factors that influenced implementation. Most managers were positive about the program. However, the degree of operational support of managers for OTs regarding the implementation was not always adequate. Managers stated that a well-defined place for occupational therapy within the dementia-care network was lacking although this was perceived necessary for successful implementation. Several physicians perceived psychosocial interventions not to be in their area of expertise or not their responsibility. All professionals perceived inter-professional collaboration to be a facilitator for effective implementation, and general practitioners were perceived as key partners in this collaboration. However, collaboration was not always optimal. OTs indicated that increasing the referral rate was most effective when promoting OT via other disciplines within a physician's network.

In conclusion, the process data suggests that a first step in successful implementation should be to make sure that individual and organizational barriers are resolved. In addition, implementation should be network-based and encourage inter-professional collaboration. Initial promotion of
COTiD should focus on physicians that have a positive attitude toward non-pharmacological interventions.

**GENERAL DISCUSSION**
Both implementation itself and research to the effectiveness of implementation strategies are complex due to the many known and unknown influencing factors. The main study described in this thesis answers the research question: "Is the newly developed multifaceted training package more effective than the usual post-graduate course in increasing the number of COTiD referrals, in improving OT adherence to COTiD, and in improving client and caregiver treatment outcomes?" As has been stated in the summary, the multifaceted training package was only successful in increasing the number of COTiD referrals. However, the study uncovered various factors that are important to consider when implementing complex interventions in the future. These findings have been discussed in the previous chapters. The first part of this general discussion focuses on several methodological considerations regarding both our study and implementation in general. In the second part of this general discussion lessons learned from our study are discussed. Last, recommendations for research and clinical practice are made based on both the lessons learned in our study and recent literature.

**How much evidence is necessary before implementing effective innovations?**
Effective innovations should be implemented to make sure the community can benefit from these interventions in the future. But how much evidence is necessary before initiating the implementation process? When the implementation of the COTiD program was initiated only one Dutch study was conducted to assess its effectiveness. Grimshaw et al (2012)\(^1\) argue that this is inappropriate because individual studies rarely provide sufficient evidence for changes in policy and practice due to bias or random variation in their findings. An additional reason provided by these authors is the 'Proteus phenomenon'. This phenomenon entails that the first published study that evaluates a scientific question may find the highest effect size and that this effect size tends to decrease as further evidence is gathered\(^2\). As these are valid arguments, a more robust evidence-base should be established. Other studies have been conducted and initiated since the original Dutch effectiveness study and the implementation study. A pragmatic study on the effectiveness of the COTiD program has been conducted in Germany using a multi-center design\(^3\)\(^5\). This study was conducted parallel to the study described in this thesis. The study did not find significant effects of COTiD in a German sample\(^6\). The process evaluation of this German study showed that this lack of effect could partially be explained by an implementation error and suggested that it is crucial to first adapt an intervention to a new context (cross-cultural translation)\(^3\). Presently, a study on the effectiveness and implementation of the COTiD program in the United Kingdom is also conducted\(^6\) in which all steps of the Medical Research Council’s framework will be taken regarding the development (adapting the intervention to the situation in the UK), evaluation, and implementation of this complex intervention. Finally, to address
implementation and to develop a framework of components for cross-national transfer regarding the COTID program a European application is submitted to conduct a pilot-implementation study in four European countries. Following the finalization of these ongoing trials, the overall state of evidence on the COTID program needs to be evaluated. Even so, there is no consensus in the literature on when there is sufficient evidence for new interventions to be transferred to clinical practice and more discussion on this subject is necessary.

**How to study effectiveness of innovations and its implementation?**

We propose that the development and evaluation of new (complex) interventions should include several steps. In Figure 1 the consequent steps that should be conducted are displayed. The first step includes proof of concept studies which may include the first three phases of the Medical Research Council’s framework (theory, modeling, and exploratory phase)\(^8\)\(^-\)\(^10\). These steps should result in a clear understanding of the potential effect of an intervention as well as the essential active components of the intervention. During this first step the translation to clinical practice should already be taken into account by involving various stakeholders in the process of developing the intervention. These stakeholders may include healthcare professionals, management of healthcare organizations, clients, and health insurance companies. They can provide essential input to create a feasible intervention of which the active elements will hold up in clinical practice.

A second step is to evaluate the effectiveness of the intervention on a larger scale. There are two options to evaluate this effectiveness 1) a conventional randomized controlled trail (RCT) (or comparable designs) or 2) a pragmatic randomized controlled trial (see Box 1 for the definitions of the different trials). Conventional RCTs evaluate the effectiveness of an intervention in the ideal situation where the essential intervention components are controlled. This type of study does provide valuable information on the potential effect of the intervention. However, as a more pragmatic approach may increase both the ability of professionals to participate and to increase ‘real-world’ generalizability of results\(^9\)\(^-\)\(^11\), pragmatic trials seem to be the preferred method to evaluate the effect of new interventions. In addition to that, pragmatic trials will provide useful information that can be used directly to improve the intervention or for the development of implementation strategies. As in step 1 stakeholders should be involved in the entire process to increase the chance at successful implementation.

Vernooij-Dassen & Moniz-Cook (2014) emphasize the importance to avoid a type three (implementation) error in pragmatic trials. The implementation error refers to a failure to report positive outcomes due to low treatment fidelity (and not due to genuine ineffectiveness)\(^12\)\(^,\)\(^13\). In addition, Ruggeri and colleagues argue that it is a challenge to make sure pragmatic trials do not lose their methodological rigor\(^11\) and its effect on internal validity should be taken into account by researchers\(^9\)\(^,\)\(^10\). To maintain this rigor and obtain valid and useful information, essential factors that may influence the effectiveness in routine care should be monitored during a pragmatic effectiveness trial. This information should include characteristics of the interventionists (e.g.
awareness, knowledge, skills, adherence, motivation, experience), characteristics of the treatment as executed, characteristics of the clients and/or caregivers (age, disease severity etc.), and characteristics of the setting. This should include careful monitoring of treatment fidelity by professionals. As a result, the use of subgroup analysis is of high importance in pragmatic trials to be able to evaluate the impact of an intervention on various subgroups. For this purpose, researchers should make sure they are able to obtain a sufficient number of participants to conduct these subgroup analysis.

Figure 1. A process on the developing and testing of (complex) interventions

A third step would entail the improvement of the innovation based on the influencing factors found during the pragmatic trial. If necessary, implementation strategies should be developed based on the implementation model of Grol & Wensing (2006). After improving the intervention it should be tested again. This cyclic process can be repeated until the intervention is implemented sufficiently, meaning that the society profits from the intervention. However, when the intervention is used in another setting, region or country the intervention should be adapted to the new context and the process should start at step 1 again.
For the development of the COTiD program the first three phases of the MRC framework were used to proof the concept of the intervention. Based on these outcomes the effectiveness of the COTiD program was assessed using a conventional one-center randomized controlled study among a Dutch sample of people with dementia and their caregivers. This showed that the COTiD program was highly effective and cost-effective compared to no occupational therapy (measures at 0, 6, and 12 weeks)\textsuperscript{15-17}. A German study to the effectiveness of the COTiD program used a pragmatic seven-center design\textsuperscript{3,4}. This study compared the COTiD program with an active control group that included one home-visit by an OT (measures at 0, 6, 16, 26, and 52 weeks). The German study found no significant differences between groups regarding patients' daily functioning and outcomes remained stable over time\textsuperscript{3,4}.

The Dutch study had a more conventional study design which included only clients from one center and used only two very motivated and experienced interventionists which is likely to result in high treatment fidelity. The variability of the intervention and interventionists was limited and therefore the generalizability of the results are limited too. In the German study a more pragmatic design was used with multiple centers and multiple interventionists that were motivated but had no experience with the intervention before the start of the randomized controlled trial\textsuperscript{4}. A process evaluation of this study showed great variation in the quality of treatment performance between the interventionists and poor treatment fidelity for several sub-processes of the COTiD program\textsuperscript{3}. Finally, the COTiD program was not adapted to the German culture prior to the start of the study nor piloted in advance\textsuperscript{3}. In the German study need for assistance was the primary outcome. The study showed that the participants had a limited need for assistance in daily activities at baseline in contrast to the Dutch study, although cognitive functioning of the patients in both trials were comparable. No improvement could be reached on need for assistance (ceiling effect) in the German trial. OTs also stated that client-centered goal setting was very difficult and unusual. Here a cultural component may have played a role which may have influenced the results. We recommend that when an intervention is transferred to another region or country the process displayed in Figure 1 should be followed from the start to increase the chance at success. As stated by Graff (2015) previous studies on COTiD have provided valuable information on the preparations that are necessary for cross-national transfer\textsuperscript{18}. Currently, these lessons are applied in the UK during the VALID project where the COTiD program is adapted to the UK culture (COTiD-UK)\textsuperscript{19}.

We recommend to reassess the overall state of evidence and effectiveness of COTiD after completion of the currently ongoing trials\textsuperscript{18}. 


Box 1. Definitions of different types of studies

**Proof of concept studies**
The aim of a proof of concept study is to determine the feasibility and validity of using a newly developed intervention and uncovering the key components of an intervention. These often are small scale studies such as case studies, focus groups, preliminary surveys, or small observational studies.

**Randomized controlled (cost) effectiveness trials**
The RCT is an experimental design used to test the effectiveness and/or cost-effectiveness of an intervention. Individuals are assigned randomly to a treatment group or a control group. The outcomes of both groups are compared. An RCT does not aim to represent a "normal" treatment situation. Often the intervention is delivered by a limited number of very experienced interventionists.

**Pragmatic randomized controlled trials**
The design of a pragmatic RCT is similar to that of a regular RCT. However in a pragmatic trial the intervention may vary substantially in content between different centers and between clinicians (e.g. frequency and intensity). This flexible approach may increase the 'real-world' generalizability of the results. In this type of studies it is essential to monitor and describe the characteristics of the intervention to be able to draw appropriate lessons from the trial.

**Implementation studies**
Implementation research includes the evaluation of interventions to promote the systematic uptake of new or underused evidence-based, effective interventions into routine clinical practice.

The role of professionals in the implementation process
In our implementation study, OTs, physicians, and managers were involved in the implementation process. The process evaluation suggests that the self-perceived roles of managers and physicians within the implementation process varied. This may be caused by having different subtypes of professionals involved (e.g. operational managers and strategic managers; general practitioners and various types of specialists). Even so, the same interventions were offered to professionals of different subtypes regardless of their varying roles within organizations. The lack of tailoring the implementation strategy to these different roles may have decreased the effectiveness of the implementation strategy. Therefore, future studies in both the Netherlands as in other countries should take variation in roles into account and offer tailor-made strategies for (at least) each subtype.

The importance of the role of managers in implementation has been found previously\(^{20,21}\). However, both our study and a study by Girard et al (2011)\(^{22}\) showed that various barriers affected managers' involvement in implementation. In our opinion, a manager is essential in the implementation process and needs to take the lead in establishing relationships with partners for collaboration in the region (such as physicians, private practices etc.). The OT is responsible for the content of the innovation and the execution of several implementation activities (such as
providing informational talks about the innovation to promote their services among other professionals and potential clients). In addition, OTs need to keep their manager informed about the content of the innovation and about additional implementation needs. However, our process evaluation showed that most interviewed managers provided their OTs with limited guidance in the implementation process.

Various types of physicians were involved in the implementation study. These different target groups may require different approaches. However, we used the same interventions and information for all participating physicians. The results of the process evaluation suggested that the general practitioners may have a primary role in dementia care and dementia care management. In the Netherlands care shifts more from secondary to primary care. Due to this the already pivotal role of the primary-care physician will increase even further. Similarly, in the UK care is also shifting more to primary care. This can be illustrated by the introduction of GP commissioning starting April of 2013\(^ {23} \). GP commissioning groups make decisions on the specialist services chosen for patients that require a referral from primary care. Therefore, future studies in primary dementia care may need to take this important role into account. However, it should also be considered that due to this increase in responsibility for primary-care physicians a lack of time may become a stronger barrier to the implementation of and referral to new interventions. The use of other professionals within the primary care physicians' network (e.g. physician assistants, community nurses, and case managers) needs to be considered. As this network varies per region or even per primary-care physician we recommend that future implementation strategies are adapted to the local situation.

Our process evaluation showed that collaboration between professionals was found to be an important element (Chapter 6)\(^ {24} \) which is in line with a review\(^ {25} \) that found that interdisciplinary collaboration may positively affect professional behavior. This process evaluation showed that especially interpersonal contact helped to increase physicians' knowledge and awareness of OT. This is in agreement with previous literature suggesting that interpersonal contact is important, especially with people who are less open to change\(^ {26} \). In our multifaceted implementation strategy we only indirectly encouraged OTs to collaborate with physicians in their region. The exposure of physicians and managers to interpersonal communication seemed limited. Studies regarding multifaceted implementation strategies suggest that a multidisciplinary and network-based approach is both feasible\(^ {27} \) and effective\(^ {28} \) in improving attitudes, knowledge, and behavior\(^ {29} \). This indicates that a more prominent place for interdisciplinary network-based collaboration within our strategy might have been necessary to kick-start collaboration and networking. Future implementation studies should therefore include this in their strategy and focus on stimulating and facilitating local networking and collaboration.

In recruiting functional units (a team of at least one physician, one occupational therapist and one manager involved in delivering outpatient care for people with dementia) for our study we preferred professionals within one functional unit to be working at the same organization. However, due to practical reasons and differences between regions regarding the organization of
dementia care some functional units were a collaboration between professionals of different organizations (e.g. a primary care physician in a functional unit with an OT and manager from an organization in the same working area). The variation in functional units may represent the real-life situation. Our process evaluation showed that the type of setting of different professional may influence factors such as the type of financial reimbursement and the degree of collaboration. These factors may have created variation in the degree of implementation. Based on this we recommend future studies to tailor implementation strategies to the organizational structure and type of collaboration of individual regions or functional units.

A more holistic view on implementation in research
We included not only outcome measures at cluster and professional level, but we also included outcomes on client and caregiver level as well as cost data (cost data were not included in this thesis). This provides a more holistic view on implementation and allows researchers to evaluate if positive effects on professional level also result in benefits for the target group of the intervention (in this case people with dementia and their caregivers) and in benefits for the society. More studies should include these outcomes. A challenge, however, remains that this approach requires to collect an extensive amount of data from clients and caregivers. In addition, the recruitment of client-caregiver couples was challenging in our study which is a common problem in clinical trials involving people with dementia. As one of the primary outcome measures was the number of referrals to COTID, the research team was not able to actively recruit client-caregiver couples and therefore decided to recruit couples through the participating physicians. A study by Galvin et al. (2009) found that physicians who were in close proximity to a research center and the availability of internet information on diagnostic evaluation were more likely to refer clients for participation in clinical trials. Barriers preventing referrals to a clinical trial were concerns about exposure of patients to uncomfortable procedures and lack of time to discuss participation with the client. As dementia is becoming an increasing problem and countries are spending more money on dementia research it is essential to find a solution to this recruitment problem and find effective ways to encourage physicians to refer patients for participation in research. The use of computerized record pop-up prompts to assist professionals in the recruitment as well as the participation of clients and caregivers in trial development may contribute to improving the recruitment process. Client involvement in trial preparation is a requirement incorporated in an increasing number of grant application procedures. However, when attempting to improve recruitment researchers still should prevent the referral and inclusion of patients primarily to 'save' the trial. Researchers should keep focusing and targeting clients that are most likely to benefit. This may prevent the likelihood of negative trials. Another approach to collect sufficient data from people with dementia and caregivers is to make use of data already collected during the clinical process. Researchers should explore the possibility of using these data and dare to assess the minimum amount of data necessary instead of collecting as much data as possible to be certain nothing is left out.
The use of vignettes to measure adherence

Although (video) observations and standardized patients are the gold standard to evaluate adherence, this was considered to be too labor-intensive and too burdensome for participants with dementia. Studies have shown that the use of vignettes is a valid alternative for measuring adherence. To create a suitable case-mix we used one vignette that represented a case of average difficulty and a second vignette that represented a more difficult case. The creation of this case-mix seemed to be successful as our data showed that overall OTs' in both groups had significantly lower adherence scores for the more difficult case at all times of measurement. For this study, we chose to use open-ended questions to prevent biased results due to cues provided when using close-ended questions. Although the scoring process of open-ended questions is an elaborate process we believe it provides a better representation of the actual adherence. To decrease the time spent on scoring future studies, one may choose to use an automated algorithm. Luck et al. (2006) showed that such an algorithm is a feasible and accurate way to score clinical vignettes compared to an assessor. Although the inter-rater reliability of the vignettes was found to be very good \( r = 0.88 \), we did not evaluate other types of reliability or validity. Further testing of the validity and reliability is recommended before they are used in future studies.

Upon making a choice between the use of vignettes and observations the purpose of the study must be taken into account. For the primary purpose of our study, the use of vignettes was suitable. However, it would have been valuable to evaluate the correlation between the percent adherence and patient outcomes. As the adherence to the COTiD program was not evaluated for individual client-caregiver couples but through vignettes, this correlation could not be assessed.

LESSONS LEARNED

In this second part of the general discussion we address the lessons learned with regard to the implementation of a complex intervention. These lessons should be taken into account in future studies that are either developing an intervention or aim to implement an existing intervention. While these lessons might be most suitable for the implementation of complex interventions these lessons may provide valuable information for the implementation of other interventions in healthcare.

Tailor the innovation to fit a specific region

Our study showed that there were various barriers to the implementation of COTiD. Various factors require that the innovation (in this case COTiD) is adapted is adapted to the local circumstances. In addition, other studies to the effectiveness and implementation of COTiD showed that the program cannot be transferred to another country without adapting it to the new context. Therefore we recommend that a first step to successful implementation is to adapt the program to the local setting. Adapting the intervention should be done in close collaboration with local stakeholders such as healthcare organizations and professionals.
should be assigned an active role in this process. This allows them to have a say in the intervention to be applied and may create a feeling of ownership for both the organizations and professionals.

**Select competent and motivated occupational therapists**

In our study the only criteria for OTs to participate in the study was that they completed the postgraduate course on the COTiD program. In spite of this adherence of OTs in both the control and intervention group was low. Therefore, it should be considered to train only a select group of OTs who are motivated and willing to specialize in the treatment of people with dementia and their caregivers. A study to the effect of an implementation initiative called ParkinsonNet\(^{27}\) indicates that specialization may contribute to improving professionals’ guideline adherence. This initiative has a strong focus on both close collaboration between professionals and on specialization of a small group of motivated and competent professionals\(^{27}\). When using this approach a specific list of necessary competences should be developed to select professionals.

**Select committed partners for collaboration**

Our study has shown that implementation of COTiD is a joint effort that requires commitment of therapists, physicians, and managers working in a certain region. The process evaluation revealed that professionals within a functional unit need to be selected carefully (chapter 6). Several physicians were not able to include the required eight client/caregiver couples. One of the reasons mentioned by general practitioners was the lack of older adults within their practice. In addition, we found that some physicians had a negative attitude toward psychosocial interventions. Therefore, we recommend that partners for collaboration should be selected based on practical requirements (e.g. suitable client population), ambition, motivation, and personal commitment. This may increase the chance of a fast and successful implementation.

**Tailor the implementation strategy to a specific region**

The process evaluation showed that the regional network in which OTs are working is important in the implementation process. It was mentioned that OTs were often consulted too late (not until the later stages of the disease). One of the factors that may affect the implementation rate is that several physicians and managers in our study perceived overlap between OT and other professionals. This indicates that it is important that OTs communicate to other professionals (e.g. physicians, case managers, district nurses, and physicians assistants) within their network about what their services entail and what the added value is.

Our multifaceted implementation strategy was based on barriers identified by a sample of OTs, physicians, and managers. Based on these barriers an overall implementation strategy was developed for all regions. Part of the strategy provided room to tailor the strategy to specific needs of each functional unit. However, identifying local barriers and facilitators for each functional unit may have led to more effective implementation. We therefore recommend that
implementation studies should address possible barriers and facilitators in a specific region and that strategies should be tailored to the way care is organized at a local level.

**Tailor the implementation strategy to individual professionals**

Our strategy toward OTs was tailored to individual needs by addressing individual questions and barriers during coaching on the job sessions. However, future strategies may include a more explicit evaluation of the stage of the diffusion process (knowledge, persuasion, decision, implementation, or confirmation stage) a professional is at and the type of adopter a professional is (innovators, early adopters, early majority, late majority, laggards)\(^26\). This information can be used by the coach to more precisely select and tailor strategies to the individual professional. A similar approach may be used for interventions toward managers and physicians.

**Invest in the development of an organizational structure to facilitate and monitor implementation**

There were several organizational factors that affected the implementation of COTiD. These determinants were a lack of guidance provided by managers and the negative influence of support from colleagues on OT adherence (chapter 6). Hysong et al (2006)\(^21\) suggest that adherence to guidelines is most optimal when an organizational structure is used to provide clinicians with timely, individualized and non-punitive feedback. To encourage and facilitate implementation in the long run, we therefore recommend that organizations invest in the development of such organizational structures which make it possible to facilitate and monitor implementation of evidence-based interventions. As managers indicated that limited involvement and support in the implementation was caused by factors such as workload pressure and a lack of knowledge on the content of a new innovation, coaches may be hired by organizations to guide individual professionals.

**Improve collaboration between professionals**

The results of the process evaluation showed the important role of collaboration between professionals, such as between OTs and physicians (chapter 6). In our multifaceted training package we only indirectly encourage OTs to collaborate with physicians in their region and their managers. A review by Zwarenstein et al. (2009)\(^25\) indicates that interdisciplinary collaboration may positively affect professional behavior and healthcare outcomes. Several studies regarding a multifaceted implementation strategy to implement a Parkinson's disease guidelines suggest that a multidisciplinary and network-based approach is both feasible\(^27\) and effective\(^28\). This indicates that a more prominent place for interdisciplinary collaboration within our strategy might have been necessary. A study to the effectiveness of a dementia training program for pairs of general practitioners and primary care nurses showed that this training was effective in improving attitude, knowledge, and behavior regarding dementia care management\(^29\). Future studies may therefore consider the use of multi-professional training to kick-start collaboration and
networking. The training should provide sufficient attention to existing teams in specific local areas and take into account the local organizational structure.

**Pay attention to promotional skills, gaining experience, and prerequisites for implementation**

The multifaceted training package was intended to both increase promotional skills of therapists as well as their adherence and experience with COTiD. However, our process evaluation showed that in reality the strategy focused more on increasing OTs promotional skills. This was caused by an initial lack of referrals of people with dementia to the COTiD program. By the time the referral rate increased, there was only a limited amount of time to increase OTs skills in using the COTiD program (and increasing adherence).

The results of the process evaluation suggest that the strategies regarding promotional skills were effective (chapter 4 & 5). However, data also showed that sufficient attention for gaining experience with COTiD was important as well. Baseline data demonstrated that 75% of the OTs felt they lacked experience and that only 14% felt competent in using the program. OTs who agreed that they had sufficient experience with the COTiD program felt more competent in using the program and were more likely to feel capable to justify using the program toward physicians (chapter 6). This points out that increasing professionals (self-perceived) experience with an innovation should receive proper attention within the implementation strategy. This was lacking in the execution of our multifaceted training package. We recommend that future implementation efforts identify prerequisites and that these are addressed prior to the actual implementation process. In addition, researchers and funding agencies should bear in mind that implementation of interventions takes time. This means that studies may need to increase follow-up time beyond a one year period to be able to measure effectiveness.

**Use coaching on the job and peer-assessment as the main strategy components**

Coaching on the job was provided to OTs and more coaching sessions was associated with higher adherence to the COTiD program. This is in agreement with a Cochrane review that reported that implementation strategies that included educational outreach visits show slightly better outcomes than strategies such as audit and feedback. We recommend to keep providing these coaching sessions for the implementation of COTiD and to make these the main ingredient of the implementation strategy. In addition, problem-based peer assessment has shown to be a promising method to improve professionals knowledge on guidelines and guideline consistent reasoning. This method includes different educational strategies such as dissemination of a guideline, in-depth assessment of the guideline through a problem solving process, assessment of therapist performance, individualized performance feedback, and the use of an individually tailored improvement plan. The benefit of this method is that it can be done continuously by the professionals themselves with minimal support from an external expert. This might be a valuable addition to the coaching on the job sessions which was a successful component of our multifaceted training package in increasing adherence.
In summary, the following recommendations are formulated for future implementation efforts:

1. Tailor the innovation to fit a specific region
2. Select competent and motivated professionals
3. Select committed partners for collaboration
4. Tailor the implementation strategy to a specific region
5. Tailor the implementation strategy to individual professionals
6. Invest in the development of an organizational structure to facilitate and monitor implementation
7. Improve collaboration between professionals
8. Pay attention to promotional skills and gaining experience
9. Use coaching on the job and peer-assessment as the main strategy components

**Recommendations for future studies**

1. There is no consensus in the literature on when there is sufficient evidence for new innovations to be transferred to clinical practice. More discussion between researchers, practitioners and policy makers on this subject is necessary.
2. Stakeholders (e.g. healthcare organizations, professionals) should have an active role in the development of complex interventions to increase their feasibility.
3. Monitor treatment fidelity and other essential factors when assessing the effectiveness of both the innovations and the implementation strategy.
4. Adapt existing innovations to a new context prior to assessing its effectiveness in the new context. Involve stakeholders from the new context in this process.
5. Implementation strategies should be tailored to a specific region including professional roles, organizational structures, and type of collaborations.
6. Interdisciplinary training should have a prominent place within implementation strategies.
7. Recruitment of clients with dementia and their caregiver(s) is challenging. As countries are spending more money on dementia research an effective solution to this recruitment problem should be found. Client and caregiver participation in this phase probably is crucial for success. Researchers should be properly trained on this crucial issue.
8. Researchers should explore the possibility to make use of already existing data/data already collected in the clinical setting.
9. Depending on the research aim, vignettes seem to be an appropriate instrument to measure professionals behavior. However, scoring vignettes with open-ended questions is a labor-intensive process. Methods should be explored to create a more efficient manner to score these vignettes.
10. Establishing change in clinical practice takes time. Evaluation of implementation strategies may require longer than a one year period. Based on our findings we suggest to measure at least up to a year and a half or even two years after the start of the intervention.
11. We were not able to evaluate correlations between OT characteristics and adherence. We recommend future studies to explore what subgroups of OTs or what OT characteristics determine the degree of adherence to the COTiD program (or new innovations in general). This makes it possible to adapt implementation strategies to these characteristics.

**Recommendations for healthcare professionals**

OTs have a positive attitude toward the EBP principles (integration of evidence, experience, and client preferences to base clinical decisions on)\(^20\). However, overall OTs mainly use sources such as colleagues as evidence. The use of research evidence was limited\(^20\) which was illustrated by the limited use of the COTiD program in clinical practice (Graff and Van Uden, unpublished). Based on our study we recommend the following:

1. For clients and caregivers to be able to benefit from OT services, OTs need to create awareness of their services among physicians and other healthcare professionals. Our results suggest that for this purpose OTs should integrate into the regional dementia care network and collaborate with other professionals involved in dementia care within their region.

2. Prior to implementation, managers should evaluate the feasibility of this implementation based on influencing factors such as the focus of the organization and the number of trained professional.

3. Managers should take the lead in the implementation process and facilitate networking opportunities. OTs should make sure they are knowledgeable on the content of the innovation (in this case the COTiD program) and are able to gain sufficient experience with the program.

4. OTs should have an active and assertive approach toward their manager (keep him/her up to date on the implementation process and address problems that occur) and physicians.
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Samenvatting
Hoofdstuk 1 - Introductie
Dementie is wereldwijd een steeds groter wordend probleem. Verschillende psychosociale interventies zijn effectief gebleken in het vergroten van de kwaliteit van leven van mensen met dementie. Een aantal van deze psychosociale interventies zijn tevens effectief gebleken in het vergroten van de kwaliteit van leven van mantelzorgers en/of het verminderen van de draaglast van deze mantelzorgers. Ondanks de positieve impact die psychosociale interventies kunnen hebben is er weinig onderzoek gedaan naar de implementatie van deze interventies in de dagelijkse praktijk.

Een psychosociale interventie die effectief is gebleken in de onderzoeksetting is ergotherapie voor ouderen met dementie en hun mantelzorgers aan huis (het EDOMAH programma). Echter, er werden verschillende barrières gevonden die optimale implementatie van het EDOMAH programma in de dagelijkse praktijk belemmeren.

Hoofdstuk 2 - Evidence-based practice onder Nederlandse ergotherapeuten
Het EDOMAH programma is een voorbeeld van een evidence-based interventie. In hoofdstuk 2 worden de resultaten van een cross-sectioneel onderzoek naar evidence-based practice (EBP) onder Nederlandse ergotherapeuten beschreven. Dit onderzoek had als doel te evalueren hoe Nederlandse ergotherapeuten tegen EBP aankijken, welke soorten bewijs zij gebruiken voor het nemen van behandelbeslissingen en welke barrières zij ondervinden bij het implementeren van EBP.

Om dit te evalueren werd een vragenlijst verstuurd naar 200 ergotherapeuten die willekeurig geselecteerd werden uit een totale populatie van 2019 werkzame ergotherapeuten. Data verzameling vond plaats van 1 mei tot 31 juli 2008. De resultaten van dit onderzoek toonden aan dat ergotherapeuten een positieve houding hebben tegen opzichte van EBP. Collega's werden het meest gebruikt als bron om behandelbeslissingen te nemen. Sterkere typen bewijs (zoals wetenschappelijke literatuur) werden veel minder gebruikt voor het nemen van beslissingen omtrent de behandeling. Een opvallende bevinding was dat ergotherapeuten met minder ervaring over het algemeen meer gebruik maakten van collega's als bron van informatie.

De meest voorkomende barrières voor het gebruiken van de EBP principes hadden te maken met de vaardigheden van ergotherapeuten, zoals moeite hebben met het bepalen van de kwaliteit van bewijs en een gebrek aan kennis over onderzoeksmethoden en statistische methoden. Daarnaast hadden veel barrières betrekking op factoren gerelateerd aan de werkplek. Het ervaren van steun van het management, van ergotherapie collega's en van collega's van andere disciplines had een positieve invloed op EBP. Over het algemeen kwamen de opvattingen, ervaringen en barrières van de Nederlandse ergotherapeuten overeen met die van professionals in andere landen en die van andere type professionals. Een barrière die specifiek in deze studie naar voren kwam is dat een groot percentage van de deelnemers problemen ervaarden bij het gebruiken van bewijs in een buitenlandse taal. Ergotherapeuten die deze barrière ondervonden maakten minder vaak gebruik van bewijs in een buitenlandse taal.
De resultaten van dit onderzoek impliceren dat organisaties (management) een belangrijke rol spelen in het stimuleren en ondersteunen van het gebruik van EBP principes. Dit betreft onder andere het gebruik van interventies die gebaseerd zijn op wetenschappelijk bewijs (zoals het EDOMAH programma). Daarnaast lijkt verdere scholing essentieel om de vaardigheden van ergotherapeuten te vergroten. Het gaat hier met name om vaardigheden die nodig zijn om de kwaliteit van bewijs te kunnen beoordelen en om resultaten van onderzoek te kunnen vertalen naar de praktijk. Om professionals hierin te ondersteunen zullen onderzoekers hun onderzoekresultaten op een heldere wijze moeten beschrijven waarbij zij suggesties geven voor het toepassen van de resultaten in de praktijk.

**Hoofdstuk 3–5 – Effectiviteit van een strategie om het EDOMAH programma te implementeren**

Om het gebruik van het EDOMAH programma in de praktijk te vergroten is een nieuwe implementatiestrategie ontwikkeld gericht op ergotherapeuten, artsen en managers. Deze implementatiestrategie was gericht op het verbeteren van de mate waarin ergotherapeuten zich aan EDOMAH houden, het verhogen van het aantal verwijzingen naar EDOMAH en het verbeteren van behandelresultaten op het niveau van de cliënt en de mantelzorger.

In het kader van deze nieuwe implementatiestrategie ontvingen ergotherapeuten naast de reguliere post-HBO cursus eveneens:
- twee educatieve bijeenkomsten
- vijf tot zeven coaching-on-the-job sessies
- vier regionale netwerk bijeenkomsten
- toegang tot een web-based rapportagesysteem
- toegang tot een discussie platform.


Primaire uitkomstmaten waren de mate waarin ergotherapeuten zich aan het EDOMAH programma hielden (adherentie), het aantal verwijzingen binnen een cluster naar ergotherapie volgens het EDOMAH programma en de kosteneffectiviteit van de implementatiestrategieën. Adherentie werd gemeten doormiddel van vignetten (casus met open vragen). Secondaire

In totaal werden 45 clusters gestratificeerd naar type instelling (verpleeghuis, ziekenhuis, GGZ instelling) en willekeurig verdeeld over de controle en interventie groep in een verhouding van 2:1. Deze willekeurige verdeling leidde tot 28 controle clusters (58 ergotherapeuten, 44 artsen en 28 managers) en 17 interventie clusters (36 ergotherapeuten, 36 artsen en 20 managers). Een totaal van 71 cliënten met dementie en hun mantelzorger werd geïncludeerd (27 in de controle groep en 44 in de experimentele groep).

Verwijzingen werden verzameld per cluster en verwijzingen van zowel deelnemende artsen (die de controle of experimentele strategie ontvingen) als niet deelnemende artsen (die niet de controle of experimentele strategie ontvingen, maar waarvan ergotherapeuten wel verwijzingen ontvingen) werden hierin meegenomen. Na 12 maanden ontvingen experimentele clusters (de nieuwe implementatiestrategie) gemiddeld significant meer verwijzingen (5.25 verwijzingen (SD 5.75)) dan controle clusters (post-HBO cursus) (2.07 verwijzingen (SD 5.14)). Dit verschil werd niet veroorzaakt door een verschil in het aantal verwijzingen van artsen die deelnamen aan het onderzoek, maar door meer verwijzingen van niet deelnemende artsen in de experimentele groep na 12 maanden (t -2.55 / 43 / 0.02). Er was geen verschil tussen de groepen met betrekking tot de kennis van deelnemende artsen over EDOMAH.

Er werd geen significant verschil gevonden tussen de groepen wat betreft de mate waarin ergotherapeuten zich aan het EDOMAH programma hielden. Na 12 maanden was de mate van adherentie nog steeds laag in beide groepen met een gemiddelde van 44,5% adherentie in de experimentele groep en 41,7% in de controle groep. Betere adherentie was gekoppeld aan het ontvangen van meer coaching-on-the-job sessies en het uitvoeren van minder (zelfgerapporteerde) EDOMAH behandelingen voor de start van de implementatiestrategie. Daarnaast was een beter adherentie gekoppeld aan een betere kennis van dementie voor de start van de implementatiestrategie en het ervaren van minder steun van ergotherapie collega’s. Er werd geen verschil gevonden tussen groepen met betrekking tot behandeluitkomsten van cliënten met dementie en hun mantelzorger. Echter, ondanks de progressieve aard van dementie waren de behandeluitkomsten in beide groepen stabiel gedurende een periode van 1 jaar.

**Hoofdstuk 6 – Evaluatie van het implementatieproces**

Om het succes en falen van de nieuwe implementatiestrategie te verklaren is er een procesevaluatie uitgevoerd. Verschillende methoden werden hiervoor gebruikt. De nieuwe
implementatiestrategie zoals origineel ontwikkeld is middels een raamwerk beschreven. Dit raamwerk is bedoeld als hulpmiddel om een implementatiestrategie op een specifieke en gedetailleerde wijze te omschrijven. Gebaseerd op dit raamwerk is beschreven op welke punten tijdens het uitvoeren van de strategie is afgeweken van het originele plan. Om de opvattingen en barrières van deelnemende ergotherapeuten omtrent het EDOMAH programma en de implementatie in kaart te brengen is gebruik gemaakt van een vragenlijst met 19 stellingen. Alle 94 ergotherapeuten die deelnamen aan de effectstudie werd gevraagd om deze vragenlijst voor het ontvangen van de implementatiestrategie in te vullen. Voor alle stellingen werden frequenties en correlaties berekend. Om data omtrent de ervaringen van professionals met de nieuwe implementatiestrategie te verzamelen werden focusgroepen gedaan met ergotherapeuten en telefonische interviews met artsen en managers. Deze data werd geanalyseerd door gebruik te maken van een inductieve inhoudsanalyse.

De procesanalyse toonde aan dat verschillende factoren het effect van de nieuwe implementatiestrategie beïnvloed kunnen hebben. Het positieve effect van de implementatiestrategie op het aantal verwijzingen naar EDOMAH kan verklaard worden doordat de nadruk van de implementatiestrategie lag op het verbeteren van de communicatie- en PR vaardigheden van ergotherapeuten. Deze focus was noodzakelijk door het initiële gebrek aan verwijzingen dat nodig was om ervaring op te doen met het programma. Daarnaast hebben een gebrek aan voldoende verwijzingen en een negatieve houding van artsen tegenover het programma er aan bijgedragen dat het aantal verwijzingen niet verder steeg. Het gebrek aan effect op het gebied van adherentie wordt mogelijk verklaard door de sterke focus van de interventie op het verbeteren van PR vaardigheden. Hierdoor was er weinig tijd over om te werken aan het verbeteren van vaardigheden omtrent het gebruik van het programma in de dagelijkse praktijk. Verder werd persoonlijk contact belangrijk gevonden. Echter artsen en managers werden hier in beperkte mate aan blootgesteld tijdens de implementatie. Daarnaast vertrouwden managers in grote mate op de kennis en vaardigheden van ergotherapeuten maar verleenden zij over het algemeen weinig ondersteuning in het implementatieproces. Organisatiefactoren die invloed hadden op de implementatie waren het aantal beschikbare getrainde ergotherapeuten, de grootte van de regio die een organisatie moet bedienen, de speerpunten van de organisatie, de vraag naar ergotherapie bij dementie en de balans tussen de kosten en effecten van het EDOMAH programma in de dagelijkse praktijk. Als laatste waren de mate van samenwerking tussen professionals en het gebrek aan geschikte cliënten belangrijke determinanten voor succesvolle implementatie.
Conclusies en aanbevelingen
Het onderzoek zoals beschreven in deze samenvatting laat zien dat de implementatie van complexe interventies geen makkelijke taak is, zelfs als de interventie effectief is gebleken in de onderzoeksetting. De implementatie van het EDOMAH programma werd beïnvloed door verschillende factoren die betrekking hebben op de implementatiestrategie, de interventie zelf, de professionals, de organisatie en de sociaal-politieke context.

Op basis van de resultaten van dit onderzoek volgen de onderstaande aanbevelingen:
1. Pas de interventie aan aan de specifieke regio waar deze geïmplementeerd wordt
2. Selecteer competent en gemotiveerde professionals
3. Selecteer toegewijde samenwerkingspartners
4. Pas de implementatiestrategie aan aan de specifieke regio waar de interventie geïmplementeerd wordt.
5. Creëer een strategie die aangepast kan worden aan de individuele professionals.
6. Investeer in de ontwikkeling van een organisatiestructuur om de implementatie van interventies te faciliteren en monitoren.
7. Verbeter samenwerking tussen professionals.
8. Heb aandacht voor vaardigheden om interventies te promoten en het opdoen van ervaring met de interventie.
9. Gebruik coaching on the job als een van de primaire implementatiestrategieën

Voor een uitgebreidere discussie van de onderzoeksresultaten kan hoofdstuk 7 "Summary and General discussion" geraadpleegd worden.
Dankwoord
Dankwoord

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Curriculum Vitae


Carola Döpp was born in Hoorn in 1983. In 2000 she graduated from high school and went to the Amsterdam University of Applied Sciences to obtain a Bachelor's degree in occupational therapy. After graduation in 2004 she worked as an occupational therapist at a nursing home for two years. In 2006 she left the Netherlands to pursue a Master of Science in occupational therapy degree at the University of Kansas Medical Center in the United States. In 2009 she obtained this degree with honors. Next to studying she work as a research assistant at the Landon Center on Ageing and did volunteer work as an occupational therapist at the American Stroke Foundation. In 2007 she received the E. Roose Scholarship from the University of Kansas Medical Center. To complete this Master's degree she conducted a cross-sectional study to evidence-based practice among Dutch occupational therapists. After graduation she went back to the Netherlands were she started her PhD research at the Scientific Institute for Quality of Healthcare at the Radboud University Medical Center in Nijmegen. As can be read in this PhD thesis this concerned a study to the implementation of a community-based occupational therapy intervention in clinical practice. In 2013 she started as a researcher at TNO (Netherlands Organization for Applied Scientific Research). She continued finishing her PhD thesis alongside this job and completed her PhD in 2015.