



Universiteit
Leiden
The Netherlands

Collaborative mental health care : changing the landscape of mental health care?

Orden, M.L. van; Orden M.L. van

Citation

Orden, M. L. van. (2017, October 5). *Collaborative mental health care : changing the landscape of mental health care?*. Retrieved from <https://hdl.handle.net/1887/52992>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/52992>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/52992> holds various files of this Leiden University dissertation.

Author: Orden, M.L. van

Title: Collaborative mental health care : changing the landscape of mental health care?

Issue Date: 2017-10-05

Collaborative mental health care

Changing the landscape of mental health care?



C
H
A
N
G
E
C

Mirjam L. van Orden

Collaborative mental health care

Changing the landscape of mental health care?

Mirjam L. van Orden

©2017 Mirjam van Orden

ISBN: 978-90-77877-20-3

Den Haag: Parnassia Groep

Financial support for the study was provided by Delta Lloyd and OHRA Ziekenfonds.
Financial support for the publication of this thesis by the Parnassia Academy (part of Parnassia Psychiatric Institute) is gratefully acknowledged.

Layout and printing: ProefschriftMaken | www.proefschriftmaken.nl

Collaborative mental health care

Changing the landscape of mental health care?

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden
op gezag van Rector Magnificus prof.mr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op donderdag 5 oktober 2017
klokke 15.00 uur

door

Mirjam Lieselotte van Orden
geboren te Leonberg, Duitsland
in 1976

Promotores:

Prof. dr. Ph. Spinhoven

Prof. dr. E. Hoencamp

Copromotor:

Dr. P.M.J. Haffmans

Promotiecommissie:

Prof. dr. J.D. Blom

Prof. dr. A.M. van Hemert

Prof. dr. N.H. Chavannes

Prof. dr. C.M. van der Felz-Cornelis (Tilburg University)

Prof. dr. B. Tiemens (Radboud University Nijmegen)

Content

CHAPTER 1	Introduction	7
CHAPTER 2	Collaborative Mental Health Care Versus Care as Usual in a Primary Care Setting: A Randomized Controlled Trial	21
CHAPTER 3	Cost-effectiveness of collaborative care versus specialized care for common mental disorders	35
CHAPTER 4	Prediction of mental health services use one year after regular referral to specialized care versus referral to stepped collaborative care	49
CHAPTER 5	Five-Year Mental Health Care Use by Patients Referred to Collaborative Care or to Specialized Care	63
CHAPTER 6	The association of implementation factors with the uptake and utilization of blended collaborative mental health care: the importance of the organizational structure	75
CHAPTER 7	General discussion	95
Appendix	Nederlandse samenvatting	109
	References	117
	List of Publications	129
	Curriculum Vitae	131
	Dankwoord	133



1

Introduction

“Innovation is the ability to see change as an opportunity – not a threat”
Steve Jobs

1 General introduction

In this thesis two major changes in the organization of mental health care delivery are explored, collaborative mental health care and the integration of eHealth in collaborative care practice. These changes resulted from developments in health care, strongly influenced by political and financial factors, societal changes and last but not least the changing “patient-therapist” relationship. The most important influences that led to changes in the organization of mental health care delivery will be described in this introduction.

Change involves renouncing the security of the known and taking risks by stepping into the unknown. It is an inevitable part of life. Depending on the subject and the motive, a process of change can have a minor or major impact on an individual person, as well as on an organization. Proper formulation and planning can enhance the chance of positive results, but even then, is not always easy to win acceptance and to have change incorporated. The degree and duration of resistance to change in organizations as well as the actual success or failure of implementing such change is linked to how well the process is managed. According to Gabel (1), strategies to support the implementation of organizational change can be envisioned within three dimensions: (1) accurate assessment of ongoing and new needs from different perspectives, (2) understanding and helping individuals and groups to work through the different emotional stages in adapting to the change and (3) paying attention to individual and group reactions and attitudes while implementing and monitoring the restructuring. Such restructuring can be accompanied by stress, anxiety, as well as productive and innovative processes (1). A few (resistant) individuals may be able to block the efforts of others who are willing to change. On the other hand, a few motivated individuals who desire to change can motivate and lead others who otherwise remain passive in the face of the unknown.

In 2003, when the preparations for this thesis started thorough evidence about the effectiveness and related costs (efficiency) of collaborative care as well as evidence on whether the results of collaborative care could have been produced at a lower cost compared to the alternatives (cost-effectiveness) was lacking. E-mental health care was still in its’ infancy. The data collection for the cluster randomized study started at the end of 2003, included a 7-year follow-up period, and ended in the late 2009.

1.1 Developments in mental health care delivery in the last 50 years

Mental health care reform has been dominated by deinstitutionalization since the 1950s by means of the replacement of inpatient care by stimulating community mental health care (2), outpatient and day-care care facilities (3). Three main reasons for this

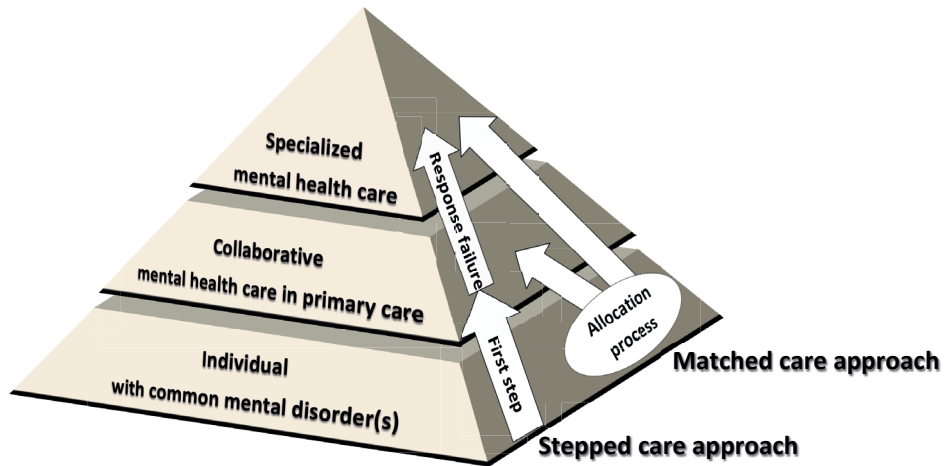


Figure 1. The difference between matched and stepped care approach in the changing landscape of mental health care

movement in that period were: the belief that psychiatric hospitals were cruel and inhumane, the hope that new psychopharmacological treatments would be developed that could cure the illness and the aim to save money (4). Similarly, the concept of early detection and early treatment gained popularity. Early intervention is perceived to be fundamental in preventing mental disorders to prevent worsening of symptoms and improving outcomes. The earlier an appropriate treatment is initiated, the better the prognosis, according to the World Health Organization (5).

From the 1960s until the turn of the millennium, health spending in the OECD countries (members of the Organization for Economic Co-operation and Development; (6)) increased. To restrain rising expenditures on mental health care, a reform in different European countries during the 1980s, called the managed market, focused on the use of budgetary incentives to stimulate improved performance. To achieve this, health insurers would contract selectively with health care providers, which in the Netherlands are largely private. This selective contracting by insurers with providers would create a market on the supply side, increase efficiency and raise standards of care (7). Raising the care standards was aimed to be achieved by implementing evidence based-practices. Evidence based medicine is defined as “(...) the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research. (...)” (8) pp. 71. Implementation of evidence-based practice, however, proved to be complex and difficult due to organizational structures and commitment factors, indistinctness

about roles and responsibilities, service boundaries as well as the health care policy (9, 10).

The growth in per capita health spending slightly declined in the years from 2001 to 2010 when it stopped completely as a consequence of the global financial and economic crisis in 2008/2009 (11). Meanwhile the undesirable job insecurity and financial consequences of the crisis have been linked to an increase in the risk for psychological and behavioural morbidity (12). In order to make rational decisions in the allocation of scarce resources in the field of health economics, information based on the cost-effectiveness of mental health care was embraced by a growing number of health care policy makers in the late 20th century. Clinical evidence was no longer the primary criterion for accepting and funding new treatments (13).

1.2 Important transitions in the population and mental health care users

Most countries experience a rapid demographic transition. There has been an population increase in developed countries since 1950 and a decline in the number of births combined with an increased life expectancy. Trends of urbanization, international migration and changes in family and household structures have also been observed (14). Along with this demographic transition, the risk for mental disorders is expected to rise (15).

Around the 1980's an important movement for patient empowerment originated, namely patient councils and user organizations. They became accepted parties in mental health care organization (16). Patient empowerment is also emphasized by the changing terms used for patients in mental health care, pinpointing the changes in their relationship with mental health providers and a shifting power dynamics. From being mental health care patients or clients in need of help, they became consumers or users of mental health care demanding a voice and an increasing say in how services were developed and delivered. And in recent times experts by experience with a relationship with the mental health care provider of equals whereby the provider has acquired his/her knowledge and skills through education and practice and the other by experience (17).

Despite the growing empowerment of patients, mental illness is often negatively labelled -stigmatized- within society, even nowadays. Despite the fact that nearly half of the Dutch population may experience a mental health illness once in their lifetime, there is still a taboo attached to conditions such as depression, anxiety, addiction, and personality disorder (18). 'Samen sterk zonder stigma' is an important governmental

organization in the Dutch mental health landscape today that aims to improve mental health literacy in the Netherlands in order to reduce stigma.

The presence of societal and/or self-perceived stigma is one of the possible explanations for the fact that a large part of the population with mental health problems (64% in the Netherlands according to the NEMESIS-study) does not seek treatment (15), while 14% of the global burden of disease has been attributed to neuropsychiatric disorders (19) with unipolar depression being the second leading factor in the disease burden (15). A second explanation that has been discussed in the literature relates to access to mental health care, such as the availability of a mental health care provider in the near surrounding areas or financial barriers due to health insurance coverage. The importance of the latter aspect varies significantly between different countries with different health care systems (20, 21). Patient related factors, like being born in a foreign country, reporting loneliness, receiving little social support and experiencing substantial clinical impairment are shown to be another reason why people in need do not seek treatment (22).

Mental and physical health conditions have been proven to be strongly interwoven. Mental disorders are risk factors for the development of somatic health conditions, and contribute to accidental and non-accidental injuries. Many somatic health conditions increase the risk for mental disorder, or lengthen episodes of mental conditions. The resulting comorbidity complicates help-seeking, diagnosis, the quality of care provided, treatment, and adherence and affects treatment outcomes. Therefore, the integration of mental health care within primary general health care is strongly advocated by researchers (19, 23).

The developments and changes in population, mental health care and mental health care use described in paragraph 1.1 en 1.2 contributed to a major shift in health policies worldwide at the end of the 20th century. The focus was on offering (mental) health care in the natural environment of the patient, as early as possible with collaboration between the (specialized) mental health care sector and the primary care sector. Several models are described that differ in the degree of cooperation between the mental health specialist and the primary care specialists and the degree to which the model focuses on improving their skills and confidence in managing mental health problems (24). The general practitioner has the greatest involvement in the training model. The involvement decreases in the consultation-liaison, collaborative care, and replacement/referral models. The training model involves the provision of knowledge and skills concerning mental health care to the general practitioners. The consultation-liaison model is a variant of the training model, but involves mental health specialists

entering into an ongoing educational relationship with general practitioners, to support them in treating individual patients. Collaborative care can involve aspects of both training and consultation-liaison but also includes the addition of mental health care professionals who work with patients and liaise with primary care clinicians and specialists in order to improve quality of care. In the replacement/referral model, the primary responsibility for the management of the presenting problem is passed to the specialized mental health sector.

1.3 Collaborative mental health care within the stepped care model

Based on examples in the United Kingdom, Australia and Canada, collaborative care programs where mental health care was integrated in general care and community services emerged in the Netherlands in the early 21st century. In these countries, the role of the general practitioner increased as a gatekeeper for the detection of mental health problems and the referral of patients to specialized mental health treatment and delivering of mental health care (25). In the collaborative care program investigated for this thesis, a brief time-limited intervention with a maximum of five sessions was offered over a period of 6 months, based on a time-limited intervention model with a cognitive behavioural approach by community psychiatric nurses or psychologists (26, 27). If indicated by the mental health professional, consultation of the patient by a psychiatrist was possible. The mental health professional had regular face-to-face contacts with the general practitioner. A team of psychiatrists met the mental health professional once a month and conducted regular meetings with the general practitioner. By means of this enhanced collaboration between the general practitioner and the mental health professional, it was expected that common mental disorders could be treated at an earlier stage with fewer resources, thus treating mental health disorders effectively, but more efficiently than under the usual referral and treatment system within specialized mental health care.

Collaborative care treatment in primary care was considered as an early/first step following the principles of the stepped care model. The underlying principle of the stepped care model was that all patients (with non-acute and non-severe mental health conditions) would initially receive the least intensive treatment possible as quickly as possible in the first place. Treatment would only be stepped up for those patients who failed to respond to the initial treatment, with a referral to specialized mental health care (28). The stepped care approach differs ideologically and practically from the matched care concept. From a practical viewpoint, in contrary to stepped care, in the matched care approach the patients are allocated to the most appropriate treatment based on available information at the start of a treatment. As a result of this allocation process, the treatment method, intensity and setting may vary (29). Viewed

ideologically, the difference between the two approaches lies in the persuasion of ability to pinpoint all relevant factors that potentially predict the response to treatment. While in the stepped care approach treatment is offered at an early stage for the broad spectrum of mental health conditions as the first step in treatment, in the matched care approach, being able to include all potential predictors in the allocation process is crucial for quick and appropriate allocation (29) In figure 1, the difference between both approaches is depicted.

The implementation of collaborative care was a considerable change for mental health organizations, and their employees and professionals working in primary care. For those who participated in the collaboration program, the work setting changed. Mental health professionals who formerly worked in the premises of the mental health care institution, now worked and consulted patients in the premises of the general practitioner's office in close alliance with the general practitioner. General practitioners had to adapt to the mental health professional working in their office. Mental health professionals, who continued their practice in the specialized mental health care setting, expected to be confronted with a changing patient population. While the common mild to medium conditions now would mainly be treated within the primary care sector, only the more severe cases would be referred to specialized care.

The implementation of collaborative care went along with a number of critical questions and remarks from different stakeholders in mental health care:

1. Which organization should provide the mental health professionals working in the general practitioner's office? There was a concern, that if these professionals were affiliated to a specialized mental health care organization (as was the case in the present study), they could merely siphoning patients into the mental health care organization, like in the replacement/referral model (24). In that case a mental health co-worker who was affiliated to the general practitioner's practice could be considered as a better alternative.
2. As a consequence of the above mentioned, it was asked who should bear the responsibility for the care delivered in the general practitioner practice. In the case the mental health professional was affiliated to a mental health organization, was the general practitioner responsible or the mental health organization?
3. It was expected that the availability of a mental health professional in the general practitioner practice would lower the threshold for patients to seek help. This expectation raised the question whether this would increase the number of patients treated for very mild psychological symptoms who would otherwise not receive professional treatment because their symptoms would disappear on their own. Or

would this lowered threshold would really be a solution for offering professional help to people in need who otherwise would not seek treatment?

4. At that time there was no sound scientific evidence for the effectiveness and efficiency of the stepped care concept as a form of collaborative care in the primary care setting versus referral as usual to a specialized setting. Would this stepped care model only postpone more intensive specialized treatment? And would this consequently result in increased utilization of (specialized) mental health care and subsequent costs?
5. In relation to the above mentioned critical points, there was also debate about the intensity of the short-time treatment offered in the primary care setting. Although most short-time treatments offer between ten and fifteen visits to the patients, no data about the ideal treatment intensity in primary care setting was available.

After experimenting for approximately 10 years with various forms of collaborative mental health care in the Netherlands, wherein the number of programs and their impact on the sector increased substantially, the Dutch government implemented a reorganized mental health care system in 2014 with a split between general “basic” mental health care and “specialized” mental health care. With this new system the Dutch government aimed to offer the appropriate care in the appropriate setting. Treatment of non-acute, non-complex disorders since then has been positioned within the basic care, mainly in various forms of collaborative care programs. More severe patients are treated within the specialized mental health care sector. This reorganization took place after the data collection phase of the study reported in this thesis.

1.4 Integrating health technology in mental health care

Public use of the internet has grown dramatically in the past decade. Only 8% of the Dutch population older than twelve years has never used the internet (30). With the tremendous growth of internet and social devices, technology driven possibilities were integrated in mental health care from the early 21st century. The integration of technology in mental health care was expected to empower patients through enhanced possibilities for self-management, to enrich the patient-professional relationship and to improve the cost-effectiveness of mental health treatments (31-37). There are various forms of e-mental health care for (supporting) treatment of common mental disorders like depression, anxiety disorders, substance dependency with varying results on benefits: un-guided and guided self-help programmes (38-40) blended care, where parts of the treatment are face-to-face contacts between the patient and the therapist and other parts are offered via internet (33, 41) and interventions that are entirely online with online guidance from a therapist (42-44). Furthermore, experimental

interventions like serious games or virtual communities and peer-support groups have been developed and investigated (45, 46).

1.5 State of knowledge of the new mental health care environment

In 2005 Bower and Gilbody concluded their review of conceptual models of managing common mental disorders in primary care and their evidence base as follows: “Clearly, insufficient evidence exists to provide a definitive answer as to the clinical effectiveness and cost effectiveness of individual models and their impact on access and equity or to provide a rigorous comparison between models. All the reviews reported problems with the quality of the included studies, and the amount of evidence available for some models (such as consultation-liaison) is limited. Continuing evaluation of these models and new ways of providing them (for example, primary care mental health workers) is essential.” (pp. 841). Meanwhile, extensive studies have been undertaken to examine feasibility, effectiveness and efficiency of (stepped or matched) forms of collaborative care and lately the inclusion of eMental health care. Meta-analyses have proven that collaborative care is more effective than regular care for patients with anxiety disorders (47-49), depression (50-53) and multiple conditions (49). The body of evidence about the efficiency of collaborative care is less convincing (49, 52, 54, 55). In the vast majority of all studies the regular care, to which the collaborative care model is compared, is care coordinated by the general practitioner (in the primary care setting) or sometimes even no mental health treatment at all. Since collaborative care is a service concept that has to prevent unnecessary referral to and treatment within specialized mental health care with effective treatment against reduced costs, comparing the cost-effectiveness of collaborative care to usual specialized mental health care should provide important insights into whether this original aim was achieved.

As described in the above paragraph, there is a growing body of evidence of the favorable results of integrating eHealth in mental health care and the global telemedicine market in Europe is growing fast (56). The enthusiasm for technological innovation around eHealth among policy-makers and health officials has, however, not always been matched by uptake and utilization in practice. There is growing attention for identifying and addressing barriers and facilitators of eHealth implementation (57). Professional resistance to new technologies is cited as a major barrier to progress. Implementing and embedding eHealth involves complex processes of change for individual professionals and patients and for health-care organizations themselves. The European Union has recently argued that implementing eHealth strategies “has almost everywhere proven to be much more complex and time-consuming than initially anticipated” (58).

The gaps in knowledge that I aimed to resolve in this thesis are related to the expectations of policy makers that due to enhanced collaboration between the general practitioner and the mental health professional common mental disorders could be treated at an earlier stage with fewer resources. In other words, is collaborative care for mental health disorders not only more effective, but also more cost-effective in the short and long term in comparison to usual referral and treatment within the specialized mental health care sector? Furthermore, literature and my own experience from participating in the development and implementation of eHealth in the local mental health organization have taught that, although different forms of e-mental health care yield promising results, adoption and uptake is a major problem. I wanted to assess the influence of implementation factors on the mental health professionals' blended care uptake and the patients' care utilization.

1.6 Aims and outline of this thesis

The aim of this thesis was a thorough investigation of the expected short and long term benefits of treating patients with common mental disorders within a collaborative care program in primary care within the general practitioner practice as a first step in the stepped care approach compared to the direct regular referral of patients to and treatment within specialized mental health care and the implementation of eHealth on the effectiveness and efficiency of collaborative care.

In *chapter 2* the results of an examination of the effectiveness and efficiency of the collaborative care program compared to specialized mental health care and the appreciation of the care by patients and general practitioners are reported. The design of the study was a cluster randomized trial, where the general practitioner practice was the unit of randomization. In the collaborative care condition the general practitioner had a mental health professional who was working in the premises of the general practitioner. If indicated, the mental health professional offered a short behavioural and problem oriented intervention with a maximum of 5 sessions. In the usual care condition the general practitioner continued his usual system of referring patients to specialized mental health care, where the patient received regular treatment, if indicated. The patients who participated in the study automatically belonged to the condition of their referring general practitioner. Participating patients were given follow-ups during one year with four assessments: during referral, 3 months, 6 months and 12 months later. Effectiveness was measured in terms of symptom reduction and efficiency in terms of contacts with the mental health professional.

In *chapter 3* I present the results of a cost-effectiveness analysis. The cost assessment was part of the cluster randomized trial we described in chapter two. Costs were

inventoried from the societal perspective, including direct and indirect mental health care costs, other healthcare costs and productivity losses due to health condition. The incremental cost-effectiveness ratio was calculated by relating the total costs to the treatment effects in terms of a decrease in patients' symptoms in the collaborative care condition versus participants who received the usual specialized mental health care. The uncertainty around the incremental cost-effectiveness ratio was addressed by establishing a cost-effectiveness acceptability curve.

In *chapter 4* I investigated whether I was able to detect patient or symptom related characteristics that would predict a priori, during referral, whether a patient would (not) benefit from short-time collaborative care intervention. Was it possible to identify patients beforehand who would need higher treatment intensity than the collaborative intervention and therefore be better referred directly to specialized mental health care? In other words, we wanted to find evidence for the suitability of the stepped collaborative care approach for patients with common mental disorders in general or for an identifiable subgroup only. To answer this question, I performed a post-hoc analysis with the data collected within the cluster randomized trial. Patient and symptom factors were analysed as potential predictors for mental health care use, i.e. number of mental health care contacts.

In *chapter 5* the results of the long-term efficiency of the collaborative care program compared to regular specialized mental health care are reported. Therefore, a post-hoc analysis was performed with the data from the cluster randomized trial reported in chapter two. Additional to the data collected within this trial, we collected utilization data from the electronic health record of the local mental health care institution in The Hague and surrounding areas that offered both the collaborative care program and specialized mental health care. The total time frame of the follow-up period was seven years, from 2003 to 2009. I collected information about mental health care contacts, which encompassed all direct patient contacts with a mental health care professional, such as face-to-face visits, telephone contact, e-mail contacts during all received treatments, total treatment duration, treatment termination and the number of new treatments within the follow-up period. The patient group that received collaborative care during the trial period was compared to the group that received regular specialized mental health care on the above mentioned outcome variables five years after referral to care with multi level analysis.

In *chapter 6* the effect of implementation of blended collaborative care was investigated. In the blended care variant of the collaborative care program, the treatment is

split into one part that was face-to-face and another part offered through an internet module. The primary goal of offering the blended care variant is to improve the efficiency of the treatment. The design of this study was a naturalistic retrospective analysis of a patient cohort that was offered the blended collaborative care variant in 2014/2015 in combination with a survey research, performed in 2016. The survey was performed among those mental health professionals who offered the blended treatment and systematically targeted factors that inhibit or promote implementation of eHealth. For the retrospective analysis of the patient cohort, data about blended care utilization and outcome data routinely measured within the program by means of routine outcome monitoring was collected. With multi-level analysis, I assessed the influence of implementation factors as perceived by the mental health professional on their blended care uptake and the patients' care utilization.

The last chapter, *chapter 7*, includes a summary and discussion of the results. I will place the study results in the context of the changing mental health care landscape, address methodological issues and make recommendations for further research and clinical practice.



Collaborative Mental Health Care Versus Care as Usual in a Primary Care Setting: A Randomized Controlled Trial

Published as:

Van Orden M.L, Hoffman, T., Haffmans, J., Spinhoven, P., Hoencamp, E. (2009)
Collaborative mental health care versus care as usual in a primary care setting: a
randomized controlled trial. *Psychiatric Services*, 60(1), 74-79.

2.1 Abstract

Objective: This study compared the effectiveness of treating common mental disorders in a collaborative care program in a primary care setting and the effectiveness of treating such disorders through traditional referral of patients to mental health services.

Methods: In a cluster randomized controlled trial, 27 general practitioner practices in the Netherlands were designated to provide either collaborative care or usual care. In the collaborative care condition, a mental health care professional worked on site at the primary care practice and was available to provide patients a maximum of five appointments if they were referred by the general practitioner. If indicated, referral to specialized mental health services followed. In the usual care condition, if indicated, general practitioners would refer patients to off-site specialized mental health services. The study included 165 patients. At baseline and at three, six, and 12 months, the study assessed patients' psychopathology, patients' quality of life, and patients' and general practitioners' satisfaction with the treatment provided. Delay in seeing a mental health provider, duration of treatment, number of appointments, and related treatment costs were assessed at 12 months. The data were analyzed with hierarchical linear models.

Results: Level of patients' psychopathology and quality of life significantly improved over time, and there were no significant differences between models of care. There was no significant difference in patients' satisfaction with care in either condition. The collaborative care condition resulted in significantly higher satisfaction with services among general practitioners, shorter referral delay, reduced time in treatment, fewer appointments, and consequently lower treatment costs. **Conclusions:** Collaborative care for a heterogeneous group of persons with common mental disorders seems to be as effective as the usual practice of referral to mental health services for reducing psychopathology, but it is significantly more efficient regarding referral delay, duration of treatment, number of appointments, and related treatment costs.

2.2 Introduction

In the Netherlands, the general practitioner acts both as a mental health care provider and as a gatekeeper. As a gatekeeper, the general practitioner can refer patients for mental health care that is more specialized. Over the past 20 years there has been an increase in general practitioner referrals to mental health services. In response the Dutch government has strengthened the general practitioner's gatekeeper function to manage and limit the ever-increasing number of people using mental health care services (16). The government did this by specifying in the insurance guidelines that a specialist in nonacute care can start treatment only after receiving a formal written referral by a general practitioner. Yet general practitioners, already struggling with increasing workloads, needs of patients, and long working hours (59), have tended increasingly to refer patients with mental health problems to mental health services (60). This has resulted in long waiting times, poor continuity of care, and increasing dissatisfaction among patients, general practitioners, and mental health professionals (61). To decrease both the workload of the general practitioner and referrals to specialized mental health services, various forms of collaborative mental health care have been introduced (59).

Three collaborative care models have been described: the shifted outpatient clinic, the consultation liaison model, and the attached-mental health professional model (liaison attachment scheme) (62, 63). In the third model, mental health professionals are attached to a primary care practice and operate as part of the extended primary care team, leading to co-located services. This model results in improved geographical convenience for patients, decreased stigma, increased ease of referral, increased communication, and better continuity and integrated care (62, 63).

The literature concerning the feasibility and effectiveness of the various collaborative care models mainly addresses specific psychiatric conditions. Collaborative care interventions have proved to be effective in reducing psychopathology among persons with depression (64, 65), including elderly persons (66). Studies involving patients with psychosis, patients who abuse substances, and patients who use a high volume of mental health care have yielded mixed results. Studies of patients with anxiety disorders, personality disorders, eating disorders, attention-deficit disorder, and dementia are underrepresented (67). Collaborative care studies of heterogeneous patient groups with common mental disorders are scarce. Only two randomized controlled trials, both carried out in the United Kingdom, have been conducted (68, 69). The studies found a significant improvement in mean patient symptom scores, social functioning, and quality of life, with no significant differences between the usual and collaborative care conditions.

This study compared the effect of introducing collaborative care based on the attached-mental health professional model in a primary care setting in the Netherlands. We hypothesized that collaborative care would be at least equal to usual care regarding the effect on the psychopathology of patients, quality of life of patients, and satisfaction of patients and general practitioners, but it would be superior with regard to referral delay, duration of treatment, number of appointments, and related treatment costs.

2.3 Methods

Approval for the study was obtained from an Independent National Review Board for Mental Health (METIGG) in Utrecht.

Randomization

We invited all general practitioner practices in the Hague metropolitan area (126 practices with 240 general practitioners) that were not already participating in an ongoing collaborative care program to participate in this study. Of the 42 eligible practices, 15 declined to participate, and the remaining 27 practices (with 46 general practitioners) were randomly assigned to groups—14 practices were assigned to the collaborative care condition and 13 were assigned to care as usual. [A diagram showing the participating practices and number of patients referred to the trial is available as an online supplement at <http://ps.psychiatryonline.org/doi/suppl/10.1176/ps.2009.60.1.74>.] In this cluster randomized controlled trial, practices were the unit of randomization (70, 71). The practices (not individual patients) were randomly assigned to one of two conditions: either the practice continued its usual way of referring patients to specialized mental health services if indicated (usual care), or the practice referred patients to an on-site mental health professional who could see the patient for a maximum of five sessions (collaborative care). Between January 2003 and March 2005 all participating practices reported to the researchers all patients whom they intended to refer to a mental health organization.

Study population

Inclusion criteria for patients were age 18 or older, the presence of a mental disorder, and an indication for treatment that is more specialized. Exclusion criteria were dementia, delirium, acute severe psychotic symptoms, or a crisis condition demanding immediate care. The enrolled patients (N=165) reflect an urban population, and all were insured under the near-universal Dutch health insurance system. Of the 165 patients, 133 (81%) were native Dutch, ten (6%) were from Surinam, four (2%) were Turkish, three (2%) were Moroccan, and 15 (9%) were born in various other countries.

According to the Mini International Neuropsychiatric Interview (MINI) (72, 73), the study group consisted of a heterogeneous group with common mental disorders, mainly mood and anxiety disorders (Table 1).

TABLE 1. Sociodemographic characteristics of patients with mental disorders who were seen by general practitioner practices in the Netherlands, by type of care provided

	Study nonparticipants (N=71)		Study participants ^a			
			Collaborative care (N=102)		Usual care (N=63)	
	N	%	N	%	N	%
Age (M±SD) ^b	36.1±15.0		40.2±14.3		40.4±12.9	
Gender						
Male	25	35	29	28	24	38
Female	46	65	73	72	39	62
Duration of complaints before referral ^c						
<3 months	19	30	23	23	18	31
3–9 months	17	27	30	30	13	22
>9 months	27	43	47	47	27	47
Mini International Neuropsychiatric Interview Diagnosis						
Mood disorder	33	32	19	30		
Anxiety disorder	33	32	28	44		
Addiction	1	1	2	3		
Eating disorder	2	2	1	2		
Psychotic disorder	1	1	2	3		
Suicidal ideation	7	7	2	3		
Adjustment disorder	25	25	9	14		

^a No significant differences were found between care conditions.

^b Significant difference between nonparticipants and participants ($t=2.09$, $df=233$, $p=.037$).

^c Not all data were available for all persons.

After oral and written information was presented to the patient, written informed consent was obtained. Neither patients nor general practitioners received financial or other incentives to participate.

Assessments

In this study the official Dutch version of the MINI 5.0.0. was used (74). Patients were interviewed by an independent, well-trained research nurse. The Symptom Checklist (SCL-90) ((75) is a validated self-report inventory with 90 items measuring psychopathology during the previous week. The overall psychoneuroticism score was used (76). The World Health Organization Quality of Life Questionnaire (WHOQOL-BREF) (77) is a validated scale and produces scores in four domains related to quality of life and one domain referred to as the general evaluative facet, which describes overall quality of life and general health. The Dutch Mental Healthcare's "Thermometer of Satisfaction" is a widely used 20-item questionnaire that assesses patient satisfaction with mental health care received (78). The general practitioner completed a Likert scale survey with four items indicating satisfaction with regard to time saving, workload relief, change in patients' complaints, and change in patients' quality of life.

At baseline, the MINI, SCL-90, and WHOQOL-BREF were administered. At three, six, and 12 months the SCL-90, WHOQOL-BREF, and patient and general practitioner satisfaction surveys were given. Waiting time between referral and the first face-to-face contact with a mental health professional (referral delay), duration of the treatment, and the number of mental health care appointments and their costs in Euros were assessed by telephone interviews with patients, by the electronic patient record system of the mental health services in the Hague, and by the rates provided by the Dutch Health Care Authority.

Interventions

In the collaborative care program, trained mental health professionals (community psychiatric nurses and psychologists) from mental health services had regular face-to-face contact with the general practitioner, consulted patients, and helped to refer patients in need of acute care. In the general practitioner's office, patients who were referred to the attached mental health professional received a short focused intervention consisting of a clinical assessment. This was followed by a maximum of four sessions based on cognitive-behavioral therapy and supporting principles (79). A team of psychiatrists met face to face with the mental health professionals once a month and conducted regular meetings with the general practitioners. If indicated, patients could be referred to a specialized mental health care program after the initial clinical assessment with the mental health professional or at a later date.

Usual care involved the traditional referral of patients by the general practitioner, if indicated, to mental health services for treatment.

Analysis

Outcome measures included patients' psychopathology, patients' quality of life, patients' and general practitioners' satisfaction with care, system-related waiting time before treatment (referral delay), duration of the treatment, and the number of mental health care appointments and their costs in the 12-month follow-up after referral. For a study where the patients were randomly assigned to treatment, the Power and Precision software (Biostat) determined that 82 patients per condition should be needed to detect a clinically relevant difference in mean $\pm$ SD scores between the two conditions of 22 $\pm$ 50 points on the SCL-90 (power 80%, α =.05). Taking into account an intraclass correlation coefficient (ICC) of .01 for the cluster randomization (80), the needed sample size per condition was 85 to 89 patients.

Preliminary analyses included checking for selection bias and the computation of descriptive statistics, chi square analyses, and t tests to assess the comparability of study groups at baseline. Five patients (two in collaborative care, three in usual care) had no contact with any mental health service during the 12 months after referral by their general practitioner. These patients were included in the analyses (intention-to-treat principle).

A consequence of cluster randomization at the level of general practitioner practices (instead of at the level of individual patients) was a lack of independence for the outcomes of patients from the same practice. This means that outcomes for patients from the same practice were correlated—that is, nonindependent (70). Ignoring clustering and dependence of outcome could create serious technical problems—for example, underestimation of standard errors and regression coefficients (81). Therefore hierarchical linear modeling was chosen as the statistical method to resolve these issues (81). Analyses were carried out with MLwiN 2.0 (82). A hierarchical structure with three levels was identified in the data: each patient had several repeated measurements of outcomes, and several patients were referred by the same general practitioner. The repeated measurements per patient were assigned to level 1, the patients to level 2, and the general practitioners to level 3. Units at one level were grouped, or nested, within units at the next highest level.

In the analyses four dependent variables were used: the SCL-90 sum score as an indicator of overall psychopathology, WHOQOL-BREF general evaluative facet regarding quality of life, patients' overall satisfaction rating, and the mean score on the four items indicating general practitioners' satisfaction. These variables were analyzed separately; the satisfaction of general practitioners and patients was assessed at three time points, whereas psychopathology and quality of life were assessed at four time points.

To examine the effects of the variables, a conceptual model for a general time effect was constructed. The relative effects of condition and its time effect were examined by entering them in the basic model. Variables resulting in a significant improvement of the conceptual model were retained. See Raudenbush and Bryk (81) for a formal description of the analysis, or contact the authors of this article for more information.

2.4 Results

The 27 participating general practitioner practices used standard forms to identify for the researchers 236 patients who were eligible for inclusion in the study. Of these patients 165 consented to participate: 102 of the patients were being seen at practices in the collaborative care group, and 63 were from practices in the usual care group.

The imbalance between the two conditions with regard to the number of patients referred to mental health services is noteworthy. A difference in the number of referrals between the general practitioners practices was already apparent two years before the start of the study and persisted two years after the start of the trial. This consistency indicates that the difference is a reflection of a historical referral pattern and is not related to this study.

The 165 participating patients did not differ from the 71 patients who declined to participate in the study except in regard to age: participants were significantly older (40.3 ± 13.7 versus 36.1 ± 15.0 years). There were no differences between the usual care group and the collaborative care group on any of the other baseline variables (Tables 1 and 2).

As shown in Table 2, the number of patients using medication (antidepressants, benzodiazepines, analgesics, or antipsychotics) did not differ between conditions (collaborative care or care as usual) at baseline or at the end of the trial. The mean $\pm$ SD waiting time for the first face-to-face contact with a mental health professional was significantly lower for collaborative care (2.8 ± 3.2 weeks) than for usual care (6.3 ± 10.2 weeks), according to a t test for independent samples. In the collaborative care condition, 33 patients (32%) were subsequently referred to specialized mental health care after one or more appointments with the mental health professional. For the patients who were subsequently referred, the mean number of appointments with the attached-mental health professional in the collaborative care group was 3.5 ± 4.2 . The patients who were subsequently referred to specialized mental health care by the collaborative care professional had an additional mean number of 21.7 ± 24.3 appointments.

TABLE 2. Outcomes of patients with mental disorders who were seen by general practitioner practices in the Netherlands, by type of care provided

	Baseline										12 months									
	Collaborative care (N=102)					Usual care (N=63)					Collaborative care (N=96)					Usual care (N=59)				
	Total		%		N	Total		%		N	Total		%		N	Total		%		N
	N	N	N	N		N	N	N	N		N	N	N	N		N	N	N	N	
SCL-90 psychopathology (M±SD score) ^a	90	181.2±58.6	56	188.4±64.2	71	158.9±64.6	43	154.4±52.4			71	158.9±64.6	43	154.4±52.4			43	3.3±.7		
WHOQOL-Brief (M±SD score) ^b	89	3.0±.8	56	3.0±1.0	70	3.3±.9	51	6.6±1.5			70	3.3±.9	43	3.3±.7			43	6.7±1.5		
Patients' satisfaction (M±SD score) ^c																				
General practitioners' satisfaction (M±SD score) ^d																				
Patient waiting time (M±SD weeks) ^e																				
Total number of treatment appointments (M±SD) ^f																				
Duration of mental health treatment after baseline ^g																				
≤1 year																				
>1 year																				
Patients' medication use during trial ^h	96	43	45	61	31	51	85	27	32	49	18	37								

^a As measured by the psychopathology subscale on the 90-item Symptom Checklist. Possible scores range from 90 to 450, with higher scores indicating more psychological distress. No difference between groups at baseline.

^b As measured by the general evaluative facet domain on the World Health Organization Quality of Life Questionnaire. Possible scores range from 1 to 5, with higher scores indicating a higher perceived quality of life. Collaborative care group compared with usual care group at baseline: $t=426$, $df=143$, $p=671$

^c As measured by the patients' overall satisfaction rating on the Dutch Mental Healthcare's Thermometer of Satisfaction. Possible scores range from 1 to 10, with higher scores indicating a higher satisfaction with care.

^d As measured by the mean score on the four items on the general practitioner satisfaction survey. Possible scores range from 1 to 5, with higher scores indicating a higher satisfaction with care of the referred individual patients.

^e $t=-2.5$, $df=61.2$, $p=.016$, ^f $t=-2.1$, $df=140$, $p=.04$, ^g $\chi^2=5.3$, $df=1$, $p=.02$, ^h No difference between groups

According to a t test for independent samples, the total mean number of appointments in the 12-month period was significantly lower in the collaborative care condition (12.4 ± 17.1) than in the usual care condition (18.9 ± 18.9). The mean cost for a patient in the collaborative care condition was €1,199±1,621, and it was €1,762±1,683 in the usual care condition. At the end of the 12-month period, significantly more participants from the collaborative care condition (N=65, or 72%) were no longer participating in treatment, compared with participants from the usual care condition (N=30, or 54%), according to a chi square test (Table 2).

As shown in Table 3, a significant improvement over time was found for both the SCL-90 psychopathology score ($p=.001$) and the WHOQOL-BREF general evaluative facet ($p=.001$). However, there was no significant difference between the two conditions, and there was no interaction effect between improvement and condition. Patient

TABLE 3. Multilevel estimates of primary outcome measures among patients with mental disorders who were seen by general practitioner practices in the Netherlands

Variable ^a	Estimate	SE	p
SCL-90 psychopathology subscale score			
Average initial psychopathology (intercept)	167.624	7.805	.001
Average improvement rate	-2.210	.417	.001
Average condition effect	-1.181	14.333	.934
Interaction of improvement rate and condition effect	.868	.772	.263
WHOQOL-BREF			
Average initial quality of life (intercept)	3.217	.096	.001
Average improvement rate	.027	.006	.001
Average condition effect	-.069	.177	.697
Interaction of improvement rate and condition effect	-.016	.011	.148
Patients' satisfaction			
Average initial satisfaction (intercept)	6.521	.165	.001
Average improvement rate	.007	.023	.761
Average condition effect	.195	.303	.521
Interaction of improvement rate and condition effect	-.023	.042	.585
General practitioners' satisfaction			
Average initial satisfaction (intercept)	3.838	.062	.001
Average improvement rate	.000	.009	1.000
Average condition effect	.436	.114	.001
Interaction of improvement rate condition effect	-.011	.016	.493

^a SCL-90, 90-item Symptom Checklist; WHOQOL-BREF, World Health Organization Quality of Life Questionnaire, general evaluative facet

satisfaction showed no significant improvement over time, no condition effect, and no interaction effect between improvement and condition. General practitioners' satisfaction did not improve significantly over time, and there was no interaction effect between improvement and condition. However, a significant difference was found between the conditions. General practitioners from the collaborative care condition had a satisfaction score that was significantly higher than that of general practitioners from the usual care condition ($p=.001$) (Table 3).

2.5 Discussion

We expected collaborative care to be equally or more effective than usual care in reducing psychopathology and increasing quality of life, patients' satisfaction, and general practitioners' satisfaction. We found that both collaborative care and usual care significantly reduced existing psychopathology, increased quality of life, and resulted in comparable satisfaction of patients. Collaborative care led to significantly higher levels of general practitioners' satisfaction and a significant reduction in referral delay and duration of treatment. A significant reduction of contacts with mental health organizations was achieved in the 12-month period, leading to a significant reduction in costs.

Our results are in accordance with the two randomized controlled trials comparing generic community mental health nursing care and problem-solving treatment with usual primary care (68, 69). Problem-solving treatment is a brief (six session) structured psychological treatment that has been developed. In another pilot study, enhanced liaison between secondary mental health care and primary care teams did not lead to a significant difference in the reduction of symptoms, compared with standard care (83). Although our study was slightly underpowered, the comparable effectiveness of both service models in decreasing patients' symptoms and increasing their quality of life may be a reflection of the high standard of primary care in the Netherlands. Consequently, it might be hard for an intervention to achieve significantly higher effectiveness than usual care (16). Additionally, the fact that the care in the collaborative care condition was provided by mental health professionals trained and supervised within the context of a mental health organization might account for the comparability of outcome in both conditions. Of course it might also be a reflection of the natural course of the disorders, in which symptoms may improve over time.

There are limitations to this study. When the study started in 2003, about 65% of the general practitioners in the Hague area were already participating in the collaborative care program. The remaining general practitioners who wanted to participate first had

to enroll in this study. This may have resulted in a bias, because being assigned to the usual care condition might have created dissatisfaction for the general practitioner involved. Also, the number of referrals per general practitioner practice in the usual care condition was substantially less than that for the collaborative care condition. However, when this number was compared with the referral pattern two years before starting and two years after the trial, there was no change in the number of patients referred. In hindsight, stratification by number of earlier referrals at the start of the study could have prevented the risk of a possible preexisting referral bias. The fact that patients from both conditions were comparable on all baseline variables indicates that the randomization at the level of the general practitioner practice resulted in a successful randomization at the individual patient level. Finally, this study cannot answer whether other collaborative care programs might be more or less cost-effective than this particular collaborative intervention.

A strength of this study is that randomization occurred at the general practitioner level. This design permits comparison of general practitioner practice referrals, rather than the individual course of treatment per patient. The high follow-up rate and low drop-out rate are indications of the quality of the trial management. Because patients in the study had various common mental disorders—the types of disorders that are regularly seen by general practitioners—the findings of our study are generalizable to other general practitioners.

This study is the first randomized controlled trial comparing collaborative care and usual care among patients in an urban environment. Results might be generalized to other urban settings and countries with similar health care systems, such as the United Kingdom, Spain (84), and Canada (85).

2.6 Conclusion

This trial provides evidence that collaborative care for patients with common mental disorders at the primary care level is feasible and as effective as standard mental health care. However, collaborative care results in significantly lower utilization of resources, as indicated by fewer appointments with a mental health professional, shorter treatment duration, and higher satisfaction among general practitioners.

2.7 Acknowledgments and disclosures

This study was funded by Delta Lloyd and OHRA Ziekenfonds, a health insurance company. The authors thank the patients and general practitioners, interviewer L.

Dijkhuizen, M.Sc., the staff and management of the collaborative care program, and the Parnassia Bavo Group.

The authors report no competing interests.



Cost-effectiveness of collaborative care versus specialized care for common mental disorders

van Orden, M.L, Deen, M.L., Stant, A.D, Spinhoven, P., Haffmans, J. & Hoencamp, E. (submitted). Cost-effectiveness of collaborative care versus specialized care for common mental disorders. *Manuscript submitted for publication, December, 26, 2016.*

3.1 Abstract

Background: To determine the incremental cost-effectiveness of a stepped collaborative mental health care program (CCP) in primary care for common mental disorders compared to regular treatment in specialized mental health care (Care As Usual; CAU). **Methods:** In a cluster randomised controlled trial, 27 general practitioner (GP) practices were assigned to either CCP or CAU. Within the CCP condition, brief interventions were offered by a mental health professional in the GPs' practice. Patients who failed to respond were referred to specialised mental health care. In the CAU condition patients were regularly referred and treated within specialized mental health care. 165 patients were included in the study with a one-year follow-up. Self-reported severity of psychopathology on the Symptom Checklist-90 (SCL-90) was the main clinical outcome measure. The economic evaluation was based on a societal perspective. An incremental cost-effectiveness ratio (ICER) was estimated by calculating the ratio of difference in costs to the difference in outcome of CCP compared to CAU. A bootstrap analysis was performed to estimate the uncertainty around the ICER and displayed in a cost-effectiveness acceptability curve. **Results:** The calculated ICER was €-148 per additional point of improvement of psychopathology. The cost-effectiveness analysis showed that CCP is significantly less costly (€ -1244) and non-significantly less effective than CAU (-8.4 points on the SCL-90). **Conclusion:** The collaborative care program is a more efficient service concept compared to regular referral and treatment in specialized mental health care.

3.2 Introduction

Mental health problems have become an increasing focus of attention during the last two decades, both of the public in general and of health care policy makers. Meta-analyses demonstrate that common mental health disorders are highly prevalent globally with twelve months prevalence estimates around 30% and lifetime prevalence even higher (86) (87). Furthermore, mental health disorders are associated with immense impairment and disability for individual and society (years lived with disability, work loss days, work productivity, quality of life, etc.) (88). Evidence is growing that, in the Netherlands, costs of mental disorders are comparable to those of physical illnesses and that a substantial part of the costs are caused by new cases (89). These findings are supportive for strengthening preventive mental health care and stepped collaborative care models, where the least intensive treatment is offered in primary care and the treatment intensity is stepped up, when necessary, in specialised mental health care.

While the clinical effectiveness of collaborative care models in primary care is well established for different mental disorders, the cost-effectiveness is inconclusive (90), (91). Many studies compared collaborative care with regular GP treatment in primary care, wherein the collaborative care treatments did not seem to be cost-effective for the treatment of depressive symptoms (90), less serious mental health problems (92), panic disorders (93), and prevention of depression and anxiety in elder persons (91). A quantitative Cochrane review conducted by Bower and Rowland (94) indicated that counselling in primary care does not seem to be any better than GP care in the long term and that although some types of healthcare utilization may be reduced, it does not seem to reduce overall healthcare costs. They also concluded that there is very limited evidence comparing counselling with other psychological therapies. The results of available trials seem to be more positive concerning cost-effectiveness. Drummond et al. (95) compared a stepped care intervention with minimal intervention delivered by a practice nurse. He concluded that the stepped care intervention resulted in greater cost savings compared to the minimal intervention.

The collaborative care program (CCP) investigated in this study was developed to address all non-acute common mental health problems that usually were referred to and treated within specialized mental health care organizations. Therefore, in contrast to the studies reported in the literature, in this economic evaluation, the incremental cost-effectiveness of the CCP was compared to direct referral and treatment within specialized mental health care.

3.3 Methods

The economic evaluation was part of a 12-month clinical study on the effectiveness of a stepped collaborative mental health care program (CCP) compared to care as usual (CAU). Details on the design and the results of the clinical study are provided elsewhere (96). The study was approved by an independent Dutch ethics committee (METIGG) in Utrecht.

Study population

Recruitment of participants (GPs and patients) took place between January 2003 and March 2005. Patients were eligible if they had psychological problems that demanded professional care and age was 18 years or older. Patients were excluded if they had dementia, delirium, acute and severe psychotic symptoms or any crisis situation demanding immediate care.

Design and randomisation

Economic data were collected alongside a cluster randomized trial, where GPs' practices were the unit of randomisation. At the time GPs were recruited for the study, about 65% of all GPs in the region already participated in the CCP and weren't eligible for randomisation. All other GP's were asked to participate. 27 GPs consented to randomisation (Additional Figure 1). GPs were randomly assigned to the CCP or the CAU condition. When assigned to the CCP condition, a CCP professional was attached to the GP's practice. GPs who were assigned to the CAU condition continued referring patients to mental health organisations according to their usual referral procedure. After randomisation, GPs were asked to report all patients indicated for referral to mental health treatment, which met the inclusion criteria for the study, to the researchers.

Intervention

The basic principle of the collaborative care program is that patients receive short-time treatment in their natural environment, i.e. their GP's practice. Professionals (community psychiatric nurses, clinical psychologists and psychotherapists) from specialized mental health care were attached to the GP practices. In the GP practice they had regular face-to-face contact with the GP, consulted patients and supported the GP in referring patients.

The short-time treatment in primary care consisted of a clinical assessment followed by a maximum of four sessions based on cognitive-behavioural and supporting principles (97). If indicated, patients could be referred after clinical assessment, during or after treatment to specialised mental health care. All professionals were trained in providing this short-time treatment model (97). A team of psychiatrists had face-to-

face contacts with the CCP professionals once a month and regular meetings with GPs and other professionals, working in the GP's practice, were held.

CAU involved traditional referral to specialized mental health care and subsequent treatment, starting with usual inquiries by the GP, followed by referral to primary or specialized mental health care when indicated. Primary mental health care was provided by private psychologists, psychiatrists, psychotherapists and social workers.

Specialized mental health care (MHC) in the Netherlands encompasses eight services: child- and youth MHC, adult MHC, MHC for the elderly, forensic psychiatry, addiction care and public mental health care. MHC was until 2012 completely covered by public health insurance.

Outcome measures, power analysis and measurements

The main clinical outcome measure for this trial was the Symptom Checklist (SCL-90; (75). The SCL-90 is a validated self-report inventory with 90 items measuring level of psychopathology during the previous week (98). The total score of the SCL-90, ranging from 90 – 450 is based on nine subscales. Lower scores indicate better functioning and less psychopathology. A power analyses was conducted. In a patient randomised study 82 patients per condition are needed to detect a clinically relevant difference of 22 points (Power and Precision Biostat inc.) between conditions on the SCL-90 (SD=50, power 80%, $\alpha = .05$). Due to cluster randomisation, the intracluster correlation coefficient (ICC) was taken into account. With ICC values usually between 0.01 and 0.02 in human studies (80), the needed sample size per condition was 85 to 89 patients.

Outcome measurement took place at baseline and after 3, 6 and 12 months.

Cost measurement and unit prices

The economic evaluation was conducted from a societal perspective. Direct healthcare costs and costs outside the health sector were assessed. Direct medical costs included primary and specialized mental healthcare, general healthcare and prescribed medication. Costs for training of CCP professionals in the short-time treatment model and housing costs were comparable to the costs of regular training of CAU professionals and internal housing. Thus, these additional costs were not included in the analyses. Costs outside the health sector included productivity losses with and without absence from paid workplace.

The information on resource use was primarily collected by means of a Dutch questionnaire, the Trimbos/iMTA questionnaire for Costs associated with Psychiatric

Illness (TiC-P), constructed to measure direct and indirect costs within and outside the healthcare sector for health economic studies (99). The questionnaire was administered during telephone interviews 3, 6 and 12 months after baseline. All specialized mental health care costs were additionally extracted from the electronic health record of the local mental health care institution in The Hague and surrounding area that offered both the CCP and specialized mental health care for 84% of the total patient group (100). Prices for direct medical costs were based on Dutch standard prices (101). True costs were estimated when standard prices were not available. All prices were adjusted for the year 2003 using consumer price index figures (Statistics, Netherlands, 2010). Productivity losses were calculated by means of the friction cost method (102).

Design of the economic evaluation

In the present study, costs are related to the primary outcome measure (SCL-90) for the CPP group compared to the CAU group. Costs per point improvement on the SCL-90 were calculated by the incremental cost-effectiveness ratio (ICER):

$$\text{ICER} = \frac{\text{costs (CCP)} - \text{costs (CAU)}}{\text{SCL-90 (CCP)} - \text{SCL90 (CAU)}}$$

Where costs (CCP) is mean costs per patient in the CCP group, costs (CAU) is mean costs per patient in the CAU group, SCL-90 (CCP) is mean SCL-90 difference score in the CCP group and SCL-90 (CAU) is mean SCL90 difference score in the CAU group. Costs were discounted according to current guidelines.

To circumvent potentially biased results due to missing data, we carried out the Fully Conditional Specification Approach (FCS) to multiple imputation (103) with five complete datasets. Because of the nesting of the data, two-stage bootstrapping with shrinkage correction was used to estimate uncertainty around the incremental cost-effectiveness ratio (ICER; (104). The uncertainty of the parameter estimators was presented on a cost-effectiveness acceptability curve (CEAC).

3.4 Results

Baseline characteristics and participant flow

In figure 1 the participants and general practitioners flow can be seen. Participants were followed during a one-year follow-up. The randomization appeared to be successful since there were no significant differences on the sociodemographic and clinical characteristics at baseline (Table 1).

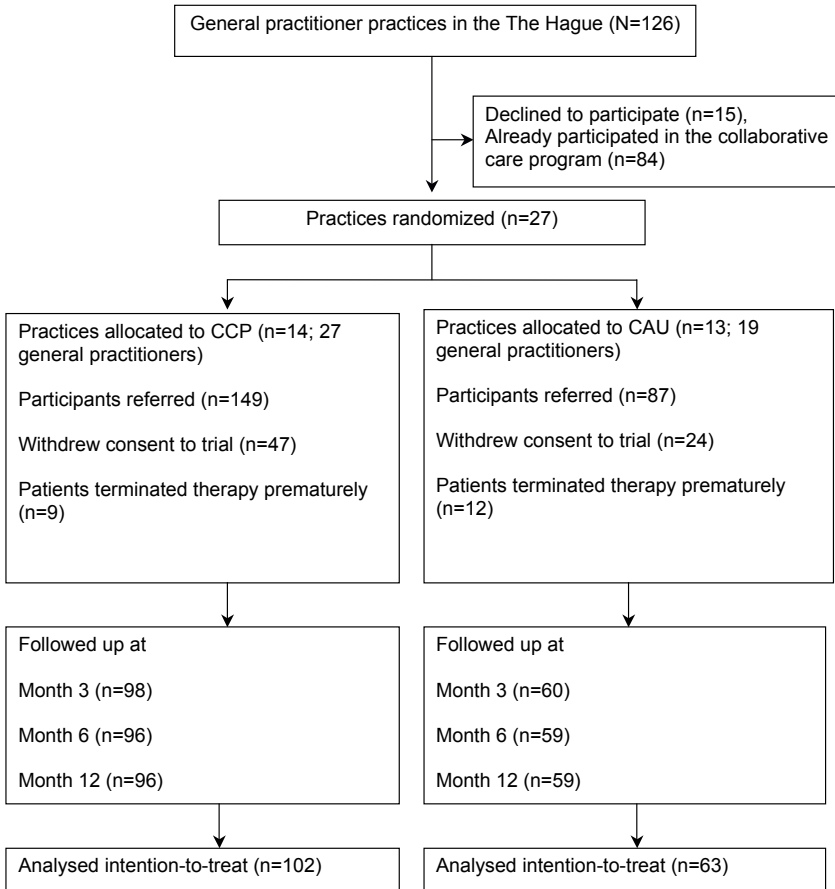


FIGURE 1. Consort Diagram of participating general practitioner practices and number of patients referred to the trial

TABLE 1. Sociodemographic and clinical characteristics of collaborative care program (CCP) and care as usual (CAU) groups

	CCP group (N=102)		CAU group (N=63)	
	N	%	N	%
Age in years: M±SD	40.2±14.3		40.4±12.9	
Gender female	73	72	39	62
Duration of complaints before referral				
<3 months	23	23	18	31
3–9 months	30	30	13	22
>9 months	47	47	27	47
SCL-90 psychopathology at baseline: M±SD	90	181.2±58.6	56	188.4±64.2

All t-tests and χ^2 were not significant.

Missing data

In total 10 patients (6%) dropped out of the study during the one-year period (six from the CCP group and 4 from the CAU group (96). Regarding to missing data for the economic evaluation, at baseline effectiveness data were missing for 19 patients (12%), either because they did not complete the questionnaire or because more than ten items of the SCL-90 were missing. This number increased to 51 patients (31 %) at one year follow-up. The data on resource use was missing for 3 (2%) patients at baseline and for 14 (8%) at one year follow-up. As previously mentioned, we carried out the Fully Conditional Specification Approach (FCS) to multiple imputation (103) with five complete datasets to circumvent potentially biased results due to the missing data.

Health outcomes

For the CCP group the mean difference on the SCL-90 psychopathology score between baseline and one-year follow-up was -34.6 (SD 60.0). For the CAU group the mean difference score on the SCL-90 psychopathology score was -43.0 (SD 55.6). This difference between both patient groups of 8.4 (SD 9.4) was not statistically significant.

Resource use

The mean total costs of the CCP group during the one-year follow-up period was significantly lower (€3108) than the mean total costs of the CAU group (€ 4352; see Table 2). The largest differences in costs between the two groups can be found in outpatient and inpatient mental health services (see additional Table 3 for a summary of all costs per unit).

Cost-effectiveness analysis

The calculated mean value of the ICER was €-148 for the relinquish of one additional point on the SCL-90. About 80% of the bootstrapped mean ICERs were located in the southwest quadrant, indicating that CCP is less effective and less costly than CAU in 80% of the bootstrapped mean ICERs. The other bootstrap simulations (20%) were located in the southeast quadrant indicating that the CCP was more effective and less costly than CAU in 20% of the bootstrapped mean ICERs. To interpret the results correctly, one has to take a closer look at the actual value of difference in effects. The mean (95% CI) difference between the CCP group compared to the CAU group of -8.37 ± 9.4 (-10 - 27) is neither statistically significant ($t(163)=-.90$; $p=.372$), nor clinically relevant with a negligible effect size of $d=0.1$. A difference (95% CI) upward of 18.50 (.40 - 37) becomes statistically significant, which corresponds to only 13.8% of the bootstrap simulated effect differences. The point estimate of the ICER and the results of the bootstrap analysis are presented in Figure 2.

TABLE 2. Total costs (€) during the study

Time period	CPP (N=102)		CAU (N=63)		Difference in costs, mean (95% CI) ^a
	MEAN	MEDIAN	MEAN	MEDIAN	
T0-T3	494	420	601	534	107 (-29 – 243)
T3-T6	551	323	1072	699	521 ^b (56 – 986)
T6-T12	1204	489	1684	1019	481 (-85 – 1047)
T0-T12 ^c	3108	2518	4352	3042	1244 ^b (179 – 2308)

^a 95% CI and difference of mean costs between the CCP and CAU group during the different time periods

^b Significant difference between means of CCP compared to CAU

^c Productivity costs are only included in this time period, because these costs were calculated for whole year

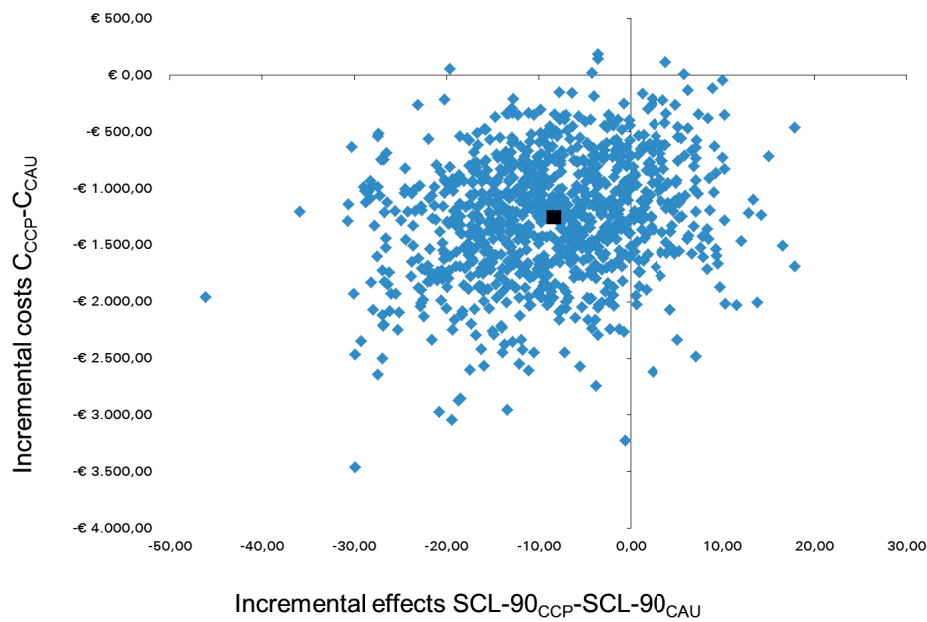


FIGURE 2. Cost–effectiveness plane of the imputed dataset

C_{CCP} = costs in the Collaborative Care Programme (CCP) group

C_{CAU} = costs in the Care As Usual (CAU) group

$SCL\ 90_{CCP}$ =difference between SCL-90 score on baseline and SCL-90 score after one year in the CCP group

$SCL\ 90_{CAU}$ =difference between SCL-90 score on baseline and SCL-90 score after one year in the CAU group

The dark square is the point estimate of the incremental cost effectiveness ratio (ICER):

Δ cost: -1243,34 ; Δ effect: -8,37

The cost-effectiveness acceptability curve (Figure 3) based on the two-stage bootstrapping with shrinkage correction shows that the probability that CCP is more cost-effective compared to CAU is 85%. The probability of cost-effectiveness decreases when the demand for compensation for one point lost on the SCL-90 increases.

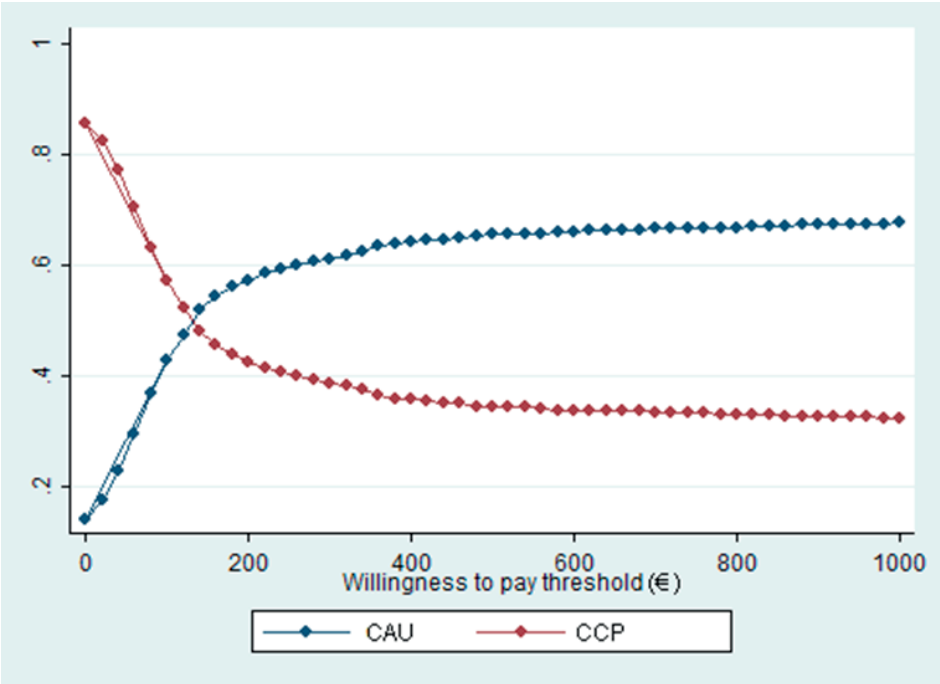


FIGURE 3. Cost-effectiveness acceptability curve

3.5 Discussion

In this study we examined the cost-effectiveness of a stepped collaborative care program in primary care compared to regular referral and treatment in specialized mental health care. The results of the analyses provide evidence that treatment within the collaborative care program is less costly compared to direct referral and treatment in specialized care sector. The cost-effectiveness plane also shows that the collaborative care program seems to be less effective than regular specialized mental health care, based on the clinical outcome measure SCL-90. This difference, however has shown to be neither statistically nor clinically relevant. This non-significance is in line with the earlier multilevel analysis of the clinical effectiveness of the RCT data (96) and a meta-analysis of comparative effectiveness of chronic care models in primary care compared to other care conditions, that also included the present study (49). In the light of the willingness to accept (WTA) versus willingness to pay (WTP) disparity discus-

sion, when incremental cost-effectiveness ratio falls in the South-West (SW) quadrant of the cost-effectiveness plane, there are several theories and methods described to address this disparity (105) (106) (107). It has been shown that WTP for health changes can differ from the WTA health changes of the same magnitude. There are several statistical methods described to handle this disparity, like drawing different multiple CEAC's for creating different levels of the accept/reject ratio (107) or performing a two-way sensitivity analysis on the incremental net benefit (106). It is also argued, however that the existence and magnitude of a so called 'kink' in the accept/reject threshold depends on the intervention/technology studied and the societal position of political and economic decision makers involved. Concerning the Collaborative Care Program analysed in this study, a mere statistical approach to a possible disparity might not be useful for societal decision making. Given the worldwide economic constraints on health budgets, a mental health care service program whose effectiveness is not significantly lower and satisfaction of patients about treatment is comparable (96), but significantly less costly for society, might be considered as a preferable alternative to direct referral to specialised mental health care.

This study has several strengths and weaknesses. The primary limitation of this analysis is that the economic evaluation was conducted as part of a clinical trial that has been designed primarily to assess the effectiveness of the collaborative care program. With regard to the non-normally shaped distribution of the cost-data, the sample size of this study is likely to be too small. By means of non-parametric bootstrapping, however, we addressed the uncertainty of the point estimate of the ICER.

Despite of the low attrition rate of the study, the number of missing variables, especially in the clinical outcome variable was substantial (for 36% of the total study group no difference score on the SCL-90 could be computed). To investigate the influence of the missing data on the results, we imputed the missing data and compared this data set with the standard dataset and found that the imported dataset did not affect the acceptability curve.

The telephone interviews as a way to collect data on resource use could pose a problem for the validity of the data. Relying on patients' memory to recall information over a couple of months (from three months up to six months between two interviews) could have had a negative effect on internal validity of estimates (108). Use of collaborative care and specialized mental care was also retrieved from the patients' mental health record from the local mental health care organization, which can be expected to increase the validity of the data on mental health care costs (108). Since data collection on resource use was identical for both study groups, the potential validity problem

would have affected both groups equally and is therefore not likely to influence the outcome of the cost-effectiveness analysis.

An important strength of this study is its' ecological validity. All patients with non-acute common mental health problems with or without co-morbidity were eligible for inclusion in the study. Only crisis conditions that needed immediate care were contra-indications. Thus, the results are likely to be generalizable to the general patient population in need of non-immediate mental health care.

Another strength of the study is the low drop-out rate from the study. The overall drop-out of 6% during the one-year period is of little concern for validity of the results (109). Furthermore, the attrition rate was comparable across conditions.

The societal perspective of the economic evaluation, which implies including all forms of direct and indirect health care costs as well as productivity losses, is also a strength. This may facilitate optimal decision making of policy makers that affect societal welfare and does not only take into account the payer's perspective. It is relevant to note that the restriction of the number of therapy sessions - to five in this study- could lead patients to consequently use other resources to compensate an experienced lack of sufficient care. Through collecting costs from the societal perspective, we were able to refute this possibility.

3.6 Conclusion

This study provides evidence that a collaborative care program in a primary care setting with a brief treatment intervention with a maximum of 5 appointments is a cost-effective service concept compared to direct referral to a specialized care setting if indicated. Further research with a larger population is needed to confirm the research findings from this study.

3.7 Acknowledgements and disclosures

This study was funded by Delta Lloyd en OHRA Ziekenfonds (a Dutch health insurance company). We thank the patients and general practitioners, interviewer L. Dijkhuizen, M.Sc., the staff and management of the collaborative care program, and the Parnassia Group.

Conflicts of interest

None declared.

3.8 Appendix chapter

TABLE 3. Medical and non-medical costs (€) for participants in the two treatment groups during 12 months: mean costs (SD) with imputed data, mean costs (SD) of the total treatment groups and mean costs (N) of persons using the particular health service

Healthcare services	CCP group (N=102)			CAU group (N=63)		
	Mean costs with imputed data (SD)	Mean costs whole group (SD)	Mean costs ¹ (N)	Mean costs with imputed data (SD)	Mean costs whole group (SD)	Mean costs ¹ (N)
<i>Outpatient mental health care</i>						
CCP and specialized mhc	1130 (1577)	917 (1493)	1077 (86)	1643 (1887)	1402 (1793)	1738 (50)
Private psychiatrist	20 (68)	6 (57)	562 (1)	61 (180)	38 (171)	583 (4)
Private psychologist	54 (141)	20 (117)	334 (6)	142 (337)	93 (322)	810 (7)
Private psychotherapist	33 (173)	23 (163)	1105 (2)	23 (73)	8 (64)	502 (1)
Social worker	32 (143)	19 (124)	381 (5)	38 (64)	19 (58)	145 (8)
<i>In-patient/semi-inpatient healthcare</i>						
Psychiatric hospital admission	179 (441)	0 (-)	0 (-)	632 (2426)	334 (2606)	20351 (1)
Day care	4 (14)	1 (13)	132 (1)	9 (23)	4 (24)	132 (2)
<i>General healthcare</i>						
General practitioner	103 (120)	81 (113)	103 (77)	95 (81)	72 (78)	98 (45)
Alternative and paramedic healthcare	270 (438)	171 (388)	492 (34)	340 (704)	209 (654)	608 (21)
Home care	56 (273)	27 (256)	887 (3)	53 (124)	13 (100)	779 (1)
Emergency care	28 (68)	13 (60)	220 (6)	25 (42)	5 (26)	147 (2)
Medical specialist	159 (162)	116 (145)	207 (55)	129 (177)	71 (153)	240 (18)
Other general healthcare (lab)	24 (40)	17 (37)	53 (31)	24 (30)	13 (27)	46 (17)
<i>Medication</i>						
Daily defined dose medication used	47 (55)	87 (166)	174 (49)	66 (73)	137 (250)	246 (34)
<i>Productivity losses</i>						
Paid work	856 (1658)	612 (1665)	2101 (23)	989 (1442)	820 (1489)	1835 (21)

¹ Mean costs of persons using the particular health care service (number of patients using these services between brackets)



Prediction of mental health services use one year after regular referral to specialized care versus referral to stepped collaborative care

Published as:

van Orden, M., Leone, S., Haffmans, J., Spinhoven, P., & Hoencamp, E. (2017).
Prediction of mental health services use one year after regular referral to
specialized care versus referral to stepped collaborative care. *Community mental
health journal*, 53(3), 316-323.

4.1 Abstract

Referral to collaborative mental health care within the primary care setting is a service concept that has shown to be as effective as direct referral to specialized mental health care for patients with common mental disorders. Additionally it is more efficient in terms of lower mental health services use. This post-hoc analysis examines if treatment intensity during 1-year of follow-up can be predicted prospectively by baseline characteristics. With multilevel multivariate regression analyses baseline characteristics were examined as potential predictors of visit counts. Results showed that only the enabling factors service concept and referral delay for treatment had a significant association with mental health visit counts, when outcome was dichotomized in five or more visits. Inclusion of the outcome variable as a count variable confirmed the predictive value of service concept and referral delay, but added marital status as a significant predictor. Overall, enabling factors (service concept and referral delay) seem to be important and dominant predictors of mental health services use.

4.2 Introduction

As a result of increasing demands and limited resources, mental health care is under increasing pressure to enhance efficiency (110). For this reason, high quality short-term treatment is more appealing than ever. Stepped care is an approach where the initial treatment is the least restrictive of those available, but still likely to provide significant health gain (24). Only for patients who fail to respond, the treatment intensity is 'stepped up', i.e. referral to specialized mental health care. This prevents unnecessary treatment for most of the patients who will recover with minimal interventions (111). In recent years, the first treatment step is increasingly offered in the primary care setting, supported by liaison-consultation functions (i.e. collaborative care). Integrating specialized mental health services in primary care was one of the most fundamental recommendations of the World Health Organization in 2001 (112). Stepped/collaborative care has been shown to be effective for patients with anxiety, depression and addictive problems with regard to a decrease in complaints (49, 96, 111). With regard to efficiency there are indications that collaborative care is associated with decreased mental health care utilization (96) and a subsequent decrease in costs (95), even on the longer term (100).

An alternative approach to stepped care is matched care. In this approach the patient is allocated to the most appropriate therapy based on available intake information. As a result, treatment method, treatment intensity and treatment setting may vary (29). Quick and appropriate allocation could enhance continuity and efficiency of care. Crucial in this approach is to integrate all relevant criteria in the allocation process that potentially predicts response to the treatment. This approach poses a major problem, however, as factors which are stable predictors for subsequent treatment intensity have to be known and the available empirical evidence on such predictors is inconclusive.

An important and widely used theoretical prediction model is Andersen's model of health services use (113). According to this model, people's use of health care is a function of (a) their predisposition to use services, (b) need for care, and (c) enabling factors. The predisposition to use services includes demographic factors, like age and gender, social structures and health beliefs. Social structure is measured by various factors that determine the status of a person in the community, his or her ability to cope with presenting problems, and the state of health of the physical environment. Social structures include factors such as education, occupation, ethnicity, culture, social networks and social interactions. Health beliefs are attitudes, values, and knowledge about health and health services that might influence perceptions of need and use of health services.

The subjective evaluation or perceived need for care is based on the perception of one's own general health and functional state, as well as how symptoms of illness, pain, and worries about health are experienced. Furthermore, the judgment whether problems are of sufficient importance and magnitude to seek professional help is an important factor in subjective evaluation. Objective or evaluated need for care represents professional judgment about people's health status and need for care.

Regarding enabling resources, two types of resources must be present for health care use to take place: community and personal enabling resources. Therefore, health personnel and facilities must be available. On a personal level people must have the means and know-how to approach these services and make use of them. Income, health insurance, a regular source of care, and travel and waiting times are relevant variables in this context. One concern about Andersen's (113) initial model was that organizational factors were not given enough attention. Knowledge about the organization of care (i.e. the various kinds of medical care providers and types of health services organizations in the community) was expected to improve the ability to explain and predict care. Accordingly, Andersen suggests including organizational measures as additional enabling factors.

The aim of the randomised controlled trial assessing the effectiveness and efficiency of a Dutch collaborative care program for treatment of common mental disorders was to examine the effectiveness, efficiency, accessibility and acceptance of CCP compared to usual specialized mental health care. The results of this trial confirmed our hypothesis that that for the treatment of common mental disorders referral to collaborative care was (at least) equally effective as direct referral to specialized mental health care, but resulted in significantly lower mental health services use, even 5 years after referral (100). In this study however, 32% of the patients who were initially treated within the collaborative care condition still needed subsequent referral to specialized mental health services. This raises the question whether the investigated stepped care approach is suitable for all patients with common mental disorders or whether there is an identifiable group of patients who do not benefit sufficiently from the collaborative care program and for whom it would be better to be referred directly to specialized care/matched care? To answer this question we performed a post-hoc analysis of the data of the above mentioned RCT to find out whether treatment intensity was dependent on dispositional, need for care and enabling factors, as described by (113). In other words: is it possible to identify a subgroup of patients for whom matched care would be more appropriate than collaborative care?

While the primary care sector is the fastest growing sector of mental health care delivery, only a small number of studies have examined correlates of mental health care use in primary care (114). Lindsay et al. found that need for care variables, including mood disorders, anxiety and substance use disorders seem to be most strongly related to treatment use compared to predisposing and enabling factors. In a study in the Netherlands, Schaefer et al. (110) investigated the impact of patient characteristics on the decision and referral process to brief (maximum of six visits) and longer-term treatment models by clinicians. They concluded that patients who have assets and a number of aspects in their lives in which they function well (especially good relationships) are considered to be better candidates for brief-term treatment than patients who have besides their target problem also other weaknesses and problems in living. In terms of Andersen's model, certain predispositional and need for care factors have an influence on the allocation process of clinicians to brief or longer-term treatment.

The primary aim of the present study was to conduct a post-hoc analysis to identify predispositional, enabling and need for care factors that predict mental health services use within the year after referral to either a stepped collaborative care program or specialized mental health services.

4.3 Methods

Setting

This post-hoc analysis uses data from a previously performed randomized controlled trial (96). For this trial, general practitioner (GP) practices ($n=27$) were randomized to one of two conditions: either the practice continued its usual way of referring patients to specialized mental health services if indicated (care as usual, CAU; $n=63$ patients) or the GP practice referred patients to an on-site mental health professional who could see the patient for a maximum of five sessions with subsequent referral to specialized mental health care if indicated (stepped collaborative care in the primary care setting, CCP; $n=102$ patients). The general agreement between the CCP professional and the GP was that the GP would refer all patients to the CCP professional initially, unless there were patient-related reasons for directly referring a patient to specialized mental health care (such as patients needing acute mental health care). The regular assessment of GPs' motivation for referral to either CCP or CAU was not part of the study protocol. In the CCP condition, a brief time-limited intervention with a maximum of five sessions is offered in a period of 6 months, based on a time-limited intervention model with a cognitive behavioural approach (79) by community psychiatric nurses or psychologists. If indicated by the mental health professional, consultation of the

patient by a psychiatrist was possible. The mental health professional had regular face-to-face contacts with the GP. A team of psychiatrists met the mental health professional once a month and conducted regular meetings with the GP. The CAU condition encompassed regular referral by the GP practices to specialized mental health care.

In the trial no significant baseline differences (sociodemographic characteristics, diagnosis, severity of psychopathology) were found between the patients that were referred to either the CCP condition or the care as usual condition (96). Moreover, at 1-year follow-up there were no significant differences between the two conditions with respect to severity of psychopathology, quality of life and patient satisfaction. Collaborative care did lead to significantly higher levels of GP's satisfaction and proved to be more efficient than care as usual with respect to referral delay, defined as the waiting time for patients between referral by GP and first face-to-face appointment with a mental health professional, duration of treatment, number of appointments and related treatment costs.

The retrospective study was performed between January and September 2013.

Written informed consent and the approval of the accredited Medical Research Ethics Committee (METiGG) was obtained.

Measurements

Based on the variables collected within the RCT we were able to integrate a number of factors, assessed at baseline, that potentially predict people's use of health care according to Andersen's prediction model (113). Regarding to predispositional factors, participating patients were queried about gender, age, education and marital status. As objective need measures we used the Mini International Neuropsychiatric Interview (72), the Clinical Global Impression Scale (CGI) (115) and an assessment of symptom duration. The Mini International Neuropsychiatric Interview was conducted by trained interviewers for Axis-I diagnosis according to DSM-IV criteria. The GP rated the severity of the patient's symptoms on a seven-point scale with the CGI and symptom duration on a three-point scale: <3 months, 3-9 months and >9 months. As subjective need factors, the Symptom Checklist (SCL-90) (75) was used for self-reported mental health problems (76) and the World Health Organization Quality of Life Questionnaire (WHOQOL-Bref) (112) for self-rated overall quality of life and general health.

As enabling factors we were able to include referral delay which was defined as the waiting time in weeks for patients between referral by their GP and their first face-to-face appointment with a mental health professional and the actual service concept,

consisting of the two treatment conditions [i.e., care as usual (CAU) and stepped collaborative care in the primary care setting (CCP)].

Analysis

The intraclass correlation coefficient (ICC) was calculated to test the relatedness of patients belonging to the same GP (clusters).

For the primary post-hoc analysis, patients were divided into two outcome groups regardless of the original referral condition: patients who finished treatment with five or less visits ('low service group') to the mental health care professional and patients who were treated with more than five visits ('high service group'). The choice for the split on five appointments was based on the service concept of the CCP by offering a maximum of five sessions to a patient with further referral to specialized care, only in case the patient was not sufficiently recovered. We compared baseline predictor variables and drop-out rates (premature termination of treatment) between the high and low service use groups using Chi square tests, non-parametric tests and t-tests.

While only 10 (6%) of the enrolled patients in the RCT dropped out of the study during the 1-year follow-up period (see (96) for details), for 39% of patients one or more variables were missing in their dataset. To circumvent reduced representativeness of the sample, we conducted multiple imputation (MI) by Markov Chain Monte Carlo (MCMC) simulation with 50 iterations. With a two-level (patient as the first and GP as the second level) multivariate logistic model with maximum-likelihood estimation (MLE), we investigated the associations between the predictors and the dichotomous outcome variable.

Because of the limited statistical power of reducing service use to a dichotomous variable, we carried out a second post-hoc analysis. In a two-level multivariate regression analysis with MLE, we investigated the association of the predictors with the outcome 'count' variable (total number of mental health care visits during the one year after referral). Because of the nonnormality of our count data distribution (skewness 2.721; kurtosis 9.245), we log-transformed (ten-log) the outcome count data before conducting the regression analysis.

Statistical analyses of baseline data were performed using SPSS 20 and multilevel regression analyses using Mplus 6 (116).

All authors certify responsibility. There are no known conflicts of interest.

TABLE 1. Demographic and symptom characteristics of patients by mental health services use

	Low use (< 5 appointments; N=85)		High use (≥ 5 appointments; N=74)	
	N	%	N	%
<u>Predispositional factors</u>				
Age (M $\pm$ SD)	40.2 $\pm$ 13.3		40.8 $\pm$ 13.8	
Gender				
Male	25	29	25	34
Female	60	71	49	66
Marital status				
Not married	45	53	46	62
Married/living together	40	47	28	38
Education ^a				
Primary	9	13	8	13
Secondary	18	27	18	30
Low vocational	20	29	18	30
High vocational	16	24	12	20
University	5	7	5	8
<u>Need factors</u>				
Clinical Global Impression: Symptom severity ^a				
Normal, not at all ill	8	10	16	25
Borderline mentally ill	11	14	5	8
Mildly ill	28	35	17	26
Moderately ill	13	17	12	19
Markedly ill	17	22	11	17
Severely ill	2	3	4	6
Extremely ill	-	-	-	-
Symptom duration ^a				
Less than 3 months	23	29	17	24
3-9 months	22	28	18	25
More than 9 months	35	44	37	51
Diagnosis				
Mood disorder	23	27	26	35
Anxiety disorder	31	37	30	41
Other axis 1 disorder	31	37	18	24
SCL-90 Psychopathology score (M $\pm$ SD) ^a	179 $\pm$ 61.7		190 $\pm$ 62.0	
WHOQOL-Bref General evaluative facet (M $\pm$ SD) ^a	3.1 $\pm$.8		2.9 $\pm$.8	
<u>Enabling factors</u>				
Treatment delay in weeks (M $\pm$ SD) ^a	4.6 $\pm$ 8.2		3.6 $\pm$ 5.1	

^a Not all data were available for all persons

4.4 Results

For 159 of the 165 patients who participated in the RCT we were able to obtain data about their mental health services use during the 1 year after enrolment in the RCT. A low mental health services use (five or less visits) was found for 85 patients (60 % CCP, 43 % CAU) and 74 patients had a high mental health services use (more than five visits; 40 % CCP, 57 % CAU).

Within the CCP group, 32 % (n=27) were subsequently referred to specialized mental health care. Of the 68 % (n=58) of the CCP group that were not referred to specialized care, 90 % (n=52) had low mental health services use compared to 10 % (n=8) that had high mental health services use. There was no significant difference in drop-out rates, defined as premature termination of treatment by the patient, between the CCP group (n=9; 8,8 %; for ten patients data about drop-out was missing) compared to the CAU group (n=12; 19 %; for 6 patients data about drop-out was missing).

TABLE 2. Associations (OR's and 95% CI) of predictor variables and outcome variable of the multivariate logistic regression model

	Multivariate logistic regression model (dichotomous outcome; low use=0)				
	Estimate	S.E.	OR	95% CI	Sig.
<u>Predispositional factors</u>					
Age	0.06	0.10	1.06	(0.88 - 1.28)	.62
Gender (male=0)	-0.02	0.09	0.98	(0.83 - 1.17)	.85
Marital status (not married=0)	-0.13	0.09	0.88	(0.74 - 1.04)	.14
Education (primary school=0)	0.05	0.10	1.05	(0.86 - 1.28)	.62
<u>Need factors</u>					
Clinical Global Impression: Symptom severity (normal=1)	-0.08	0.10	0.93	(0.76 - 1.12)	.43
Symptom duration (less than 3 months=0)	0.16	0.09	1.17	(0.98 - 1.40)	.09
Diagnosis (mood disorders=0; anxiety disorders=1; other Axis I disorders=3)	-0.13	0.11	0.88	(0.71 - 1.08)	.21
SCL-90 Psychopathology score	-0.04	0.13	0.97	(0.75 - 1.25)	.79
WHOQOL-Bref General evaluative facet	-0.14	0.15	0.87	(0.66 - 1.16)	.34
<u>Enabling factors</u>					
Treatment delay in weeks	-0.23	0.11	0.80	(0.64 - 0.99)	.04
Service concept (CCP=0)	0.23	0.09	1.26	(1.05 - 1.51)	.01

Significant associations at $P < 0.05$ level are shown in bold

Table 1 shows the descriptives of all baseline predictor variables of the dichotomized outcome groups. There were no statistically significant differences between the low mental health services use group and the high mental health services use group on any of the baseline variables.

The intra-class correlation was 0.044, indicating a very small cluster-effect.

In the multilevel multivariate logistic regression analyses, the enabling factors service concept (OR=1.261; P=0.012) and referral delay (OR=0.796; P=0.038) were the only factors with a significant association with the mental health services use, indicating that patients who were referred to the CAU condition had a 26% Odds of belonging to the high service use group (see Table 2). On the other hand, the longer the waiting time, the lower the ODDS of belonging to the high service group.

TABLE 3. Associations (OR's and 95% CI) of predictor variables and outcome variable of the multivariate Poisson regression model

	Multivariate Poisson regression model (mental health visit counts)			
	Estimate	S.E.	Estimate/S.E.	Sig.
<u>Predispositional factors</u>				
Age	0.12	0.08	1.39	.16
Gender (male=0)	-0.01	0.08	-0.06	.95
Marital status (not married=0)	-0.22	0.07	-2.99	.00
Education (primary school=0)	0.10	0.09	1.10	.27
<u>Need factors</u>				
Clinical Global Impression: Symptom severity (normal=1)	-0.03	0.08	-0.40	.69
Symptom duration (less than 3 months=0)	0.13	0.08	1.58	.11
Diagnosis (mood disorders=0; anxiety disorders=1; other Axis I disorders=3)	-0.13	0.09	-1.35	.18
SCL-90 Psychopathology score	-0.04	0.11	-0.33	.75
WHOQOL-Bref General evaluative facet	-0.12	0.12	-1.07	.28
<u>Enabling factors</u>				
Treatment delay in weeks	-0.21	0.09	-2.39	.02
Service concept (CCP=0)	0.26	0.11	2.50	.01

Significant associations at $P < 0.05$ level are shown in bold

4.5 Discussion

In this study we examined potential predictors of mental health services use during a 1-year period after referral to either collaborative care in primary care or specialized mental health care. Based on the theoretical concept of the collaborative care model used, we dichotomized mental health services use in high (>5 visits) vs. low (≤ 5 visits) mental health services use. In the two-level multivariate logistic regression analysis we found that mental health services use was not significantly associated with predispositional or need for care characteristics. In this analysis the enabling factors service concept and referral delay were the sole factors with a significant predictive value on the number of mental health visits patients received. Referral of patients to collaborative care decreases the number of mental health visits compared to direct referral to specialized mental health care. An increase in referral delay decreases the number of mental health visits. In the multivariate regression model (with the outcome variable as a count variable), the predictive value of the enabling factors (service concept and referral delay) was confirmed, but marital status became also a significant predictor with married patients being less likely to receive more mental health visits.

Our findings strongly support Anderson's conclusions that organizational factors are important enabling factors for mental health care use (113). These factors might even be superior over need and predispositional factors in predicting mental health service use. By finding no evidence that need for care and predispositional factors (except marriage as a potential protective factor) have to be included in the allocation process for referral, we obtained preliminary evidence that stepped care might be preferred over matched care for patients with common mental disorders. Interestingly, the predictive value of marital status is consistent with the findings of Schaefer et al. (2013) that relationship factors (marital status) could have a protective effect on becoming a high mental health services user.

An important feature in which this study differs from most similar studies is the number of visits offered to patients in the primary care setting. Meta-analyses of treatment outcome studies suggest that the largest gains are made during the first six to eight treatment sessions. In Schaefer's study brief treatment included six visits (110). In this study, the time-limited treatment model included only five visits, which is less than most short time treatment models.

It also has to be noted that this study has been performed in the Netherlands with a mental health system that differs from mental health systems in other countries, like the U.S. In a review of studies that assessed the use and implementation of Andersen's model (117) factors related to the accessibility of mental health care, such as being

insured and having a regular source of care have been pointed out as influencers of the likelihood of service use in the U.S. In the Netherlands the above mentioned factors do not have this importance because all Dutch citizens are obliged to buy individual private health insurance with an income dependent contribution. Furthermore each insured person has to register with a single GP, who is assumed to coordinate and preauthorize specialist care (118). The evaluation of enabling factors of mental health care use thus has to be performed in the light of the existing health care system. It is possible, that if this study was performed within the U.S., accessibility of mental health care could constitute an important confounder leading to different results. The reform of health insurance in the U.S. following the Dutch universal mandatory health insurance model as described by van de Ven and Schut (2008) could improve enabling factors for U.S. citizens to use mental health care.

This study has some important limitations that have to be addressed in interpreting our results. First, the relatively small sample size limits the power to detect weaker associations between mental health services use and predictor variables and limits the number of potential predictor variables that can be included in the analyses. By recoding our count data into dichotomous categories, we realize that this poses additional problems of losing information and reducing statistical power even more. Therefore, we additionally conducted a multivariate regression analyses with the outcome variable as a count variable to check whether the findings from our logistic regression analysis could be confirmed.

The second important limitation concerns the rate of missing data. Despite of low levels of attrition, there was a notable rate of missing data, especially data about need for care factors. We assume that the way of collecting these data by sending questionnaires by mail to the patients accounted for the high rate of missing data. However, the availability of an electronic database resulted in a much lower percentage of missing data of actual mental health services use and probably more reliable data on service use than self-reports by the patients themselves. By means of the MI approach, we attempted to increase power and decrease the risk of biased results. The third limitation is partially related to the design of the study, set up to assess the effectiveness and efficiency of collaborative care compared to care as usual. Measurements were chosen that served this primary intent. Therefore, inquiries about relevant aspects related to social structures, like ethnicity, employment, income and health beliefs were limited. Other potential predictors, like self-perceived need of mental health care (119, 120) and coping that could also provide valuable information as predictors of mental health services use, could not be included in the analyses. The fourth limitation concerns the follow-up period of 1 year, which could have affected the results of our analyses. 28 %

of the collaborative care group and 46% of the usual care group did not terminate treatment within the 1 year follow-up period (96). Consequently, it is possible that some of the patients, who did not terminate treatment within the follow-up period, could have ended up in the high services group. This is expected to affect especially the care as usual group since nearly half of this group did receive treatment after the 1 year period. This possibility could also be related to the result of the variable referral delay. The longer the referral delay for treatment, the less chance of terminating treatment within the 1-year period. An alternative explanation for the effect of referral delay on mental health visit counts may be the influence of wait time for treatment on patient's motivation. (121) found that increased wait time for an initial appointment at a community mental health centre adversely affects the rate of kept appointments. The shorter the referral delay, the less likely are missed appointments during treatment. In the context of this study, this would imply that in some cases, low intensity use would not automatically relate to the need for treatment, but to diminished motivation due to long referral delay. A second alternative explanation could be that referral delay, in some cases, could cause a natural decrease in severity of symptoms leading to a decreased need of treatment intensity.

In this study we found no evidence that it is possible to identify a subgroup of patients that will not sufficiently respond to a short-time collaborative care treatment as a first and least intensive step in a stepped care model on the basis of pre-treatment dispositional or need for care factors. The factor that had the largest influence on eventual mental health services use was the organization of care. Paying attention to the support system of the patient could, however, also be of importance for the intensity of the actual treatment process. Further research is needed to, first, investigate the role of quality of relationships as a protecting factor for mental health services use and, second, investigate mental health services use during a longer follow-up period.

Based on our findings and taking into account the discussed limitations of our study, we recommend that in countries where general practitioners play a pivotal role in the referral system as gatekeepers for access to mental health care, it may be appropriate to reconsider referral patterns and offer the first and least intensive mental health treatment step in the primary care setting to all non-acute patients with common mental disorders. This would imply that referral to specialized secondary mental health care should be considered as a second step, offered only to patients, who fail to exhibit sufficient signs of recovery.



Five-Year Mental Health Care Use by Patients Referred to Collaborative Care or to Specialized Care

Published as:

Van Orden, M.L., Deen, M.L., Spinhoven, P., Haffmans, J., Hoencamp, E. (2016)
Five-year mental health care use by patients referred to collaborative care or to
specialized care. *Psychiatric Services*, 66(8), 840-844.

5.1 Abstract

Objective: This study compared long-term use of mental health care by two groups of patients who had common mental disorders in the Netherlands—those treated in a collaborative care setting and those referred to off-site specialized mental health services if indicated. **Methods:** The study was a retrospective analysis of use of mental health care over five years by 139 patients who participated in a cluster-randomized parent study. The parent study involved 27 general practitioners (GPs) who provided either collaborative care or usual care. In the collaborative care condition, a mental health professional worked on site at the GP's practice and was available to provide short-term treatment. In the usual-care condition, the GP referred the patient to off-site specialized mental health services if indicated; if not indicated, the GP provided usual care. The two treatment groups were compared on the number of mental health care contacts and total treatment duration, the proportion that initiated a new treatment episode after termination of the initial treatment, and time to new treatment. **Results:** Patients in the collaborative care condition received about half the number of mental health care contacts as those in the usual-care condition, and no differences were found in the rate of initiation of new treatment episodes after initial treatment, time to new treatment, and total treatment duration. **Conclusions:** Referral of patients with common mental disorders to collaborative mental health care as a first intervention led to fewer contacts with a mental health care professional over the long term, compared with referral to specialized mental health care.

5.2 Introduction

Collaborative care programs in primary care are effective for a wide variety of mental health conditions (49, 122). The benefits of collaborative care in terms of efficiency have been inconclusive until recently (55). In randomized trials investigating the effectiveness and efficiency of collaborative care, the follow-up period is usually limited to the period of active treatment (mean $\pm$ SD=13.7 $\pm$ 9.8 months, range of three to 36 months (49)). Furthermore, collaborative care has been compared with various types of usual care, yielding different results for comparative effectiveness and efficiency. Most studies have compared collaborative care programs with usual care by a primary care physician. Compared with regular treatment by a primary care physician, collaborative care is often a more intensive treatment and more expensive (90). Only a few studies have compared collaborative care with usual specialized mental health care for patients with common mental disorders. In a study with elderly primary care patients, a group that is said to underutilize mental health services, collaborative care was associated with a greater number of mental health contacts compared with usual care (123). This finding was, however, accompanied by substantially greater treatment attendance at the collaborative care setting.

Because most of the evidence about treatment efficiency is limited to a relatively short follow-up period, little is known about utilization and costs over the longer term. There is preliminary evidence that the additional costs associated with provision of enhanced collaborative care for depressed patients compared with provision of usual care by a primary care provider disappear over time (124) and that collaborative care may even result in lower total health care costs (125). It is especially important to assess long-term mental health care utilization of collaborative care compared with specialized care because collaborative care has recently been promoted as a more cost-saving alternative than specialized mental health care. It may be that that efficiency gains resulting from collaborative care in the short term are lost over the longer term because of diminishing effectiveness of treatment and the need for greater treatment intensity.

This study analyzed data from patients formerly enrolled in a cluster-randomized controlled trial that compared the effectiveness and utilization of collaborative mental health care and usual care in the specialized mental health care setting (96). The hypothesis of that study was that referral to and treatment in a collaborative care program (CCP) would lead to fewer contacts with a mental health care professional than referral to and treatment in specialized mental health care (usual care). After the trial's one-year follow-up period, we were able to confirm this hypothesis. The mean annual difference in the number of mental health care contacts was 6.5 in favor of the CCP, with no significant differences in patient outcome. The mean difference in mental

health care costs was €563, also in favor of the CCP. We also found, however, that 32% of the total sample (28% in the CCP and 46% in usual care) did not terminate treatment within the one-year follow-up period. Extending the follow-up period to the point at which all patients had terminated treatment may have yielded different results.

In the study reported here, we used post-hoc analyses to investigate long-term use of mental health care in the CCP and in usual care. Therefore, we extended the follow-up term to five years after referral. More specifically, we investigated whether the one-year differences between CCP and usual care in mental health care contacts, total treatment duration, proportion of patients receiving a new treatment, and time to a new treatment episode persisted over a five-year follow-up period.

5.3 Methods

Participants

We conducted a retrospective analysis of mental health care utilization among patients included in a cluster-randomized controlled trial that was conducted from 2003 until 2005 (96). For the trial, 27 general practitioners (GPs) were randomly assigned to either the CCP or the usual-care condition (specialized mental health care). Most of the GP practices in the region were not eligible for randomization, because they already had a collaborative care mental health professional working in their practice. A total of 165 patients were included in the trial: 102 patients were referred to and treated in the CCP, and 63 were referred to usual care (off-site specialized mental health care) if indicated. All patients were followed up for one year after referral by their GP. Ten patients dropped out of the study during the trial phase. Only one of these patients was also excluded from the post-hoc analyses because we lacked utilization data. Informed consent and institutional review board approval were obtained for the trial.

Interventions

In the CCP, GPs gave a mental health professional a position in their practice. The mental health professional was able to offer treatment based on a short-term model (126) to patients with nonacute common mental disorders, with a maximum of five appointments. If indicated on the basis of severity or complexity of symptoms, patients could be referred to specialized mental health care for more intensive treatment after the initial clinical assessment with the mental health professional or at a later date. For patients assigned to the usual-care condition, the GP continued his or her regular way of treating and referring the patient to specialized mental health care, usually to specialized mental health care.

Measures

For the analyses, data about utilization, including termination, were extracted from the electronic health record of the local mental health care institution in The Hague and surrounding area that offered both the CCP and specialized mental health care. Mental health care use by study participants within five years after the date of referral by their GP was documented. The total time frame of the follow-up period was seven years (2003–2009).

Mental health care contacts encompassed all direct patient contacts with a mental health professional, such as face-to-face contacts, telephone contacts, and e-mail contacts, during all received treatments. Treatment duration encompassed the total time in weeks of all mental health care contacts. Initiation of new treatment refers to the proportion of patients who initiated one or more new treatment episodes after termination of the initial treatment within the five-year period. The new treatment could be a follow-up treatment because of recurrence of symptoms or another treatment for other symptoms. Time to new treatment refers to the number of weeks between termination of the initial treatment episode and the start of a new or follow-up treatment. A treatment was usually mutually terminated by the professional and the patient or, in fewer cases, by one of them. Various reasons for terminating a treatment were documented. In most cases, termination occurred because treatment goals formulated by the professional and patient at the start of the treatment were achieved. Sometimes treatment was terminated because no further improvement was expected.

The treatment groups were compared on four variables collected at the trial's baseline: age, gender, diagnosis according to the Mini-International Neuropsychiatric Interview (72, 127), and symptom duration before referral, rated by the GP on a 3-point Likert scale (zero to three months, three to nine months, and more than nine months).

Statistical Analyses

Differences between the two treatment groups on baseline variables (gender, age, diagnosis, and symptom duration before referral) were analyzed with chi square tests and t tests in SPSS 20. To assess the difference between CCP and usual care in mental health care contacts and treatment duration, generalized linear mixed models were fitted in R (128) by using the glmmADMB package (129), which is an implementation of the AD Model Builder (130). Both outcome variables were assumed to follow a negative binomial distribution. Patients were designated as level 1 and GP as level 2. Group differences were assumed to be present if the model containing both a random intercept and the group variable had a better fit to the data than the random-intercept-only model as assessed by Akaike's information criterion (AIC) (131). In general, a lower AIC

represents a better model fit. Treatment group was included as the primary predictor, and the baseline variables were included as covariates if these variables were significantly different between the two treatment groups. First, a random-intercept-only model was fitted, and it was then determined whether addition of the treatment group to the statistical model would lead to a better fit. Subsequently, the baseline variables were added if there were group differences.

To compare CCP and usual-care patients regarding time to a new treatment episode within the five-year time frame, Cox regression was used. The time interval in weeks between termination of the initial treatment and initiation of the follow-up treatment was entered as the time variable, and a dichotomous variable indicating the presence of a follow-up treatment was used as the state variable. Group participation was entered as a covariate. Five patients were excluded from the Cox regression because they remained in their initial treatment for the entire five-year period (that is, their treatment started late in the five-year period).

5.4 Results

A total of 139 (84%) of the 165 patients enrolled in the randomized trial could be included in the follow-up analyses. Ten CCP patients (10% of the total CCP group) and 16 usual-care patients (26% of the total usual-care group) had not been registered at the local mental health care institution during the five-year period. [A figure illustrating recruitment is available as supplementary material at http://ps.psychiatryonline.org/doi/suppl/10.1176/appi.ps.201400238/suppl_file/appi.ps.201400238.ds001.pdf.] These patients could have received treatment from another mental health care provider or had not had any mental health treatment at all. Of the 139 patients, 134 (96%) had terminated their initial treatment within the five-year period after enrollment. Four patients from the usual-care group and one in the CCP-group had not terminated their initial treatment.

No significant differences were noted between the two treatment groups on the baseline variables gender, age, diagnosis, and symptom duration before referral (Table 1). Negative binomial mixed-effects models examined the effect of treatment group on the number of mental health care contacts. The model containing treatment group as the predictor had the best fit (AIC=1,271.85), performing better than the random-intercept-only model (AIC=1,273.10). The fixed effect of treatment group was .61 (SE=.33), which means that in general, the usual-care group was predicted to have 1.84 times the number of contacts that the CCP group had ($e^{.61}=1.84$). Generalized linear mixed models with a negative binomial distribution for treatment duration, in weeks, showed no group differences (random-intercept AIC=1,606.57; random-intercept plus group AIC=1,608.37).

TABLE 1. Patient characteristics and mental health care utilization of the treatment groups^a

Characteristic	Collaborative care (N=92)		Usual care (N=47)	
	N	%	N	%
Gender				
Male	24	26	17	36
Female	68	74	30	64
Age (M±SD)	40.2±14.2		39.7±13.2	
Treatment duration (M±SD weeks) ^b	114.3±96.9		122.3±97.2	
Initiation of new treatment episode	27	29	15	32
Time to new treatment (M±SD weeks)	102.2±77.2		75.2±65.3	
Mental health care contacts (M±SD)	33±78.3		54±105.8	
Duration of symptoms before referral (months) ^b				
<3	22	24	10	23
3–9	27	29	11	26
>9	42	46	22	51
Mini-International Neuropsychiatric Interview diagnosis				
Mood disorder	28	30	15	32
Anxiety disorder	31	34	20	43
Other axis I disorder	33	36	12	26

^aMeans were compared by t tests, and proportions were compared by chi square tests ($p>.05$ for all comparisons).

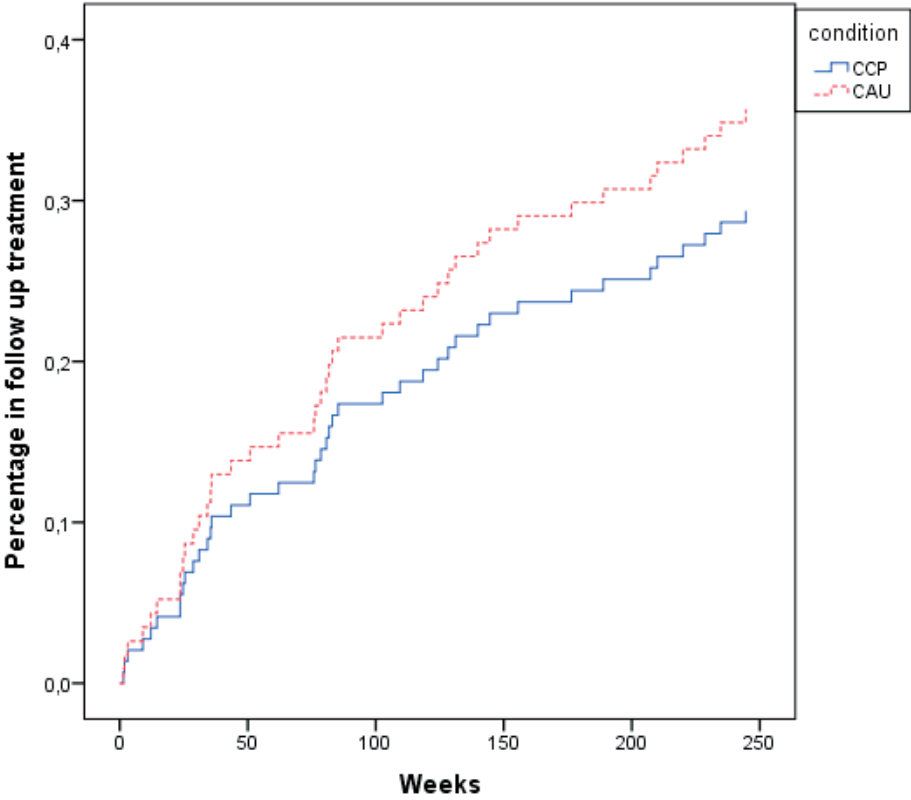
^bData were missing for some patients.

Results of chi square tests showed no significant difference between the CCP group and the usual-care group in the proportion that initiated a new treatment episode. In regard to the time to new treatment, Cox regression analysis did not show any between-group difference. The proportion of participants that received new treatment as a function of time in weeks is depicted in Figure 1.

5.5 Discussion

In this five-year, post-hoc analysis of data from a previously published randomized controlled trial (96), we found that the short-term (one-year) efficiency gains that resulted from referring patients to collaborative care in the primary care setting rather than to specialized mental health care (usual care) persisted five years after referral. Patients allocated to CCP or to usual care had an equal chance of initiating a new treatment episode (approximately 30% in both groups), and the groups did not differ in the time to new treatment and total treatment duration. Most important, mental

FIGURE 1. Cox regression analysis of the proportion of 139 patients initiating a new treatment episode



health care use by CCP patients was almost half that of the usual-care group. We found no indication of a catch-up effect of mental health care use among CCP patients over the long term. In other words, short-term reduction in the use of mental health care did not lead to a higher use over the longer term.

As far as we are aware, no previous studies have investigated the long-term efficiency of collaborative care compared with usual mental health care. There is evidence that collaborative care is more efficient than usual care provided by a primary care physician over the long term (124, 125). We now provide preliminary evidence that this is also the case for collaborative care compared with specialized mental health care, at least in terms of mental health care utilization.

The obvious difference in mental health care use could have been caused by several factors: the type and model of the underlying CCP treatment model and the service concept. The treatment model of the CCP is considered to be very intensive, although there is limited contact between the therapist and the patient (126). In addition to symptom reduction, two important goals of the model are increased empowerment and improved problem-solving abilities (79). To achieve these goals, patients must be very active between therapy sessions in working on their problems. Usually the interval between sessions increases with the course of therapy. Patients may incorporate this way of working on their problems such that even if a new episode of treatment is necessary, they need fewer contacts with the therapist because they are used to working more independently on problems in their daily life.

Besides this model-based explanation, the difference in use of mental health care could also have resulted from aspects of the collaborative care service concept. Short and intensified communication lines between the GP and therapist, quick referral, and receipt of treatment in the familiar premises of the GP's offices are factors that may have influenced mental health care use. Favorable effects on access and attrition of offering mental health services in primary care have been demonstrated (132).

Finally, the shortcomings of this study in regard to the scope and availability of the utilization data should also be noted as a possible explanation. First, the analyses were based on mental health care use at a regional mental health care organization, and services received from other mental health professionals, such as private psychiatrists and psychologists, were beyond the scope of our analyses. The second limitation was the inability to assess possible shifts in costs to other sectors (for example, costs of general health care and productivity losses) because we did not contact the patients to assess additional costs. There is some evidence that patients receiving minimal interventions tend to seek subsequent additional treatment elsewhere (28). Thus it is possible that the actual amount of care that the patients received was underestimated. Inclusion in the analyses of cost data for services delivered by other mental health care providers and in other health care sectors as well as cost data for productivity losses could have produced different results.

Notwithstanding these limitations, the loss of information from dropout or failure to track patients was restricted because the vast majority of the study group was treated by the same regional mental health care organization. However, there was a noticeable difference between the two treatment groups in the number of patients for whom we did not have utilization data. Although only 10% of the original CCP study group was not traceable in the electronic health record, the proportion not traceable in the

usual-care group was 26%. Patients in the CCP may have been more likely to seek help than patients who received specialized care, and CCP patients may have been more accepting of care than those who received specialized care, as found in a study of elderly patients by Bartels and colleagues (2004). Focused research is needed to compare acceptance of collaborative care and of regular specialized mental health care in an adult patient population.

Collaborative mental health care with a primary care physician who works in close alliance with a mental health professional has become an important part of mental health care in many industrialized countries, and reforms to extend collaborative care even more are under way (133, 134). In the Netherlands, mental health care reforms were implemented in 2014. Currently, the primary-care sector and a part of the specialized mental health sector form so-called basic-mental health care. Basic care is for patients with mild to moderate, noncomplex mental health problems and patients with stable chronic mental health problems. Specialized secondary mental health care is for patients with severe mental health problems.

Favorable short-term effects of collaborative care on effectiveness and efficiency have been documented (49, 96). A thorough evaluation of the efficiency of collaborative care demands the extension of the follow-up period for cost analyses.

5.6 Conclusions

The findings provide preliminary evidence that for patients with nonacute common mental disorders referral to collaborative mental health care as a first intervention, compared with referral to specialized mental health services, leads to fewer contacts with a mental health care professional over the short and long terms. Further research on long-term costs and benefits from a societal perspective is recommended.

5.7 Acknowledgements and disclosures

The authors report no financial relationships with commercial interests.



The association of implementation factors with the uptake and utilization of blended collaborative mental health care: the importance of the organizational structure

van Orden, M.L., Deen, M.L., Spinhoven P., Tiemens, B., Haffmans, J. & Hoencamp, E. (submitted). The association of implementation factors with the uptake and utilization of blended collaborative mental health care: the importance of the organizational structure. *Manuscript submitted for publication, February 27, 2017.*

6.1 Abstract

To examine whether implementation factors, as experienced by mental health professionals, influence their uptake of blended collaborative mental health care and the utilization by their patients. Data of a survey investigation were linked to data of a cohort of patients whom blended care was offered. Mixed model analyses showed that especially participation and engagement of professionals within the blended care service relate significantly to the their uptake of blended care and the online activity of their patients. To increase uptake and utilization of blended care, mental health care organizations should pay attention to the wider social framework within the organization.

6.2 Introduction

In the last two decades, policy-makers and mental health organizations have embraced the development and implementation of internet-based mental health treatment with enthusiasm. Internet-based treatment was assumed to hold great potentials, such as improved access to mental health care, increased privacy and anonymity to individuals and increased cost-effectiveness (135). There are two main ways for individuals to obtain internet-based treatment. The first way is through seeking help on their own initiative, often via internet, sometimes recommended by the general practitioner or another (mental) health professional. Those treatments are offered by public care organizations or (semi-) commercial care organizations, either anonymous or not, either free of charge or charged. Content of the treatments may vary from mainly psycho-educational, self-help programs to more sophisticated interventions, with or without (individual) guidance and feedback by a mental health professional. The second way of obtaining internet-based treatment is by a (mental) health care organization that offers internet-based treatment to its patients. These treatments may vary from programs with very limited or no face-to-face contact to the so-called blended care treatment. In the latter treatment model, the traditional face-to-face contacts with the health care professional are combined with internet-assistance.

Since the introduction of internet-based treatment in mental health care, much scientific work has been performed to investigate the merits of different forms of treatments. The advantages and challenges vary between forms and contexts of internet-based treatment. Several systematic reviews have demonstrated superiority of guided internet-based treatments over unguided self-help internet-based treatments on efficacy (136) (137). Compared to the regular face-to-face cognitive behavioural therapy (CBT), guided internet-based treatment has been proven to be equally effective (138). Compared to control conditions with no intervention (waiting list) or minimal intervention (information control, self-monitoring control or discussion control) meta-analyses have shown that guided internet-based treatment is more effective for anxiety and mood disorders (139). Adherence to internet-based treatments varies for different mental health conditions. While health care utilization and treatment adherence seem to improve for patients with addictions compared to traditional face-to-face treatment (140), for patients with mood disorders adherence poses a major challenge (141). However, compared to other psychological therapies drop-out rates of internet-based CBT seem to be comparable for depressive patients (142). The amount of contact with a therapist has been shown to be an important factor in the adherence to and effectiveness of internet-based therapy (143, 144). Although there are high expectations especially about efficiency and cost-effectiveness, scientific proof is promising but scarce (145) (146) (39).

Most of the scientific evidence on internet-based treatment is based on studies performed with single computer-based treatments, that individuals can access via the internet and the control conditions consist of either no or minimal intervention. From an economic perspective, substantial gains can be expected if internet-based treatment reduces face-to-face encounters through broad integration and adoption within the regular mental health care setting. A fundamental question is whether evidence-based internet-based therapies show similar results if implemented in daily clinical practice within regular mental health care with an array of services for a broad population (147). Meanwhile, blended care is the preferred internet-based treatment variant in the Dutch mental health care sector, because it is assumed to be less disruptive than self-help and guided self-help for mental health care organizations (148). Ruwaard and Kok (2015) argue that blended care that is based on an evidence-based face-to-face treatment protocol cannot automatically be presumed to be as effective as the original protocol, which policy makers often do. They advocate the execution of scientific validation studies in the development and implementation phase of blended care treatments.

Despite the existence of numerous internet-based interventions, integration and uptake of those interventions stay far behind the expectations and aims. Mair et al. (149) concluded that the literature focuses mainly on (problems with) the workability of eHealth systems and that underlying mechanisms at work have not been well characterized or explained. They carried out a systematic review of reviews of e-health implementation studies and interpreted the results in the light of an explanatory framework, the Normalization Process Theory (150) that specifies mechanisms of importance in implementation processes. Through this approach they were able to explain factors influencing the implementation of e-health systems in clinical practice. Sixteen factors were identified, clustered in four domains: (1) Coherence (sense-making) includes factors determining whether users see it as differing from existing practice, have a shared view of its purpose, understand how it will affect them personally and grasp its potential benefits. (2) Cognitive participation (relationship work) relates to the work undertaken to engage with potential users and get them to “buy into” the new e-health system. (3) Collective action (enacting work) relates to the work performed by individuals, groups of professionals or organizations in operationalizing a new technology in practice, like contextual integration of the e-health system, effects on health care tasks, roles, responsibilities, confidence to execute the new treatment and accountability. (4) Reflexive monitoring (appraisal work) relates to the ways in which managers and other users appraise whether an e-health intervention is worthwhile or not, like ongoing evaluation to address problems and benefits (see Figure 1).

The aim of this study was twofold. Firstly, we wanted to gain insight into the implementation factors of blended collaborative care according to the mental health professionals involved. Secondly, we aimed to assess the association of these factors with the uptake of blended collaborative care treatment by mental health professionals and the actual utilization of a blended collaborative care model by patients.

6.3 Methods

Setting

A nationally operating mental health care provider in the Netherlands (Indigo) provides healthcare to patients within the primary care sector in close alliance with general practitioners. Compared to referral to specialized mental health care treatment, the effectiveness and efficiency of this collaborative care has been proved in a previous study (96, 100, 151). Since 2014, the Dutch mental health care sector is divided into a basic care sector and a specialized care sector. The basic mental health care sector provides care for mild to severe common mental health problems and relapse-prevention for stable chronic mental health conditions. Severe mental health problems with co-morbidity and acute problems are referred to and treated within the specialized mental health care sector. Indigo delivers basic mental health care. In 2013, a blended variant of the original face-to-face treatment model (27) was developed. Several steps of the treatment model including basic principles of the model and the exercises (psycho-education) were integrated in an online program. The online program consists of four steps: introduction, active learning and exercise phase, consolidation phase and relapse-prevention phase. The aim of offering a blended variant of the treatment model was twofold: in the first place, it aimed to enhance self-empowerment of patients. This was expected to lead to a decline in the number of face-to-face encounters with the therapist. The second aim of the blended care variant was that it would be at least as effective as the regular face-to-face treatment. At the time the blended care was implemented, all mental health professionals were trained in the use of the online program and the theoretical integration of blended care in the treatment. The mental health professionals were able to give all patients who reported a valid e-mail address at the time of registration for treatment, access to the online program.

Cohort definition

For this study, we obtained two datasets from the basic mental health care provider Indigo: a first dataset with regularly collected patient and utilization data and outcome data from routine outcome monitoring and a second dataset with utilization data of the e-health program. The databases are anonymous and linked by unique identifiers

for patients that are common to both databases. Access to and use of the anonymized data was in accordance with the Dutch Law on Medical Treatment Agreement and the Law for the Protection of Personal Information. Ethical approval was not needed, because the measurements were part of usual care, no extra efforts were asked from patients, and because all data were anonymized.

We used a retrospective cohort design including all patients registered for collaborative care treatment in the years 2014 and 2015 from the five Indigo treatment sites that offered blended care treatment at that time. For privacy reasons the treatment sites were anonymized. The datasets were obtained in May 2016. In November 2016 a link to access a digital survey with 16 statements about implementation factors, that were derived from Mair’s Normalization framework (149) (see Figure 1) was sent by e-mail to all professionals who offered blended care to patients of the investigated cohort. The Dutch questionnaire can be requested from the authors.

Normalization process theory coding framework used for qualitative analysis of review data on e-health implementation

Coherence (Sense-making work)	Cognitive participation (Relationship work)	Collective action (Enacting work)	Reflexive monitoring (Appraisal work)
Differentiation Is there a clear understanding of how a new e-health service differs from existing practice?	Enrolment Do individuals “buy into” the idea of the e-health service?	Skill set workability How does the innovation affect roles and responsibilities or training needs?	Reconfiguration Do individuals try to alter the new service?
Communal specification Do individuals have a shared understanding of the aims, objectives and expected benefits of the e-health service?	Activation Can individuals sustain involvement?	Contextual Integration Is there organizational support?	Communal appraisal How do groups judge the value of the e-health service?
Individual specification Do individuals have a clear understanding of their specific tasks and responsibilities in the implementation of an e-health service?	Initiation Are key individuals willing to drive the implementation?	Interactional workability Does the e-health service make people’s work easier?	Individual appraisal How do individuals appraise the effects on them and their work environment?
Internalization Do individuals understand the value, benefits and importance of the e-health service?	Legitimation Do individuals believe it is right for them to be involved?	Relational integration Do individuals have confidence in the new system?	Systematization How are benefits or problems identified or measured?

FIGURE 1. Factors that promote or inhibit the implementation of e-health systems, retrieved from: Bull World Health Organ. 2012 May 1; 90(5): 357–364. doi: 10.2471/BLT.11.099424

Outcome and predictor variables

The outcome variable of uptake of blended care by mental health professionals was derived from a question in the digital survey that was sent to the mental health professionals. In the survey, mental health professionals were asked to rate the percentage of their patient caseload that they actively treated with blended care in the years 2014/2015.

The outcome variable utilization, i.e. online activity of patients, was derived from the obtained database of the patient cohort. Patients were divided into three groups according to their utilization data of the online program: non-active in the online program, active up to phase 1 of the online program, and active reaching phase 2

and beyond. Predictor variables were based on the four domain scores for coherence, cognitive participation, collective action and reflexive monitoring, as described in the framework of Mair et al. (149) (see Figure 1).

In the digital survey each of the four domains included four statements that were inventoried with response categories ranging between 0 (completely disagree=poorly integrated in the implementation process) to 4 (completely agree=perfectly integrated in the implementation process). To calculate an overall implementation index and the four separate domain indexes, we followed the approach of Bickman et al. (152). Therefore, statement scores were recoded to quartiles, ranging from 0%= not/poorly integrated in the implementation process till 100% = perfectly integrated in the implementation process.

The outcome of the collaborative care treatments provided was regularly measured by means of Routine Outcome Monitoring (ROM). The Dutch version of the Outcome-Questionnaire (OQ-45.2) (153, 154) was the primary outcome measure. Outcome measurements were only included in the descriptive statistical analyses, not in the prediction models.

Analyses

Differences between the patient group that has not been offered blended care and the group that has been offered blended care, divided in subgroups according to their online activity were explored by Chi-square tests and One-way Analysis of Variance using SPSS 23 (155).

For the prediction of uptake of blended care by professionals with the implementation indicators as a set of predictors (coherence, cognitive participation, collective action and reflexive monitoring) and possible clinician characteristics (age and gender) as covariates, linear mixed models were used with patients at the first level and clinicians at the second level. For the prediction of online activity of patients, the same sets of predictors and covariates were used, albeit in a cumulative linear mixed model since the response variable was measured at an ordinal measurement level. For the linear mixed model the lme4 package (156) was used, while for the cumulative linear mixed model the ordinal package (157) was used in R (158). For both analyses, the following steps were followed. Firstly, a model with only a fixed and a random intercept were fitted. Secondly, the four implementation indicators were added to that model. Thirdly, the covariates were added. For both series of fitted models, Akaike's Information Criterion (AIC) (131) was used as the model selection criterion. In general, a lower AIC represents a better model fit.

6.4 Results

Descriptive statistics

Of all 16.995 clients who started treatment in 2014/2015, 11% (1.831 patients) were offered blended care by the mental health professionals. Sixty-nine percent (1.152) of the 1.831 patients started the online program against 31% who did not. Of all patients who started the online program, 9% did not reach the active treatment phase (i.e., did not get actively involved in the blended care treatment). The majority of all patients who actively worked in the online program (79%) did not pass treatment phase 1, the learning and exercising phase. 20% reached the second treatment phase, the phase with consolidation exercises and 2% did reach the end of the online program, the relapse-prevention phase (see Figure 2).

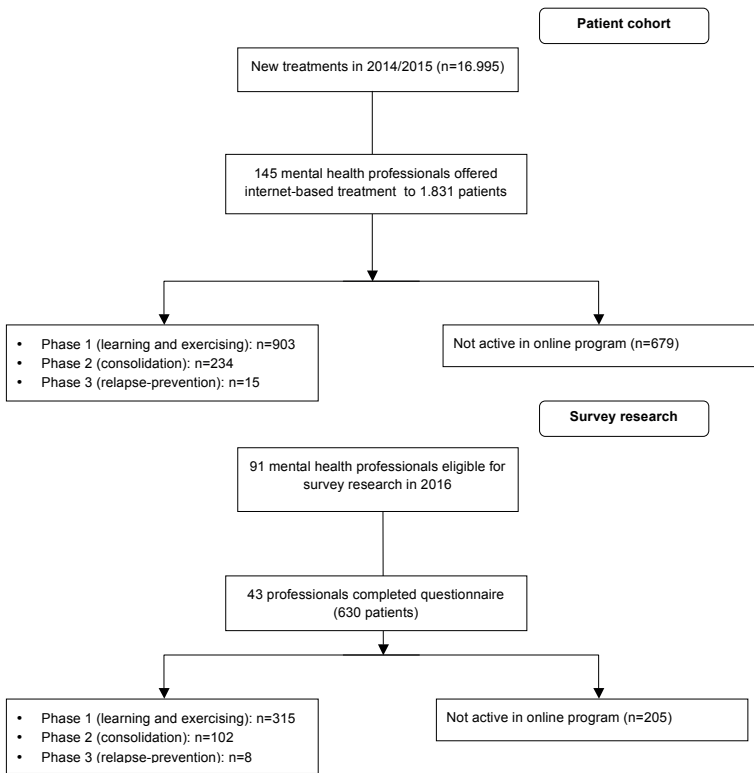


FIGURE 2. Flow diagram

The patients who had been offered blended care significantly differed from patients to whom only regular face-to-face care was offered. Blended care was offered to predominantly younger, native Dutch patients, with a higher education, being employed, and not married (see Table 1). Approximately 25% of the data on the patient characteristics of ethnicity, educational status, marital status and employment was missing.

TABLE 1. Patient characteristics of the group that has been offered regular face-to-face care and blended collaborative care

Offered regular care (n=15163)	Offered blended collaborative care (n=1831)							
	Not active in online program (n=679)		Phase 1 in online program (n=903)		≥Phase 2 in online program (n=249)			
	N	%	N	%	N	%	N	%
Age ^a (MEAN±SD)	39.7±13.8		36.8±12.1		37.3±12.2		38.6±12.2	
Gender								
Male	5760	38	261	38	342	38	97	39
Female	9403	62	418	62	561	62	152	61
Ethnicity ^b								
Born in the Netherlands	8184	54	514	76	724	80	186	75
Born in a western country	268	2	14	2	12	1	4	2
Born in a non-western country	1663	11	78	12	54	6	10	4
Not registered	5048	33	73	11	113	13	49	20
Educational status ^c								
Pre-primary education	164	1	5	1	2	0	-	-
Primary education	630	4	51	8	35	4	4	2
Lower secondary education	3226	21	200	30	200	22	46	19
Upper secondary education	4693	31	245	36	361	40	101	41
Tertiary education	2644	17	114	17	199	22	69	28
Not registered	3806	25	64	9	106	12	29	12
Marital status ^d								
Married	3829	25	179	26	237	26	74	26
Not married	5986	40	350	52	474	53	115	46
Divorced	1292	9	72	11	77	9	26	10
Widow/widower	250	2	14	2	9	1	5	2
Not registered	3806	25	64	9	106	12	29	12
Employment ^e								
Employed	7040	46	333	49	492	55	149	60
Non-employed	4723	31	285	42	310	34	71	29
Not registered	3400	22	61	9	101	11	29	12

^aF(3)=17.9, $p<.05$; ^b $\chi^2(9)=422.2, p<.05$; ^c $\chi^2(15)=251.0, p<.05$; ^d $\chi^2(12)=209.0, p<.05$; ^e $\chi^2(6)=160.1, p<.05$

TABLE 2. Differences in symptom and treatment characteristics between the patient groups that were offered blended care

Treatment site ^a	Offered regular care (n=15163)		Offered blended collaborative care (n=1831)		Not active in blended care (n=679)		Phase 1 in online program (n=903)		≥Phase 2 in program (n=249)	
	N	%	N	%	N	%	N	%	N	%
A	2465	16	496	73	626	69	155	62		
B	2577	17	121	18	164	18	63	25		
C	2514	17	20	3	21	2	-	-		
D	5297	35	17	3	44	5	11	4		
E	2310	15	25	4	48	5	20	8		
DSM-diagnosis ^b										
Mood disorder	5958	39	281	41	385	43	106	43		
Anxiety disorder	3663	24	176	26	263	29	83	33		
Trauma and stress related disorders	1331	9	69	10	64	7	17	7		
Somatic symptom and related disorders	918	6	24	4	46	5	15	6		
Neurobiological developmental disorders	701	5	42	6	52	6	10	4		
Personality disorders	494	3	21	3	24	3	5	2		
Other disorders	1152	8	27	4	25	3	6	2		
Not registered	946	6	39	6	44	5	7	3		
Treatment intensity ^c										
Short	972	6	83	12	65	7	14	6		
Medium	4093	27	173	26	266	30	78	31		

TABLE 2. Differences in symptom and treatment characteristics between the patient groups that were offered blended care (continued)

	Offered regular care (n=15163)		Offered blended collaborative care (n=1831)			
	N	%	Not active in blended care (n=679)	Phase 1 in online program (n=903)	≥Phase 2 in program (n=249)	
High	6452	43	287	42	45	118
Chronic	1528	10	41	6	8	11
Transition*	988	7	28	4	4	3
Not registered	1130	8	67	10	7	25
Reason treatment termination ^d						
Treatment completed	4806	32	524	77	73	172
Not meeting criteria for psychiatric treatment	7195	48	102	15	20	71
Patient condition too severe for basic mental health care	428	3	4	1	2	-
No show	429	3	14	2	2	-
Other reasons for termination treatment	2305	15	35	5	4	6
Outcome questionnaire-45 baseline (n; MEAN±SD) ^e	13603; 78.2±23.8		635; 80.9±23.3	838; 80.7±21.3	239; 79.7±20.4	
Outcome questionnaire-45 treatment termination (n; MEAN±SD) ^f	7073; 60.3±26.3		315; 63.3±27.2	546; 63.2±25.1	162; 58.6±21.7	
Total treatment time in minutes (MEAN±SD) ^g	551.3±354.5		486.4±283.0	526.8±249.4	543.6±233.5	

^a $\chi^2(12)=2986.7, p<.05$; ^b $\chi^2(21)=95.1, p<.05$; ^c $\chi^2(15)=95.5, p<.05$; ^d $\chi^2(12)=1282.6, p<.05$; ^e $F(3)=5.3, p<.05$; ^f $F(3)=3.5, p<.05$; ^g $F(3)=8.8, p<.05$

*The transition-category was a temporary category, available during a one-year period after the introduction of the basic mental health care sector in 2014, to declare treatment activities that did not fit within one of the four regular treatment categories.

The groups also significantly differed on all symptom- and treatment characteristics measured (Table 2). In the first place, there were large differences between the different treatment sites in offering blended care, ranging from 2 to 70% of patients. Concerning to symptom factors, blended care treatment was primarily offered to and actively used by patients with anxiety and depressive disorders. Also, there were statistically significant differences between the groups on treatment-intensity, reason for treatment termination and number of contacts. Compared to the group that was offered regular care, patients receiving blended care were more often treated with short, medium and intensive treatment intensity. Also, in this group treatment was more often terminated because it was completed, compared to the patients who received regular care. At baseline assessment before start of treatment, the patient group that utilized blended health care scored slightly higher on the total score of the OQ-45. On the follow-up assessment after treatment termination, the group that reached at least phase 2 of the online program scored lower on the OQ-45 than all other comparison groups. The group that was offered regular care had the highest total treatment time and the group that did not actively utilize the online program the lowest (see Table 2).

Implementation index

Of the 145 mental health professionals who offered the blended collaborative care treatment, 91 (63%) were eligible for the survey assessment, because they still worked for the collaborative mental health care provider at that time. 43 (47%) completed and returned the implementation survey. These 43 mental health professionals treated 630 patients (43%) from the original patient cohort that was offered blended care (range 1-102 patients).

As can be seen in Table 3, the evaluation of the individual implementation items as well as domain scores and the total implementation index score rise along with the increase in online activity, except for the items Individual specification and Legitimation. Overall, the domain cognitive participation received the highest rating from the mental health professionals and the domain reflexive monitoring the lowest. The mean total implementation index score ranges between 48% by professionals of patients who have not got active in the online program and 58% by mental health professionals of patients who reached phase 2 in the online program.

Prediction of blended collaborative care uptake and utilization

Concerning to the uptake of blended care by mental health professionals, the model containing the implementation factors as predictors had the best fit (AIC=852.3), performing better than the random-intercept-only model (AIC=864.9) and the model with implementation factors as predictors and correction for gender of the mental health

TABLE 3. Mean percentage and standard deviation of the item-, domain- and total implementation index scores

Item-, subscales- and total score	Total group (n=630)	Not active in online program (n=205)	Phase 1 in online program (n=315)	≥Phase 2 in program (n=110)
	MEAN±SD	MEAN±SD	MEAN±SD	MEAN±SD
<i>Coherence (Sense-making work)*</i>	50.7±19.8	47.7±19.8	51.0±20.3	55.4±17.5
Differentiation*	25.6±25.9	21.2±25.1	26.8±26.6	30.2±24.4
Communal specification*	74.2±30.2	71.1±31.0	72.9±30.9	84.1±24.4
Individual specification**	37.8±27.3	36.5±27.3	40.5±28.0	32.7±24.1
Internalization*	65.1±30.2	61.8±29.9	64.0±30.0	74.5±29.7
<i>Cognitive participation (Relationship work)*</i>	64.3±22.3	60.5±21.9	63.8±21.7	72.5±22.6
Enrolment*	76.6±29.7	72.2±30.3	76.1±30.2	86.1±24.3
Activation**	79.3±22.9	76.6±22.8	79.8±22.4	83.2±24.0
Initiation*	40.9±35.9	32.9±32.9	39.1±35.0	60.7±36.2
Legitimation	60.2±31.8	60.4±32.2	60.2±31.6	60.0±32.0
<i>Collective action (Enacting work)*</i>	50.8±27.2	47.0±26.4	50.8±27.0	58.3±28.1
Skill set workability	74.8±35.1	71.8±36.2	74.4±35.1	81.4±32.2
Contextual integration*	35.0±33.2	30.6±32.4	35.1±33.1	42.7±33.9
Interactional workability	42.3±32.6	39.4±33.3	42.3±31.9	47.5±33.0
Relational integration*	51.3±38.6	46.2±38.0	51.1±38.7	61.6±38.0
<i>Reflexive monitoring (Appraisal work)*</i>	39.0±26.5	35.0±26.6	38.5±26.6	47.9±24.4
Reconfiguration*	41.5±33.3	37.3±32.7	41.0±32.9	50.9±34.0
Communal appraisal*	32.0±27.4	29.0±26.5	31.1±26.9	40.0±29.0
Individual appraisal	33.4±27.5	31.8±28.8	33.8±28.1	35.2±23.0
Systematization*	49.2±40.1	41.8±39.6	48.3±40.2	65.7±36.5
<i>Total Implementation-index*</i>	51.2±21.9	47.5±21.5	51.0±22.0	58.5±21.0

*significant at the .01 level; **significant at the .05 level, assessed with One-way ANOVA

professional (AIC=853.3). The implementation factors cognitive participation and collective action had the largest association with blended care uptake (see Table 4).

Concerning to the blended care activity of patients, the model containing the implementation factors as predictors, corrected for gender and age of the mental health care professional, had the best fit (AIC=1246.43), performing better than the random-intercept-only model (AIC=1252.79) and the model with implementation factors as predictors (AIC=1252.29). In these models, cognitive participation was the only implementation factor with a significant association with blended care activity of patients (see Table 5).

TABLE 4. Associations between implementation factors and blended care uptake by mental health professionals of the linear mixed model

Model	AIC	Estimate	SE	T value
1 Random intercept only model	864.9	15.603	2.727	5.72
2 Model with predictors (intercept)	852.3	20.3856	2.4412	8.35
<i>Coherence</i>		-2.0675	3.0994	-0.67
<i>Cognitive participation</i>		9.6469	3.1525	3.06
<i>Collective action</i>		6.1591	4.5354	1.36
<i>Reflexive monitoring</i>		-0.1678	4.3678	-0.04
3 Model with predictors, corrected for gender*	853.3	26.7451	6.7318	3.97
<i>Coherence</i>		-1.6293	3.0900	3.09
<i>Cognitive participation</i>		9.8435	3.1180	3.16
<i>Collective action</i>		6.1472	4.4770	1.37
<i>Reflexive monitoring</i>		-0.2265	4.3119	-0.05
<i>Gender (female=1)</i>		-7.0404	6.9587	-1.01

*due to optimization problems, age of mental health professional had to be deleted from the prediction model

TABLE 5. Associations between implementation factors and blended care activity by patients of the cumulative link mixed model

	AIC	Estimate	SE	Z value	p
1 Random intercept only model	1252.79				
Not active -> phase 1		-0.7229	0.1605	-4.503	
Phase 1 -> phase 2		1.7500	0.1788	9.786	
2 Model with predictors (intercept)	1252.29				
<i>Coherence</i>		0.2007	0.2065	0.972	0.33
<i>Cognitive participation</i>		0.4608	0.2254	2.045	0.04
<i>Collective action</i>		-0.5060	0.3043	-1.663	0.10
<i>Reflexive monitoring</i>		0.3090	0.2451	1.261	0.21
3 Model with predictors, corrected for gender and age	1246.43				
<i>Coherence</i>		0.21851	0.20888	1.046	0.30
<i>Cognitive participation</i>		0.45831	0.22568	2.031	0.04
<i>Collective action</i>		-0.47942	0.30065	-1.595	0.11
<i>Reflexive monitoring</i>		0.27762	0.24582	1.129	0.26
<i>Gender (female=1)</i>		0.02702	0.42544	0.064	0.95
<i>Age</i>		0.01385	0.01412	0.981	0.33

Significant associations ($p < 0.05$) are shown in bold.

6.5 Discussion

In this study the association of implementation factors, as perceived by mental health professionals, with the uptake of blended collaborative care by mental health professionals and the online activity of their patients was investigated.

The results indicate that blended care was offered to a selective minority of patients by their mental health professional. In the first place, there were clear differences in the proportion of blended care treatments between the investigated treatment sites, which could indicate differences in organizational guidelines in how and when to offer blended care. Also, this difference between sites makes it plausible that selective offering of blended care is not the result of appropriateness of internet-based treatment due to patients' access to internet or having a valid e-mail address. Secondly, there were clear differences in patient characteristics of patients to whom blended care was offered and patients that actively used the online program. The blended care treatment was predominantly offered to native Dutch patients, more highly educated and employed at the start of their treatment. Significant differences were also found in symptom- and treatment characteristics. Blended care treatment was primarily offered to and actively used by patients with anxiety and depressive disorders and these patients were more often treated with short, medium and intensive treatment intensity. Also, in this group treatment was more often terminated because it was completed, compared to the patients who received regular care. These differences between populations raise the question whether this type of health provision and/or this blended care program is suitable for all patients or for a certain subgroup of patients or that mental health professionals presume that this treatment is only suitable for a subgroup of their patients. Having a clear understanding of the patient group that is most likely to utilize the online program could make it easier for professionals to select patients for this type of care, provide the care and probably enhance its' effectiveness and efficiency. Or otherwise, if the goal of an organization is that blended care is the standard treatment for all patients, reflexive monitoring, i.e. a continuous evaluation of the design and content of the blended care program, could help to find out which adjustments have to be made to enhance its appropriateness for all patients.

A majority of the patients to whom blended care was offered got actively involved with the program, but only 20% did complete the whole program. One could argue that the quality of the online program (partially) accounts for the limited adherence to the online program. Results of the Routine Outcome Monitoring, however, show promising results regarding to the outcome of the blended care model. Quality factors of the blended care program are therefore not likely to account for the limited adherence. It is more likely that the amount of contact with a therapist is an important factor, as

indicated by the result of this study that cognitive participation of the mental health professional is significantly associated with online activity of the patients, which is in accordance with former research (143, 144). Therefore, it is reasonable to assume, that the mental health professional is an important motivator for patients to sustain involvement. In order to be able to perform this task, the mental health professional needs a clear understanding of his role, responsibility and tasks in the blended care treatment (coherence, cognitive participation and collective action). Moreover, it is important to supply him with information derived from ongoing evaluation to adapt to and grow in these roles and tasks (reflexive monitoring).

According to mental health professionals the overall implementation of the blended care model can be evaluated as only partially successful (58% on the total implementation index). Especially factors that reflect the preparation and support of professionals in practicing and integrating the new method in their existing practice are rated poorly. The implementation factor cognitive participation, including having key individuals who drive the innovation, believing that it is right to be involved, buying in to the idea of the blended care model and being able to sustain involvement in the blended care model, appears to be the most important factor associated with the uptake of blended care by professionals and online activity of the patients. The higher the rating of this domain by professionals, the more they offer the blended care treatment and the more patients become active in the online program. Factors relating to the (shared) understanding of how the blended care treatment differs from the regular face-to-face practice, how it changes their role and relationship with the patient and a (shared) reflexive monitoring system of the service are rated poorly by the respondents. It is reasonable to assume that this experienced lack of organizational support could to a certain degree account for the selectivity in uptake and utilization of the blended care. The importance of facilitating conditions, particularly the role of organizational support and leadership, has already been shown in implementing measurement feedback systems in regular community mental health care (159).

In interpreting our study results, we have to address several important weaknesses of this study. The first one is related to the study design. Since it was a naturalistic retrospective patient cohort study that made use of regularly collected data, it was not possible to measure additional data on eHealth related factors at the patient level, like attitude, willingness to utilize the blended care treatment and the actual availability of internet and electronic devices to make use of. In addition, missing data is a problem in the dataset from routine outcome monitoring. While baseline assessment of the Outcome Questionnaire was available for 90% of the patients, treatment termination

assessment was available for only 47% of the patients. For about 25% of the patients, data about ethnicity, educational status, marital status and employment was missing.

The second limitation concerns the implementation survey aimed at mental health providers. Data collection took place one to two years after treatment of the investigated patient cohort. This time lag probably influenced the relative low response rate on the survey. Meanwhile 37% of mental health care professionals were no longer working for the health care provider anymore. Furthermore, two of the treatment sites had decided to choose another internet-based treatment program meanwhile. It is very likely that some of the mental health professionals of these sites were less motivated to respond. Also, the time lag between the survey inventory and the patient cohort that had to be evaluated, could have affected the memory recall of the mental health professionals.

The third limitation is the lack of information of actual adherence to the content of the blended care treatment protocol, as well as from the patients as from the mental health care provider. We only had information from regular registration of activity in the program, i.e. which phase of the treatment program the patients reached.

Strengths of this study are that it is based on real life data in a large population and that we were able to account for the nesting in the data, which enabled us to explore and learn from the real practice of mental health care providers offering a new blended collaborative care treatment to their patients.

6.6 Conclusion

There is a gap between organizational ambitions and expectations about internet based interventions - blended care - and the reality. With this study, we have shown that the preparedness and readiness of the mental health professional who is expected to offer blended care can be an important factor in implementing and achieving the expected benefits. Our results concur with Mair's (149) conclusion that organizations have to pay considerable attention to the wider social framework within the organization when introducing new technologies. The outcome of the blended care investigated in this study is promising compared to regular face to face care. By ensuring that the organizational structure supports mental health professional in reaching a shared vision and understanding of what the new service will mean for the organization, for their professional identity, roles and responsibilities and that it supports them by providing ongoing feedback to improve their practice and the service, it is very likely that the gap will eventually close and reality will harmonize with organizational

ambitions and expectations. Implementing eHealth in a mental health organization implies making fundamental choices on all levels, strategic, managerial, professional and patient related.

Conflict of Interest: The authors declare that they have no conflict of interest.



General discussion

With the studies presented in this thesis, I aimed to enrich the scientific literature with results of a thorough investigation into two major changes in mental health service provision. The first is collaborative mental health care in primary care, developed as an alternative way to treat common mental health disorders compared to the traditional referral and treatment practice. The collaborative care program followed the principles of stepped care. The first and least intensive treatment step was provided within the collaborative care program in the primary care setting. Treatment intensity was only stepped up through referral to specialized mental health care for patients who did not sufficiently respond to the first step. The traditional practice was direct referral and treatment within specialized care. In several studies I investigated effectiveness, short- and long-term efficiency, cost-effectiveness and whether the stepped care approach was appropriate for all patients instead of the matched care approach. The second change was the integration of eHealth in the collaborative care treatment model. In this study, I focused on implementation factors that could either inhibit or promote the uptake and utilization of blended collaborative care by mental health professionals and patients.

7.1 Summary of study results

The results of a cluster randomized controlled trial, described in chapter two, where the participating general practitioners were the unit of randomization, showed that collaborative mental health care for a heterogeneous group of persons with common mental disorders was as effective as the usual practice of referral to specialized mental health services for reducing psychopathology, but was significantly more efficient regarding to referral delay, duration of treatment, number of appointments, and related treatment costs. The superiority of the collaborative care treatment with regard to efficiency was confirmed in a cost-effectiveness analyses, described in chapter three. One year after referral, collaborative care treatment was significant less costly from the societal perspective than regular referral to and treatment within specialized care.

The feasibility of the stepped care approach for the collaborative care program was investigated in chapter four with a post-hoc analysis performed with the data of the cluster randomized controlled trial. In this study, no evidence was found for the feasibility to identify a subgroup of patients that will not sufficiently respond to a short-time collaborative care treatment as a first and least intensive step in a stepped care model on the basis of pre-treatment dispositional or need for care factors. The factor that had the largest influence on the subsequent use of mental health services was the organization of care. Referral of patients to collaborative care decreased the number of mental health visits compared to direct referral to specialized mental health care.

Marital status was also found to be of importance for treatment use, showing that being married had a protective effect on becoming a high mental health care user.

With a retrospective analysis of the utilization of mental health services during the five years after referral of the patients included in the cluster randomized trial, the long-term efficiency of the collaborative care program compared to specialized mental health care was investigated in chapter five. This analysis showed that the short-term (one-year) efficiency gains that resulted from referring patients to collaborative care in the primary care setting rather than to specialized mental health care (usual care) persisted for five years after referral. There was no indication found of a catch-up effect of mental health care utilization among collaborative care patients over the long term.

The study reported in chapter six addressed the near future of collaborative mental health care and general mental health care in general: the integration of internet assistance in the collaborative care treatment. Regularly collected data from a multi-site patient cohort of a nationally operating collaborative care provider, of which the collaborative care program investigated in this thesis is part of, was combined with information from a survey investigation aimed at mental health professionals who were expected to offer blended collaborative mental health care. The analyses showed that implementation factors related to the wider social framework of professionals, such as effects on their roles and responsibilities as well as transparency about expected benefits through continuing evaluation and feedback of blended care are important in increasing uptake and utilization of blended collaborative health care.

7.2 The results of this study in the context of existing scientific literature

The studies presented in this thesis added relevant information to the existing empirical evidence because of the comparison to specialized mental health care. As stated in the introduction of this thesis, in the vast majority of the studies reported in the scientific literature collaborative care is compared to regular care delivered by the general practitioner or no alternative treatment at all. The collaborative care program investigated in this thesis was developed as an effective, but more efficient alternative manner to deliver mental health care as soon as possible, in the client's natural environment, instead of referral to specialized mental health care. To investigate whether this goal was achieved, it was necessary to compare this new intervention to the usual intervention, namely direct referral to specialized mental health care. In this way, it is not surprisingly that the results of the present studies differed from those found in other studies. When compared to regular general practitioner care or no treatment at all collaborative care has proved to be more effective in the literature for various

common mental disorders (48), (49), (50), (53). Compared to specialized mental health care, that in the Netherlands has been proved to be of good quality (160), the goal was that the collaborative care would be at least as effective as specialized care. The same is true for studies investigating the efficiency of collaborative care. When compared to regular general practitioner care or no treatment at all, one could expect that collaborative care, that will probably imply additional care, would lead to higher costs and consequently be less efficient. In the situation where collaborative care was an alternative to specialized mental health care one would expect that the collaborative care program, aimed at short-time intervention in an early stage, would be more efficient than the regular care, which was confirmed with the performed studies.

In the second phase of the development of a model with factors that predict mental health care use, Anderson and colleagues (113) extended their model with the inclusion of the health care system in addition to predisposing characteristics, enabling resources and need factors as predictors for mental health care use, "(...) giving recognition to the importance of national health policy and the resources and their organization in the health care system as important determinants of the population's use of services, as well as changes in those use patterns over time." (pp. 6). With a post-hoc analysis of the dataset of the randomized controlled trial the importance of the mental health service as a relevant and maybe even the most relevant factor for subsequent mental health care use was confirmed. In this analysis, service concept was the only stable factor predicting mental health care outcome, besides marital status. This finding was in accordance with the principles of the stepped care approach (28), since no patient need for care or dispositional factors influenced mental health care use significantly except marital status. Interestingly, in the original version of his model, Anderson focused on the family as the unit of analysis, because he at that time assumed that the care an individual received was influenced by demographic social and economic characteristics of the family as a unit. In the following phases of the model, he began to focus on the individual. The results of this study give rise to questions about whether family or social support in general could possibly have an important protective effect on the need to use mental health care and therefore should receive more attention in mental health care delivery. The importance of relationship factors on need for mental health care was already proved by Schaefer et al. (110).

The need for long-term outcomes was also mentioned in the existing literature since the follow-up period of the vast majority of the studies was restricted to the actual treatment time (49) and the available evidence of long-term outcomes was restricted to the US care setting (50). One of the studies of this thesis showed that collaborative care was more efficient than direct referral and treatment within specialized mental

health care during a five-year follow-up period with regard to direct mental health care costs.

Much has been written about opportunities and different ways to integrate internet-assistance to mental health care and the preliminary effectiveness and efficiency of blended care. It is however also argued in the literature, that the adoption and integration of e-mental healthcare in regular mental health care practice is a far bigger challenge than one would expect from the enthusiasm of policy makers and health care organizations and the speed and the quantity in the development of eHealth care applications (149, 161) (148). Furthermore, it has been argued that scientific research has mainly focused on e-health systems' workability and that there was a gap in literature focusing on how eHealth services will impact everyday clinical practice. Mair et al. (149) developed a conceptual framework to describe barriers and facilitators of the implementation of eHealth. I was able to confirm that the factors Mair et al. identified as important in their framework, such as eHealth's effects on roles and responsibilities, risk management, ways to engage with professionals and reflexive monitoring affected the uptake of blended collaborative care by mental health care professionals and utilization by their patients.

7.3 Strengths and weaknesses of the studies presented in this thesis

The studies presented in this thesis had several strengths and weaknesses that have to be discussed. The first methodological strength was the ecological validity of the studies performed for this thesis, which increased the generalizability of the study results to comparable service concepts in countries with similar health care systems. The randomization occurred at the general practitioner level. This enabled comparison of general practitioner referral practices. A second strength was the follow-up period of the randomized controlled trial. The one-year follow-up period extended the actual length of treatment for the vast majority of the patients. If waiting times for treatment increased, which was especially the case in the care as usual condition, even the one-year follow-up period was in some cases too short to follow the complete treatment. To investigate the long-term efficiency of the service concept with regard to mental health care utilization the follow-up period was extended to a five-year follow-up period. The low attrition rate from the cluster randomized trial is another strength that has to be mentioned. During the one year follow-up period, only 6% of the patients dropped-out of the study. This is presumably the result of the study's design i.e. the number of contacts the research assistant and I had with the participants during the one-year follow-up period. Besides the regular assessments, when the participants were asked about the outcome measures, they were telephoned every six weeks with

one question “How are you doing?” This extra attention might be responsible for the low attrition rate from the study. Since this method was applied to all participants, it will not have advantaged one of the treatment conditions. Linked to this strength is the availability of information from patients’ mental health care record for the retrospective cohort-analyses. The Parnassia Groep, the provider of the collaborative mental health care program investigated in the cluster randomized trial, has a sound digital health record system, from which reliable data could be obtained for the analyses. This applies as well to Indigo, the basic mental health care provider which since 2006 has grown to be a national franchise business, where the eHealth implementation was studied.

The studies presented in this thesis also have some important weaknesses. The first weakness concerns the sample size of the study population of the cluster randomized trial. According to the results of a power analyses, where we accounted for the inter-class coefficient because of the cluster randomization, the size of our control group with patients receiving care as usual was slightly too small. Sample size was also likely to be an issue in the cost-effectiveness analysis. The clinical trial was used as a vehicle for a cost-effectiveness analysis, the so called “piggyback”-arrangement, a method that is often performed in scientific trials. The consequence of this method is, however, that the cost-effectiveness analysis was likely to be underpowered (162, 163). Given the non-normal skewed shaped distribution of the cost-data, as described in chapter three, this was indeed the case in the cost-effectiveness study of this thesis. Although the number of participants that dropped out of the study was low, the relatively large amount of missing data was an issue in several of the studies. If necessary and feasible, we imputed missing values through multiple imputation techniques. A second weakness concerns the prediction studies included in this thesis (chapters 4 and 6). Several potentially relevant factors that could have had an influence on the outcome variable(s) were not assessed within these studies. For example, patients’ coping strategies and need for care could have influenced the intensity of their care utilization (chapter 4) as well as their preferences and utilization of blended care (chapter 6). Social capital is also an important factor that was not included in the studies but could have affected several of the outcome measures. The link between social isolation and reduced psychological well-being is well established in the scientific literature (164). The underlying mechanisms, however, that explain how social capital relates to mental health are far from clear (164), but necessary to understand to design effective interventions (165). A third weakness concerns the availability of certain types of data, when data from regularly collected systems and electronic health record system was used. Although these systems are basically sound because information from these data sources is used to handle declarations for the delivered care, certain types

of information, which is not part of the declarations, are less thoroughly collected and registered. Mainly patient-related information, like ethnicity, education and marital status frequently show missing values. Fourthly, in two studies, a part of the collected information was based on memory recall. In chapter three, patients were asked to recall information about visits to (mental) health care providers. In chapter six mental health professionals were asked to recall their experiences with the implementation of blended collaborative health care that had taken place one to two years ago. These time lapses could have influenced the accuracy of the remembered information.

7.4 Implication of this scientific work for mental health care and politics

With the studies performed for this thesis I believe I was able to confirm the relevance and expediency of collaborative mental health care as the first treatment step for patients with common mental disorders in the Netherlands. Referral to specialized mental health care was only necessary for those patients who had not sufficiently responded to the initial treatment step within the primary care sector. At the time the data for the cluster randomized trial was collected, the Dutch mental health care system had not yet been divided into a general basic mental health care sector and a specialized mental health care sector. The Dutch government introduced this division in 2014. It is reasonable to assume that this division could have increased the effectiveness and efficiency of Dutch mental health care. The actual operation of basic mental health care, however, raises important questions. In the basic care sector, mental health professionals are forced to allocate patients to one of the treatment intensities at the start of the treatment. In the studies performed for this thesis, no patient- and symptom characteristics were found to predict treatment intensity. One could question how well mental health professionals are able to succeed in allocating patients and how this division in treatment intensities will affect cost-effectiveness. The feasibility of the collaborative care concept investigated in this thesis depends on the country's mental health care system. In the Dutch mental health care sector, all Dutch citizens are obliged to have a basic health insurance and to register with a general practitioner (166). The general practitioners have a crucial role in the mental health care system. He acts as a so-called gatekeeper for referrals to mental health care. This was the case before the mental health care reform in 2014. This role might have increased now, since much of the mental health care since then has taken place on the premises of the primary care sector.

In the introduction, I mentioned several critical remarks or questions that stakeholders expressed when collaborative care was implemented in the Netherlands. The results of these studies added relevant information to refute or approve these remarks:

1. Stakeholders were concerned that if the specialized mental health organization supplied the mental health professionals, the collaborative care program could move into a replacement/referral model (24) in which the collaboration between primary and specialized health care was not the primary goal, but the referral of patients to specialized care. Results of these studies show that the vast majority (68%) of the patients treated within the collaborative care program had not been referred to specialized mental health care. For 32% of the patients, the short-time treatment within the collaborative care program seemed to be not sufficient. These patients were eventually referred to specialized mental health care. With these results, I believe that we can conclude that in this case the fact that the specialized mental health organization supplied the mental health professional did not deflect from the original collaborative care concept.
2. As a consequence of the above mentioned, it was questioned who should bear the responsibility for the mental health care delivered in the general practitioner's practice if the mental health professional was affiliated to a mental health organization. In the case of the investigated collaborative care program, the mental health care organization to which the mental health professional was affiliated was responsible for the professional practice of the mental health professional.
3. It was expected that the availability of a mental health professional in the general practitioner practice would lower the threshold for patients to seek help, and stakeholders voiced concern that in the long-term this would only increase the number of patients receiving professional care. Although this aspect was not investigated in this research project, based on the available literature the conclusion is that unmet needs are still a big global problem in the mental health care sector (167). Recent research in the Netherlands confirmed that almost half of individuals with mental health problems do not access mental health care, especially because of the high costs (168). Based on the available evidence I recommend mental health policy should be concerned about solving the unmet need for mental health care problem by offering low-threshold and accessible mental health care to prevent symptoms worsening and/or the need for more expensive specialized mental health care. It should additionally focus on developing and implementing effective and innovative primary prevention programmes (169).
4. Another critical remark concerned the long-term effect of collaborative care. It was questioned whether there was a risk that stepped short-time care in the primary care setting would only postpone the need and use of specialized mental health care and thus would eventually lead to an increase use of (specialized) mental health care in the longer term, proving contrary evidence. Results show that during the one-year follow-up period, as well as over the five-year period, the mental health care utilization of patients (initially) treated within collaborative mental

health care was significant lower than of patients who were directly referred to and treated within specialized mental health care. I believe it is tenable to conclude, that concerns over the postponing of intensive treatment or a catch-up effect of increased mental health utilization are unfounded.

5. In relation to the above mentioned critical points, there was also debate about the intensity of the short-time treatment offered in the primary care setting. Although most of the short-time treatments offer between ten and fifteen visits to the patients, no evidence about the ideal treatment intensity in this context was available. The researchers of a cumulative meta-analysis and review of longer-term outcomes of collaborative care for depression within the US concluded that there was no proof for a dose-response relationship with regard to the number of therapy sessions and confirmed that even short-time treatments were effective (50). According to Lambert (170) a substantial number of patients respond to psychotherapy much sooner (with a median session of 5) and more substantially than theory about psychotherapy would predict. With this study, I was able to show that the ultra-short treatment intensity with a maximum of five contacts was sufficient for the vast majority of clients. This is a crucial and critical aspect of collaborative care and in accordance with available evidence.

Regarding the use of eHealth tools and devices within mental health care practice, the results of this thesis show the complexity of the implementation process in the uptake and utilization of this new treatment. In this study, blended care was investigated, a treatment that is assumed to be less intrusive for the organization (148). For the mental health professional who has to provide this treatment and is accustomed to providing face-to-face treatment, blended care is a new form of treatment and can be as intrusive as other forms of new treatment they have to get used to. Besides learning how the eHealth system actually works, they have to become familiar with the content and the underlying ideas of the eHealth program. They have to sort out and practice in which way the new treatment affects their working practice, how it affects the relationship and the communication with the patient. Furthermore, the mental health professional, as well as the providing organization have to be able to learn from and adapt to increased knowledge of the system through ongoing evaluation and feedback. My study of the implementation of blended collaborative care treatment shows there is room for improvement of those implementation factors. Regarding the results of this study, it is reasonable to assume that thoroughly addressing those factors will increase the uptake and utilization of blended care as well as improve its treatment effects.

7.5 Recommendations for further research

At the time the data for the cluster randomized trial was collected, the mental health care system had not been divided in general basic mental health care and specialized mental health care. The Dutch government introduced this division in 2014. General basic mental health care was split into four intensity-groups: short, medium, intensive and chronic. The short-time treatment, offered within the collaborative care program, investigated in this thesis, consisted of a maximum of five treatment contacts independent of the severity of the presenting problems. Since these studies have provided the first indications of the feasibility of the stepped care approach compared to the shared care approach in finding no evidence that the treatment intensity could be predicted a priori by pre-disposing or enabling factors, it seems questionable how well mental health professional are able to succeed in allocating their patients to the appropriate treatment-intensity group, which is the procedure within the new basic care system and a form of shared care. Future research should determine how well mental health professionals manage to allocate patients based on intake information.

In relation to the above mentioned, it would also be of interest to investigate whether the introduction of treatment intensities has had an effect on syndrome-clusters, treated within collaborative care and the actual treatment intensity. The population for the cluster randomized trial consisted of patients with common mental disorders, mainly anxiety disorders, depressions and addiction problems. By differentiating between treatment-intensities (adding a chronic care intensity) within collaborative care and extending treatment duration for patients allocated to higher treatment intensities, the first question that arises is whether there is a difference between syndrome-clusters treated within collaborative care at the time the randomized trial was performed compared to the current collaborative care practice. Secondly, it is important to investigate the association between diagnosis and the allocation to treatment intensity. It is essential to know whether the allocation of patients/syndromes to treatment intensity leads to (unnecessary) prolonging of treatments. Finally, in addition to allocation, research on the influence of other process-related factors on the outcome of collaborative care, like the frequency of care management contacts or psychiatric consults (171) or ways of potential collaboration and communication between the different professionals (172) is needed to gain insights in underlying mechanisms for treatment success.

With the studies performed for this thesis, the long-term efficiency of the collaborative care model regarding direct mental health care costs was investigated. A limitation of this study was the omission of cost data for services delivered by other mental health care providers and in other health care sectors as well as cost data for productivity

losses. It would be interesting to investigate the long-term efficiency from the societal perspective and of course effectiveness of the collaborative care program in the long-term. Concerning the cost-effectiveness analyses I agree with Briggs (162), that health economists should be involved from the outset of the design if a cost-effectiveness analysis is planned alongside a clinical trial.

A lot of data is structurally collected through different systems for different purposes. For the studies described in this thesis, I collected data exclusively for this purpose and was able to make use of regularly collected datasets from routine outcome monitoring and data registered within the electronic health system. There are many more datasets outside mental health service care registrations, in which data is automatically collected and saved that could offer interesting insights. For example, in the study described in the fourth chapter marital status has been found as a possible protective variable for mental health care utilization. One could imagine that other important factors linked to social capital and societal participation may also have important protective properties for primary or secondary prevention of mental health care problems and mental health care utilization. I strongly recommend making use of regularly collected databases in scientific research. Furthermore, I think grasping the possibilities of big data-research will be beneficial for the advance of scientific knowledge in different fields. Especially when it comes to preventive mental health care, factors that researchers within hypothesis testing research would not include in their analyses because they have not been proven to be relevant or are not obviously to be linked to the outcome parameter of interest could probably lead to surprising and very relevant results. To what extent will factors like the individual's purchases at the grocery store, fitness club membership, number of Facebook friends, police records, ancestry and surrounding weather and climate, influence the need for, utilization and effectiveness of collaborative mental health care? An example for the potential of this so called personalized medicine approach is the study from Chekroud et al. (173). With their machine learning trial of prediction of treatment outcomes in depression, they were able to develop a model to predict symptomatic remission comparable to the best available biomarker for depression. The machine learning approach enables researchers to shift focus from population-level findings (for example 30% of patients achieve symptomatic remission for a given treatment and episode) to person-level findings (which 30% of patients are the best candidates for a specific treatment). This approach could also be of great value to determine which patients are the best candidates for eHealth. The success of this approach depends on the collection and sharing of large-scale (clinical-grade) datasets (173) and finding ways to link those datasets (174). Succeeding in sharing and linking those datasets holds great potential to help assemble a holistic view of a patient in order to increase efficiency and accountability

in (mental) health care (174). A crucial aspect that has to be ensured when combining large datasets is ethical management. Meanwhile, several management models have been designed that focus on protecting privacy and respecting confidentiality (175).

7.6 Conclusion

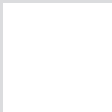
Based on the studies in this thesis, I conclude that collaborative mental health care has changed the landscape of mental health care in the Netherlands. The relevance and expediency of offering mental health care in the primary care setting in close alliance with the general practitioner has been confirmed and led to a change in mental health care policy. It is however questionable whether the actual operationalization of this concept in the Netherlands produces the desired effects. In the basic care sector, mental health professionals are forced to allocate patients to one of the treatment intensities at the start of the treatment. Based on the findings in the studies performed for this thesis, where no patient- and symptom characteristics were found to predict treatment intensity, one could question how well mental health professionals are able to succeed in this allocation. Since mental health professionals undoubtedly care for their patients, one could assume that they are more likely to allocate a patient to a higher treatment intensity, in case of doubt. This could negatively affect efficacy gains, found in the studies of the original concept.

The integration of eHealth in collaborative care has the potential to change the landscape of mental healthcare furthermore by increasing the accessibility of treatment, enhancing the autonomy and self-empowerment of patients and eventually increasing cost-effectiveness of treatment. To make eHealth work, however, policy makers must understand that offering eHealth poses a major challenge for mental health care professionals since it affects their role and professional identity. Policy makers and organizations will have to spend more time and effort in implementing eHealth properly and accompanying the implementation by scientific research to be certain that it is broadly adopted within regular mental health care and proves to be as effective, efficient and cost-effective as expected.

Since the 1980's we have had evidence based medicine, since the 1990's we have had evidence based management. Now it is time for evidence based politics.

“Quality is more important than quantity. One homerun is much better than two doubles.” Steve Jobs





Appendix

Nederlandse samenvatting

References

List of Publications

Curriculum Vitae

Dankwoord



Nederlandse samenvatting

Inleiding

In de tweede helft van de twintigste eeuw hebben vele maatschappelijke en zorg-gerelateerde ontwikkelingen plaatsgevonden, die van grote invloed zijn geweest op de manier waarop geestelijke gezondheidszorg (GGZ) vandaag de dag wordt aangeboden. Deze ontwikkelingen zijn in sterke mate ingegeven door financiële, politieke en maatschappelijke veranderingen. Samenvattend komt het erop neer, dat de zorg in de afgelopen decennia eerder en dichter in de leefomgeving van de cliënt aangeboden werd, de cliënt meer inspraak in zijn eigen zorgtraject kreeg, er veel meer waarde werd gehecht aan wetenschappelijke evidentie en bekostiging van zorg een belangrijk onderliggend thema werd. De implementatie van veranderingen in een (zorg-) organisatie is geen sinecure. De kwaliteit van de begeleiding van het veranderingsproces heeft invloed op het verloop en het uiteindelijke slagen of falen van de implementatie van een verandering.

Het concept ‘collaborative mental health care’ (gedeelde geestelijke gezondheidszorg) is een belangrijke verandering in de geestelijke gezondheidszorg sinds het begin van de 21^{ste} eeuw. In de basis gaat het hierbij om de samenwerking tussen hulpverleners vanuit de eerstelijns gezondheidszorg met hulpverleners vanuit de gespecialiseerde gezondheidszorg in het aanbieden van zorg in een vroeg stadium in de leefomgeving van de cliënt. Het concept kent diverse uitwerkingen, waarin er verschillen zijn in het aantal en de expertise van de verschillende samenwerkende hulpverleners en de mate waarin zij samenwerken in de zorgverlening.

In **hoofdstuk 1** wordt (de ontwikkeling van) het concept ‘collaborative mental health care’ nader beschreven. In dit proefschrift is het ‘stepped collaborative mental health care program’ (CCP) onderzocht. Een programma, waarbij kortdurende behandeling met maximaal vijf gesprekken wordt aangeboden gedurende een periode van maximaal zes maanden aan cliënten met diverse psychiatrische klachten (die geen acute zorg nodig hebben). De behandeling is gebaseerd op een kortdurende cognitief- gedragstherapeutische benadering en wordt aangeboden door professionals vanuit de GGZ. Tussen de GGZ professional en de huisarts is regelmatig overleg. Indien nodig kan een psychiatrisch consult door een psychiater worden aangevraagd. Het CCP wordt gezien als de eerste stap volgens de principes van een ‘stepped care model’ (getrapte zorg). Volgens dit model ontvangen alle cliënten met diverse psychiatrische klachten, die geen acute zorg nodig hebben, in eerste instantie zo snel mogelijk de minst intensieve behandeling, via het CCP. Alleen voor cliënten, die na CCP behandeling

onvoldoende hersteld zijn, wordt de behandelintensiteit verhoogd door het verwijzen naar de gespecialiseerde zorg.

Doel van dit proefschrift was het verrijken van de wetenschappelijke evidentie van de korte- en lange termijn effecten van het behandelen van cliënten met algemene psychiatrische klachten in het kader van het collaborative care programma als een eerste stap in een stepped care benadering. Een aanvullend doel was gericht op de toekomst van de zorg, namelijk het onderzoeken welke effecten implementatiefactoren hebben op de adoptie van een, door internet ondersteunde, variant van CCP door GGZ professionals en het gebruik ervan door cliënten.

Belangrijkste bevindingen

Effectiviteit en efficiëntie van CCP in vergelijking met CAU na één jaar

In **hoofdstuk 2** worden de resultaten van een cluster gerandomiseerd onderzoek beschreven naar de effectiviteit en efficiëntie van cliënten, die behandeld zijn in het kader van het CCP in vergelijking met regulier naar de gespecialiseerde GGZ verwezen cliënten. Aan het onderzoek deelnemende huisartsen (n=27) werden willekeurig toegewezen aan één van twee behandelcondities: collaborative care-programma (CCP; n=14) en care as usual conditie (CAU; n=13). CCP-huisartsen hadden een GGZ professional in hun praktijk en werkten volgens het concept van het CCP. CAU-huisartsen (n=13) bleven cliënten op de reguliere manier voor behandeling verwijzen naar gespecialiseerde zorg, alwaar ze, indien geïndiceerd, werden behandeld. Cliënten die aan het onderzoek deelnamen (n=165) behoorden automatisch tot de conditie, waartoe hun huisarts behoorde (CCP n=102; CAU n=63). Deelnemende cliënten werden gedurende één jaar na verwijzing gevolgd met metingen: tijdens de verwijzing, en 3 maanden, 6 maanden en 12 maanden daarna. Effectiviteit werd gemeten in termen van klachtreductie en efficiëntie onder andere door middel van het aantal contacten met een GGZ professional.

Multi level analyse toonde aan dat CCP even effectief was als CAU in reductie van klachten. Echter, de CCP behandeling bleek significant efficiënter in termen van een korterewachttijd en behandelduur, minder zorgcontacten en lagere zorgkosten.

Kosteneffectiviteit van CCP in vergelijking met CAU na één jaar

De relatie tussen kosten vanuit een maatschappelijke perspectief en de effectiviteit van CCP in vergelijking met reguliere zorg is onderzocht in een kosteneffectiviteitsanalyse, die wordt beschreven in **hoofdstuk 3** van het proefschrift. De inventarisatie van kosten maakte deel uit van het cluster gerandomiseerde onderzoek dat wordt beschreven in

hoofdstuk 2. De benadering van de kosten vanuit een maatschappelijk perspectief hield in, dat niet alleen directe GGZ zorgkosten in de analyse werden betrokken, maar tevens indirecte GGZ kosten, kosten vanuit behandelingen in andere zorgsectoren en productiviteitsverliezen door gezondheidsproblemen. De incrementele kosteneffectiviteitsratio (ICER) werd berekend door alle geïnventariseerde kosten te relateren aan behandel-effecten in termen van klachtreductie van de CCP groep versus CAU groep. De onzekerheid rondom de ICER werd geadresseerd door het opstellen van een kosteneffectiviteitscurve.

De in hoofdstuk 2 beschreven superioriteit van het CCP in termen van efficiëntie kon door de kosteneffectiviteitsanalyse worden bevestigd. Er werd geconcludeerd dat ook vanuit maatschappelijk oogpunt behandeling in het kader van CCP gunstiger was dan reguliere verwijzing en behandeling in de specialistische GGZ.

Is stepped care de juiste benadering voor CCP?

Uit het cluster gerandomiseerde onderzoek beschreven in hoofdstuk 2 kwam naar voren dat 32% van de cliënten, die via het CCP werd behandeld, naderhand alsnog werd verwezen naar de reguliere zorg. Met een post-hoc analyse van de in het kader van het cluster gerandomiseerde onderzoek verzamelde data werd onderzocht in hoeverre er cliënt- of klacht gerelateerde kenmerken gevonden konden worden die voor het begin van de CCP behandeling konden voorspellen of een cliënt onvoldoende zou profiteren van de CCP behandeling en dus (uiteindelijk) toch gespecialiseerde zorg nodig zou hebben. Doel van deze analyse, beschreven in **hoofdstuk 4**, was het beantwoorden van de vraag of er bij voorbaat cliënten geïdentificeerd konden worden die een hogere zorgintensiteit nodig zouden hebben en daarom beter direct naar de gespecialiseerde GGZ verwezen hadden kunnen worden. Met andere woorden, kon evidentie worden gevonden dat de stepped care benadering de juiste benadering was voor alle cliënten of dat een matched care benadering, waarbij toewijzing van cliënten naar CCP of CAU plaatsvindt op basis van specifieke klacht- of patiënt gerelateerde kenmerken voor behandeling, een betere benadering zou zijn geweest.

De resultaten uit een multilevel predictie model tonen aan dat het niet mogelijk was om bij voorbaat cliënten aan te wijzen die op basis van specifieke klacht- of patiënt gerelateerde kenmerken niet voldoende zouden profiteren van CCP en daarom beter gelijk verwezen en behandeld hadden kunnen worden binnen de gespecialiseerde GGZ. Het zorgconcept zelf bleek de belangrijkste voorspeller van de uiteindelijke zorgconsumptie: ongeacht persoons- en klacht gerelateerde kenmerken zouden cliënten die naar CCP werden verwezen minder zorgcontacten nodig hebben in vergelijking met verwijzing naar de reguliere gespecialiseerde zorg. Er werd geconcludeerd dat

stepped care de juiste benadering is in de context van het in dit proefschrift onderzochte populatie in CCP.

Lange termijn efficiëntie van CCP tot vijf jaar na verwijzing

Naast korte termijneffecten tot één jaar na verwijzing, werd voor dit proefschrift ook onderzoek gedaan naar lange termijneffecten op het gebied van efficiëntie. Voor deze studie (**hoofdstuk 5**) werd wederom gebruik gemaakt van de verzamelde data in het kader van het cluster gerandomiseerde onderzoek, aangevuld met data uit het elektronische patiëntendossier van de zorgverlener. Gegevens over alle GGZ zorgcontacten werden geïncludeerd in de analyse. De twee onderzoeksgroepen uit het cluster gerandomiseerde onderzoek, de CCP groep en CAU groep, werden vergeleken op GGZ zorggebruik gedurende 5 jaar na verwijzing. Resultaten van deze analyse tonen aan dat de korte termijn efficiëntiewinst van het behandelen van cliënten in CCP in vergelijking met CAU ook op de langere termijn (tot vijf jaar na verwijzing) behouden bleef. Geconcludeerd werd dat er geen indicatie was voor een inhaaleffect van zorggebruik door cliënten, die in eerste instantie via CCP kortdurende zorg ontvingen.

De implementatie van 'blended collaborative mental health care'

In **hoofdstuk 6** wordt de toekomst van collaborative mental health care en de GGZ in het algemeen geadresseerd: de integratie van internet ondersteuning in de behandeling. In een 'blended variant' van het CCP is de behandeling gesplitst in een deel dat zoals gebruikelijk uit face-to-face contacten bestaat en een ander deel van de behandeling, dat wordt aangeboden via een online module. Middels de, in dit hoofdstuk beschreven, studie werd de invloed van implementatie op de adoptie van de blended CCP variant door de GGZ professional en het gebruik ervan door cliënten onderzocht. Het design van deze studie was een naturalistisch retrospectieve analyse van een patiëntencohort, dat in de jaren 2014 en 2015 de blended variant van de collaborative care behandeling aangeboden heeft gekregen (n=1.831) in combinatie met een vragenlijstonderzoek, uitgevoerd in 2016. Voor het vragenlijstonderzoek werden de behandelaren van de cliënten uit het cohort benaderd (n=91). In de vragenlijst werden factoren geadresseerd die een wetenschappelijk bewezen relevante bevorderende of belemmerende invloed op de implementatie van eHealth kunnen hebben. Ten behoeve van de retrospectieve analyse van het patiëntencohort werden regulier verzamelde data over het gebruik van de blended behandeling en uitkomstdata, verzameld via Routine Outcome Monitoring, gebruikt. Middels multi level analyse werd de invloed van implementatie factoren, zoals ervaren door GGZ professionals, op hun adoptie van de blended behandeling als ook het gebruik van de behandeling door cliënten onderzocht. Het onderzoek laat zien dat slechts 10% van de zorgprofessionals de blended behandeling aan cliënten aanbiedt en dat 69% van de cliënten van de online

module gebruik maakt. Er werd geconcludeerd dat een organisatiestructuur nodig is die zorgprofessionals ondersteunt om betekenis te kunnen geven aan deze nieuwe manier van behandelen, inzicht geeft in veranderende rollen en verantwoordelijkheden, als ook doorlopende evaluatie en feedback mogelijk maakt, zodat professionals zich de nieuwe manier van werken eigen kunnen maken. Indien aan deze voorwaarden wordt voldaan kan worden verwacht dat blended collaborative care een structureel onderdeel wordt van collaborative mental health care.

Conclusie

Het doel van het onderzoek beschreven in dit proefschrift was het evalueren van collaborative mental health care als een relevante verandering in het landschap van de geestelijke gezondheidszorg. Op basis van de beschreven bevindingen en in het licht van eerder onderzoek concluderen we dat collaborative mental health care (in zijn diverse vormen) inderdaad het GGZ landschap in Nederland heeft veranderd. De relevantie en doelmatigheid van het aanbieden van geestelijke gezondheidszorg in de eerstelijns, de praktijk van de huisarts, werd ondersteund en heeft inmiddels geleid tot veranderingen in de organisatie van de geestelijke gezondheidszorg. Het is echter de vraag of de manier waarop het aanbieden van GGZ in de eerstelijns in Nederland is georganiseerd de gewenste effecten gaat opleveren. In de huidige organisatie van de BasisGGZ, waarin collaborative care wordt aangeboden, worden professionals gedwongen om cliënten toe te wijzen aan een van de zorgwaartetrajecten binnen de BasisGGZ. Gebaseerd op de bevindingen in dit proefschrift, waar geen persoons- en klacht gerelateerde kenmerken zorgintensiteit konden voorspellen, kan men zich afvragen in hoeverre professionals erin slagen om een juiste toewijzing te doen en of deze werkwijze wellicht zelfs een negatieve invloed heeft op de efficiëntiewinst die werd gevonden in het in dit proefschrift onderzochte collaborative care model.

De integratie van internet ondersteuning in CCP heeft de potentie om het zorgland- schap verder te veranderen door het verbeteren van de toegankelijkheid van zorg, het verhogen van zelfsturing en autonomie van cliënten en het verhogen van kosteneff- ectiviteit van de zorg. Om deze winsten te kunnen boeken is het echter van belang dat beleidsmakers zich realiseren, dat de implementatie en integratie van internet ondersteuning in de zorg een substantiële verandering voor zorgprofessionals met zich meebrengt aangezien deze hun rol als hulpverleners en professionele identiteit beïnvloedt. Dit onderzoek geeft belangrijke aanwijzingen voor beleidsmakers en orga- nisaties, dat zij voldoende aandacht moeten besteden aan het implementatieproces van internet ondersteuning in de geestelijke gezondheidszorg en het implementatie- proces moeten begeleiden en bovenal evalueren door wetenschappelijk onderzoek, zodat wetenschappelijke onderbouwing en structurele integratie hand in hand gaan.

References

1. Gabel S, Oster GD. Mental health providers confronting organizational change: process, problems, and strategies. *Psychiatry*. 1998;61(4):302-16.
2. Priebe S, Badesconyi A, Fioritti A, Hansson L, Kilian R, Torres-Gonzales F, et al. Reinstitutionalisation in mental health care: comparison of data on service provision from six European countries. *BMJ*. 2005;330(7483):123-6.
3. Haveman MJ. Dehospitalization of psychiatric care in The Netherlands. *Acta Psychiatr Scand*. 1986;73(4):456-63.
4. Yohanna D. Deinstitutionalization of people with mental illness: causes and consequences. *Virtual Mentor*. 2013;15(10):886-91.
5. WHO. The World Health Report 2001: Mental Health : New Understanding, New Hope. Geneva, Switzerland: 2001.
6. Anderson G, Hussey PS. Comparing health system performance in OECD countries. Organization for Economic Cooperation and Development. *Health Aff (Millwood)*. 2001;20(3):219-32.
7. Ham C, Brommels M. Health care reform in The Netherlands, Sweden, and the United Kingdom. *Health Aff (Millwood)*. 1994;13(5):106-19.
8. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996;312(7023):71-2.
9. Aarons GA, Wells RS, Zagursky K, Fettes DL, Palinkas LA. Implementing evidence-based practice in community mental health agencies: a multiple stakeholder analysis. *Am J Public Health*. 2009;99(11):2087-95.
10. Drake RE, Goldman HH, Leff HS, Lehman AF, Dixon L, Mueser KT, et al. Implementing evidence-based practices in routine mental health service settings. *Psychiatr Serv*. 2001;52(2):179-82.
11. OECD. OECD Health Statistics 2015 - Focus on health spending. 2015.
12. Catalano R, Goldman-Mellor S, Saxton K, Margerison-Zilko C, Subbaraman M, LeWinn K, et al. The health effects of economic decline. *Annu Rev Public Health*. 2011;32:431-50.
13. Eichler HG, Kong SX, Gerth WC, Mavros P, Jonsson B. Use of cost-effectiveness analysis in health-care resource allocation decision-making: how are cost-effectiveness thresholds expected to emerge? *Value Health*. 2004;7(5):518-28.
14. Bongaarts J. Human population growth and the demographic transition. *Philos Trans R Soc Lond B Biol Sci*. 2009;364(1532):2985-90.
15. Bijl RV, Ravelli A. Psychiatric morbidity, service use, and need for care in the general population: results of The Netherlands Mental Health Survey and Incidence Study. *Am J Public Health*. 2000;90(4):602-7.
16. Schene AH, Faber AM. Mental health care reform in The Netherlands. *Acta Psychiatr Scand Suppl*. 2001(410):74-81.
17. McLaughlin H. What's in a name: 'client', 'patient', 'customer', 'consumer', 'expert by experience', 'service user'—what's next? *British Journal of Social Work*. 2009;39(6):1101-17.

18. PsyNld. Psychiatrische aandoeningen, stigmatisering én de invloed van media 2015. Available from: <http://psychiatrie-nederland.nl/nieuws/psychiatrische-aandoeningen-stigmatisering-en-de-invloed-van-media/>.
19. Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips M, et al. No health without mental health. *Lancet*. 2007;370 (Series):859-77.
20. Sareen J, Jagdeo A, Cox BJ, Clara I, ten Have M, Belik SL, et al. Perceived barriers to mental health service utilization in the United States, Ontario, and the Netherlands. *Psychiatr Serv*. 2007;58(3):357-64.
21. Schoen C, Osborn R, Doty MM, Bishop M, Peugh J, Murukutla N. Toward higher-performance health systems: adults' health care experiences in seven countries, 2007. *Health Aff (Millwood)*. 2007;26(6):w717-34.
22. van Beljouw I, Verhaak P, Prins M, Cuijpers P, Penninx B, Bensing J. Reasons and determinants for not receiving treatment for common mental disorders. *Psychiatr Serv*. 2010;61(3):250-7.
23. Unutzer J, Schoenbaum M, Druss BG, Katon WJ. Transforming mental health care at the interface with general medicine: report for the presidents commission. *Psychiatr Serv*. 2006;57(1):37-47.
24. Bower P, Gilbody S. Managing common mental health disorders in primary care: conceptual models and evidence base. *BMJ*. 2005;330(7495):839-42.
25. Kates N, Craven M, Crustolo AM, Nikolaou L, Allen C. Integrating mental health services within primary care. A Canadian program. *Gen Hosp Psychiatry*. 1997;19(5):324-32.
26. Rijnders P, de Jong, T, Isebaert, L, van Tilburg, C, van den Amelee, H, editor. Kortdurend behandelen in de GGZ. De Praktijk Houten/Diegem: Bohn Stafleu van Loghum; 2002.
27. Rijnders P, Heene, E, editor. Kortdurende psychologische interventies voor de eerste lijn. Amsterdam: Uitgeverij Boom; 2014.
28. Bower P, Gilbody S. Stepped care in psychological therapies: access, effectiveness and efficiency. Narrative literature review. *Br J Psychiatry*. 2005;186:11-7.
29. van Straten A, Tiemens B, Hakkaart L, Nolen WA, Donker MC. Stepped care vs. matched care for mood and anxiety disorders: a randomized trial in routine practice. *Acta Psychiatr Scand*. 2006;113(6):468-76.
30. CBS. Acht procent van de Nederlanders nooit op internet: Centraal Bureau voor de statistiek; 2016. Available from: <https://www.cbs.nl/nl-nl/nieuws/2016/22/acht-procent-van-de-nederlanders-nooit-op-internet>.
31. Barr Taylor C, Luce K. Computer- and Internet-Based Psychotherapy Interventions. *Current Directions in Psychological Science*. 2003;12(1):18-22.
32. Forkner-Dunn J. Internet-based patient self-care: the next generation of health care delivery. *J Med Internet Res*. 2003;5(2):e8.
33. Kemmeren LL, van Schaik DJ, Riper H, Kleiboer AM, Bosmans JE, Smit JH. Effectiveness of blended depression treatment for adults in specialised mental healthcare: study protocol for a randomised controlled trial. *BMC Psychiatry*. 2016;16:113.
34. Kleiboer A, Smit J, Bosmans J, Ruwaard J, Andersson G, Topooco N, et al. European COMPARative Effectiveness research on blended Depression treatment versus treatment-

- as-usual (E-COMPARED): study protocol for a randomized controlled, non-inferiority trial in eight European countries. *Trials*. 2016;17(1):387.
35. Mathiasen K, Andersen TE, Riper H, Kleiboer AA, Roessler KK. Blended CBT versus face-to-face CBT: a randomised non-inferiority trial. *BMC Psychiatry*. 2016;16(1):432.
 36. Romijn G, Riper H, Kok R, Donker T, Goorden M, van Roijen LH, et al. Cost-effectiveness of blended vs. face-to-face cognitive behavioural therapy for severe anxiety disorders: study protocol of a randomized controlled trial. *BMC Psychiatry*. 2015;15:311.
 37. Volker D, Vlasveld MC, Anema JR, Beekman AT, Roijen LH, Brouwers EP, et al. Blended E-health module on return to work embedded in collaborative occupational health care for common mental disorders: design of a cluster randomized controlled trial. *Neuropsychiatr Dis Treat*. 2013;9:529-37.
 38. Andersson G, Bergstrom J, Hollandare F, Carlbring P, Kaldo V, Ekselius L. Internet-based self-help for depression: randomised controlled trial. *Br J Psychiatry*. 2005;187:456-61.
 39. Lewis C, Pearce J, Bisson JI. Efficacy, cost-effectiveness and acceptability of self-help interventions for anxiety disorders: systematic review. *Br J Psychiatry*. 2012;200(1):15-21.
 40. Riper H, Spek V, Boon B, Conijn B, Kramer J, Martin-Abello K, et al. Effectiveness of E-self-help interventions for curbing adult problem drinking: a meta-analysis. *J Med Internet Res*. 2011;13(2):e42.
 41. Andersson G. Using the Internet to provide cognitive behaviour therapy. *Behaviour Research and Therapy*. 2009;47(3):175-80.
 42. Klein B, Meyer D, Austin DW, Kyrios M. Anxiety online: a virtual clinic: preliminary outcomes following completion of five fully automated treatment programs for anxiety disorders and symptoms. *J Med Internet Res*. 2011;13(4):e89.
 43. Mackinnon A, Griffiths KM, Christensen H. Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes. *Br J Psychiatry*. 2008;192(2):130-4.
 44. Wagner B, Horn AB, Maercker A. Internet-based versus face-to-face cognitive-behavioral intervention for depression: a randomized controlled non-inferiority trial. *J Affect Disord*. 2014;152-154:113-21.
 45. Eysenbach G, Powell J, Englesakis M, Rizo C, Stern A. Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions. *BMJ*. 2004;328(7449):1166.
 46. Krijn M, Emmelkamp PM, Olafsson RP, Biemond R. Virtual reality exposure therapy of anxiety disorders: a review. *Clin Psychol Rev*. 2004;24(3):259-81.
 47. Muntingh A, van der Feltz-Cornelis C, van Marwijk H, Spinhoven P, Assendelft W, de Waal M, et al. Effectiveness of collaborative stepped care for anxiety disorders in primary care: a pragmatic cluster randomised controlled trial. *Psychother Psychosom*. 2014;83(1):37-44.
 48. Muntingh AD, van der Feltz-Cornelis CM, van Marwijk HW, Spinhoven P, van Balkom AJ. Collaborative care for anxiety disorders in primary care: a systematic review and meta-analysis. *BMC Fam Pract*. 2016;17:62.

49. Woltmann E, Grogan-Kaylor A, Perron B, Georges H, Kilbourne AM, Bauer MS. Comparative effectiveness of collaborative chronic care models for mental health conditions across primary, specialty, and behavioral health care settings: systematic review and meta-analysis. *Am J Psychiatry*. 2012;169(8):790-804.
50. Gilbody S, Bower P, Fletcher J, Richards D, Sutton AJ. Collaborative care for depression: a cumulative meta-analysis and review of longer-term outcomes. *Arch Intern Med*. 2006;166(21):2314-21.
51. Gilbody S, Lewis H, Adamson J, Atherton K, Bailey D, Birtwistle J, et al. Effect of Collaborative Care vs Usual Care on Depressive Symptoms in Older Adults With Subthreshold Depression: The CASPER Randomized Clinical Trial. *Jama*. 2017;317(7):728-37.
52. Richards DA, Bower P, Chew-Graham C, Gask L, Lovell K, Cape J, et al. Clinical effectiveness and cost-effectiveness of collaborative care for depression in UK primary care (CADET): a cluster randomised controlled trial. *Health Technol Assess*. 2016;20(14):1-192.
53. Thota AB, Sipe TA, Byard GJ, Zometa CS, Hahn RA, McKnight-Eily LR, et al. Collaborative care to improve the management of depressive disorders: a community guide systematic review and meta-analysis. *Am J Prev Med*. 2012;42(5):525-38.
54. Jacob V, Chattopadhyay SK, Sipe TA, Thota AB, Byard GJ, Chapman DP, et al. Economics of collaborative care for management of depressive disorders: a community guide systematic review. *Am J Prev Med*. 2012;42(5):539-49.
55. van Steenbergen-Weijenburg KM, van der Feltz-Cornelis CM, Horn EK, van Marwijk HW, Beekman AT, Rutten FF, et al. Cost-effectiveness of collaborative care for the treatment of major depressive disorder in primary care. A systematic review. *BMC Health Serv Res*. 2010;10:19.
56. Commission E. eHealth Action Plan 2012-2020 - Innovative healthcare for the 21st century. In: Commission E, editor. Brussels 2012.
57. Ross J, Stevenson F, Lau R, Murray E. Exploring the challenges of implementing e-health: a protocol for an update of a systematic review of reviews. *BMJ Open*. 2015;5(4):e006773.
58. Mair F, May C, O'Donnel C. Factors that promote or inhibit the implementation of e-health systems: an explanatory systematic review. *Bulletin of the World Health Organization*. 2012.
59. Verhaak PF, Hoeymans N, Garssen AA, Westert GP. Mental health in the Dutch population and in general practice: 1987-2001. *Br J Gen Pract*. 2005;55(519):770-5.
60. Verhaak PF, van de Lisdonk EH, Bor JH, Hutschemaekers GJ. GPs' referral to mental health care during the past 25 years. *Br J Gen Pract*. 2000;50(453):307-8.
61. Vries de W. Consultation in primary care: know-it-all or gift from heaven? [in Dutch]. *Huisarts en Wetenschap*. 2001;12:559-62.
62. Craven MA, Bland R. Shared mental health care: a bibliography and overview. *Can J Psychiatry*. 2002;47(2 Suppl 1):iS-viiiS, 1S-103S.
63. Gask L, Sibbald B, Creed F. Evaluating models of working at the interface between mental health services and primary care. *Br J Psychiatry*. 1997;170:6-11.

64. Bower P, Gilbody S, Richards D, Fletcher J, Sutton A. Collaborative care for depression in primary care. Making sense of a complex intervention: systematic review and meta-regression. *Br J Psychiatry*. 2006;189:484-93.
65. Katon W, Von Korff M, Lin E, Walker E, Simon GE, Bush T, et al. Collaborative management to achieve treatment guidelines. Impact on depression in primary care. *Jama*. 1995;273(13):1026-31.
66. Unutzer J, Katon W, Callahan CM, Williams JW, Jr., Hunkeler E, Harpole L, et al. Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. *Jama*. 2002;288(22):2836-45.
67. Craven MA, Bland R. Better practices in collaborative mental health care: an analysis of the evidence base. *Can J Psychiatry*. 2006;51(6 Suppl 1):7S-72S.
68. Gournay K, Brooking J. Community psychiatric nurses in primary health care. *Br J Psychiatry*. 1994;165(2):231-8.
69. Kendrick T, Simons L, Mynors-Wallis L, Gray A, Lathlean J, Pickering R, et al. Cost-effectiveness of referral for generic care or problem-solving treatment from community mental health nurses, compared with usual general practitioner care for common mental disorders: Randomised controlled trial. *Br J Psychiatry*. 2006;189:50-9.
70. Campbell MK, Grimshaw JM. Cluster randomised trials: time for improvement. The implications of adopting a cluster design are still largely being ignored. *BMJ*. 1998;317(7167):1171-2.
71. Campbell MK, Elbourne DR, Altman DG. CONSORT statement: extension to cluster randomised trials. *Bmj*. 2004;328(7441):702-8.
72. Sheehan D, Lecrubier Y, Sheehan K, Amorim P, Janavas J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): The Development and Validation of a Structured Diagnostic Psychiatric Interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*. 1998;59(suppl. 20):22-33.
73. Lecrubier Y, Sheehan D, Weiller E, Amorim P, Bonora I, Sheehan K, et al. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. *European Psychiatry*. 1997;12:224-31.
74. Overbeek T, Schruers K, Griez E. MINI-The International Neuropsychiatric Interview: Dutch version 5.0.0 DSM-IV. Internal Publication University of Maastricht: Maastricht., 1999.
75. Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale--preliminary report. *Psychopharmacol Bull*. 1973;9(1):13-28.
76. Arrindell W, Ettema J. Manual of a Multidimensional Indicator of Psychopathology [in Dutch]. Netherlands: Swets Test Publishers, 1986.
77. Group TW. Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. *Psychological Medicine*. 1998;28:551-8.
78. Kok I, van Wijngaarden B. Client Appreciation in Mental Health Care: Manual of the Dutch Mental Healthcare Thermometer of Appreciation by Clients [in Dutch]. Utrecht: Trimbos-instituut/GGZ Nederland, 2003.
79. Rijnders P, de Jong T, Isebaert, L, van Tilburg, C, van den Amelee, H, editor. Practice Model [in Dutch]. Houten/Diegem: Bohn Stafleu van Loghum; 2002.

80. Killip S, Mahfoud Z, Pearce K. What is an intracluster correlation coefficient? Crucial concepts for primary care researchers. *Ann Fam Med*. 2004;2(3):204-8.
81. Raudenbush S, Bryk A. Hierarchical Linear Models. Applications and Data Analysis Methods Second edition ed. Newbury Park,CA: Sage Publications; 2002.
82. Rasbash J, Steele F, Browne W, Prosser B. A User's Guide to MLwiN. 2.0 ed: Centre for Multilevel Modelling, University of Bristol; 2005.
83. Emmanuel JS, McGee A, Ukoumunne OC, Tyrer P. A randomised controlled trial of enhanced key-worker liaison psychiatry in general practice. *Soc Psychiatry Psychiatr Epidemiol*. 2002;37(6):261-6.
84. Verhaak PF, van den Brink-Muinen A, Bensing JM, Gask L. Demand and supply for psychological help in general practice in different European countries: access to primary mental health care in six European countries. *Eur J Public Health*. 2004;14(2):134-40.
85. Kates N, Craven, M.A., Crustolo, A.-M., Nikolaou, L. Mental health Services in the Family Physician's Office: A Canadian Experiment. *Israelian Journal of Related Sciences*. 1998;35(2):104-13.
86. Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. *Int J Epidemiol*. 2014;43(2):476-93.
87. Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jonsson B, et al. The size and burden of mental disorders and other disorders of the brain in Europe 2010. *Eur Neuropsychopharmacol*. 2011;21(9):655-79.
88. Wittchen HU, Jacobi F. Size and burden of mental disorders in Europe--a critical review and appraisal of 27 studies. *Eur Neuropsychopharmacol*. 2005;15(4):357-76.
89. Smit F, Cuijpers P, Oostenbrink J, Batelaan N, de Graaf R, Beekman A. Costs of nine common mental disorders: implications for curative and preventive psychiatry. *J Ment Health Policy Econ*. 2006;9(4):193-200.
90. Gilbody S, Bower P, Whitty P. Costs and consequences of enhanced primary care for depression: systematic review of randomised economic evaluations. *Br J Psychiatry*. 2006;189:297-308.
91. Van't Veer-Tazelaar P, Smit F, van Hout H, van Oppen P, van der Horst H, Beekman A, et al. Cost-effectiveness of a stepped care intervention to prevent depression and anxiety in late life: randomised trial. *Br J Psychiatry*. 196:319-25.
92. Gournay K, Brooking J. The community psychiatric nurse in primary care: an economic analysis. *J Adv Nurs*. 1995;22(4):769-78.
93. Katon W, Russo J, Sherbourne C, Stein MB, Craske M, Fan MY, et al. Incremental cost-effectiveness of a collaborative care intervention for panic disorder. *Psychol Med*. 2006;36(3):353-63.
94. Bower P, Rowland N. Effectiveness and cost effectiveness of counselling in primary care. *Cochrane Database Syst Rev*. 2006(3):CD001025.
95. Drummond C, Coulton S, James D, Godfrey C, Parrott S, Baxter J, et al. Effectiveness and cost-effectiveness of a stepped care intervention for alcohol use disorders in primary care: pilot study. *Br J Psychiatry*. 2009;195(5):448-56.

96. van Orden M, Hoffman T, Haffmans J, Spinhoven P, Hoencamp E. Collaborative mental health care versus care as usual in a primary care setting: a randomized controlled trial. *Psychiatr Serv.* 2009;60(1):74-9.
97. Rijnders P, De Jong T, Isebaert L, Van Tilburg C, Van den Ameele H. Kortdurend behandelen in de GGZ: de praktijk. Houten/Diegem: Bohn Stafleu Van Loghum; 2002.
98. Ettema JHM, Arrindel WA. SCL-90, Handleiding bij een multidimensionele psychopathologie indicator. . Amsterdam: Pearson; 2003.
99. Hakkaart-van Roijen L. [Manual Trimbo's/IMTA questionnaire for costs associated with psychiatric illness In Dutch]. Rotterdam: Institute for Medical Technology Assessment; 2002, 2002.
100. van Orden ML, Deen ML, Spinhoven P, Haffmans J, Hoencamp E. Five-Year Mental Health Care Use by Patients Referred to Collaborative Care or to Specialized Care. *Psychiatr Serv.* 2015;66(8):840-4.
101. Oostenbrink JB, Bouwmans CAM, Koopmanschap MA, Rutten FFH. Handleiding voor kostenonderzoek. Methoden en standaard kostprijzen voor economische evaluaties in de gezondheidszorg. Rotterdam: Instituut voor Medical Technology Assessment, Erasmus MC, 2004.
102. Koopmanschap MA, Rutten FF, van Ineveld BM, van Roijen L. The friction cost method for measuring indirect costs of disease. *J Health Econ.* 1995;14(2):171-89.
103. van Buuren S. Multiple imputation of discrete and continuous data by fully conditional specification. *Stat Methods Med Res.* 2007;16(3):219-42.
104. Ng E, Grieve R. Two-stage nonparametric bootstrap sampling with shrinkage correction for clustered data. *The Stata Journal.* 2013;13:141-64.
105. O'Brien BJ, Gertsen K, Willan AR, Faulkner LA. Is there a kink in consumers' threshold value for cost-effectiveness in health care? *Health Econ.* 2002;11(2):175-80.
106. Willan AR, O'Brien BJ, Leyva RA. Cost-effectiveness analysis when the WTA is greater than the WTP. *Stat Med.* 2001;20(21):3251-9.
107. Severens JL, Brunenberg DE, Fenwick EA, O'Brien B, Joore MA. Cost-effectiveness acceptability curves and a reluctance to lose. *Pharmacoeconomics.* 2005;23(12):1207-14.
108. Evans CJ, Crawford B. Data collection methods in prospective economic evaluations: how accurate are the results? *Value Health.* 2000;3(4):277-86.
109. Fewtrell MS, Kennedy K, Singhal A, Martin RM, Ness A, Hadders-Algra M, et al. How much loss to follow-up is acceptable in long-term randomised trials and prospective studies? *Arch Dis Child.* 2008;93(6):458-61.
110. Schaefer BA, Koeter MW, Wouters L, Emmelkamp PM, Schene AH. What patient characteristics make clinicians recommend brief treatment? *Acta Psychiatr Scand.* 2003;107(3):188-96.
111. Meeuwissen JA, van der Feltz-Cornelis CM, van Marwijk HW, Rijnders PB, Donker MC. A stepped care programme for depression management: an uncontrolled pre-post study in primary and secondary care in The Netherlands. *Int J Integr Care.* 2008;8:e05.
112. WHO. The World Health Report 2001. Mental Health: New Understanding, New Hope. Geneva: World Health Organization. , 2001.

113. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *Journal of health and social behavior*. 1995;36(1):1-10.
114. Lindsay Nour BME, Jon D.; Ford, Julian D.; Frueh, B. Christopher The role of physical health functioning, mental health, and sociodemographic factors in determining the intensity of mental health care use among primary care medical patients. *Psychological Services*. 2009;6(4):243-52.
115. Guy W. CGI-Clinical Global Impression. Rockville, MD: National Institute of Mental Health; 1976. 217-22 p.
116. Muthén LKaM, B.O. Mplus User's Guide. Sixth Edition ed: Los Angeles, CA: Muthén & Muthén; 1998-2010.
117. Babitsch B, Gohl D, von Lengerke T. Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998-2011. *Psychosoc Med*. 2012;9:Doc11.
118. van de Ven W, Schut F. Universal Mandatory Health Insurance In The Netherlands: A Model For The United States? *Health Affairs*. 2008;27(3):771-81.
119. Aoun S, Pennebaker D, Wood C. Assessing population need for mental health care: a review of approaches and predictors. *Ment Health Serv Res*. 2004;6(1):33-46.
120. Sareen J, Stein MB, Campbell DW, Hassard T, Menec V. The relation between perceived need for mental health treatment, DSM diagnosis, and quality of life: a Canadian population-based survey. *Can J Psychiatry*. 2005;50(2):87-94.
121. Gallucci G, Swartz W, Hackerman F. Impact of the wait for an initial appointment on the rate of kept appointments at a mental health center. *Psychiatr Serv*. 2005;56(3):344-6.
122. Archer J, Bower P, Gilbody S, Lovell K, Richards D, Gask L, et al. Collaborative care for depression and anxiety problems. *The Cochrane database of systematic reviews*. 2012;10:CD006525.
123. Bartels SJ, Coakley EH, Zubritsky C, Ware JH, Miles KM, Areal PA, et al. Improving access to geriatric mental health services: a randomized trial comparing treatment engagement with integrated versus enhanced referral care for depression, anxiety, and at-risk alcohol use. *Am J Psychiatry*. 2004;161(8):1455-62.
124. Katon W, Russo J, Von Korff M, Lin E, Simon G, Bush T, et al. Long-term effects of a collaborative care intervention in persistently depressed primary care patients. *Journal of general internal medicine*. 2002;17(10):741-8.
125. Unutzer J, Katon WJ, Fan MY, Schoenbaum MC, Lin EH, Della Penna RD, et al. Long-term cost effects of collaborative care for late-life depression. *The American journal of managed care*. 2008;14(2):95-100.
126. Rijnders P, Heene, E, editor. *Brief Psychological Interventions for the Primary Care Setting [in Dutch]*. Amsterdam: Uitgeverij Boom; 2014.
127. van Vliet IM, de Beurs E. [The MINI-International Neuropsychiatric Interview. A brief structured diagnostic psychiatric interview for DSM-IV en ICD-10 psychiatric disorders]. *Tijdschrift voor psychiatrie*. 2007;49(6):393-7.
128. Team RDC, editor. *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing; 2008.

129. Skauk H, Bolker, B., & Magnussen, A. . glmmADMB: generalized linear mixed models using ADMB [14-01-2014]. Available from: <http://r-forge.r-project.org/projects/glmmadmb/>.
130. Fournier DA, H.J. Skaug, J. Ancheta, J. Ianelli, A. Magnusson, M.N. Maunder, A. Nielsen, and J. Sibert. AD Model Builder: using automatic differentiation for statistical inference of highly parameterized complex nonlinear models. *Optimization Methods and Software*. 2012;27(2):233-49.
131. Akaike H. A new look at the statistical model identification. *IEEE Transactions on Automatic Control*. 1974;AC-19(6):716-23.
132. Pomerantz AS, Shiner B, Watts BV, Detzer MJ, Kutter C, Street B, et al. The White River model of colocated collaborative care: A platform for mental and behavioral health care in the medical home. *Families, systems & health : the journal of collaborative family healthcare*. 2010;28(2):114-29.
133. Fleury MJ, Imboua A, Aube D, Farand L. Collaboration between general practitioners (GPs) and mental healthcare professionals within the context of reforms in Quebec. *Mental health in family medicine*. 2012;9(2):77-90.
134. GGz LP. Governmental agreement future mental health care sector 2013–2014 [in Dutch] 2012 [updated 08-03-2014]. Available from: <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/06/18/bestuurlijk-akkoord-toekomst-ggz-2013-2014.html>.
135. Barak A, Grohol JM. Current and Future Trends in Internet-Supported Mental Health Interventions. *Journal of Technology in Human Services*. 2011;29:155-96.
136. Baumeister H, Reichler L, Munzinger M, Lin J. The impact of guidance on Internet-based mental health interventions — A systematic review. *Internet Interventions*. 2014;1(4):205-15.
137. Richards D, Richardson T. Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clin Psychol Rev*. 2012;32(4):329-42.
138. Andersson G, Cuijpers P, Carlbring P, Riper H, Hedman E. Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World Psychiatry*. 2014;13(3):288-95.
139. Andrews G, Cuijpers P, Craske MG, McEvoy P, Titov N. Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PLoS One*. 2010;5(10):e13196.
140. Gainsbury S, Blaszczynski A. A systematic review of Internet-based therapy for the treatment of addictions. *Clin Psychol Rev*. 2011;31(3):490-8.
141. Wilhelmsen M, Lillevoll K, Risor MB, Hoifodt R, Johansen ML, Waterloo K, et al. Motivation to persist with internet-based cognitive behavioural treatment using blended care: a qualitative study. *BMC Psychiatry*. 2013;13:296.
142. Kaltenthaler E, Sutcliffe P, Parry G, Beverley C, Rees A, Ferriter M. The acceptability to patients of computerized cognitive behaviour therapy for depression: a systematic review. *Psychol Med*. 2008;38(11):1521-30.
143. Newman MG, Szokodny LE, Llera SJ, Przeworski A. A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy? *Clin Psychol Rev*. 2011;31(1):89-103.

144. Lancee J, van den Bout J, Sorbi MJ, van Straten A. Motivational support provided via email improves the effectiveness of internet-delivered self-help treatment for insomnia: a randomized trial. *Behav Res Ther.* 2013;51(12):797-805.
145. Kaltenthaler E, Brazier J, De Nigris E, Tumor I, Ferriter M, Beverley C, et al. Computerised cognitive behaviour therapy for depression and anxiety update: a systematic review and economic evaluation. *Health Technol Assess.* 2006;10(33):iii, xi-xiv, 1-168.
146. Tate DF, Finkelstein EA, Khavjou O, Gustafson A. Cost effectiveness of internet interventions: review and recommendations. *Ann Behav Med.* 2009;38(1):40-5.
147. Lal S, Adair CE. E-mental health: a rapid review of the literature. *Psychiatr Serv.* 2014;65(1):24-32.
148. Ruwaard J, Kok R. Wild west eHealth: Time to hold our horses? *The European Health Psychologist.* 2015;17(1):45-9.
149. Mair FS, May C, O'Donnell C, Finch T, Sullivan F, Murray E. Factors that promote or inhibit the implementation of e-health systems: an explanatory systematic review. *Bull World Health Organ.* 2012;90(5):357-64.
150. May CR, Mair F, Finch T, MacFarlane A, Dowrick C, Treweek S, et al. Development of a theory of implementation and integration: Normalization Process Theory. *Implement Sci.* 2009;4:29.
151. van Orden M, Leone S, Haffmans J, Spinhoven P, Hoencamp E. Prediction of Mental Health Services Use One Year After Regular Referral to Specialized Care Versus Referral to Stepped Collaborative Care. *Community Ment Health J.* 2016.
152. Bickman L, Douglas SR, De Andrade AR, Tomlinson M, Gleacher A, Olin S, et al. Implementing a Measurement Feedback System: A Tale of Two Sites. *Adm Policy Ment Health.* 2016;43(3):410-25.
153. Beckstead DJ, Hatch AL, Lambert MJ, Eggett DL, Goates MK, Vermeersch DA. Clinical significance of the Outcome Questionnaire (OQ-45.2). *The Behavior Analyst Today.* 2003;4(1):86.
154. de Jong K, Nugter A, Lambert MJ, Burlingame GM. The Outcome Questionnaire OQ-45.2 Manual [Handleiding voor afname en scoring van de Outcome Questionnaire OQ-45.2]. Salt Lake City: OQ Measures LLC, 2008.
155. IBM SPSS Statistics for Windows, Version 23.0 [Internet]. Armonk, NY: IBM Corp. 2015.
156. Bates D, Mächler M, Bolker B, Walker S. Fitting linear mixed-effects models using lme4. *arXiv preprint arXiv:14065823.* 2014.
157. Christensen RHB. Regression Models for Ordinal Data [R package ordinal version 2015.6-28]. 2016.
158. Team RC. R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing; 2016. Available from: <https://www.R-project.org/>.
159. Gleacher AA, Olin SS, Nadeem E, Pollock M, Ringle V, Bickman L, et al. Implementing a Measurement Feedback System in Community Mental Health Clinics: A Case Study of Multilevel Barriers and Facilitators. *Adm Policy Ment Health.* 2016;43(3):426-40.
160. Schut E, Sorbe S, Hoj J. Health Care Reform and Long-Term Care in the Netherlands. OECD Economics Department Working Papers, No. 1010, OECD Publishing, 2013.

161. Murray E, Burns J, May C, Finch T, O'Donnell C, Wallace P, et al. Why is it difficult to implement e-health initiatives? A qualitative study. *Implement Sci.* 2011;6:6.
162. Briggs A. Economic evaluation and clinical trials: size matters. *BMJ.* 2000;321(7273):1362-3.
163. O'Sullivan AK, Thompson D, Drummond MF. Collection of health-economic data alongside clinical trials: is there a future for piggyback evaluations? *Value Health.* 2005;8(1):67-79.
164. McKenzie K, Whitley R, Weich S. Social capital and mental health. *Br J Psychiatry.* 2002;181:280-3.
165. Thoits PA. Mechanisms linking social ties and support to physical and mental health. *Journal of health and social behavior.* 2011;52(2):145-61.
166. van de Ven WP, Schut FT. Universal mandatory health insurance in the Netherlands: a model for the United States? *Health Aff (Millwood).* 2008;27(3):771-81.
167. Becker AE, Kleinman A. Mental health and the global agenda. *N Engl J Med.* 2013;369(1):66-73.
168. Nederland P, Ieder[in], GGZ/MIND LP. Verkiezingen 2017. De ervaringen van patiënten en cliënten in de zorg en hulpverlening gedurende de afgelopen 4 jaar en hun inbreng voor de komende kabinetsperiode. Utrecht: 2017.
169. Jacka FN, Reavley NJ, Jorm AF, Toumbourou JW, Lewis AJ, Berk M. Prevention of common mental disorders: what can we learn from those who have gone before and where do we go next? *Aust N Z J Psychiatry.* 2013;47(10):920-9.
170. Lambert MJ. Outcome in psychotherapy: the past and important advances. *Psychotherapy (Chic).* 2013;50(1):42-51.
171. Bao Y, Druss BG, Jung HY, Chan YF, Unutzer J. Unpacking Collaborative Care for Depression: Examining Two Essential Tasks for Implementation. *Psychiatr Serv.* 2016;67(4):418-24.
172. Van den Broeck K, Remmen R, Vanmeerbeek M, Destoop M, Dom G. Collaborative care regarding major depressed patients: A review of guidelines and current practices. *J Affect Disord.* 2016;200:189-203.
173. Chekroud AM, Zotti RJ, Shehzad Z, Gueorguieva R, Johnson MK, Trivedi MH, et al. Cross-trial prediction of treatment outcome in depression: a machine learning approach. *Lancet Psychiatry.* 2016;3(3):243-50.
174. Weber GM, Mandl KD, Kohane IS. Finding the missing link for big biomedical data. *JAMA.* 2014;311(24):2479-80.
175. Wylie JE, Mineau GP. Biomedical databases: protecting privacy and promoting research. *Trends in biotechnology.* 2003;21(3):113-6.

List of Publications

This thesis

Van Orden, M., Hoffman, T., Haffmans, J., Spinhoven, P., & Hoencamp, E. (2009). Collaborative mental health care versus care as usual in a primary care setting: a randomized controlled trial. *Psychiatric Services*, 60(1), 74-79.

van Orden, M. L., Deen, M. L., Spinhoven, P., Haffmans, J., & Hoencamp, E. (2015). Five-year mental health care use by patients referred to collaborative care or to specialized care. *Psychiatric Services*, 66(8), 840-844.

van Orden, M., Leone, S., Haffmans, J., Spinhoven, P., & Hoencamp, E. (2017). Prediction of mental health services use one year after regular referral to specialized care versus referral to stepped collaborative care. *Community mental health journal*, 53(3), 316-323.

van Orden, M.L, Deen, M.L., Stant, A.D, Spinhoven, P., Haffmans, P.M.J. & Hoencamp, E. (submitted). Cost-effectiveness of collaborative care versus specialized care for common mental disorders.

van Orden, M.L., Deen, M.L., Spinhoven P., Tiemens, B.G, Haffmans, P.M.J.& Hoencamp, E. (submitted). The association of implementation factors with the uptake and utilization of blended collaborative mental health care: the importance of the organizational structure.

Other papers

Van Orden, M. L. (2002) Project 'Samenwerking huisartsen – GGZ Den Haag'. Een eerste evaluatie. *Epidemiologisch bulletin*, 37(2).

Van Orden, M.L., Roosenschoon, B., Polman, A. (2014) Onbewust bekwaam – Richtlijnengebruik getoetst. *Maandblad Geestelijke Volksgezondheid*, 69(06); 19-21.

van Orden, M., Smit, R., Velders, E., van de Ven, M., Vranckx, G., & van Weeghel, J. (2016). Uit het sociale isolement – De integratie van een sociale trainingstool in de reguliere zorg voor cliënten met ernstige psychiatrische aandoeningen. *Participatie en Herstel*; Vol. 2016, No. 1.

van Mens, K., Lokkerbol, J., Janssen, R., van Orden, M., Kloos, M., Tiemens, B. (submitted). A cost-utility analysis to evaluate a system change in mental healthcare in the Netherlands for patients with depression or anxiety.

Van Orden, M., den Hollander, N. (submitted). Herstelgerichte ‘blended’ cognitieve gedragstherapie voor cliënten met verslavingsproblematiek: kansen en uitdagingen.

Curriculum Vitae

Mirjam van Orden was born on the 13th of August 1976 in Leonberg, Germany. She completed her pre-university education in 1996 at the Hedwig-Dohm-Gymnasium in Stuttgart, Germany, and moved to the Netherlands to study psychology at the University of Amsterdam. She received her Master in 2001. She did a combined clinical/research internship at Parnassia in The Hague. She completed the research internship at the Parnassia Research Centre, where she participated in various ongoing studies, among which the evaluation of an outpatient treatment program for depressed patients. She completed her clinical internship at Parnassia's outpatient center.

Mirjam started her career in 2000 at the Parnassia Groep as a researcher and trainer. Since then she is involved in ongoing studies to investigate the feasibility, implementation and expediency of the collaborative care program and other research projects aimed to investigate and improve feasibility and quality of mental health care. Besides her research work she was involved with Routine Outcome Monitoring as a project manager (2009-2016) and a research coordinator of Indigo Parnassia Groep, a department of the Parnassia Groep, that provides mental health care in collaboration with general practitioners (2011-2016). In addition to her research work, she was a trainer in the Mini International Neuropsychiatric Interview from 2004 until 2015.

Currently, she works as a staff member for the Parnassia Academy and her main research focus is on the implementation and evaluation of digital care innovation.

Mirjam is married and has a son and a daughter.

Dankwoord

“Gut Ding will Weile haben” zouden ze in Duitsland zeggen. Het heeft me behoorlijk wat jaren gekost om dit proefschrift te voltooien. Op sommige momenten twijfelde ik zelfs of het ooit nog wel zou afkomen. Dan leek die spreekwoordelijke berg (werk) zo hoog en onbeklimbaar. Bijna onwerkelijk, maar oh zo goed voelde het dat je ineens kon zeggen dat je bezig bent met het schrijven van de inleiding de discussie, dat het manuscript af is en bij de leescommissie ligt, dat de leescommissie het manuscript positief heeft beoordeeld en uiteindelijk dat er een datum is.

“Gut Ding will Weile haben” Is dat altijd wel waar? Ik denk van niet. Het onderwerp van het proefschrift ‘Collaborative mental health care. Changing the landscape of mental health care?’ geeft wel aan dat er tijd voor nodig is om een landschap te zien veranderen en in kaart te brengen. Maar bij het werken aan dit proefschrift schoot ik soms door omstandigheden maar ook mijn eigen grenzen gewoon niet voldoende op. Inhoudelijk was het Huisartsenproject (HAP), later Huisartsenprogramma (ook HAP) dat vervolgens onderdeel werd van Indigo, een goede ontwikkeling. Het idee en de uitvoering klopten gewoon. Professionele hulpverlening in de leefomgeving van de cliënt in de vertrouwde omgeving van de huisarts, zonder wachttijden, geen drempels.

Felix Olthuis en Erik Hoencamp, de bedenkers van het oorspronkelijke Huisartsenproject, hebben mij op voordracht van Judith Haffmans het vertrouwen en de kans gegeven om het eerste evaluatieonderzoek van het Huisartsenprogramma uit te voeren en na afloop daarvan om door te gaan met dit promotieonderzoek. Veel huisartsen uit de Haagse regio waren enthousiast om aan het HAP deel te nemen. Daarvan hebben 27 de moeite genomen om te participeren in en bij te dragen aan de dataverzameling voor dit promotieonderzoek. Collega's van het HAP en later Indigo en hun management, directie en stafmedewerkers, die ervoor hebben gezorgd en er nog steeds voor zorgen, dat cliënten (bewezen) goede zorg krijgen. En uiteraard alle cliënten, die hebben geparticipeerd in dit onderzoek en bereid waren om mij en mijn onderzoeksassistente een jaar lang regelmatig te woord te staan en vragenlijsten in te vullen.

Een onderzoek voer je niet in je eentje uit. Promotoren Erik Hoencamp, Philip Spinhoven en co-promotor Judith Haffmans, met jullie specifieke deskundigheid, wederzijds respect en door jullie onaflatende steun en motivatie hebben jullie voor een belangrijk deel bijgedragen aan dit resultaat. Samen met mijn onderzoeksassistente Leonie Dijkhuizen heb ik destijds 165 deelnemers aan het onderzoek geïnterviewd. We waren in die tijd veel op pad en hebben veel indrukken opgedaan. Fijn dat je mijn paranimf wilde zijn, Leonie. Zonder de ondersteuning van eerst Tonko Hoffman en naderhand Mathijs Deen was de statistiek een nog grotere opgave geweest dan dat ze nu al was.

Al die jaren dat ik onder andere aan dit proefschrift heb gewerkt, heb ik geweldige collega's om me heen gehad bij de Parnassia Groep, onder andere op de afdeling Wetenschappelijk onderzoek, het HAP en Indigo Zorgservice, en het team specialisme-ondersteuning. Collega's, die je inspireren, waarmee je kunt samenwerken, waarvan je kunt leren, die je steunen, waarmee je zowel de vreugdevolle als de verdrietige momenten kunt delen. Verdrietige momenten hebben we gedeeld om Frans Vermeulen, Wim Dijken, Geert de Redelijkheid en Annelies de Sain, bijzondere collega's, die helaas veel te vroeg zijn overleden. Eén van de vele collega's, waarvan ik sinds het begin van mijn carrière veel inspiratie en steun heb ontvangen is Cokky van der Venne. Fijn dat je mijn paranimf wilde zijn, Cokky.

Al deze bovengenoemde met naam of niet met naam genoemde collega's wil ik van harte bedanken voor hun bijdrage (direct of indirect) aan dit proefschrift.

Last but not least, ik ben ervan overtuigd dat dit proefschrift niet tot een succesvol einde was gekomen als er geen goede balans was geweest tussen werk en privé. Voor deze balans hebben jullie, familie, vrienden, maar vooral natuurlijk Tuncay, Sinan en Hannah gezorgd. Belangrijk om te weten en te ervaren dat je de ruimte krijgt van fijne mensen om je heen om jezelf te zijn en tot jezelf te komen en het werk even het werk te laten zijn.

“Gut ding will Weile haben.” In dit geval klopt het, vind ik.

