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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 significantly 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