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Effect of psychiatric consultation models in primary care. A systematic review and meta-analysis of randomized clinical trials ^{☆,☆☆,★}

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Abstract

Objective: Psychiatric consultation in primary care is meant to enhance and improve treatment for mental disorder in that setting. An estimate of the effect for different conditions as well as identification of particularly effective elements is needed. **Methods:** Database search for randomized controlled trials (RCTs) on psychiatric consultation in primary care. Validity assessment and data extraction according to Cochrane criteria were performed by independent assessors in duplicate. Meta-analysis was performed. **Results:** Data were collected from 10 RCTs with a total of 3408 included patients with somatoform disorder or depressive disorder, which compared psychiatric consultation to care as usual (CAU). Meta-analysis irrespective of condition showed a weighted mean indicating a combined assessment of

illness burden as outcome of psychiatric consultation, compared to CAU, of 0.313 (95% CI 0.190–0.437). The effect was especially large in somatoform disorder (0.614; 95% CI 0.206–1.022). RCTs in which after the consult, consultation advice was given by means of a consultation letter, showed a combined weighted mean effect size of 0.561 (95% CI 0.337–0.786), while studies not using such a letter showed a small effect of 0.210 (95% CI 0.102–0.319). Effects are highest on utilization of health care services with 0.507 (95% CI 0.305–0.708). **Conclusion:** Psychiatric consultation in the primary care setting is effective in patients with somatoform and depressive disorder. Largest effects are seen in reduction of utilization of health care services.

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Keywords: Psychiatric consultation; Meta-analysis; Systematic review; Primary care; Collaborative care; Somatoform disorder; Consultation letter

Introduction

Primary care is ‘the point of entry into the health care system and the locus of responsibility for organizing care for patients and populations over time’ [1]. Various

multidisciplinary collaborative care models as well as guidelines for anxiety disorders [2] and depressive disorders [3,4] have been developed in the primary care setting. In these models, access to integrated care is much better guaranteed than by referring the patient to a second-line mental health care setting, as was common practice before [5,6]. Psychiatric consultation has been developed as a way to support family physicians in the implementation of those models and guidelines and in the best and quickest treatment of those patients towards remission [7,8]. However, in general, the effect size of such consultations, and the effectiveness of different models for consultation, has not yet been studied.

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In psychiatric consultation as described by Caplan [9] from the perspective of ‘community mental health,’ the psychiatrist himself sees the patient and provides the family physician with a diagnosis and treatment plan. Afterwards, the family physician continues treatment according to this consultation advice. This psychiatric consultation can take place at the location of the psychiatric practice, as in the studies of Smith et al. [10,11], or at the family practice, where it is mostly done in the presence of the family physician [4,12]. Family physicians appreciate this form of support [13]. Psychiatric consultation is often embedded in a larger collaborative relationship in which other disciplines, especially psychiatric nurses, also play a role, so-called collaborative care. Such collaborative models can take a variety of forms, depending on the psychiatric facilities and the target group [12,14]. In general, such collaboration is considered collaborative care if at least two out of three professionals (family physician, consultant psychiatrist, and care manager) are involved in the treatment of the patient. In such collaboration, the consultant psychiatrist can advise the family physician or the care manager, and perform consultation vis-à-vis the patient during the course of treatment.

As several effect studies have addressed the issue of psychiatric consultation, be it in the context of collaborative care or otherwise, perhaps an estimate can be made of the overall effect, as well as the effect on particular disorders such as somatoform disorder, which is the most difficult problem in primary care, in terms of treatment resistance, and for depressive disorder, the most prevalent. This estimate would be useful in clinical context as well as in the context of health services policies to enhance the treatment of mental disorders in the primary care practice setting. In this article, we review systematically the effects of consultation by a psychiatrist actually seeing the patient, resulting in advice to the family physician in the primary care practice setting, vs. usual care, and perform a meta-analytic synthesis.

Method

From 2006 to 2007, the multidisciplinary workgroup for the guideline ‘consultation psychiatry’ of the Netherlands Psychiatric Association developed a guideline on psychiatric consultation with the scientific support of the Dutch Institute for Healthcare Improvement (CBO), which was published in 2008 [15,16]. The workgroup consisted of a family physician, a specialist in internal medicine, three consultant psychiatrists working in the hospital setting, and three consultant psychiatrists working in the primary care setting. The guideline presents an overview and recommendations on psychiatric consultation both in the hospital setting and in the primary care setting [17]. A systematic review about the effectiveness of psychiatric consultation in the primary care setting was part of this guideline. In this article, this systematic review is updated

and extended with a meta-analysis, according to the PRISMA guidelines [18].

Information sources, eligibility, and search criteria

The workgroup defined the search strategy and the selection criteria. Subsequently, a literature search was performed with support from the CBO. After publication of the guideline, the search was updated and the meta-analysis was performed. Potentially eligible randomized clinical trials were identified by searching the databases PubMed (1949 to June 2009), PsycINFO (1806 to June 2009), EMBASE (1947 to June 2009), and searching the total database of the Cochrane Library (including Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effect, Cochrane Central Register of Controlled Trials, Health Technology Assessment Database, NHS Economic Evaluation Database). MeSH terms and free text terms for ‘consult’ AND ‘consultation’ AND ‘psychiatr*’ AND primary care* OR General Practice* AND ‘RCT’ were used to search PubMed. This search strategy is shown in Appendix A. It was adapted for the other databases. We did not use language restrictions to minimize ‘Tower of Babel Bias’ [19]. The reference lists of selected randomized controlled trials (RCTs) and reviews were checked for missed studies. Personal files of the workgroup members were checked for relevant publications, and experts were consulted about relevant publications in order to identify additional RCTs that were not found by our search strategy. Moreover, studies in the area of consultation were searched in the library of the Netherlands Institute of Mental Health and Addiction. The search was limited to publications until June 2009.

Selection of studies

In this systematic review, RCTs were included that evaluated psychiatric consultation as a standalone intervention, or as part of an intervention such as collaborative care, and reported separate outcomes on this intervention, compared to care as usual (CAU), in primary care patients. Studies of collaborative care were excluded unless the word psychiatrist, or its stem psychiatr*, was in the article. Consultation by psychologists or mental health nurses as such was not included, as they were supposed to use other clinical models than psychiatrists and family physicians and this would have made interpretation difficult. There was no restriction on the kind of mental disorders for which psychiatric consultation was requested. The trials should assess the effect of the psychiatric consultation, or psychiatric consultation as part of an organizational intervention such as collaborative care. It should be consultation performed by a psychiatrist actually seeing the patient, and the advice should be given to the family physician. Principal outcomes had to be defined in quantitative measures in order to make meta-analysis

possible. Trials that focused on the effects of psychiatric consultation in populations of patients with medical comorbidity, i.e., diabetes mellitus, were included. Studies were included whether randomization was performed between patients or between general practices or family physicians [20]. In Table 2 it is specified which studies used such a design.

Risk of bias assessment

The workgroup performed risk of bias assessment with two independent assessors (TvO, CFC) who were unaware of each other's assessments; if assessments differed, they were discussed until a consensus was reached. The studies were checked according to the Cochrane quality criteria [21], of which randomization was considered the most important [20]. The results of this risk-of-bias assessment are shown in a risk-of-bias table (Table 1).

Data collection process

Data extraction was performed independently and in duplicate by two members of the workgroup (AL, CFC).

Data items—study characteristics

Type of study design

Randomized controlled trials.

Details of the intervention

Prerequisite for the inclusion was that the intervention should be sufficiently described to classify it as a vis-à-vis psychiatric consultation in which the psychiatrist actually saw the patient and gave the family physician advice, after which the family physician would continue treatment and the consultant psychiatrist would withdraw. There was no selection on such consultation as standalone intervention or as part of a collaborative care intervention. The psychiatric consultation could be performed by a psychiatrist visiting

the family practice and actually seeing patients as part of consultation, or seeing the patient vis-à-vis in his own practice and providing the family physician with advice afterwards. He could see the patient together with the family physician or alone. He would see the patient only once. Advice could be given by consultation letter or otherwise; contact between consultant and family physician about the advice could be more than once, if needed, up to a maximum of three times, if specified. The only further requirement would be that the consultant would give advice to the family physician and not take over treatment himself, as that would be considered a referral, not a consultation.

Models in which the consultant provided advice not only to the family physician but also to the practice nurse or care manager were acceptable as well. Telemedicine consultation was not included.

Collaborative care models that included a psychiatric dimension provided by a nurse, i.e., some kind of motivational interviewing done by the nurse without direct consultation and advice of the psychiatrist towards the family physician, were not included, as nurses and physicians differ fundamentally in terms of their clinical models and mixing both models would have limited the scope of the interpretation of the outcome of this meta-analysis.

The interventions were classified as follows, as can be seen in Table 2:

- (1) Collaborative care with psychiatrist giving consultation vis-à-vis to patient in the primary care practice; and psychiatrist supervising care manager and family physician
- (2) Single psychiatric consultation vis-à-vis with patient in the primary care practice, in the presence of family physician; and advising family physician and patient by consultation letter (CL)
- (3) Collaborative care with psychiatrist giving consultation vis-à-vis to patient in the primary care practice, and advising family physician

Table 1
Risk-of-bias table of all included studies (N=10)

Author (year)	Sequence generation method described	Allocation concealment	Blind outcome assessor	Blind other	Loss to follow-up/intention-to-treat analysis reported	Selective outcome reporting	Other bias	Appraisal of quality
Katon et al., 1995 [35]	Yes	Unclear	Yes	No	Yes	No	No	Very good
Katon et al., 2004 [36]	Yes	Unclear	Yes	No	Yes	No	No	Very good
Unützer et al., 2002 [38]	Yes	Yes	Yes	No	Yes	No	No	Excellent
Hunkeler et al., 2006 [39]	Yes	Yes	Yes	No	Yes	No	No	Excellent
Van der Feltz-Cornelis et al., 2006 [7]	Yes	Yes	Yes	No	Yes	No	No	Excellent
Katon et al., 1992 [12]	Yes	Unclear	Yes	No	Unclear	No	No	Good
Katzelnick et al., 2000 [40]	Yes	Yes	Yes	No	Yes	No	No	Excellent
Katon et al., 1999 [37]	Yes	Unclear	Yes	No	Yes	No	No	Very good
Smith et al., 1986 [10]	Yes	Yes	Yes	No	Yes	No	No	Excellent
Smith et al., 1995 [11]	Yes	Unclear	Yes	No	Unclear	No	No	Good

Table 2
Summary of studies into the efficacy of psychiatric consultation in general practice

Study	Study design	N	Psychiatric diagnosis	Outcome compared to CAU	Level of proof [22]
<i>Collaborative care with psychiatrist giving consultation vis-à-vis to patient in the primary care practice, and psychiatrist supervising CM and advising FP</i>					
Katon et al., 1995 [35]	RCT	1 clinic with 22 family physicians. 217 patients	Depression	– Improved adherence to medication – Improved depression outcome in major depressive disorder	1B
Katon et al., 2004 [36]	RCT. Pathways Study	9 clinics from a HMO. 329 patients	Comorbid depression in diabetes mellitus	– Improved depression outcomes – No significant improvement in glycemic control	1B
Unützer et al., 2002 [38]	RCT	18 clinics from 8 HMOs. 1801 patients	Late-life depression (≥60 years old)	– Improvement of general functioning – Improvement of depressive symptoms	1B
Hunkeler et al., 2006 [39]	RCT IMPACT trial.	18 clinics from 8 HMOs. 1801 patients	Late-life depression (≥60 years old)	– Adherence to treatment improved in long-term – Depression outcomes improved in long-term – General functioning improved in long-term	1B
<i>Single psychiatric consultation vis-à-vis with patient in the primary care practice, in the presence of FP, and advising FP and patient by CL</i>					
Van der Feltz-Cornelis et al., 2006 [7]	RCT. Cluster randomization	36 general practices. 81 patients	Medically unexplained symptoms	– Improvement of social function – Decrease in severity of the physical symptom – Reduction in the utilization of medical care	1B
Katon et al., 1992 [12]	RCT. Cluster randomization	18 clinics. 251 patients.	Distressed high utilizers	– Increase of consumption of antidepressants – Improvement of treatment compliance	1B
Katzelnick et al., 2000 [40]	RCT. Cluster randomization	163 clinics in 3 HMOs. 407 patients.	Depressed high utilizers	– Improved general health status – Improved depression outcomes	1B
<i>Collaborative care with psychiatrist giving consultation vis-à-vis to patient in the primary care practice, and advising FP</i>					
Katon et al., 1999 [37]	RCT	4 clinics with 73 family physicians. 228 patients.	Persistent depression	– Improved adherence to medication – Improved depression outcomes	1B
<i>Single psychiatric consultation, vis-à-vis with patient, not in the family practice, with a CL to FP</i>					
Smith et al., 1986 [10]	RCT. Cluster randomization. Cross-over	38 patients	Somatization disorder	– Reduction in the costs of medical care by 53%	1B
Smith et al., 1995 [11]	RCT. Cluster randomization.	56 patients	Somatoform disorder	– Reduction in the costs of medical care by 33% – Improvement of physical function	1B

- (4) Single psychiatric consultation, vis-à-vis with patient, not in the family practice, with a CL to the family physician.

Patient groups

Studies could include patients with any mental disorder, such as depressive disorder or somatoform disorder; but also patients with ‘unexplained symptoms’ or who were ‘distressed high utilizers’ of the health care system were included.

Outcome definitions

Outcome should define impact of the intervention on the clinical condition of the patients in terms of general and mental well-being, functioning, and health care use. Outcomes should report objective measures of such dimensions and could include severity of mental disorder, general functioning, medical symptoms, and utilization of health care services, as assessed by validated questionnaires or methods. We used the severity of depressive symptoms, a continuous outcome measure, for pooling.

Levels of evidence

Levels of evidence were defined according to the criteria of the Oxford Centre of Evidence Based Medicine [22].

Summary measures

We calculated the effect sizes for each study using a statistical program [23]. As the studies reported on multiple outcomes, we chose to take the following outcome measures into account for the analysis:

- (1) general functioning, in which higher levels would be an improvement of the condition of the patient;
- (2) health care use, in which higher numbers would indicate deterioration of the condition of the patient;
- (3) psychological symptoms, in which lower symptom levels would indicate an improvement; and
- (4) medical symptoms, in which lower symptom levels would indicate an improvement of the clinical condition of the patient as well. We calculated effect sizes for those outcomes and pooled the effect sizes.

Then, we used a weighted mean that should indicate a combined assessment of illness burden. This should be an outcome that establishes the impact of psychiatric consultation on the general clinical condition of the patients. The clinical meaning of this is envisioned to be somewhat similar to an assessment that a clinician would make in order to

indicate if the general clinical condition of a patient improved in terms of psychological and medical symptoms, functioning, and health care (e.g., the Clinical Global Index). For this we used the four outcomes mentioned above and translated those continuous measures to a standardized pooled combined equally weighted effect size with a statistical program that corrects for possible inflated weights in case of multiple outcomes by equal weighting [24]. The program computes the weighted mean for each study, by taking the average of the outcomes and the average variance. This computation assumes that the correlation between the outcomes of one study is 1.0. In fact, this correlation is almost certainly lower than 1.0, so this is a conservative approach, aimed at correcting for possible inflated weight by multiple outcomes.

Synthesis of results

We performed a random-effects meta-analysis [25]. Between-study heterogeneity was assessed using the Q -statistic [26] which reflects the observed dispersion. In order to quantify this dispersion, the I^2 statistic was used, which describes the percentage of total variation across studies that is the result of heterogeneity rather than of chance. Publication bias was examined by constructing a Begg [27] funnel plot and performing the fail-safe N [28]. High-resolution plots are presented. All statistical pooling was conducted using Comprehensive Meta-Analysis, version 2 [24].

Additional pre-envisioned subgroup analyses

In order to deal with possible clinical heterogeneity, subgroup analysis on studies with somatoform disorder vs. depressive disorder, and with different elements in the psychiatric consultation, was performed in the meta-analytic synthesis.

Also, subgroup analysis was performed on studies evaluating several psychiatric consultation models. As not only the combined weighted mean effects may be clinically relevant, but the four outcomes separately as well, we performed a meta-analytic synthesis in terms of pooled effects for the four outcome measures separately.

Results

Study selection

The search yielded 78 hits, including one feasibility study [8], 17 RCTs, two study protocols, and two meta-analyses on collaborative care, which took the effects of the availability of structural consultation for patients with depressive disorder into account [29,30]. Those meta-analytic reviews reviewed 35 of the 37 respective RCTs; however, there was significant overlap between the RCTs that were included. As both were published in 2006, only the meta-analysis of Gilbody et al. [29] was taken into account for this meta-

analysis, as this meta-analysis contained two more RCTs than the other one. The 37 RCTs in this meta-analysis were studied and it turned out that seven RCTs evaluated psychiatric consultation by a psychiatrist actually seeing the patient and giving advice to a family physician in a collaborative care program compared to CAU. Only those seven studies were included. The Cochrane library yielded a study protocol with the title ‘CL letters’ for patients with somatoform disorders in a primary care setting; however, at the time of the meta-analysis, the outcome was not clear yet [31]. The NIMHA Library yielded the evaluation of *Tussen de lijnen* (between the lines) [32], a thesis on psychiatric consultation by Buis [33], and a study by Bensing [34] into the quality of communication during consultation in general practice. However, none of these was included as they were not RCTs but qualitative research. Four other RCTs were not included in this meta-analysis, as they did not report on psychiatric consultation. One of them reported on consultation by psychologists. A check for duplicates was performed. Finally, 10 randomized studies on psychiatric consultation for various forms of somatoform symptoms or disorders as well as depressive disorders were considered for evaluation. Results of the search are shown according to the PRISMA guidelines in the trial flowchart in Fig. 1.

Study characteristics

Study design

The included RCTs are summarized in Table 1. Ten studies were RCTs. The studies of Smith et al. [10,11] performed physician randomization in combination with a crossover design. The studies of Katon et al. [12,35–37], Unutzer et al. [38], and Hunkeler et al. [39] performed patient randomization, and the study of Katzelnick et al. [40], Van der Feltz-Cornelis et al. [7], and Katon et al. [12] performed cluster randomization between primary care practices or physicians. Risk of bias is reported in Table 1. Table 1 shows that the studies do fulfill the majority of criteria to eliminate risk of bias. Taking into account that this kind of intervention cannot be evaluated in a blinded design, the maximum score per study could be 6; all studies scored 4 or higher. Studies not scoring the maximum might be underestimated due to reporting. The method of concealment of allocation for randomization was not always reported, and some studies were unclear about the use of intention-to-treat analysis. All studies were considered of sound quality according to AGREE guidelines [22,41].

Participants' characteristics

Six studies reported on the effect of psychiatric consultation in collaborative care models focused on patients with depressive disorders. The other four studies focused on patients with somatoform disorders, among which somatization disorder [10], somatoform disorder [11], medically unexplained symptoms [7], and distressed high utilizers [12]. These will be summarized as ‘somatoform disorder’.

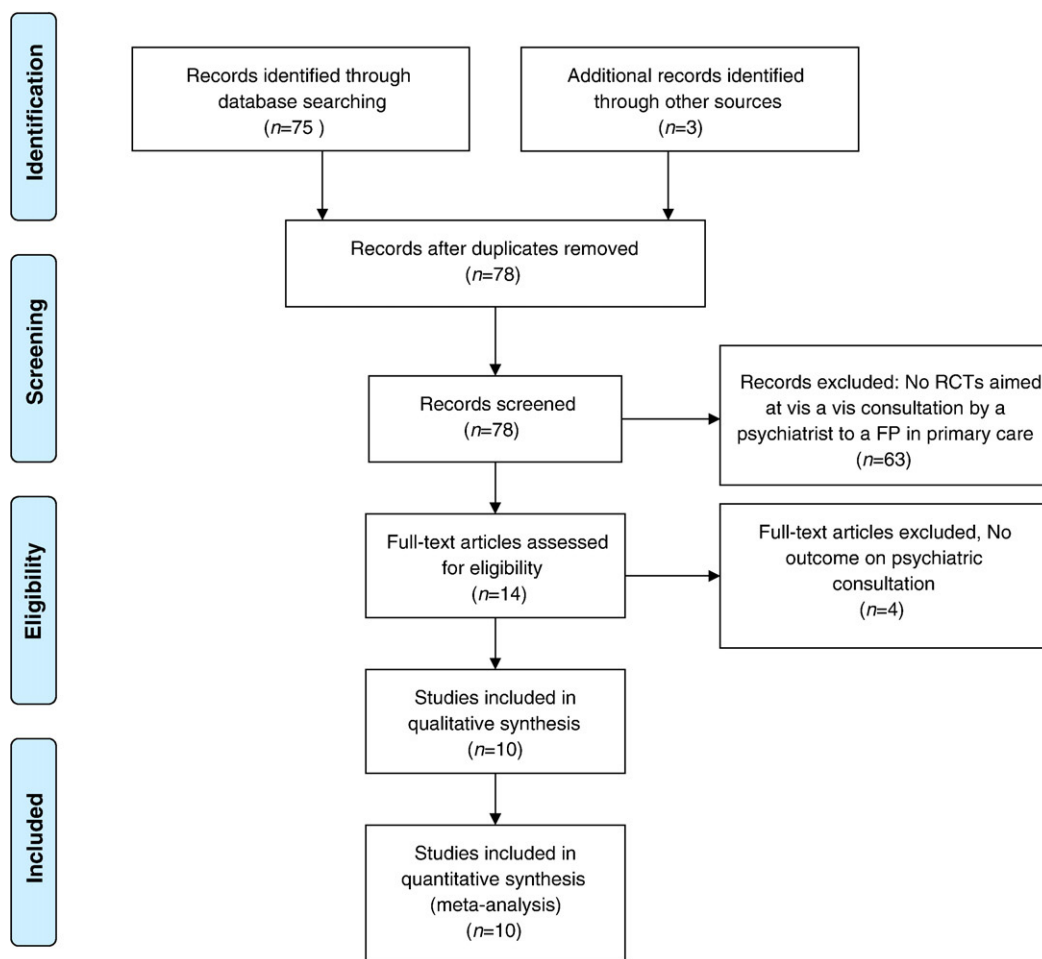


Fig. 1. PRISMA 2009 flow diagram.

Intervention characteristics

The characteristics of the consultation are described in Table 2. In the studies of Van der Feltz-Cornelis et al. [7], Katzelnick et al. [40], and Katon et al. [12], the family physician and the psychiatrist would see the patient together in the family practice setting. The model of Smith et al. [10,11] and Van der Feltz-Cornelis [7] included providing the family physician with a consultation letter, as did the model of Katon et al. [12] from 1992; Van der Feltz-Cornelis et al. provided this letter to the patient as well. In the IMPACT collaborative care model [34–36], consultation was provided by actually seeing the patient in the primary care setting and providing the family physician with consultation advice, and supervising the care manager by telephone supervision. Smith et al. [10,11] did see the patient in the psychiatric setting, not in the primary care practice setting, and provided the family physician with advice in a consultation letter.

Overall meta-analysis

In order to establish the overall effect of any kind of patient-centered psychiatric consultation on any mental

disorder, a first meta-analysis was performed for combined outcomes of all studies taken together. The effects were presented in terms of standardized effect sizes (Cohen's d). These effect sizes indicate by how many standard units the intervention group is better off than the control group on a depression severity scale. The effect size d is usually calculated by subtracting the average score of the control group (M_c) from the average score of the experimental group (M_e) and dividing the raw difference score by the pooled standard deviation of the experimental and control group [42]. An effect size of 0.5 thus indicates that the mean of the experimental group is half a standard unit larger than the mean of the control group. It is generally assumed that an effect size of 0.56 to 1.2 represents a large clinical effect, while effect sizes of 0.33 to 0.55 are moderate and effect sizes of 0 to 0.32 are small [43].

Overall meta-analytic regression for the combined effect on psychological symptoms, general functioning, medical symptoms, and health care use taken together as a weighted mean showed a small to moderate positive effect with all studies favoring the psychiatric consultation condition. The pooled estimate of effect size was 0.313 (95% CI 0.190–

0.437). The forest plot is shown in Fig. 2. Heterogeneity (Q value) of this combined effect of psychiatric consultations for all studies taken together was 28 ($df=9$, $P=.001$). The I^2 statistic was 68%, indicating sufficient heterogeneity to use a random model to fit the data, which was done in this analysis [26].

Subgroup analysis mental disorders

In order to establish whether the heterogeneity was mainly explained by differences between the studies on depressive disorder vs. the studies on somatoform disorder, a separate analysis of studies on depressive disorder and studies on somatoform disorder and symptoms was done.

Depressive disorder

For the meta-analysis on the effect of psychiatric consultation in collaborative care for depressive disorder, the pooled estimate for overall effect was 0.204 (95% CI 0.115–0.294), which is a small but statistically significant effect. This effect is smaller than the abovementioned combined effect for all indications. Q value for these studies was 8 ($df=5$, $P=.122$). The I^2 statistic was 42%, indicating medium heterogeneity levels.

Somatoform disorder and symptoms

For the studies on somatoform disorder or symptoms, the pooled estimate for the combined overall effect was large with an effect size of 0.614 (95% CI 0.206–1.022). Q value for these studies was 11 ($df=3$, $P=.011$). The I^2 statistic was 72%, indicating high heterogeneity [44]. The residuals are all below 1.96, indicating that there are no outliers. This means that the heterogeneity is mostly explained by heterogeneity in studies in somatoform disorder patients, not in the patients

with depressive disorder. This heterogeneity is not explained by outliers. The effect size is significantly higher in somatoform disorder, so a random model should be used to fit the data, which has been done in this analysis. Apparently, part of the heterogeneity can be explained by different patient groups. A high-resolution plot for the pooled estimate of the combined effect in the studies on somatoform disorder or symptoms is shown in Fig. 3.

Subgroup analysis consultation models

In order to establish whether the heterogeneity is explained by differences between consultation models as well, a separate analysis of studies according to type of psychiatric consultation was done. The combined weighted means were compared for:

- (1) psychiatric consultation in the family practice, followed by advice to the family physician, yielding a small effect of 0.281 (95% CI 0.025–0.536);
- (2) psychiatric consultation in the family practice, followed by advice to the family physician and care manager, yielding an even smaller effect: 0.212 (95% CI 0.024–0.400); and
- (3) psychiatric consultation in the family practice in the presence of the family physician, followed by advice to the family physician, yielding a moderate effect of 0.391 (95% CI 0.163–0.620). In this model, studies were included that did report advice in a consultation letter and studies that did not. This model has the highest heterogeneity, with $I^2=83\%$.
- (4) Psychiatric consultation outside of the family practice, followed by advice in a consultation letter to the family physician had a large effect size of 0.564 (95%

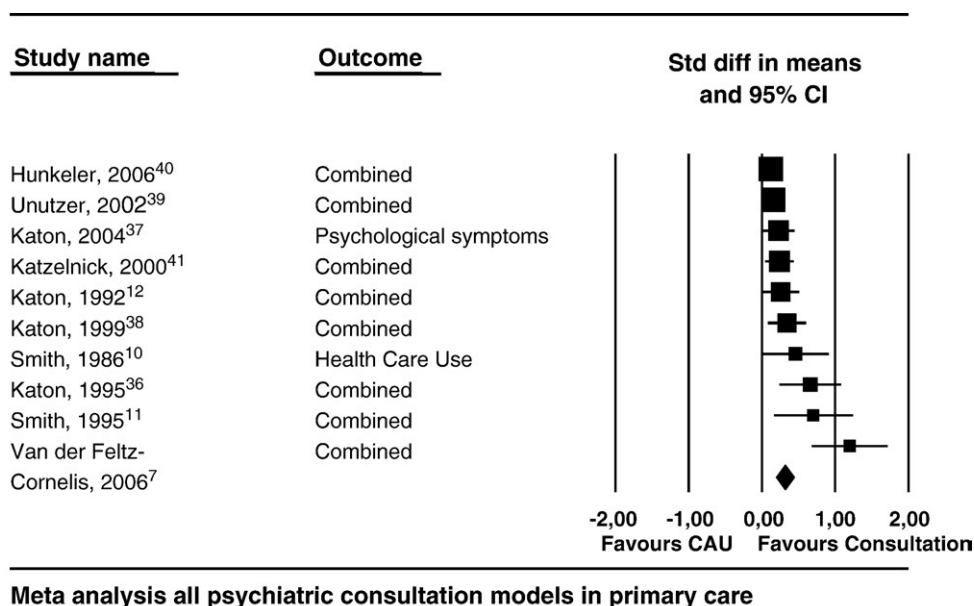


Fig. 2. Combined effect in all studies.

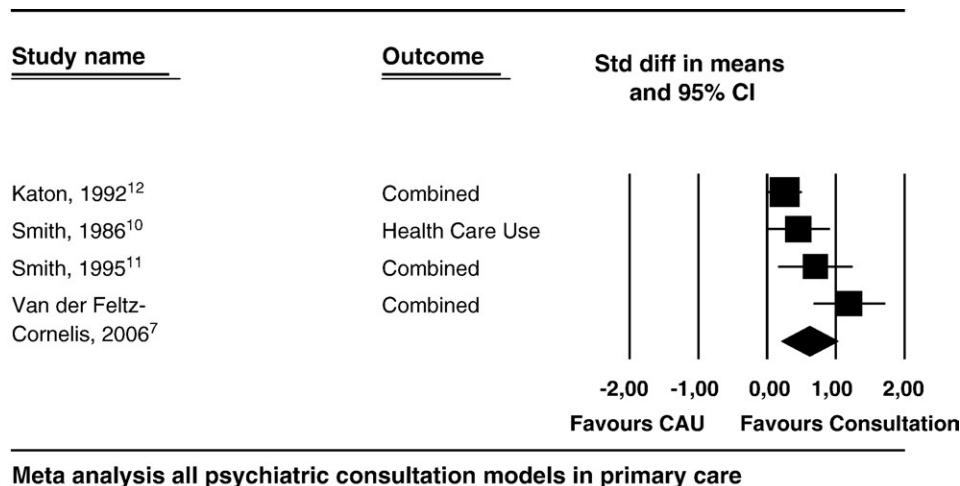


Fig. 3. Combined effect in somatoform disorder.

CI 0.165–0.962). A high-resolution plot for the pooled estimate of the combined effect in the studies on several psychiatric consultation models is shown in Fig. 4.

In a second subgroup analysis, the studies using a consultation letter for the advice to the family physician were compared to the studies in which such a letter was not used. The consultation letter studies showed a large combined weighted mean effect size of 0.561 (95% CI 0.337–0.786). The studies not using such a letter showed a small combined weighted mean effect size of 0.210 (95% CI 0.102–0.319). The variance for the psychiatric consultation models with and without a consultation letter ranges from 0.001 to 0.013, indicating that it is acceptable to perform the analysis

separately for each outcome. With the use of a random-effects model, *Q* between groups is 7 (*df*=1, *P*=.006). This indicates that the treatment effect can differ somewhat among models, but not substantially. Apparently, the heterogeneity in the models is partly explained by the use of a consultation letter for advice. A high-resolution plot for the pooled estimate of the combined effect in the studies on psychiatric consultation with and without a consultation letter is shown in Fig. 5.

Analysis grouped by outcome

An analysis was performed grouped by the four outcomes in the studies. It was performed on all studies on somatoform and depressive disorder taken together. Pooled estimates by

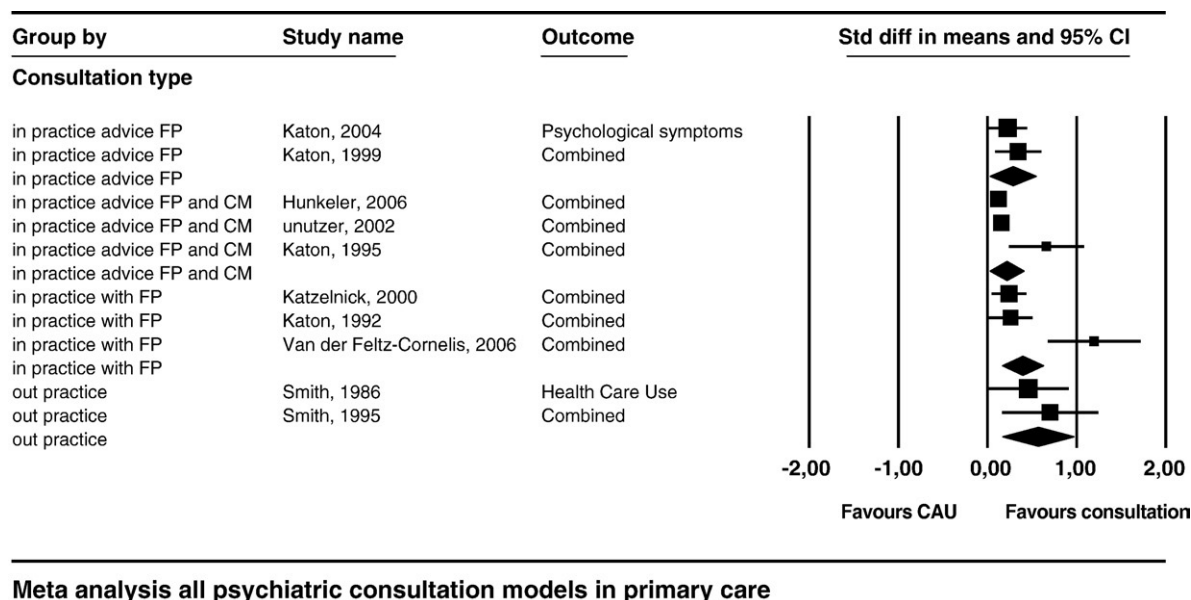
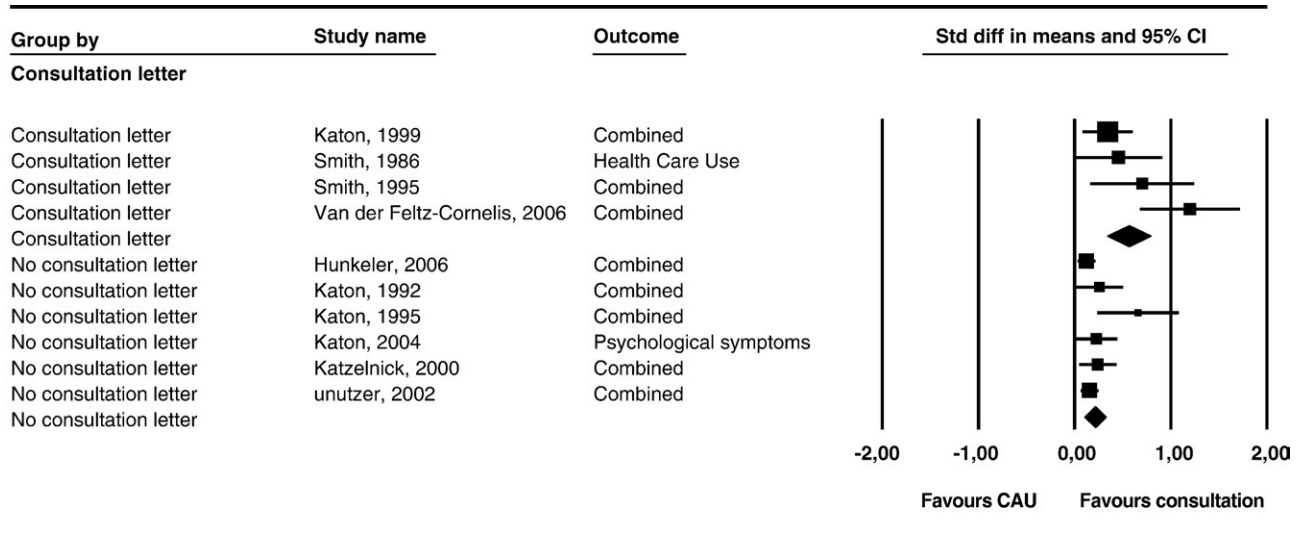


Fig. 4. Combined effect by consultation type in all disorders.



Meta analysis all psychiatric consultation models in primary care

Fig. 5. Combined effect by consultation letter in all disorders.

outcome were established. The analysis showed that psychiatric consultation had a small effect on general functioning (0.253; 95% CI 0.090–0.415) and on psychological symptoms, namely, depressive symptoms (0.253; 95% CI 0.111–0.396). Psychological symptoms were only used as outcomes in the studies in depressed patients, not in somatoform disorder. Psychiatric consultation had a moderate effect on medical symptoms (0.375; 95% CI 0.147–0.602). It had a moderate effect on utilization of health care services: 0.507 (95% CI 0.305–0.708). The variance for the groups ranged from 0.001 to 0.014, which is low, indicating that it is acceptable to perform the analysis separately for each outcome. With the use of a random-effects model, *Q* between groups is 5 (*df*=3, *P*=.171). This indicates that the

treatment effect can differ somewhat among outcomes, but not substantially.

Risk of bias across studies: publication bias

A test for publication bias was performed. The fail-safe *N* showed that 118 additional studies should be added to the analysis before the cumulative effect would become statistically nonsignificant. Given the fact that only 10 studies could be identified that looked at the effect of psychiatric consultation, it is unlikely that 118 studies were missed. The Begg funnel plot with observed and imputed studies is shown in Fig. 6. It shows that the adjusted estimate is fairly close to the original. This indicates that no significant publication bias seems to be the case and the reported effect is valid.

Funnel Plot of Standard Error by Std diff in means

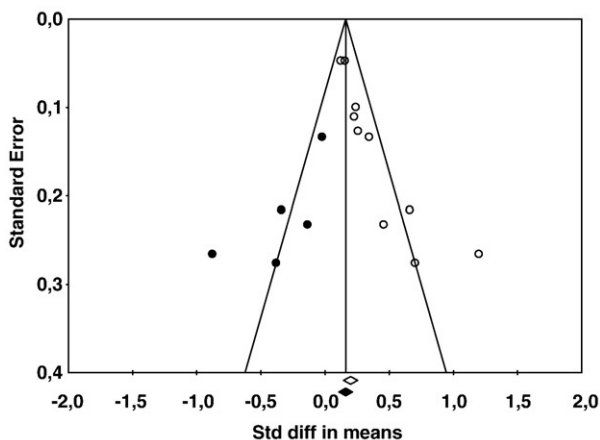


Fig. 6. Funnel plot with observed and imputed effect size. ○ = observed; ● = imputed.

Discussion

In this meta-analysis, a first attempt is made to summarize randomized clinical trials evaluating the effect of any kind of psychiatric consultation in the primary care setting and to estimate the size of the effect. However, there are several limitations that will be discussed first.

Limitations of the study

The most important limitation of this study is that the number of studies on the subject is small. Differences found between groups in the secondary analyses therefore might be conflated with other factors. For example, the finding that letters are more effective than other forms of consultation–liaison might reflect other core features of these studies, such

as diagnostic group. Also, the studied patient populations might differ in coexisting medical illnesses. Unfortunately, there are not enough studies to tease those differences out in a multivariate analysis, and, therefore, those subgroup findings should be considered exploratory.

A second limitation is that the effect sizes were only calculated and pooled on continuous outcomes; therefore, especially in depressive disorder, positive outcomes on remission rates as intervention effect were not included.

A third limitation of the study is that the calculation of the weighted mean as combined measure used to give an indication of the general clinical impact on the intervention, is an estimate that may be influenced by the fact that the multiple outcomes in the studies might be interdependent. However, the statistical program that we use corrects for this and gives a conservative estimate. Also, we give the outcomes of the multiple outcomes separately as well, allowing the reader access to the differentiated data.

Another limitation of the study is that it contains patient-randomized as well as cluster-randomized data. Only one cluster-randomized study, in 2006, reported the variance explained by the highest hierarchical level [7]. It was so low that it was not relevant for the outcomes at patient level taken into account for this meta-analysis. The other cluster-randomized studies were performed 10–23 years ago and did not allow us to make an educated estimate of the intraclass correlation (ICC) in those studies; we assumed that they would not differ much from the 2006 study reporting on the variance [7]. Therefore, we did not adjust cluster estimates to account for the ICC.

Another limitation of the study is that 6 of the 10 studies reported on psychiatric consultation in a greater framework of collaborative care for depressive disorder. This makes it difficult to separate the effects of consultation–liaison. A separate subgroup analysis which compared consultation–liaison alone with consultation–liaison as part of collaborative care was not performed, as it would be difficult to interpret due to the fact that the studies using collaborative care mostly were performed in depressive disorder and most others in somatoform disorder. The studies which used collaborative care tended to have less clear difference between the intervention and the comparison groups than those that did not use collaborative care. These studies were performed in health maintenance organization centers with good CAU, which may explain the smaller effect size found for depressive disorder.

More generally, the fact that all studies compared psychiatric consultation with CAU limits the possibilities to interpret the results. There is a great variability in family physicians' capacity to deal with their patients' mental health issues. In the past 10 years, many have developed the skills to do so while others have not.

Also, the very nature of what is considered 'primary care' and its structure vary greatly between health care systems. This limits the generalizability of the results, as the findings may differ substantially between countries depending on standards of care.

Findings of the study

It is remarkable that, despite the limitations mentioned above, all studies give evidence in the same direction, namely, that psychiatric consultation in primary care is effective for somatoform and depressive disorder. This meta-analysis from 10 RCTs with 3408 participating patients shows that psychiatric consultation in primary care has clear effect on the general clinical condition of subjects with depressive and somatoform disorder, as established as a weighted mean of all combined outcomes as delineated in the Method section. All studies favored the psychiatric consultation condition with a pooled estimated weighted mean effect size of 0.313, which is a moderate effect. For studies on somatoform disorder the effect size was 0.614, which is large, and for studies on depressive disorder the effect size was 0.204 [45], which is a small effect. Although the studies report on several outcomes, they can be combined to make a pooled estimate as the variance remains relatively low. Therefore, this can be considered as a robust effect. In somatoform disorder, psychiatric consultation improves general functioning of the patient, reduces medical symptoms, and diminishes health care. In depressive disorder, it improves adherence to antidepressants. These findings may imply that psychiatric consultation also has an impact on quality of life and on medical costs for patients with somatoform and depressive disorder, but this remains to be confirmed in other studies.

Surprisingly, in somatoform disorders, no significant effect on the severity of psychological factors, such as mood, could be established, and in depressive disorders there was only a small effect. Maybe, family physicians are so well equipped to treat depressive disorder in the primary care setting that the relative effect of psychiatric consultation is lower in depressive disorder than in somatoform disorder. Also, because of their training, family physicians take general functioning and well-being more as their frame of reference for choice and monitoring of treatment and have a more functional than a symptomatic approach. Thus, family physicians may tend to ask for consultation if patients complain of general function and if they visit the practice a lot, which is the case in somatoform disorder.

For depression, the effects of psychiatric consultation have only been studied in the context of collaborative care. In this multidisciplinary approach, it is hard to define the exact contribution of the psychiatrist in the intervention. The small effect size may be due to the fact that the collaborative care trials were pragmatic trials, comparing collaborative care with CAU in a well-developed country; patients in the CAU group received enhanced usual care since doctors were notified that their patient had major depression and over half of patients came into the trial already on an antidepressant [46]. Our results support the view of Beck [46] and reports from other studies that more exposure to a consultation psychiatrist leads to a greater effect [47]. It increases adherence to antidepressant medication, and compliance to other advice is improved by consultation [7,12,35,40].

Another subgroup analysis showed larger effects sizes of psychiatric consultation with advice laid down in a consultation letter, than in consultation procedures in which such a letter is not used. Two potential relevant factors come to mind. First, a consultation letter is a means to make communication between consultant psychiatrist and consultee family physician as clear as possible. This may greatly enhance the effect of consultation. Another relevant factor is that studies using consultation letters were mostly performed in patients with somatoform disorder, and this patient group tends to show bigger effect sizes from consultation than from depressed patients anyway. However, these findings should be considered of an exploratory nature and further research is needed.

Strengths of the study

Strengths of the study are the possibility to explore several elements in psychiatric consultation models and to give an estimate of the effect size of their application. The RCTs reviewed in this meta-analysis were pragmatic trials, thus giving an indication of effect size in clinical practice in several countries, despite the variety of health care systems in which the studies were performed. Strengths of the study are also the fact that the meta-analysis enabled us to estimate the effect in terms of global clinical impact, in terms of symptom severity, such as depressive or medical symptoms, as well as in terms of general functioning and health care use, and the lack of indications for publication bias. This enables us to identify a number of clinical, public health, and research implications as follows.

Clinical implications

Family physicians should not hesitate to ask psychiatric consultation for patients with problems in general functioning, with medically unexplained symptoms, and with high medical health care utilization, as even in case of only limited influence on psychological well-being, the other outcomes improve strongly after consultation. In the use of a psychiatric consultation model, clear-cut communication between the family physician and the consultant psychiatrist greatly enhances the effect, especially if a consultation letter is used. A consultation letter should be preceded by the consultation by the psychiatrist; should include the diagnosis, psycho education about the diagnosed mental disorder, and the course to be expected; and should give clear instruction to the family physician about required treatment and monitoring. Preferably, if possible, not only the family physician but also the patient should be provided with a copy of the consultation letter, within a week after the consultation [7].

Public health implications

Psychiatric consultation in primary care should be available for patients with somatoform as well as with

depressive disorder. Psychiatric consultation embedded in collaborative care could be utilized as a way to deliver evidence-based treatment to primary care populations with somatoform disorder and depression. As the organization of primary care differs among countries, a psychiatric consultation model should be adjusted to each country's setting to have a possible influence [48]. Now that psychiatric consultation seems to be quite effective, it should be explored if patients for whom psychiatric consultation might be relevant should be actively identified, i.e., by screening or case finding.

Research implications

In view of the promising findings of this meta-analytic review, further research into the efficacy of several elements of patient-centered psychiatric interventions should certainly be recommended. There is a general lack of studies. Future research should evaluate treatment outcome and more precisely establish effect sizes of psychiatric consultation in the primary care setting and also in other highly prevalent mental disorders in primary care, such as anxiety disorders. In this research, psychiatric consultation models should be clearly described, in order to enable generalizability. A comparison of consultation–liaison with case management alone is warranted, and also a comparison of collaborative care with consultation–liaison alone. Furthermore, studies are needed aimed at techniques and instruments identifying patients in need of psychiatric consultation in the primary care setting, such as screening or case-finding methods. Since from this meta-analysis it follows that psychiatric consultation can be effective in improving general functioning and diminishing use of health care services, cost-effectiveness studies should be performed to further clarify this effect of psychiatric consultation in somatoform and depressive disorder and on remission of mental disorder.

Policy implications

Since in primary care psychiatric consultation is substantially more effective than usual care for somatoform disorders and depression, primary care practices should have access to such a care model for these patient groups.

Conclusion

This systematic review and meta-analysis evaluated the existing literature and found that a psychiatric consultation model for patients with somatoform disorders and depression in primary care is effective. This type of consultation has the strongest effects on somatoform disorder, in terms of relief of medical symptoms and reduction of health care use. In view of this evidence, it is a remarkable finding that, in the last 5 years, only three RCTs were performed evaluating this consultation model. More research is needed.

Appendix A. PubMed

#1 Consult
 “Consult” [Mesh] OR “Consultation”[Mesh] OR “Consultation”[tiab] OR consult* [tiab]
 #2 RCT filter
 (Clinical trial[pt] OR Randomized Controlled Trial[pt] OR randomiz*[tiab] OR randomis* [tiab] OR placebo[tiab] OR clinical trials[mh] OR randomly[tiab] OR trial[ti]) NOT (animals[mh] NOT (animals[mh] AND humans[mh]))
 #3 Primary Care filter
 “Primary Care*” [tiab] OR “General Practice” [tiab]
 #1 AND #2 AND #3

Appendix B

Members of the Dutch Multidisciplinary Workgroup for the Guideline on Psychiatric Consultation are as follows: AFG Leentjens (Chair), AD Boenink, JJ Van Croonenborg, JJE van Everdingen, CM van der Feltz-Cornelis, NC Van der Laan, HWJ van Marwijk, TWDP Van Os, HN Sno, RJM Strack van Schijndel.

References

- [1] Starfield B. Health service research; a working model. *N Engl J Med* 1973;289:132–6.
- [2] Terluin B, Van heest FB, Van der Meer K, Neomagus GJH, Hekman J, Aulbers LPJ, et al. NHG-Standaard Angststoornissen. *Huisarts Wet* 2004;47:26–37.
- [3] Trimbos-instituut. National steering group. Multidisciplinary guideline development for mental disorder. Multidisciplinary guideline for depression: guideline for diagnosis and treatment of depressive disorder in adult patients. Utrecht: Trimbos-Instituut, 2005.
- [4] Van Marwijk HWJ, Bijl D, van Gelderen M, De Haan M. Dutch College of General Practitioners Guideline Depression, first revision [NHG-Standaard Depressieve stoornis (depressie). Eerste herziening. In Dutch]. *Huisarts Wet* 2003;614–23.
- [5] 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;50:307–8.
- [6] Van der Feltz-Cornelis CM, Knispel A, Elfeddali I. Treatment of mental disorder in the primary care setting in the Netherlands in the light of the new reimbursement system: a challenge? *Int J Integr Care* 2008;8:e56.
- [7] Van der Feltz-Cornelis CM, van Oppen P, Adèr H, van Dyck R. Randomised controlled trial of a collaborative care model with psychiatric consultation for persistent medically unexplained symptoms in general practice. *Psychother Psychosom* 2006;75:282–9.
- [8] Van der Feltz-Cornelis CM, Wijkkel D, Verhaak PFM, Collijn DH, Huyse FJ, van Dyck R. Psychiatric consultation for somatizing patients in the family practice setting: a feasibility study. *Int J Psychiatry Med* 1996;26:223–39.
- [9] Caplan G. Types of mental health consultation. *Am J Orthopsychiatry* 1963;33:470–81.
- [10] Smith GR, Monson RA, Ray DC. Psychiatric consultation in somatization disorder: a randomized controlled study. *N Engl J Med* 1986;314:1407–13.
- [11] Smith GR, Rost K, Kashner TM. A trial of the effect of a standardized psychiatric consultation on health outcomes and costs in somatizing patients. *Arch Gen Psychiatry* 1995;52:238–43.
- [12] Katon W, Von Korff M, Lin E, Bush T, Russo J, Lipscomb P, et al. A randomized trial of psychiatric consultation with distressed high utilizers. *Gen Hosp Psychiatry* 1992;14:86–98.
- [13] Herbert CM, van der Feltz-Cornelis CM. Wat wil de huisarts? Evaluatie van wensen van huisartsen ten aanzien van psychiatrische consulten in de praktijk (What does the GP want? Survey of psychiatric consultation needs of GPs). *Maandbl Geest Volksgezond* 2004;59:206–15.
- [14] Pincus HA. Patient-oriented models for linking primary care and mental health care. *Gen Hosp Psychiatry* 1987;9:95–101.
- [15] <http://www.nvvp.net/nvvppublic/download.aspx?doc=%5CPUBLICAT%5CRichtlijn%20consultatieve%20psychiatrie.pdf>.
- [16] Leentjens AFG, Van der Feltz-Cornelis CM, Boenink AD, Van Everdingen JJE. Richtlijnwerkgroep Consultatieve Psychiatrie van de Nederlandse Vereniging voor Psychiatrie. Richtlijn ‘Consultatieve psychiatrie’ van de Nederlandse Vereniging voor Psychiatrie voor consulten in de eerste lijn en in de ziekenhuissetting. *Ned Tijdschr Geneesk* 2008;152:1914–7.
- [17] Leentjens AF, Boenink AD, Sno HN, Strack van Schijndel RJ, van Croonenborg JJ, van Everdingen JJ, et al. The guideline “consultation psychiatry” of the Netherlands Psychiatric Association. *J Psychosom Res* 2009;66:531–5.
- [18] Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analysis: the PRISMA Statement. *PLoS Med* 2009;6:e1000097, doi:10.1371/journal.pmed.1000097.
- [19] Gregoire G, Derderian F, Le LJ. Selecting the language of the publications included in a meta-analysis: is there a Tower of Babel bias? *J Clin Epidemiol* 1995;48:159–63.
- [20] Van der Feltz-Cornelis CM, Adler HJ. Randomization in psychiatric intervention research in general practice setting. *Int J Methods Psychiatr Res* 2000;9:136–44.
- [21] McGuire H, Moncrieff J, Churchill R. International Cochrane Colloquium (6th: 1998: Baltimore, MD). Quality assessment of trials found within the scope of Cochrane Collaboration Depression, Anxiety & Neurosis (CCDAN). *Syst Rev Evid Action Int Cochrane Colloq* 6th 1998 Baltim Md 1998;6:81.
- [22] Phillips B, Ball C, Badenoch D, Straus S, Haynes B, Dawes M, et al. Oxford Centre for Evidence-Based Medicine Levels of Medicine (March 2009). <http://www2.cch.org.tw/ebm/file/CEBM-levels-of-Evidence.pdf>.
- [23] Comprehensive Meta-Analysis, Version 2. Englewood (NJ): Biostat, 2005.
- [24] Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. Comprehensive Meta-Analysis, Version 2. Englewood (NJ): Biostat, 2005.
- [25] DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control Clin Trials* 1986;7:177–88.
- [26] Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ* 2003;327:557–60.
- [27] Begg CB. Publication bias. In: Cooper H, Hedges LV, editors. *The Handbook of Research Synthesis*. New York: Russel Sage Foundation, 1994. pp. 399–409.
- [28] Borenstein M, Hedges LV, Higgins JPT, MROthstein HR. Introduction to Meta-Analysis (Statistics in Practice). Chichester (UK): Wiley & Sons, 2009.
- [29] 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;166:2314–21.
- [30] 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.
- [31] Hoedeman R, Blankenstein NAH, Van der Feltz-Cornelis CM, Krol B, Groothoff JJW. Consultation letters for medically unexplained physical symptoms. (protocol)Cochrane Database Syst Rev 2007: CD006524, doi:10.1002/14651858.CD006524.
- [32] Verhaak P, Groenendijk J, Zantinge EM, Vonk E, Voordouw I, van de Veen C. GGZ-consultaties aan de Eerstelijnszorg: eindrapportage. Utrecht: NIVEL, 2006.

- [33] Buis WMNJ. Psychiatrische diagnostiek en advies ten dienste van de huisarts. Amsterdam: Uitgeverij Thesis, 1990.
- [34] Bensing JM. Doctor–patient communication and the quality of care. An observation study into affective and instrumental behaviour in general practice. Academic dissertation. Utrecht: NIVEL, 1991.
- [35] 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;273:1026–31.
- [36] Katon WJ, Von Korff M, Lin EH, Simon G, Ludman E, Russo J, et al. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. *Arch Gen Psychiatry* 2004;61:1042–9.
- [37] Katon W, Von KM, Lin E, Simon G, Walker E, Unutzer, et al. Stepped collaborative care for primary care patients with persistent symptoms of depression: a randomized trial. *Arch Gen Psychiatry* 1999;56: 1109–15.
- [38] 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; 288:2836–45.
- [39] Hunkeler EM, Katon W, Tang L, Williams JW Jr, Kroenke K, Lin EH, et al. Long term outcomes from the IMPACT randomised trial for depressed elderly patients in primary care. *BMJ* 2006;332:259–63.
- [40] Katzelnick DJ, Simon GE, Pearson SD, Manning WG, Helstad CP, Henk HJ, et al. Randomized trial of a depression management program in high utilizers of medical care, 2000.
- [41] <http://www.cbo.nl/thema/Richtlijnen/Samenwerkingsverbanden/AGREE/>.
- [42] Hedges LV, Olkin I. Statistical methods for meta-analysis. Orlando: Academic Press, 1985.
- [43] Lipsey MW. Design sensitivity: statistical power for experimental research. Newbury Park: Sage, 1990.
- [44] Hueno-Medina TB, Sanchez-Meca J, Botella J, Marin-Martinez F. Assessing heterogeneity in meta analysis. *Psychol Methods* 2006;11: 193–206.
- [45] Lipsey MW, Wilson DB. The efficacy of psychological, educational, and behavioral treatment. Confirmation from meta-analysis. *Am Psychol* 1993;48:1181–209.
- [46] Beck BJ. Collaborative care: psychiatry and primary care. In: Stern TA, Fricchione GL, Cassem NH, Jellinek MS, Rosenbaum JF, editors. Massachusetts General Hospital Handbook of General Hospital Psychiatry. Philadelphia: Mosby, 2004. pp. 763–72.
- [47] 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;57:37–47.
- [48] de Jong FJ, van Steenbergen-Weijenburg KM, Huijbregts KM, Vlasveld MC, Van Marwijk HW, Beekman AT, et al. The Depression Initiative. Description of a collaborative care model for depression and of the factors influencing its implementation in the primary care setting in the Netherlands. *Projects and Developments. Int J Integr Care* 2009; 9:e81.