Systematic Review

Management of comorbid mental and somatic disorders in stepped care approaches in primary care: a systematic review

Kerstin Maehdera,*, Bernd Löwea, Martin Härterb, Daniela Heddaeusb, Martin Schererca and Angelika Weigela

aDepartment of Psychosomatic Medicine and Psychotherapy, University Medical Center Hamburg-Eppendorf, Germany, bDepartment of Medical Psychology, University Medical Center Hamburg-Eppendorf, Germany and cDepartment of General Practice/Primary Care, University Medical Center Hamburg-Eppendorf, Germany.

*Correspondence to Kerstin Maehder, Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Hamburg-Eppendorf, Martinistraße 52, 20246 Hamburg, Germany; E-mail: k.maehder@uke.de

Abstract

Background. Stepped care models comprise a graded treatment intensity and a systematic monitoring. For an effective implementation, stepped care models have to account for the high rates of mental and somatic comorbidity in primary care.

Objectives. The aim of the systematic review was to take stock of whether present stepped care models take comorbidities into consideration. A further aim was to give an overview on treatment components and involved health care professionals.

Methods. A systematic literature search was performed using the databases PubMed, PsycINFO, Cochrane Library and Web of Science. Selection criteria were a randomized controlled trial of a primary-care-based stepped care intervention, adult samples, publication between 2000 and 2017 and English or German language.

Results. Of 1009 search results, 39 studies were eligible. One-third of the trials were conceived for depressive disorders only, one-third for depression and further somatic and/or mental comorbidity and one-third for conditions other than depression. In 39% of the studies comorbidities were explicitly integrated in treatment, mainly via transdiagnostic self-management support, interprofessional collaboration and digital approaches for treatment, monitoring and communication. Most care teams were composed of a primary care physician, a care manager and a psychiatrist and/or psychologist. Due to the heterogeneity of the addressed disorders, no meta-analysis was performed.

Conclusions. Several stepped care models in primary care already account for comorbidities, with depression being the predominant target disorder. To determine their efficacy, the identified strategies to account for comorbidities should be investigated within stepped care models for a broader range of disorders.

Key words: Collaborative care, comorbidity, mental health care, primary health care, stepped care, telemedicine.

Introduction

Patients with comorbid disorders and undifferentiated symptoms are a major challenge in primary care (1). Comorbidity here is defined as the presence of at least two distinct disorders in one individual (2). It is crucial to provide care that accounts for comorbidity as it may have a negative impact on illness course, treatment effects, adherence and quality of life (3,4). One approach to facilitate and structure care pathways in primary care is ‘stepped care’. To date, it remains unclear whether
current stepped care approaches account for comorbidity. Yet, this question is especially important in primary care because for most patients, primary care is the pivotal setting for diagnostics and the initiation of evidence-based treatments for single and comorbid disorders (5).

Steped care models involve (i) a spectrum of interventions, with a hierarchy of care progressing from the least to the most intensive care, matched to a person’s needs, and (ii) a systematic monitoring to ensure the adequateness of a chosen treatment step (6). Due to their gatekeeper function, primary care physicians often serve as a starting point for the initiation of such stepped care models. While stepped care models may include care from primary care physicians and further health care professionals, cooperation is not a defining characteristic. This is in contrast to ‘collaborative care’ approaches where interprofessional cooperation is a central aspect (7). Problematically, current stepped care models predominantly design care pathways for single diagnoses, leaving the frequent comorbidity between both mental and somatic disorders and the clinical reality of primary care unrecognized (8). The same applies to most evidence-based guidelines for mental and somatic disorders. These have a disorder-specific focus and provide little information on the management of comorbid disorders (9,10). This gap between research on single conditions and primary care physicians’ everyday practice is one of the major barriers to guideline implementation in primary care (11).

Steped care can structure care and improve access to psychological and psychiatric treatments. Therefore, evidence-based guidelines for mental disorders increasingly describe stepped care as the preferred treatment model (12–14). Such care algorithms are particularly useful for disorders with differing degrees of severity, of longer duration and with a course susceptible to treatment. Stepped care has been implemented in a growing number of trials with promising results for different mental disorders such as depression (15), anxiety disorders (16,17), somatoform disorders (18) or musculoskeletal pain (19). Systematic reviews on the efficacy of stepped care in depression treatment indicate a non-inferiority in some studies a superiority of stepped care as compared with usual care (20,21). However, with regard to disorders other than depression, current evidence for stepped care models in primary care is mixed. Thus, an enlarged evidence base of stepped care models that considers mental and somatic disorders and their comorbidities is needed.

The present systematic review captured the present state of the integration of comorbidities in stepped care approaches. Thus, the aims of this review were to provide an overview on if and how mental and somatic comorbidities are taken into account in primary-care-based stepped care models for adults, as tested in randomized controlled trials with an active, usual care or waiting list control group.

Methods

Search strategy
A systematic search was performed using PubMed, PsycINFO, Cochrane Library and Web of Science, complemented by additional hand search and author requests to include recently completed studies. Search syntaxes were developed combining different terms used for both primary care (e.g. general practice) and stepped care (e.g. adaptive care) as found in the literature and MeSH terms, filtered by additional terms or database filter for randomized controlled trials (see Supplementary 1 for full electronic search strategy for PubMed). Studies were eligible if they reported on a randomized controlled trial of a primary-care-based stepped care intervention for adult patient samples compared with an active control group, waiting list or usual care. These inclusion criteria were chosen to evaluate the efficacy of stepped care compared with a control condition. Studies in which the term ‘stepped’ only referred to a stepped medication algorithm and that focused on collaborative care without a structured care algorithm were excluded. Studies were also considered eligible if they implemented an adaptive treatment algorithm without explicitly labelling it as ‘stepped care’ if the two core features of stepped care as described above were fulfilled. Publications could either be in English or German language and had to be published between 1/2000 and 10/2017 in peer-reviewed journals. The study protocol has not been published in advance, and the review has not been registered.

Study selection
After the removal of duplicates, all titles and abstracts were screened for eligibility. Then, two researchers (AW, KM) independently rated the remaining full texts and discussed studies with discrepant judgements until consensus was reached.

Data extraction included intervention details, participant characteristics, results and information on if and how comorbidities were taken into consideration with regard to the treatment algorithm. A treatment algorithm was considered as accounting for comorbidity if it contained at least one specific treatment component for each of at least two different disorders.

Quality assessment
The quality of selected studies was assessed according to the Cochrane Risk of Bias Tool (22) by one researcher (AW). This included the risk of bias with regard to random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting and other biases.

Analysis
At a content level, eligible studies of primary-care-based stepped care models were first investigated with regard to addressed disorders and the percentage of models that accounted for comorbidity within the applied treatment algorithms. Then, treatment steps and health care professionals as described in the included studies were analysed to gain a better understanding of the interventions and the strategies used to account for comorbidities. Finally, an overview of the efficacy of the stepped care models with regard to their primary outcomes and their effects on quality of life and disability is provided.

Results

Study selection
Of 1009 eligible studies identified by the search strategy (n = 558 duplicates removed), 190 full texts were screened, and 39 trials were included (see Fig. 1 for flowchart). Of those, all were published in English language, and no study in German language could be identified. Reasons for exclusion were (i) study protocol (n = 41), (ii) no clear stepped care structure of the intervention (n = 26), (iii) no reported results pertaining to the efficacy of the stepped care model (n = 39 studies), (iv) no randomized controlled trial (n = 4), (v) the stepped care model not being based in primary care (n = 8) or (vi) secondary analyses (n = 33). Differences in study inclusion between raters were rare and arose predominantly if structured treatment algorithms were not explicitly labelled as a stepped care approach.

Study characteristics
Setting characteristics
Studies were conducted in 10 countries. The majority of studies was based in the USA (n = 18, 46%) or the Netherlands (n = 10, 26%). Participating primary care physicians worked in small practices in
13 studies and in primary care clinics or centres in 26 studies, with different structures, sizes and patient collectives of different social and economic statuses.

**Participant characteristics**
Overall, the studies comprised 16,850 participants (range: 46–2796) of whom 57% were female (range: 0–100%). The mean age of participants was 54 years (mean range: 41.2–81.4 years). The overall dropout rate varied between 0% and 54% (mean: 18%). Exclusion criteria that were explicitly mentioned included one or more of the following conditions: psychotic symptoms, psychosis or schizophrenia (n = 31 studies), present substance abuse (n = 22), bipolar disorder (n = 24), acute suicidality (n = 18), terminal, life-threatening illness or physical illness requiring immediate treatment (n = 19) and significant cognitive impairment or dementia (n = 27).

**Disorders and comorbidities addressed in the stepped care models**
Approximately, one-third of the studies implemented a stepped care model that addressed depression and one or more comorbid mental or somatic illness(es) (n = 14; 36%) (19,23–35). In case of a combination of depression and a somatic disorder, the latter usually was the precondition for study entry, i.e. the presence of the somatic disorders determined who was approached to participate in the study. While these stepped care models included patients with two or more disorders, the treatment steps were designed for more than one disorder in 11 studies and focused on depression only in 3 studies. The remaining studies realized either a stepped care model for depression only (n = 13, 33%) (15,36–47), anxiety disorders (specific or in general; n = 5; 13%) (16,17,48–50), alcohol-related disorders (n = 2; 5%) (51,52), medically unexplained symptoms (n = 1; 3%) (53), heart failure (n = 1; 3%) (54), musculoskeletal pain (n = 2; 5%) (55,56) or coronary artery disease (n = 1; 3%) (57).

**Treatment structure in the primary-care-based stepped care models**
The stepped care interventions differed in length, intensity, involved professions and the modalities used for diagnostics, monitoring and treatment. Due to the predominant focus on mental health, most treatments included psychoeducation, case or care management, a systematic monitoring, short-term training in problem-solving or similar self-management strategies, the offer of pharmacotherapy and the option of referral to mental health specialists. In line with the concept of stepped care, basic care or case management and low-intensity self-management support were usually offered to every patient in the intervention group, whereas referral to (mental health) specialist services within or outside the study team was only offered to patients suffering from greater symptom severity or after insufficient benefit from the first treatment step(s). An exemplary stepped care treatment algorithm comprised step 1) watchful waiting and psychoeducation, step 2) guided self-help supported by telephone contacts with a nurse care manager in order to support self-management with regard to psychiatric symptoms (e.g. behavioural activation) and somatic symptoms (e.g. medication adherence), step 3) face-to-face problem-solving-treatment (seven sessions, delivered by the nurse care manager) and step 4) referral back to the primary care physician or further mental health services for pharmacotherapy and psychotherapy treatment options (stepped care model in (27)). Treatment length in the studies varied between 2 and up to 12 months.

Studies made divergent use of telehealth options and digital communication, for example, in the form of psychiatric consultation via telephone (37), telephone monitoring (17) or shared electronic health records (15). Basic study and intervention characteristics can be seen in Table 1.

In the majority of cases (37 of 39 studies), the abovementioned interventions were compared with a usual care control condition.

**Strategies used to account for comorbidity in primary-care-based stepped care models**
Based on the study descriptions in the published papers, 39% of studies (n = 15) accounted for comorbidity. The strategies used to account for comorbid illnesses could be classified as (i) assessment and treatment components that addressed at least two disorders at the same time, (ii) interprofessional cooperation and (iii) the use of telehealth and digitally shared information between health care professionals (see Fig. 2). The assessment and treatment components addressing at least two disorders (i) included diagnostic and
<table>
<thead>
<tr>
<th>First author, year, Country/setting</th>
<th>Condition</th>
<th>Sample size</th>
<th>Intervention/treatment options</th>
<th>Control condition</th>
<th>Professionals involved</th>
<th>Primary outcome</th>
<th>Comorbidity addressed in treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Araya et al., 2003 (36) Chile, 3 primary care clinics</td>
<td>Depression</td>
<td>( n = 240, \text{only women} )</td>
<td>Structured psychoeducational groups, monitoring, structured pharmacotherapy program for patients with severe or persistent depression</td>
<td>Usual care</td>
<td>Primary care physicians (PCP), psychoeducational group leaders (social workers and nurses)</td>
<td>Significantly (sign.) greater reduction in depression symptoms [Hamilton Rating Scale for Depression (HDRS)] at 3 and 6 months in the intervention group (IG)</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Aragonès et al., 2012 (38) Spain, 20 primary care centres</td>
<td>Depression</td>
<td>( n = 338 )</td>
<td>Case management, antidepressant treatment algorithm, self-help activities, psychoeducation, systematic evaluation, referral options to specialized care</td>
<td>Usual care</td>
<td>PCP, case managers/PC nurses, psychiatrists</td>
<td>Severity of depressive symptoms (PHQ-9) sign. better in IG at 3 and 6 months, no longer sign. at 12 months; response rates and remission rates sign. higher in the IG at 3, 6 and 12 months</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Bekelman et al., 2015 (54) USA, four Veterans Affairs centres</td>
<td>Heart failure</td>
<td>( n = 392 )</td>
<td>Case reviews; use of electronic medical record for communication; depression care: psychoeducation, problem-solving treatment, self-management, antidepressant medication management; telehealth monitoring of heart and depressive measures, self-care support</td>
<td>Usual care</td>
<td>PCP, nurse coordinators, cardiologist, psychiatrist</td>
<td>No sign. difference in improvement on the Kansas City Cardiomyopathy Questionnaire (KCCQ) between IG and control group (CG) at 12 months</td>
<td>Integrated treatment for heart-related health and depression</td>
</tr>
<tr>
<td>Coulton et al., 2017 (51) UK, 53 general practices</td>
<td>Hazardous alcohol use in elderly patients</td>
<td>( n = 529 )</td>
<td>Twenty-minutes behaviour change counselling by a practice or research nurse, Motivational Enhancement Therapy (MET) by alcohol therapist, referral to a specialist alcohol treatment service</td>
<td>Usual care and 5-minute structured advice session by practice or research nurse</td>
<td>Practice and research nurses, alcohol therapists, specialist alcohol treatment personnel</td>
<td>No sign. differences in the reduction of average drinks per day (ADD) between IG and CG (Alcohol Use Disorders Identification Test (AUDIT))</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Coventry et al., 2015 (23) UK, 36 general practices</td>
<td>Depression (and anxiety) &amp; diabetes and/or cardiovascular disease</td>
<td>( n = 387 )</td>
<td>Eight sessions of brief psychological therapy by case manager; collaborative meetings between patient, case manager and practice nurse; case management; supervision</td>
<td>Usual care</td>
<td>PCP, psychological wellbeing practitioners as case managers, practice nurse, psychological therapists as supervisors, study psychiatrist</td>
<td>Sign. greater reduction in depressive symptoms [Self-reported Symptom Checklist—Depression Section (SCL-D13)] in the IG at 4 month</td>
<td>Focus on depression (and anxiety) but links to diabetes and/or cardiovascular disease (e.g. in case review and management)</td>
</tr>
<tr>
<td>Dobscha et al., 2009 (55) USA, five primary care clinics</td>
<td>Musculoskeletal pain</td>
<td>( n = 401 )</td>
<td>Telephone-face-to-face assessments, psychoeducation workshop, case reviews, self-management support, assistance with pain treatment, mental health consultation</td>
<td>Usual care</td>
<td>Psychologist care manager, internist, physical therapist</td>
<td>Greater improvement in pain-related disability [Roland-Morris Disability Questionnaire (RMDQ)] and in pain intensity [Chronic Pain Grade (CPG)] in the IG at 12 months; in patients with depressive symptoms greater improvement in depression severity in the IG at 2 months (PHQ-9)</td>
<td>Integrated treatment for pain and depression</td>
</tr>
<tr>
<td>First author, year</td>
<td>Country/setting</td>
<td>Condition</td>
<td>Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------------------------------</td>
<td>-------------------</td>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Drummond et al., 2009 (52)</td>
<td>UK, six general practices</td>
<td>Alcohol use disorder</td>
<td>112</td>
<td>Forty-minute session of behaviour change counselling, a maximum of four 50-minute sessions of MET, referral to the local community alcoholTeam</td>
<td>Usual care and 5-minute directive advice session by practice nurse</td>
<td>Practice nurse, local alcohol specialist services</td>
<td>Greater but not sign. better reduction in the alcohol consumption measured over 180 days (Time Line Follow Back method) in the IG</td>
</tr>
<tr>
<td>Ell et al., 2010 (24)</td>
<td>USA, two public safety-net clinics</td>
<td>Depression and diabetes</td>
<td>387</td>
<td>Problem-solving therapy, antidepressant medication, monthly telephone symptom monitoring and relapse prevention, care and service system navigation</td>
<td>Enhanced usual care</td>
<td>PCP, social work, diabetes depression clinical specialists, assistant patient navigator, psychiatrist</td>
<td>Sign. higher chance of response in the IG [Symptom Checklist Depression Scale (SCL-20)], sign. higher chance of remission in the IG after 6 and 18 months, not after 12 months (SCL-20), no sign. differences in remission as measured with PHQ-9</td>
</tr>
<tr>
<td>Fihn et al., 2011 (57)</td>
<td>USA, four affiliated Departments of Veterans Affairs health care system</td>
<td>Stable ischaemic heart disease</td>
<td>703</td>
<td>Case reviews, psychoeducation, care management, referrals or assessments</td>
<td>Usual care</td>
<td>PCP, cardiologist, internist, clinical nurse specialist, pharmacist</td>
<td>No sign. improvement on the Seattle Angina Questionnaire (SAQ) or in self-perceived health in the IG after 12 months, higher guideline concordance in the IG</td>
</tr>
<tr>
<td>Fortney et al., 2013 (37)</td>
<td>USA, five Federally Qualified Health Centres</td>
<td>Depression</td>
<td>364</td>
<td>‘practice-based collaborative care (PBCC)’: on-site nurse depression care managers, systematic monitoring, psychoeducation, self-management, antidepressant treatment, referral to specialized care possible ‘telemedicine-based collaborative care (TBCC)’: off-site nurse depression care managers, psychiatrist, pharmacist, psychologist; telephone monitoring and case management; psychoeducation; self-management; antidepressant treatment</td>
<td>Active comparison, see left</td>
<td>PBCC: on-site PC providers, on-site nurse depression care managers (registered nurses or licensed practical nurses), referral to off-site mental health providers possible TBCC: on-site PC providers, off-site depression care manager, off-site pharmacist, off-site psychologist, off-site psychiatrist</td>
<td>Remission and response (SCL-20) sign. better in the TBCC after 6,12 and 18 months; sign. group × time interaction for depression severity in both groups with greater improvement in the TBCC</td>
</tr>
<tr>
<td>Gilbody et al., 2017 (39)</td>
<td>UK, 32 primary care centres</td>
<td>Depression</td>
<td>705</td>
<td>Collaborative care program; case management; telephone support, symptom monitoring, behavioural activation; antidepressant treatment</td>
<td>Usual care</td>
<td>PCP, case manager (background in mental health nursing or psychology), psychiatrist</td>
<td>Sign. lower depression severity (PHQ-9) in the IG at 4 month; sign. smaller number of depression diagnoses in the IG after 12, not at 4 months</td>
</tr>
<tr>
<td>First author, year</td>
<td>Country/setting</td>
<td>Condition</td>
<td>Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>--------------------------------</td>
<td>-------------------</td>
<td>------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Hedrick et al., 2004 (41)</td>
<td>USA, one Veteran Affairs primary care clinic</td>
<td>Depression</td>
<td>n = 354</td>
<td>Patient education, antidepressant medication, adjuvant medication, cognitive-behavioural therapy (CBT) group, psychologist/psychiatrist appointment, referral to MH specialty care, telephone support</td>
<td>Consult-liaison (CL) care (access to on-site services, including psychiatrist)</td>
<td>CC: PC providers, psychologist, psychiatrist, social workers, psychology technician CL: PC provider, possible referral to on-site psychiatrist, psychologist or social worker or specialty mental health clinics</td>
<td>Sign. greater improvement in depression symptoms (SCL-20) in the IG at 3 months, no longer sign. at 12 months</td>
</tr>
<tr>
<td>Huijbregts et al., 2013 (47)</td>
<td>NL, 18 primary care centres</td>
<td>Depression</td>
<td>n = 150</td>
<td>Care management, self-help manual, problem-solving treatment, antidepressant medication</td>
<td>Usual care</td>
<td>PCP, depression care manager, consultant psychiatrist</td>
<td>Response in depression sign. greater in IG at 3 and 9 months, not sign. at 6 and 12 months</td>
</tr>
<tr>
<td>Katon et al., 2004 (26)</td>
<td>USA, nine primary clinics</td>
<td>Depression and diabetes</td>
<td>n = 329</td>
<td>Antidepressant medication, problem-solving treatment, telephone and in-person appointments, psychiatric consultation, referral to specialty care, monthly telephone contacts during maintenance phase, case reviews</td>
<td>Usual care</td>
<td>PCP, depression clinical specialist nurse, psychiatrist supervisor, team psychologist</td>
<td>Sign. less depression severity in the IG (SCL-90), higher rating of patient-rated global improvement at 6 and 12 months, higher satisfaction with care at 6 and 12 months, no differences in HbA_1c</td>
</tr>
<tr>
<td>Katon et al., 2010 (25)</td>
<td>USA, 14 clinics</td>
<td>Depression and diabetes and/or coronary heart disease</td>
<td>n = 214</td>
<td>Support for self-management and medication adherence; patient education; pharmacotherapy for depression, hyperglycaemia, hypertension and hyperlipidaemia; monitoring; case reviews; monitoring telephone calls in maintenance phase</td>
<td>Usual care</td>
<td>PCP; study nurses; supervising psychiatrist, PCP and psychologist</td>
<td>Sign. greater overall 12-month improvement in the IG in the combined outcome (glycated haemoglobin levels, low-density lipoprotein cholesterol levels, systolic blood pressure and depression scores (SCL-20))</td>
</tr>
<tr>
<td>Kroenke et al., 2009 (19)</td>
<td>USA, 6 community clinics &amp; 5 Veteran Affairs general medicine clinics</td>
<td>depression and musculoskeletal pain</td>
<td>n = 250</td>
<td>Antidepressant medication, pain self-management program, telephone and in-person contacts during continuation phase, referral to psychiatrist</td>
<td>Usual care</td>
<td>PCP, nurse care manager, supervising physician depression specialist</td>
<td>Sign. greater reduction in depression severity in the IG at 12 months (SCL-20); sign. greater reduction in pain in the IG [Brief Pain Inventory (BPI)]; sign. greater global improvement in pain in the IG (7-point-scale)</td>
</tr>
<tr>
<td>First author, year</td>
<td>Country/setting</td>
<td>Condition Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
<td>Comorbidity addressed in treatment</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>-----------------------</td>
<td>--------------------------------</td>
<td>------------------</td>
<td>-----------------------</td>
<td>----------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Kroenke et al., 2014 (56)</td>
<td>USA, five primary care clinics in one Veterans Affairs medical centre</td>
<td>Chronic musculoskeletal pain ( n = 250 )</td>
<td>Case reviews, automated symptom monitoring (interactive voice-recorded telephone calls or by internet), care management through in-person and telephone contacts, analgesic optimization algorithm</td>
<td>Usual care</td>
<td>PCP, physician pain specialist, nurse care manager</td>
<td>Sign. better improvement in pain in the IG after 12 months (BPI)</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Lin et al., 2000 (42)</td>
<td>USA, four primary care clinics</td>
<td>Depression ( n = 228 )</td>
<td>Psychoeducation, behaviour activation, on-site psychiatric consultation, antidepressant medication, monitoring</td>
<td>Usual care</td>
<td>PCP, on-site psychiatrist</td>
<td>Sign. less interference in family, work + social activities in IG; trend towards more improvement in social functioning in IG, no diff. in role performance [Sheehan Disability Scale (SDS)]</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Muntingh et al., 2014 (16)</td>
<td>NL, 43 general practices</td>
<td>Anxiety disorders ( n = 180 )</td>
<td>Guided self-help and support by care manager, brief CBT interventions for generalized anxiety disorder and panic disorder by care manager, antidepressant medication, referral to specialized mental health care</td>
<td>Usual care</td>
<td>PCP, psychiatric nurses as care managers, consulting psychiatrists, specialized mental health care personnel</td>
<td>Sign. greater reduction of anxiety symptoms in the IG over 12 months [Beck Anxiety Inventory (BAI)]</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Menchetti et al., 2015 (43)</td>
<td>Italy, eight primary care sites in three Italian regions</td>
<td>Depression ( n = 227 )</td>
<td>Brief psychological interventions, pharmacotherapy, possible mental health referral</td>
<td>Usual care</td>
<td>PCP, consultant psychiatrist</td>
<td>Higher share of remission (not sign.) in IG after 3 months (PHQ-9)</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Oladeji et al., 2015 (40)</td>
<td>Nigeria, six primary care centres</td>
<td>Depression ( n = 234 )</td>
<td>Psychoeducation, activity scheduling, adapted version of problem-solving treatment, antidepressant medication</td>
<td>Usual care</td>
<td>PCP, PC workers (nurses, community health officers, community health extension workers), supervising psychiatrists</td>
<td>Focus on feasibility, better symptom improvement (PHQ-9)</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Oosterbaan et al., 2013 (35)</td>
<td>NL, 20 general practices</td>
<td>‘Common mental disorders’ ( n = 158 )</td>
<td>Guided self-help, antidepressant medication, CBT and pharmacotherapy in specialized mental health care centre, further specialized mental health care</td>
<td>Usual care</td>
<td>PCP, psychiatric nurses, psychologists, psychiatrist</td>
<td>Sign. greater improvement in the IG mid-term at 4 months [Clinical Global Impression of Improvement Scale (CGI-I)], no sign. differences at 8 and 12 months</td>
<td>Adaptation of treatment components to the different disorders</td>
</tr>
<tr>
<td>First author, year</td>
<td>Country/setting</td>
<td>Condition</td>
<td>Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------------------------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Patel et al., 2010 (33)</td>
<td>India, 12 primary care centres and 12 general practice facilities</td>
<td>Depression and anxiety</td>
<td>n = 2,796</td>
<td>Case management by lay health counsellors, psychoeducation, antidepressant medication, interpersonal psychotherapy, adherence management, referral to clinical specialist</td>
<td>Enhanced usual care</td>
<td>PCP, lay health counsellors, visiting psychiatrist (=clinical specialist)</td>
<td>Sign. greater chance of recovery in the IG after 6 months [Clinical Interview Schedule—Revised (CIS-R)]</td>
</tr>
<tr>
<td>Pols et al., 2017 (27)</td>
<td>NL, 27 primary care centres</td>
<td>Subthreshold depression and diabetes and/or coronary heart disease</td>
<td>n = 236</td>
<td>Watchful waiting with introductory meeting with practice nurse, written guided self-help and monitoring calls by practice nurse, problem-solving treatment, referral to GP, referral to specialized mental health, antidepressant medication</td>
<td>Usual care</td>
<td>PCP, practice nurses, specialized mental health care personnel</td>
<td>No sign. difference in cumulative incidence of depression [Mini-International Neuro-psychiatric Interview (MINI)]</td>
</tr>
<tr>
<td>Rollman et al., 2005 (30)</td>
<td>USA, four primary care practices</td>
<td>Generalized anxiety disorder and panic disorder</td>
<td>n = 191</td>
<td>Case reviews, psychoeducation, workbook for self-management with feedback, anxiolytic pharmacotherapy, referral to a community mental health specialist</td>
<td>Usual care</td>
<td>PCP, care managers, study team for case reviews</td>
<td>Sign. greater reduction in anxiety symptoms in the IG after 12 months [Structured Interview Guide for the Hamilton Anxiety Rating Scale (SIGH-A)]</td>
</tr>
<tr>
<td>Rollman et al., 2009 (32)</td>
<td>USA, seven university-based and community hospitals</td>
<td>Depression after coronary artery bypass graft (CABG)</td>
<td>n = 302 (± 151 non-depressed CABG-patients as comparison group)</td>
<td>Telephone-based case management by nurse care manager: psychoeducation, workbook, antidepressant medication, watchful waiting; referral to local mental health specialist</td>
<td>Usual care</td>
<td>PCP, nurse care manager, local psychiatrists and psychologists</td>
<td>Sign. greater improvement in mental health-related quality of life in the IG at 8 months follow-up [Short Form 36 Mental Component Score (SF-36 MCS)]</td>
</tr>
<tr>
<td>Rollman et al., 2017 (17)</td>
<td>USA, six affiliated primary care practices</td>
<td>Anxiety disorders</td>
<td>n = 329</td>
<td>Case reviews, psychoeducation, workbook for self-management with telephone care management, anxiolytic pharmacotherapy; referral to a community mental health specialist, telephone contacts during continuation phase, use of electronic medical records for communication</td>
<td>Usual care</td>
<td>PCP, care managers, psychiatrist, psychologist</td>
<td>Sign. higher improved mental health-related quality of life in the IG at 12 months (SF-36 MCS)</td>
</tr>
<tr>
<td>Roy-Byrne et al., 2005 (49)</td>
<td>USA, six primary care clinics</td>
<td>Panic disorder</td>
<td>n = 232</td>
<td>Psychoeducation; workbook on panic disorder; brief CBT by behavioural health specialists; care coordination; telephone contacts; medication algorithm</td>
<td>Usual care</td>
<td>PCP, behavioural health specialists, consulting psychiatrist,</td>
<td>Sign. higher proportion of responders and remitters, greater sign. improvement in WHO Disability Scale and Short Form 12 (SF-12) mental health in the IG</td>
</tr>
<tr>
<td>First author, year</td>
<td>Country/setting</td>
<td>Condition</td>
<td>Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>--------------------------------</td>
<td>-------------------</td>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Roy-Byrne et al. 2010 (48)</td>
<td>USA, 17 primary care clinics</td>
<td>Anxiety disorders</td>
<td>n = 1004</td>
<td>Psychopharmacotherapy, CBT, care management and self-management support, web-based monitoring system, telephone calls in continuation phase</td>
<td>Usual care</td>
<td>PCP, anxiety clinical specialists, supervising psychiatrist and psychologist</td>
<td>Sign. greater improvement in global anxiety symptoms in the IG at all time-points [Brief Symptom Inventory-12 (BSI-12)]</td>
</tr>
<tr>
<td>Seekles et al., 2011 (34)</td>
<td>NL, 32 general practices</td>
<td>Depression and anxiety</td>
<td>n = 120</td>
<td>Watchful waiting; guided self-help by care manager: either problem-solving-based treatment (book or internet) with feedback or exposure-based therapy (book) with feedback; problem-solving treatment; pharmacotherapy and/or referral to specialized mental health care</td>
<td>Usual care</td>
<td>PCP, psychiatric nurses, psychologists, specialized mental health care personnel</td>
<td>No sign. difference in improvement between IG and CG [Inventory of Depressive Symptomatology (IDS) &amp; Hospital Anxiety and Depression Scale (HADS)]</td>
</tr>
<tr>
<td>Silverstone et al., 2017 (44)</td>
<td>Canada, two primary care clinics</td>
<td>Depression</td>
<td>n = 1489</td>
<td>'Group 3': screening + usual care + online CBT program as option 'Group 4 (in one clinic)': stepped care (watchful waiting, self-management information, additional visits, medication, outside referral options)</td>
<td>Not specified</td>
<td>Sign. reduction in depression symptoms in all groups (PHQ-9), no sign. group differences</td>
<td>Not specified as part of the treatment algorithm</td>
</tr>
<tr>
<td>Stoop et al., 2015 (28)</td>
<td>NL, 24 general practices allied to the primary care organization PoZoB</td>
<td>Depression and anxiety in patients with diabetes, asthma or chronic obstructive pulmonary disease (COPD)</td>
<td>n = 46</td>
<td>Disease Management program for Co-morbid Depression and Anxiety (DiMaCoDeA): meetings for psychoeducation, ‘Coping with depression course’/‘Coping with anxiety course’, referral to GP, booster sessions</td>
<td>Usual care</td>
<td>PCP, practice nurses</td>
<td>Sign. lower level of anxiety in the IG at post-intervention and 6 months-follow-up [General Anxiety Disorder-7 (GAD-7)]; sign. lower level of depression at post-intervention (PHQ-9), but not in the fully adjusted model, not sign. at 6-month follow-up</td>
</tr>
<tr>
<td>Unützer et al., 2002 (15)</td>
<td>USA, 18 primary care clinics</td>
<td>Depression</td>
<td>n = 1801</td>
<td>psychoeducation, depression care management, antidepressant medication, problem-solving treatment</td>
<td>usual care</td>
<td>PCP, depression care managers (nurses or psychologists), supervising team psychiatrist, liaison PCP</td>
<td>Sign. lower depression severity in the IG (SCL-20), sign. higher response and remission rates in the IG</td>
</tr>
<tr>
<td>van Beljouw et al., 2015 (45)</td>
<td>NL, 18 general practices and 1 home care organization</td>
<td>Depression</td>
<td>n = 263</td>
<td>Watchful waiting, guided self-help or exercise program, problem-solving treatment or life-review, referral to GP</td>
<td>Usual care (stepped-wedge-trial)</td>
<td>PCP, nurses (mental health or home care nurses), physiotherapists</td>
<td>Sign. short-term reduction in depression symptoms (PHQ-9) after 3 months, sign. dropout</td>
</tr>
<tr>
<td>First authors</td>
<td>Country/setting</td>
<td>Condition</td>
<td>Sample size</td>
<td>Intervention/treatment options</td>
<td>Control condition</td>
<td>Professionals involved</td>
<td>Primary outcome</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------</td>
<td>-----------</td>
<td>-------------</td>
<td>--------------------------------</td>
<td>-------------------</td>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>van der Feltz-Cornelis et al., 2006 (53)</td>
<td>NL, 36 general practices</td>
<td>Medically unexplained symptoms (MUS)</td>
<td>$n = 81$</td>
<td>Psychiatric consultation for PCPs, psychoeducation, psychopharmacotherapy, CBT, referral to psychiatrist, self-management, further psychotherapy options, further referral options (physical therapist, social worker) Individual counselling in home visits by a community psychiatric nurse, 'Coping with depression course', referral back to PCP</td>
<td>Usual care</td>
<td>PCP, psychiatrist, CBT therapist, further referral options</td>
<td>Sign. greater improvement in severity of main MUS in the IG; no sign. difference in the improvement in psychological symptoms [Symptom Checklist-90-Revised (SCL-90-R)]</td>
</tr>
<tr>
<td>van der Weele et al., 2012 (46)</td>
<td>NL, 67 general practices</td>
<td>Depression</td>
<td>$n = 239$</td>
<td>Individual counselling in home visits by a community psychiatric nurse, 'Coping with depression course', referral back to PCP</td>
<td>Usual care</td>
<td>PCP, community psychiatric nurse, mental health professionals</td>
<td>Sign. better improvement in depression severity [Montgomery-Åsberg Depression Rating Scale (MADRS)] in the CG at 6 months, no longer sign. at 12 months</td>
</tr>
<tr>
<td>van’t Veer-Tazelaar et al., 2009 (29)</td>
<td>NL, 33 general practices</td>
<td>Prevention of depression and anxiety in late life</td>
<td>$n = 170$</td>
<td>Watchful waiting, psychoeducation by home care nurse, adapted course ‘Coping With Depression and Anxiety’ and visits/phone calls by home care nurse, brief problem-solving treatment, referral to PCP</td>
<td>Usual care</td>
<td>PCP, home care nurses, specially trained community psychiatric nurse</td>
<td>Sign. reduced cumulative incidence of depressive and anxiety disorders in the IG after 12 months (MINI)</td>
</tr>
<tr>
<td>Vera et al., 2010 (30)</td>
<td>USA (Puerto Rico), 14 internal medicine or primary care clinics</td>
<td>Depression and chronic medical conditions</td>
<td>$n = 179$</td>
<td>Psychopharmacology, care management, antidepressant medication, CBT</td>
<td>Usual care</td>
<td>PCP, care manager, consulting psychiatrist, psychologists,</td>
<td>Sign. greater reduction of depressive symptoms in the IG at 6 months (SCL-20)</td>
</tr>
<tr>
<td>Zhang et al., 2014 (31)</td>
<td>China (Hongkong), primary care clinics</td>
<td>Subthreshold depression and/or anxiety</td>
<td>$n = 240$</td>
<td>Watchful waiting, telephone counselling by trained social workers for self-management, face-to-face problem-solving treatment by trained social workers, referral to PCP, referral to a psychiatrist</td>
<td>Usual care</td>
<td>PCP, trained social workers, psychiatrist</td>
<td>No sign. difference in the cumulative probability of onset of major depression or anxiety disorder between IG and CG in 15 months [Structured Clinical Interview for DSM-IV (SCID)]</td>
</tr>
</tbody>
</table>
monitoring appointments (via phone or face-to-face) addressing the symptoms of, for example, anxiety and depression, self-management strategies like goal setting and activity scheduling for the benefit of, for example, diabetes and depression and additional treatment options for patients suffering from, for example, further mental illness like anxiety disorders (e.g. the ‘Coping with anxiety course’). Interprofessional cooperation (ii) comprised case management, case reviews and improved referral processes.

Telehealth strategies (iii) that allowed the management of more than one disorder included the use of telephone or internet-based treatment and monitoring components (e.g. case management, automated symptom monitoring). Additionally, shared electronic health records were employed for better coordination between the health care professionals.

Involved health care professionals

With regard to involved health care professionals in stepped care, primary care physicians’ main tasks were the responsibility for treatment decisions, case reviews and the prescription of medication. Primary care physicians were supported in 33 studies by case managers, with different backgrounds predominantly in nursing, and to a lesser extent in psychology or social work. Case managers were responsible for care coordination, monitoring and the training in self-management strategies. The stepped care team was complemented in 24 trials by a study psychiatrist as supervisor and/or consultant. Psychologists or other mental health specialists were frequently integrated either as part of the treatment team or as a referral option if indicated. In a small number of studies additional professionals, such as pharmacists, community or lay health care workers, cardiologists, social workers or physiotherapists were part of the stepped care team.

Efficacy of the primary-care-based stepped care models with regard to evaluated primary outcomes

The heterogeneity of outcomes and the complexity of interventions prevented us from applying meta-analytic analyses. However, the following description of the primary outcomes allows for an overall impression of the efficacy of the stepped care models. It is structured along the main disorders addressed. The first group comprises comorbidity studies that addressed depression and one or more mental and/or somatic disorders (labelled ‘comorbidity group’). Studies of the second group addressed depression only (labelled ‘depression group’), and the last group comprises studies on conditions other than depression (labelled ‘mixed group’).

The primary outcome was of psychological nature (e.g. depressive symptoms) in 30 studies and of somatic nature (e.g. HbA1c as diabetes marker) in 4 studies. Five studies combined both.

Comorbidity group

Of the 14 studies, addressing depression and one or more somatic and/or mental disorder, 6 studies reported results in favour of stepped care compared with the control condition (19,23,25,29,30,32). Four studies could not state significant differences between both groups (27,31,34,35), while four studies revealed mixed results with regard to different outcome variables and the stability of treatment effects (24,26,28,33). Taking a specific look at depression outcomes only (e.g. reduction in depressive symptoms; response, remission, or incidence rates; irrespective of whether depression was part of the primary or the secondary outcome), study results showed a significant beneficial effect compared with the control condition in 7 out of 14 stepped care studies (19,23,25,29,30,32). No such positive effect on depression symptoms (reduction or incidence) was found in 6 out of 14 studies (27,28,31,33–35), while Ell et al. (24) reported a superiority of stepped care with regard to response but not with regard to remission as assessed with the Patient Health Questionnaire 9 (PHQ-9) at all points of measurement.

Depression group

In the 13 stepped care models addressing depression, the primary outcomes predominantly focused on change in depression symptoms or remission and/or response rates with the exception of Lin et al. (42) who focused on disability. In two studies, the stepped care model reduced depression symptoms significantly greater than the control condition (15,36). In the trial of Fortney et al. (37), the telene medicine-based intervention was superior to the practice-based trial arm. In six studies, stepped care proved to be significantly superior than the control condition with significant differences on the primary outcomes at some but not at all points of measurements (as predefined as primary outcome) or not in every component of composite primary outcomes (38,39,41,42,45,47). In four studies, no
significant results in favour of stepped care compared with the control condition with regard to the primary depression outcome were found (40,43,44,46).

Mixed group
In the 12 studies addressing one or more disorders other than depression, the primary outcomes were mainly disorder-specific (except for Rollman et al. (17) with mental health-related quality of life as primary outcome). Seven studies revealed an overall superiority of the stepped care model compared with the control condition (16,48–50,53,55,56), four did not find a benefit of stepped care regarding the primary outcome (51,52,54,57). Rollman et al. (17) found significant improvement in quality of life after 12 but not after 24 months.

3) b) Results for quality of life and disability of the primary-care-based stepped care models
The results for quality of life and disability are reported for all studies combined. The heterogeneity of outcomes and interventions prevented us from applying meta-analytic analyses.

With regard to quality of life, five studies reported a significant superiority of stepped care compared with the control condition (15,19,25,36,39), whereas no significant differences were found in 11 studies (23,31,33,40,41,45,51,52,55–57). Mixed results emerged in further nine studies, mainly with a significant improvement in the mental component summary of the SF-36 in the intervention group but no such advantage in the physical component summary of the SF-36 (16,17,24,32,37,38,48–50). Quality of life was not measured or reported in 14 studies (26–30,33,34,42–44,46,47,53,54).

The majority of studies \( (n = 24) \) did not assess or report comparisons of changes in disability. Yet, seven studies showed a significant better outcome for the intervention group (15,19,30,32,48,49,53). In five studies, no superiority of the intervention group was found (23,24,40,43,56). Mixed results with regard to disability were found in three studies with significant improvements in the intervention group only in some subdomains of functioning or at some time-points of measurement (41,42,53).

Risk of bias
Overall, the risk of bias of the primary analyses with regard to random sequence generation, allocation concealment and blinding of outcome assessment was rather low. A slightly higher risk due to unclear or high risk was detected for incomplete outcome data, selective reporting and other biases (e.g. selective dropout or recruitment in only one clinic). Due to the inclusion of psychological interventions, a blinding of participants and personnel was usually not possible with the exception of additional care-team members in some studies (such as consulting pharmacists or psychiatrists). A lack of blinding resulted in a high risk of bias with regard to possible effects of expectations of both caregivers and patients.

Discussion
The present systematic review investigated the consideration of mental and somatic comorbidity in primary-care-based stepped care models. Fifteen out of 39 identified studies considered comorbidity in that they encompassed two or more disorders in their treatment algorithms. Depression was the most frequently targeted condition, both alone and comorbid to further mental or somatic disorders. The care algorithms were mainly composed of self-management support, psychotherapeutic approaches in varying intensity, (psycho-)pharmacotherapy and optional referral to further specialist services. Most health care teams included primary care physicians, case or care managers and a psychiatrist and/or psychologist. Strategies to account for comorbidities comprised (i) modular treatment, (ii) collaboration between different health care professionals and (iii) digital approaches for both treatment and communication.

In the majority of the 39 identified studies, stepped care models in general showed superior \( (n = 16) \) or mixed \( (n = 10) \) results with regard to their primary outcomes.

Results were mixed with regard to the outcome quality of life (only reported in \( n = 23 \) studies), with significant improvements mainly in mental but not in physical parameters. Disability, as another patient reported outcome, was not reported in the majority of studies; the overall picture in those studies reporting disability was positive to mixed. Due to the complexity of the interventions, the heterogeneity of the disorders and the lack of transdiagnostic outcomes, no meta-analysis was performed, and results did not allow to judge whether the consideration of comorbidity in stepped care increased the efficacy of these treatment models. Thus, future research is needed to assess the efficacy of managing comorbidities within stepped care models in terms of quality of life and disability.

The applied strategies to account for comorbidity via modular treatment options echo interventions used in collaborative care and integrative treatment models (e.g. depression and diabetes (58); depression and coronary disease (59)). There is evidence that such integrative care models improved psychological (mainly depressive) symptoms, whereas smaller effects were observed in chronic somatic conditions and depending on the condition (58–62).

All examined stepped care models applied interprofessional cooperation with case/care managers and health care professionals from medical or psychological specialties as a major care component to account for comorbidities. This result highlights again the conceptual overlap between stepped and collaborative care. Lessons learned from collaborative care research indicate that interprofessional cooperation and task delegation are particularly helpful for an integrated treatment of both mental and somatic complaints (63). Yet, establishing interprofessional cooperation in routine care requires clear care pathways, role definitions and good communication between the professionals involved, as otherwise these factors might impede on its implementation (64). Within distinct stepped care algorithms, interprofessional collaboration can be established in such a structured way that clearly defines responsibilities along the different treatment steps. With regard to the implementation of interprofessional cooperation, the different primary care systems and professional roles have to be taken into account. Despite the predominance in this systematic review of studies conducted in the USA, the diversity of settings, ranging from multi-professional primary care clinics to single practices and to the inclusion of lay health care workers, illustrates the adaptability of stepped care models to the respective settings.

The third strategy to account for comorbidities was the use of digital approaches for treatment, monitoring and interprofessional cooperation, for example, as optional psychotherapy via interactive video (37) or shared electronic health records (55). Telehealth in treatment and monitoring is on the rise, and there is evidence for their effectiveness in primary care, such as for depression (65). Technology may enhance the array of treatment options in primary care, especially for mild disorders, for patients in rural areas (66) and for patients with complex treatment needs, such as comorbidity. With regard to digital strategies for the cooperation between health
care professionals, there is hope that shared electronic health care records may improve cooperation and continuity of care, reduce redundant testing, treatment and costs (67,68), yet the overall scarce evidence-base calls for further research (67,69). Country-specific data-management regulations, health care systems and treatment infrastructures require an adaptation of technology-based strategies within stepped care approaches.

Taken together, evaluations of stepped care models that account for comorbidity have shown first promising results in randomized controlled trials with regard to different outcome domains. Also, they comprise management strategies that have already been proven useful in other care models.

Strengths and limitations

The present review was, to the best of our knowledge, the first to shed light on the integration of comorbidity treatment in current stepped care model studies. The broad search strategy adopted in this review allowed the inclusion of a wide range of studies even when a stepped intervention was not labelled as such but implemented an adaptive treatment algorithm and systematic monitoring. Yet, the term ‘stepped care’ is difficult to delineate since adaptive treatment models have been studied for a much longer time than the label ‘stepped care’ is used, and there is significant overlap between stepped and collaborative care. While the overall delineation between stepped care and collaborative care is difficult to draw and the models have been combined in some studies (18), the main characteristic of stepped care is the structured care pathway and its systematic monitoring.

The heterogenic spectrum of disorders and varying degrees of treatment duration, treatment intensity and illness severity hampered a meta-analytic approach regarding the efficacy of integrating comorbidity treatment in stepped care. Thus, whether stepped care models integrating comorbidity treatment are more successful than nonmorbid trials cannot be answered based on the current evidence and requires further research. In addition, while effective stepped care models for two or three frequently co-occurring disorders would improve primary care, the essential challenge is to develop care for multimorbidity. While the definitions of both concepts, comorbidity and multimorbidity, remain controversial, the concept of multimorbidity, in its comprehensive meaning, encompasses a broader perspective that takes into account aspects like biopsychosocial factors, health care consumption or the burden of disease (70). The stepped care models of the included studies in this review overwhelmingly addressed a small number of clearly defined disorders, not taking a multimorbid perspective which led to the decision to focus on comorbidity. Due to the lack of primary-care-based stepped care models concerned with multimorbidity, this review cannot add specific knowledge on how to care for multimorbid patients. Yet, the identification of useful strategies to account for more than one disorder is a first step on the way to a much larger toolbox that may help primary care to tackle the challenge of multimorbidity.

The exclusion of particular mental disorders such as schizophrenia, bipolar disorders and/or present substance abuse limited the range of possible comorbidities to be considered in stepped care models. This aspect illustrates the difference between scientific efficacy studies and clinical reality and highlights the urgent need for effectiveness studies.

With regard to the risk-of-bias-rating, the overall study quality was found to be acceptable, and the exclusion of non-randomized and/or non-controlled trials strengthened the validity of outcome comparisons with usual care.

Conclusion and future research

This systematic review provides a first overview of primary care-based stepped care models with regard to the management of mental and somatic comorbidities. Fifteen out of 39 identified studies have implemented strategies that enable the integrated treatment of two or more disorders. These strategies could be classified in modular assessment treatment components, interprofessional cooperation and the use of telehealth options for both treatment and interprofessional communication. While these strategies have proven useful in other care models, the complex stepped care models and their current level of evaluation did not allow to estimate both the efficacy and the effectiveness of stepped care models accounting for comorbidity. In view of the challenges posed by different comorbidity patterns and by multimorbidity, future studies should adopt a broader perspective than addressing a limited number of fixed comorbid disorders. Primary care, with its holistic approach, is the pivotal setting for developing stepped care models that allow for an adaptable care in case of different co-occurring disorders and different patient priorities with regard to health outcomes.

Further research in stepped care needs to address the questions of effectiveness both with regard to the stepped care algorithms and the required collaborating providers while acknowledging patient preferences, especially in case of comorbidity. In order to allow for a comparative evaluation of effectiveness, transdiagnostic outcome parameter such as quality of life and disability should be assessed and reported. Since the investigated stepped care models predominantly addressed depression, there is an urgent need to expand research to further and particularly to severe mental disorders such as schizophrenia and psychosis.

The identified primary-care-based stepped care models with their different strategies may serve as a blueprint for the development of such future care models.

Supplementary material

Supplementary material is available at Family Practice online.

Acknowledgements

We would like to thank Olaf von dem Knesebeck, head of the Institute of Medical Sociology at University Medical Center Hamburg-Eppendorf, for his valuable and constructive feedback on the final manuscript.

Declaration

Funding: the PhD position of KM and the position of DH are funded by the German Federal Ministry of Education and Research (BMBF) as part of the trial COMET (grant no. 01GY1602) (Collaborative and Stepped Care in Mental Health by Overcoming Treatment Sector Barriers; NCT03226743).

Ethical approval: ethical approvals were not required for this work.

Conflict of interest: none.

References


Comorbidity in stepped care


44. Silverstone PH, Rittenbach K, Suen VYM et al. Depression outcomes in adults attending family practice were not improved by screening, stepped-care, or online CBT during a 12-week study when compared to controls in a randomized trial. *Front Psychiatry* 2017; 8: 32.