

Team Effectiveness in Patient Health Management: An Overview of Reviews

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ABSTRACT

Background: The desire to improve the quality of health care for an aging population with multiple chronic diseases is fostering a rapid growth in inter-professional team care, supported by health professionals, governments, businesses and public institutions. However, the weight of evidence measuring the impact of team care on patient and health system outcomes has not, heretofore, been clear. To address this deficiency, we evaluated published evidence for the clinical effectiveness of team care within a chronic disease management context in a systematic overview. **Methods:** A search strategy was built for Medline using medical subject headings and other relevant keywords. After testing for performance, the search strategy was adapted to other databases (Cinhal, Cochrane, Embase, PsychInfo) using their specific descriptors. The searches were limited to reviews published between 1996 and 2011, in English and French languages. The results were analyzed by the number of studies favouring team intervention, based on the direction of effect and statistical significance for all reported outcomes. **Results:** Sixteen systematic and 7 narrative reviews were included. Diseases most frequently targeted were depression, followed by heart failure, diabetes and mental disorders. Effectiveness outcome measures most commonly used were clinical endpoints, resource utilization (e.g., emergency room visits, hospital admissions), costs, quality of life and medication adherence. Briefly, while improved clinical and resource utilization endpoints were commonly reported as positive outcomes, mixed directional results were often found among costs, medication adherence, mortality and patient satisfaction outcomes. **Conclusions:** We conclude that, although suggestive of some specific benefits, the overall weight of evidence for team care efficacy remains equivocal. Further studies that examine the causal interactions between multidisciplinary team care and clinical and economic outcomes of disease management are needed to more accurately assess its net program efficacy and population effectiveness.

Keywords: Team Care Effectiveness; Chronic Disease Management; Chronic Care Model; Overview of Reviews

1. Introduction

To address the growing burden of managing chronic diseases in aging populations, with increasing demand for services over time and across various care settings, innovative models of care are needed. Integrated disease care delivery represents a creative response to the challenges of chronic illness. It applies multidisciplinary care and use of available community-based social networks and interventional resources to provide evidence-based care for entire populations [1,2].

A primary component of such disease management models is the use of multidisciplinary teams in the delivery of care, with the hypothesis that teams will enhance integration of care and improve provider, patient and managerial satisfaction, as well as improving administrative and clinical processes and patient outcomes [3-5].

Thus, the multidisciplinary team approach has been widely promoted as a means to provide effective and efficient care by integrating the skills of different health care professionals to contribute to a common purpose [6-8].

Benefits of team care and teamwork have been documented in several reports [4,9-13]. Principal perceived benefits for team members include enhanced job satisfaction, sense of being valued, respected and trusted, learning from others' expertise, sharing of workload, and enhanced sense of well-being [4,9-11,13]. These feel-good perceptions among team members, sometimes referred to as the "romance of teams" phenomenon, probably contribute, in some degree, to the common belief that teams are a very effective health care work structure [3] and that the delivery of care by a coordinated team is a good thing [6,14-16].

However, in the context of chronic disease management, there have been, as yet, only limited measurements of the efficacy of team care on patient, or health system, outcomes [9,17].

The goal of this overview was to systematically examine all available evidence in an attempt to more reliably answer the question: “Does organised team care, versus individual, or non-organised or non-integrated care, achieve improved outcomes, or care processes, among patients with chronic illness in a disease management setting?”

2. Methods

2.1. Definitions

Studying the effectiveness of team care within a chronic disease management context requires definitions. There is a broad range of definitions for chronic disease management in the literature [18,19-24]. For this overview, an intervention conducted within a chronic disease management context was defined as an intervention that targeted a specific chronic disease that involved a care team in outpatient/primary care settings. Our working definition of teamwork was based on WHO’s definition: “Co-ordinated action carried out by two or more individuals jointly, concurrently or sequentially. It implies common agreed goals, clear awareness of, and respect for, others’ roles and functions” [25].

According to the Cochrane Collaboration’s definition [26], a systematic review was classified as state of the art if the five following criteria were met: clearly stated objectives, predefined eligibility criteria for studies, explicit and reproducible methodology, assessment of risk of bias, systematic presentation and synthesis. Based on the criteria of Cook *et al.*, we considered a review to be narrative if there were no explicit methods for searching literature or for reporting study results. Such reviews have a broader perspective on a given topic, sources and selec-

tion of papers usually not specified, no appraisal of studies selected, synthesis often qualitative [27].

2.2. Data Sources

In collaboration with a librarian a search strategy was built for MEDLINE using medical subject headings and other relevant keywords. After testing for its performance, the search strategy was adapted to other databases using their specific requirements. Also, reference lists from all articles in our bibliography were searched for additional citations (**Table 1**). Searches were limited to reviews published between 1996 and 2011, and to English and French languages.

2.3. Study Selection

A first selection was based on titles and abstracts, was performed by two authors (AG, BB) in duplicate; irrelevant articles (*i.e.*, obviously not a review, absence of chronic disease management context, not addressing the effectiveness of team care) were discarded at this stage. Remaining article abstracts were reviewed by two authors (AG, BB) and retained if all of the following inclusion criteria were met: 1) systematic or narrative review; 2) assessment of the effectiveness of team care, provided by at least two health professionals of different speciality and corresponding to different levels of integration (collaborative, coordinated, shared care, multidisciplinary, interdisciplinary, integrated) [28,29]; 3) chronic disease management context (full disease management context if combination of chronic disease, team, and outpatient or primary care or ambulatory setting); 4) where the impact on either a process or an outcome was measured and reported. All reported outcomes were extracted. Articles that characterized the role of individual team members only were excluded. Full papers were retrieved if one or both authors considered the abstract relevant against the four inclusion criteria. The investigators independently

Table 1. Search strategy.

Timeframe	1996-2011
Keys words used for the search equation	Patient care planning, disease management, chronic care model, primary health care, family practice, quality of care, patient care team, interdisciplinary, interprofessional, outcomes, efficacy, and effectiveness
Search equation terms (e.g. Medline)	<ul style="list-style-type: none"> • (Patient care planning or (disease management or management or multiple diseases)).mp. • (chronic care model or ((standard or usual or regular or appropriate or managed) adj2 (care or treatment))).mp. • exp primary health care/or family practice/or physicians, family/ • (primary healthcare or ((primary or family or general) adj2 (care or practi\$ or medicine))).mp. • quality of care.mp. • exp patient care team/and (outcomes or results or efficacy or *ffective\$).mp. • review.pt. or review.mp.
Databases	CINAHL, COCHRANE, EMBASE, MEDLINE, PsycINFO
Hand searches	Authors’ and third parties’ bibliographies, reference lists of selected articles

assessed full articles and discrepancies were resolved by consensual assessment.

2.4. Data Abstraction

A data abstraction form was developed and tested on several papers to ensure that it was consistent with the study objectives. The elements of the abstraction form included the type of review (systematic, narrative); the definition or model of team care and the list of healthcare professionals involved as described by the authors; the context of chronic disease management; the type of patients covered in the review; the chronic diseases targeted; the type of process and outcomes measures, the determinants of effectiveness of team care (where applicable), the conclusions of the authors of the reviews, and the category of effectiveness based on the conclusions of the authors of the reviews as follow: teamwork effective, teamwork possibly effective, teamwork possibly not effective, teamwork not effective, inconclusive. Data abstraction was performed on all eligible papers by two authors (AG, IPB). Any discrepancies were resolved by consensual assessment, and ultimately by discussion with

another member of the research team.

2.5. Data Synthesis

2.5.1. Systematic Reviews

We analyzed the results by reporting for each review the number of studies favouring the intervention based on the direction of effect and statistical significance for all reported outcomes. The quality of the systematic reviews was assessed by two elements: the 5 criteria of the Cochrane Handbook of systematic reviews [26] and the AMSTAR, a measurement tool to assess systematic reviews. AMSTAR is an 11-items tool and the total score was computed as the sum of all items answered “yes”. The tool was found to have a good agreement, reliability and validity [30-32]. Data were then reported by level of quality: low (0 to 3, medium (4 to 7), and high (8 to 11) (Table 2).

2.5.2. Narrative Reviews

We conducted a separate synthesis of the findings from narrative reviews for they often lack explicit methods for searching literature or reporting results. In addition, there

Table 2. AMSTAR assessment for included systematic reviews.

AMSTAR item [30]	1	2	3	4	5	6	7	8	9	10	11	Total score* (low 0 - 3, medium 4 - 7, high 8 - 11)
Author, Year												
Malone, 2007	Y	Y	Y	N	Y	Y	Y	CA	Y	Y	Y	9
Bower, 2006	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	8
Khan, 2007	Y	Y	Y	N	Y	Y	Y	Y	NA	N	Y	8
Koshman, 2008	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	8
Smith, 2008	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	8
Mitchell, 2008	Y	Y	Y	Y	N	Y	Y	N	NA	N	Y	7
Ravenek, 2010	Y	Y	Y	Y	N	Y	Y	Y	NA	N	N	7
McAlister, 2004	Y	Y	Y	N	N	Y	Y	N	Y	N	N	6
Holland, 2005	Y	CA	Y	N	N	Y	Y	CA	Y	Y	CA	6
Gilbody, 2006	Y	N	Y	N	N	N	N	Y	Y	Y	Y	6
Gunn, 2006	Y	CA	Y	N	N	Y	Y	Y	NA	N	Y	6
Simmonds, 2001	Y	N	Y	N	N	Y	N	N	Y	N	Y	5
Craven, 2006	Y	Y	Y	Y	N	Y	N	CA	NA	N	N	5
Kane, 2011	Y	CA	Y	CA	N	Y	CA	Y	NA	N	Y	5
McConnell, 2008	Y	N	Y	N	N	Y	N	N	NA	N	Y	4
Vliet Vlieland, 1997	Y	CA	N	N	N	Y	CA	Y	NA	N	N	3

*Total score was computed as the sum of all items answered “Y = yes”, N = no, CA = can't answer, NA = not applicable.

are no methods available as to how to assess the quality of narrative reviews.

3. Results

3.1. Characteristics of Included Review Papers

Sixteen systematic [33-48] and 7 narrative reviews were included in the overview [6,49-54] (see flow diagram in **Figure 1**). While eight systematic reviews included only randomized controlled trials, six included both randomized and non-randomized trials. Also out of the 16 systematic reviews, 8 included meta-analyses.

Diseases most frequently targeted were depression (6 reviews out of 23) followed by heart failure (4 reviews), diabetes (2 reviews) and mental disorders (2 reviews). Details about the included systematic and narrative reviews are provided in **Table 3**.

Systematic reviews with a meta-analysis were of better quality than systematic reviews without a meta-analysis, on the AMSTAR criteria (**Table 2**). The mean score for systematic reviews with meta-analyses was 7 (range 5 to 9, out of a maximum of 11) for a total of 173 primary articles (mean = 21.6) and 5.5 for non-meta-analysis systematic reviews (range 3 to 8) for a total of 135 primary articles (mean = 22.5). As expected, the quality of the systematic reviews that we classified as state of the art was very high (AMSTAR mean score = 7.2) compared to non-state of the art reviews (mean score = 4.3).

3.2. Evidence of Effectiveness

3.2.1. Systematic Reviews

Of the 16 systematic reviews reported in this study, 8 were meta-analyses. Effectiveness outcomes most commonly assessed were clinical endpoints, resource utilization (emergency room visit, hospital admission), costs, quality of life, medication adherence. While clinical and resource utilization were the most common positive outcomes, mixed results were more often found with costs, medication adherence, mortality, patient satisfaction. The overarching results are percent of the studies favouring the intervention (PSFI) and, pooled effect estimates (RR, OR, SMD) for reviews with meta-analysis. Individual results are summarized by level of quality and are reported in **Table 4**.

3.2.2. High Quality Reviews

In the review of Malone *et al.* (2007), reporting on mental illnesses, the percent of the studies favouring the intervention (PSFI) was 65% (11/17). The PSFI was 85% (53/62) for the review of Bower *et al.* (2006); for the measured outcomes depressive symptoms (OR = 0.24 CI 0.17 - 0.32) and antidepressants use (OR = 1.92 CI 1.54 - 2.39). The Khan *et al.* (2007) review on multiple sclerosis showed that 55% (12/22) of the studies favoured the intervention. In the review of Koshman *et al.* (2008), only 29% (5/17) of the studies that reported outcomes on collaborative care with heart failure team favoured the

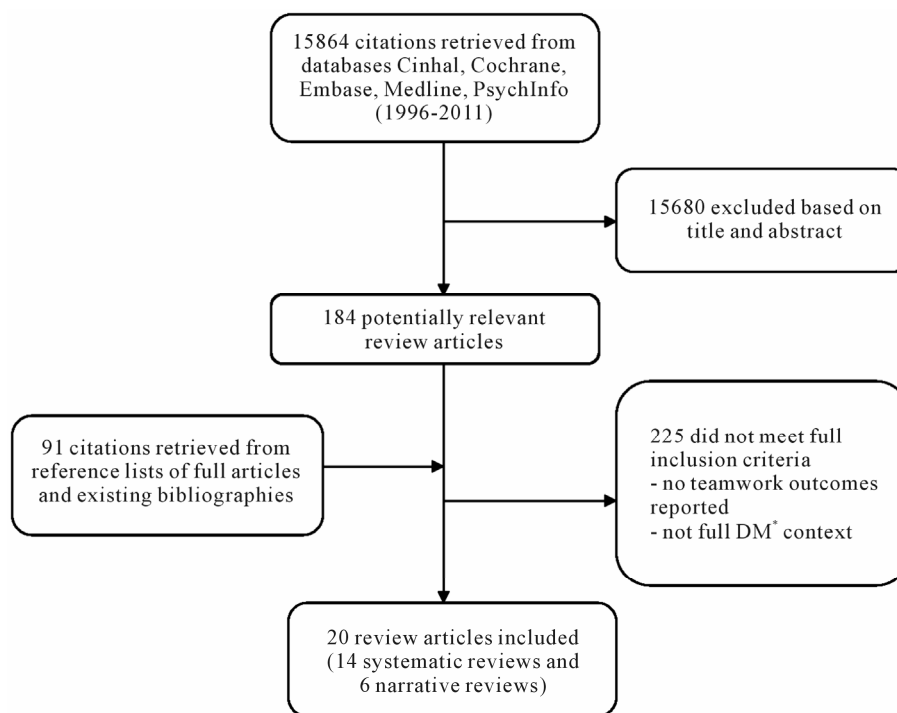


Figure 1. Flow chart of study selection. *DM = disease management (chronic disease + team + outpatient/primary care/ambulatory).

Table 3. Characteristics of reviews included.

Authors, year	Chronic disease	Nb of studies included (nb RCT)	Target patients (nb)	Definition or model of team	Healthcare professionals involved	State of the art SR?	Meta-analysis (Yes/No)	Quality score
Malone, 2007	Mental illness	3 (3 RCT)	Outpatients (587)	A multidisciplinary team of mental health staff which has a lead responsibility for the provision of specialist assessment, treatment and care to a defined population	Nurses, social workers, psychiatrists	Yes	Yes	9
Bower, 2006	Depression	34 (34 RCT)	Outpatients (12,294)	Collaborative care: a multifaceted organisational intervention with a number of components: introduction of a new role (case manager) into primary care; introduction of mechanisms to foster closer liaison between primary care clinician and mental health specialists; introduction of mechanisms to collect and share information on the progress of individual patients	PCP, specialist, care manager	Yes	Yes	8
Khan, 2007	Multiple sclerosis	8 (7 RCT)	In- and outpatients (747)	An inpatient, outpatient, home or community-based programme, delivered by two or more disciplines in conjunction with physician consultation, and targeted towards improvement at the levels of activity and/or participation	PCP, other HCPs	Yes	No	8
Koshman, 2008	Heart failure	5 (5 RCT)	In- and outpatients (600)	Pharmacist collaborative care (member of a multidisciplinary team)	Pharmacist, others not described	Yes	Yes	8
Smith, 2008	Depression, diabetes mellitus, asthma, COPD, mental illness, CHF, hypertension, Cancer	20 (19 RCT)	Not described (8902)	The joint participation of primary and specialty care practitioners in the planned delivery of care for patients with a chronic condition	PCP, specialists	Yes	Yes	8
Mitchell, 2008	Stroke	18 (5 RCT)	Outpatients (631, RCT)	Co-ordinated multi-disciplinary care planning involving primary care professionals, either wholly within primary care or by primary-secondary care teams	PCP; others not described	Yes	No	7
Ravenek, 2010	Chronic low back pain	12 (RCT or CCT)	Not described (1827)	To be considered a multidisciplinary intervention under this definition, treatment must include the physical dimension of care (e.g., exercise), and at least one psychological (e.g., cognitive behavioural therapy), social (e.g., support of co-workers) or occupational (e.g., graduated RTW) dimension	Occupational therapist, psychologist, social worker	Yes	No	7
McAlister, 2004	Heart failure	29 (29 RCT)	Outpatients (4931)	Multidisciplinary management strategies	Not described	Yes	Yes	6
Holland, 2005	Heart failure	30 (30 RCT)	Any setting (7532)	Multidisciplinary team that included medical input plus one or more of the following: a specialist nurse, a pharmacist, a health educator, a dietician, or a social worker.	PCP, specialized nurse, social worker, pharmacist, health educator, dietician	Yes	Yes	6

Continued

Gilbody, 2006	Depression	37 (37 RCT)	Not described (12355)	Collaborative care: a multifaceted intervention involving combination of 3 distinct professionals working collaboratively within the primary care setting	PCP, specialist, case manager	Yes	Yes	6
Gunn, 2006	Depression	11 (11 RCT)	General adult primary care population (3675)	Collaborative care: included team meetings, case conferences, individual consultation/supervision, shared medical records, patient-specific written or verbal feedback between care-givers	PCP, nurse, psychologist, psychiatric, pharmacist	Yes	No	6
Simmonds, 2001	Severe mental illness	5 (5 RCT)	Outpatients (869)	Community mental health team management was defined as generic care from a community-based multi-disciplinary team that provides a full range of interventions to adults aged 18 - 65 years with several mental illness	Not described	No	Yes	5
Craven, 2006	Depressive disorders	38 (25 RCT)	Not described (12,133)	Collaborative care involves providers from different specialities, disciplines, or sectors working together to offer complementary services and mutual support, to ensure that individuals receive the most appropriate service from the most appropriate provider in the most suitable location	Not described	No	No	5
Kane, 2011	Diabetes, Congestive heart failure, Hypertension, Stroke, depression	144 (48RCT)	Outpatients	Most commonly when a second discipline is added to an existing practice including case managers, pharmacists or integrating care across an interdisciplinary group	PCP, pharmacist, case manager	Yes	No	5
McConnell, 2008	Cardiovascular disease	25 (6 RCT)	Not described (12,133, RCT)	Not provided	Pharmacist; others not described	No	No	4
Vliet Vlieland, 1997	Rheumatoid Arthritis	35 (9 RCT)	In- and outpatients (589)	Various health care professionals collaborating in a multidisciplinary team	Not described	No	No	3
Codispoti, 2004	Diabetes	N/A	Not described	MDT ensures coordination and cooperation between disciplines to increase efficient use of resources and to improve outcomes for the patient through continuity of care	PCP, nurses, pharmacists, dietiticians, health educators	NR	N/A	N/A
Fleissig, 2006	Cancer	N/A	Not described	MDT = group of people of different health-care disciplines, which meets together at a given time (whether physically in one place, or by video or tele-conferencing) to discuss a given patient and who are each able to contribute independently to the diagnostic and treatment decisions about the patient	PCP, Specialists, specialized nurses, radiologists, histo- pathologists	NR	N/A	N/A

Continued

Stanos, 2006	Chronic pain	N/A	Outpatients	Interdisciplinary team model is characterized by team members working together for a common goal, making collective therapeutic decisions, and having face-to-face meetings and patient team conferences to facilitate communication and consultation. It may be led by a physician, psychologist, or nurse and include comprehensive assessment, goal setting, and treatment, usually provided in one facility	PCP, specialist, nurse, psychologist, physical or occupational therapist, social worker	NR	N/A	N/A
Ashner, 2007	Diabetes mellitus	N/A	Inpatients, outpatients	A group of HCP with complementary yet diverse skills to provide continuous and accessible care, focused on the need of the individuals, to help educate and support the patient and their family and to involve them where possible in decision-making and provision of care; the core MDT consists of a patient, physician and diabetes educator	Not described	NR	N/A	N/A
Vannoy, 2007	Depression	N/A	Outpatients	Collaborative care: utilization of nonphysician providers to support primary care providers; education of patients and providers; ongoing monitoring of depression symptoms; support of the treatment team by a mental health specialist	PCP, manager, psychiatrics	NR	N/A	N/A
Katon, 2008	Major depression	N/A	Outpatients	Collaborative care includes patient education and activation, allied health professionals, more frequent follow-ups, caseload registry, caseload supervision by psychiatrist	PCP, mental health specialists, nurses	NR	N/A	N/A
Kalisch, 2010	Heart failure	N/A	Outpatients	A framework within which pharmacists can work with physicians to identify, solve and prevent medication related problems for heart failure patients is via collaborative home medicines reviews	PCP, pharmacist	NR	N/A	N/A

SR: systematic review; NR: narrative review; PCP: Primary Care Physician; RCT: Randomized Clinical Trial; CCT: Controlled Clinical trial; N/A: not applicable.

intervention. However the pooled effect estimates were positive for all-cause hospitalization and heart failure. Smith *et al.* (2008) targeted various chronic diseases: 61% (25/41) of the studies favoured the intervention thus this review should be categorized as “teamwork possibly effective” instead of “teamwork not effective” based on the conclusion of the authors of the review.

3.2.3. Medium Quality Reviews

In the review of Mitchell *et al.* (2008) on stroke, classified as inconclusive, only 25% (2/8) of the studies favoured the intervention. The review of Ravenek *et al.* (2010) on chronic low back pain had a similar conclusion

with only 21% (6/28). In the review of McAlister *et al.* (2004), there is evidence to support the conclusion that teamwork is effective for the following outcomes: all-cause mortality (RR = 0.75, CI 0.59 - 0.96), all-cause hospitalization (RR = 0.81, CI 0.71 - 0.91), heart failure hospitalizations (RR = 0.74, CI 0.63 - 0.87). However, only 49% (43/87) favoured the intervention when all outcomes were considered. Holland *et al.* (2005) reviewed heart failure RCT studies and 71% (34/48) of them favoured the intervention. The pooled effect estimate was significant for all-cause mortality (RR 0.79 CI 0.69 - 0.92), for all-cause hospital admissions (RR 0.87 CI 0.79 - 0.95), and for heart failure hospital admissions

Table 4. Summary of results of the reviews.

Author, Year	Summary of interventions	Comparator	Type and list of outcomes	Main results (pooled point estimates)	Number of studies that favored the intervention	Review authors' conclusion (excerpt)
Malone, 2007	Multi-disciplinary assessment, regular team reviews	Standard hospital based service	<ul style="list-style-type: none"> • Death of any cause • Satisfaction with service • Admission rate to hospital • Use of emergency services • Contact with primary care • Contact with social services • Social functioning/police contacts 	RR 0.47 (0.2 - 1.3) RR 0.37 (0.2 - 0.8) RR 0.81 (0.7 - 1.0) RR 0.86 (0.7 - 1.1) RR 0.94 (0.8 - 1.1) RR 0.76 (0.6 - 1.0) RR 2.07 (1.1 - 4)	3/3 1/1 2/3 2/3 1/3 2/2 0/2	"Community mental health team management is not inferior to non-team standard care in any important respects and is superior in promoting greater acceptance of treatment. It is also likely that a person managed within a CMHT is more likely to avoid hospital admission and to spend less time as an in-patient."
Bower, 2006	Case management sessions, medication management, psychological therapy	Usual care	<ul style="list-style-type: none"> • Antidepressants use • Depressive symptoms 	OR 1.92 (1.54 - 2.39) OR 0.24 (0.17 - 0.32)	24/28 29/34	"We found a positive effect of collaborative care on antidepressant use and depressive outcomes; Findings should be considered exploratory rather than definitive"
Khan, 2007	Elements of physical and occupational therapy, speech pathology, neuro-psychology, behavioural management	Routine care	<ul style="list-style-type: none"> • Impairment and functional status • Frequency of symptoms • Quality of life (SF-36, Beck Depression Inventory, FIS, SET) • Activity measures (FIM, FISS, EDSS) • Cost 	N/A	2/7 1/1 5/6 4/8 N/A	"This review suggests that, despite no change at the level of impairment, multidisciplinary rehabilitation can improve the experience of people living with multiple impairments in terms of both activity and participation. However, the evidence for cost-effectiveness is as yet "suggestive" and further direct evidence is required."
Koshman, 2008	Components of pharmacist intervention: medication education, compliance, recommendation, follow-up	Usual care	<i>Pharmacist collaborative care with HF team</i> <ul style="list-style-type: none"> • Mortality • All-cause hospitalization • HF hospitalization • Health-related quality-of-life • Adherence 	OR 0.69 (0.41 - 1.17) OR 0.60 (0.38 - 0.95) OR 0.42 (0.24 - 0.74) MLWHF SF-36 RR (95% CI): ACE - I/ARB: 0.78 (0.33 - 1.89) β -Blocker: 0.89 (0.28 - 2.82) Digoxin: 0.79 (0.25 - 2.51) Diuretic: 1.02 (0.49 - 2.12)	0/5 1/4 3/5 1/1 0/1 0/1	"In addition to contributing to the current body of literature supporting the beneficial effects of multidisciplinary teams in the treatment of patients with HF, our findings further describe the beneficial role of the pharmacist in the treatment of patients with HF"
Smith, 2008	Defined patient reviews, education, synchronized patient records, clinical and referral guidelines	Usual care	<ul style="list-style-type: none"> • Physical health • Recovery from depression • Changes in mean depression scores • QoL and well-being • Functional impairment • Hospital admissions • Appropriate prescribing • Medication adherence and use • Participation in or defaulting from services • Outcomes relating to treatment satisfaction, service utilization, recording of risk factors, and provider outcomes • Costs 	N/A RR 1.49 (0.92 - 2.43) N/A N/A N/A RR 1.21 (1.01 - 1.44) RR 1.29 (1.21 - 1.36) N/A N/A N/A	1/7 3/4 3/6 3/5 2/4 Mixed 4/4 5/5 4/6 Mixed Mixed	"This review does not provide evidence to support the introduction of shared care for the management of patients with chronic diseases. We conclude that shared care should not be developed or introduced into mainstream clinical practice until there is evidence to support its cost-effectiveness."

Continued

Mitchell, 2008	Multi-disciplinary planning, process with PCP	Usual care	<ul style="list-style-type: none"> • Function • Mortality • Quality of life • Service utilization 	N/A	1/3 0/2 0/2 1/1	“It is unclear whether coordinated care planning involving GPs and primary care health professionals makes an unequivocal difference to patients outcomes to patients with completed stroke”
Ravenek, 2010	Physical training, stress management, education, behavioural and psychiatric support	Usual care	<ul style="list-style-type: none"> • Pain • Functional status • Employment outcomes 	N/A N/A N/A	1/9 1/7 4/12	“This review found conflicting evidence for the effectiveness of multidisciplinary treatment in improving employment outcomes, ...and no effect in improving pain and function for individuals with CLBP”
McAlister, 2004	Patient education, self-management, follow-ups, coordination, medication management	Usual care	<p><i>Multidisciplinary team follow-up heart failure clinic</i></p> <ul style="list-style-type: none"> • All-cause mortality • All-cause hospitalization • HF hospitalization • Use of medications • Adherence rate to medications • Patient quality of life or functional status • Costs of the intervention 	RR 0.75 (0.59 - 0.96) RR 0.81 (0.71 - 0.91) RR 0.74 (0.63 - 0.87) N/A N/A N/A N/A	2/12 3/14 3/9 6/10 5/6 9/18 15/18	“A wide variety of multidisciplinary strategies to manage patients with HF reduce HF hospitalizations. Programs that involve specialized follow-up by a multidisciplinary team also reduce mortality and all-cause hospitalizations.”
Holland, 2005	Home visits, follow-up, patient education, medication review	Usual care	<ul style="list-style-type: none"> • All cause hospital admission • All cause mortality • Heart failure hospital admission • Mean inpatient days 	RR 0.87 (0.79 - 0.95) RR 0.79 (0.69 - 0.92) RR 0.70 (0.61 - 0.81) 21.8 (intervention) vs 29 days (control)	14/21 20/27 N/A N/A	“Multidisciplinary interventions for heart failure reduce both hospital admission and all cause mortality. The most effective interventions were delivered at least partly in the home.”
Gilbody, 2006	Concordance in antidepressant use, case management, follow-up	Standard care	<p>Standardized depression outcomes:</p> <ul style="list-style-type: none"> • 6 months • 12 months • 18 months • 24 months • 60 months 	SMD 0.25 (0.18 - 0.32) SMD 0.31 (0.01 - 0.53) SMD 0.25 (0.03 - 0.46) SMD 0.15 (- 0.03 - 0.34) SMD 0.15 (0.001 - 0.30)	30/35 5/6 4/5 6/9 2/2	“Our results confirm that collaborative care is effective in improving short-term outcomes in depression and, to our knowledge, summarize for the first time the emerging evidence of longer-term benefit.”
Gunn, 2006	Multi-professional approach, management plan, follow-up, enhanced professional communication, care manager	Usual care	Recovery outcomes defined as no longer satisfying criteria for probable depression using the scale included in the study	N/A	7/12	“System level interventions implemented in the USA, with patients willing to take anti-depressant medication, lead to a modest increase in recovery from depression.”
Simmonds, 2001	Education, counseling, case manager, referrals to community agencies	Usual care	<ul style="list-style-type: none"> • Death (any cause) • Acceptability of management • Psychiatric hospitalization • Psychiatric symptoms and social function • Costs (less) 	OR 0.47 (0.21 - 1.06) OR 0.61 (0.45 - 0.83) Community mental health team (CMHT) > standard No difference CMHT > standard	4/5 3/5 N/A N/A 5/5	“CMHT management is effective in comparison with standard care with respect to acceptance of treatment, reduction of hospital admissions, maintaining care, reducing death by suicide and reducing costs”

Continued

Craven, 2006	Team assessment and treatment, education, follow-up, monitoring and feedback, medication counseling	Usual care	<ul style="list-style-type: none"> • Clinical outcomes • Social outcomes • Antidepressants use • Medication adherence • Emergency room visit • Bed use • Patient satisfaction • Quality of life • Costs 	N/A	19/31 2/4 11/14 2/7 1/1 2/3 9/15 1/1 1/4	“A body of experimental literature evaluating the impact of enhanced collaboration on patient outcomes—primarily in depressive disorders—now exists.”
Kane, 2011	Not described	Regular healthcare	<ul style="list-style-type: none"> • Mortality • Morbidity • Quality of life • Hospitalization/ER • Cost 	N/A	4/37 48/95 20/48 14/56 17/37	“Overall, team care seems more likely to improve the process of care than to improve outcomes”
McConnell, 2008	Pharmacist intervention: medication review and management, common treatment plan	Usual care	<ul style="list-style-type: none"> • Low-density lipoprotein-cholesterol • Blood pressure • Cardiovascular mortality • Total mortality • Medication compliance • Cost 	N/A	10/10 3/4 2/2 0/1 1/1 1/1	“In published trials, pharmacist-led interventions have been shown to be associated with improved outcomes for patients with cardiovascular disease via management of hyperlipidemia and hypertension, and increasing prescription of secondary prevention medications in a variety of arenas, including inpatient, ambulatory, and community settings.”
Vliet Vlieland, 1997	Team care and conferences, home visit, education sessions	Routine care	<ul style="list-style-type: none"> • Clinical (functional status, pain, articular index, psychosocial status) • Resource utilization 	N/A No difference	5/7 N/A	“The benefit of prolonged outpatient multidisciplinary team care is scanty”
Codispoti, 2004	N/A	N/A	<ul style="list-style-type: none"> • Hb1Ac level • Cholesterol level • Blood pressure • Diabetes related complications • utilization of healthcare resources • Cost 	N/A	N/A	“The benefits of MDT approach to diabetes management include improved QoL, lower risk of complications, decreased healthcare costs, increased patient follow-up, higher patient satisfaction and improved glycemic control.”
Fleissig, 2006	N/A	N/A	<ul style="list-style-type: none"> • Survival • Improved outcomes • Mental wellbeing 	N/A	N/A	“MDT working has been widely introduced around the UK for the provision of cancer care, but there is little evidence for its direct effect on the quality of patient care”
Stanos, 2006	N/A	N/A	<ul style="list-style-type: none"> • Function • Level of pain • Return to work • Cost 	N/A	N/A	No conclusion provided
Ashner, 2007	N/A	N/A	<ul style="list-style-type: none"> • HbA1c • Hospital admissions • Outpatient visits • Body weight • Blood pressure • Lipid profile • Quality of life • Patient satisfaction 	N/A	N/A	“These insights demonstrate how a multidisciplinary team approach to diabetes management, involving patient-centred care, promotes shared responsibility for achieving glucose goals and leads to improved outcomes”.

Continued

Vannoy, 2007	N/A	N/A	<ul style="list-style-type: none"> • Access to mental health specialist • Depression response rate • Remission rate • Depression symptoms • Response to treatment • Suicide ideation • Physical functioning • Quality of life 	N/A	N/A	“Collaborative care for late-life depression can reduce symptoms more quickly in more patients than usual treatment.”
Katon, 2008	N/A	N/A	<ul style="list-style-type: none"> • Adherence to antidepressant • Depressive outcomes • Quality of mental health • Costs 	N/A	N/A	“The Collaborative Care Model has been shown to significantly improve the quality of depression care and outcomes of patients.”
Kalisch, 2010	N/A	N/A	<ul style="list-style-type: none"> • Hospitalizations • Mortality • Physician compliance • Patient compliance • Quality of life 	N/A	N/A	“Collaborative pharmacist-physician medicines reviews for heart failure patients are effective in improving health outcomes in both randomized controlled trials and in the practice setting”

(RR 0.70 CI 0.61 - 0.81), confirming the effectiveness of teamwork. In the review of Gilbody *et al.* (2006) on depression, the evidence retrieved confirmed the conclusion of teamwork effective with 83% (47/57) of the studies favouring the intervention; e.g. SMD was 0.25 CI 0.18 - 0.32 for depression outcomes at 6 months. The PSFI was 58% (7/12) for the review of Gunn *et al.* (2006) on depression that was classified as teamwork possibly effective. In Simmonds *et al.* (2001) on severe mental illnesses, 80% (12/15) of the studies favoured the intervention. The intervention was superior to standard care for death (all cause), acceptability of management, psychiatric hospitalization and costs outcomes. No difference was found for psychiatric symptoms and social function outcomes. In the review of Craven & Bland (2006) on depressive disorders that was classified as “teamwork possibly effective”, 60% (48/80) of the studies favoured the intervention. The review of Kane *et al.* (2011), reporting on multiple chronic disease, was inconclusive with 38% of positive results. The review of McConnell *et al.* (2008) on cardiovascular disease concluded that teamwork was effective which was confirmed by the 89% of the studies favoured the intervention.

3.2.4. Low Quality Reviews

In the review of Vliet Vlieland & Hazes (1997) on rheumatoid arthritis classified as inconclusive, 71% (5/7) of the studies’ favoured the intervention on clinical outcomes and no differences for resource utilization outcomes.

Seven narrative reviews were included in the overview. Based on the conclusion of the authors of the reviews, four concluded that teamwork was effective; one review

found teamwork possibly effective; and, one was classified as inconclusive. The seventh review was disregarded because no conclusion was provided by the authors (**Table 4**).

4. Discussion

The findings of this overview do not provide unequivocal evidence that team care is universally effective in improving patient clinical care and outcomes. However, despite the limited number of reviews, the weight of cumulative results is suggestive of positive clinical and resource utilization impacts in the multidisciplinary management of several prevalent chronic diseases, namely: heart failure, depression and diabetes.

To our knowledge, no previous systematic overview has addressed the specific question of the efficacy/effectiveness of team care in chronic disease management. However, in a review of systematic reviews [55] of integrated care programs, with multidisciplinary patient care teams as a component in some of the included reviews, the investigators did report mixed results for costs and mortality outcomes; and, positive results for hospitalization, quality of life and patient satisfaction outcomes. Many unstructured reviews have also supported the benefits of health teams in terms of organisational, team members’ and patients’ perceived benefits [4].

Although the determinants of teamwork effectiveness were rarely assessed in the reviews analysed for this paper, the findings were in line with other previously reported results [8,15,56,57]. In particular, professional hierarchies, lack of leadership, poor communications and inter-team relations; and, incomplete knowledge of abili-

ties and roles are the most frequently perceived factors to have negative impact on teams' effectiveness [10,11].

Another important aspect of teamwork effectiveness and uptake is the model of remuneration or the provision of incentives. The model of reimbursement has been described in two reviews [43,51] as one of the barriers to collaborative care. Experiences in Australia and UK with new reimbursement models have been linked to team performance [15]. In Canada, health officials are increasingly advocating the benefits of interdisciplinary models and providing incentives to health professionals [58].

Finally, no conclusions could be drawn on the relationship between the level of efficiency of teamwork or the intensity of the interventions and effectiveness of patient outcomes.

Our study has several limitations. Many review papers that have examined the effectiveness of disease management programs for various chronic diseases were excluded because they did not report separate results for a multidisciplinary team care component. Thus, effects of team care could therefore not be assessed specifically. Also, in our overview, limited numbers of reviews precluded disease-specific comparisons. Another potential limitation is that vote counting, based on direction of effect and statistical significance, can disregard sample size (number of studies) and be, therefore misleading [59]. And, we did not include subjective outcome measurements for team effectiveness, which often relate to attitudinal aspects measured by team members, such as perceptions of their own team functioning [15,56]. Lastly, the methodological challenges of conducting an overview of reviews are worth noting. Only one quality assessment tool and two methodological papers are currently available for guidance [60]. Further methods need to be developed for this new form of knowledge synthesis, particularly analytical methods that take into consideration the doubling of individual studies between the reviews, the original conclusions of the component reviews, as well as the quality of evidence.

5. Conclusion

Our systematic overview add to the growing body of evidence suggesting health care teams can have beneficial impact on clinical and health resource endpoints. However, because of the limitations cited, the findings do not provide unqualified evidence of the effectiveness of team care in improving clinical outcomes in the context of chronic disease management. Further studies that examine the causal relations between multidisciplinary team care and clinical and economic outcomes of disease management programs are needed to more accurately assess its efficacy in terms of public health and cost efficiency.

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