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REVIEW

Team-Based Care and Patient Satisfaction in the Hospital Setting: A Systematic Review

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Purpose	Limited research examining the relationship between team-based models of care and patient satisfaction in the hospital setting is available. The purpose of this literature review was to explore this relationship as well as the relationships between team composition, team-based interventions, patient satisfaction, and other outcomes of care when measured as part of the study.
Methods	A systematic appraisal of research studies published through February 2017 was conducted using PubMed, Cochrane Library, CINAHL, Embase, Ovid, gray literature and Google Scholar. Inclusion criteria were 1) experimental (randomized control trials), quasi-experimental, or non-experimental (cross-sectional) study design; 2) team-based care interventions; 3) hospital setting; 4) patient satisfaction measured as an outcome; and 5) published in English.
Results	The literature search yielded 15,247 citations. In total, 142 articles were retrieved for full-text screening; 21 studies met inclusion criteria. Overall, 57% of the studies identified a statistically significant improvement in patient satisfaction associated with team-based care. Team-based care interventions ranged from single team activities such as multidisciplinary rounds to comprehensive team-based models of care. Patient satisfaction scores were greater with teams that had more than two professions and more comprehensive team-based models. About one-quarter of studies that measured patient satisfaction and at least one additional outcome demonstrated improvement in both.
Conclusions	Team-based care may positively affect patient satisfaction. Team composition and type of team intervention appears to influence the strength of the relationship. Improvements in satisfaction are not consistently accompanied by improvements in other outcomes. (<i>J Patient Cent Res Rev.</i> 2019;6:158-171.)
Keywords	patient satisfaction; interprofessional collaboration; hospital care; systematic review; quality metrics

With the advent of pay-per-performance and value-based reimbursement in the health care setting, emphasis on new innovative care delivery models is necessary. Health care systems strive to align their care delivery models with the Triple Aim: improved population health, improved patient experience, lower health care costs.¹ Over the last several decades, growth in team-based models of care have emerged in many different sectors of health care.²

This growth is largely due to the growing complexity of the health care system and the recognition that no individual health care provider or discipline can provide comprehensive care for patients, especially in the hospital setting.³

While many studies have shown a positive relationship between team-based care and patient outcomes, such as reducing cost and improving quality, few examine the impact of the health care team on the patient experience. Furthermore, defining the exact team composition or intervention to promote the Triple Aim also remains uncertain. With the fragmentation of the health care system, team-based care, often

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referred to as interprofessional collaborative practice, is imperative to provide high-value, patient-centered care, and identifying the team-based models of care that promote the largest impact on quality, safety, and patient experience is crucial.⁴

The first of its kind, this review was designed to examine the relationships between team-based models of care and patient satisfaction in the hospital setting utilizing a wide scope of research. A secondary purpose was to explore relationships among team composition, team-based interventions, and patient satisfaction.

Defining Team Composition and Interventions

The composition and key features of health care teams have been described in several different ways. One of the commonly cited definitions of teams was put forward by the Institute of Medicine's workgroup on "team-based health care." Its definition includes two or more health care professions and often includes the patient and sometimes the patient's family or caregivers.² Additional definitions describe effective teams as those that share common goals and collaborate to deliver high-value, patient-centered care.⁵ The World Health Organization defines interprofessional collaborative practice, a synonym to team-based health care, as multiple health workers from various professional backgrounds working together with patients, families, caregivers, and communities to deliver high-quality patient care.⁶ Team-based care has been further supported through development of interprofessional education and collaborative practice competencies from the World Health Organization and the Interprofessional Education Collaborative.^{6,7}

Beyond the definition of team composition in health care, broad categories of team-based care interventions proposed by Reeves et al have been described in the literature: interprofessional coordination, interprofessional collaboration, and interprofessional teamwork.⁸ These categories describe a continuum of team-based care ranging from coordination of care — which includes periodic, ad hoc communication (interprofessional coordination) — to full integration of care, in which teams are designed a priori to provide comprehensive care for a specific patient population (interprofessional teamwork).⁸ To date, no studies have examined the impact of various team composition and/or team-based care interventions on patient experience.

Evidence for Team-Based Care

Although team-based care has been well-described and significant advances to team-based care have occurred in recent years, barriers continue to exist. These include lack of reimbursement models, lack of interprofessional training to support interprofessional collaborative practice, cultural differences among health care professions, and lack of understanding of optimal team structure and function.⁹

Despite these barriers, there is a growing body of research that indicates team-based care is associated with improved patient outcomes. Some of the outcomes linked to team intervention include decreased readmission rates to the hospital for high-risk patient populations, decreased adverse events for hospitalized patients, and decreased length of stay in the hospital.^{2,4,10} Similar improved patient outcomes have been associated with team-based models of care in the ambulatory care setting.^{10,11} Patient-centered medical homes (PCMH) using team models have shown improved coordination of care, access to care, and quality and safety metrics. Specifically, in patient populations with chronic comorbid diseases, PCMH models have demonstrated decreased pharmacy expenditures and emergency department visits.¹²

With the growing emphasis on the importance of patient-centered care and the patient experience, there has been renewed interest in the impact of teamwork on patient satisfaction. Teams are being looked to as a vehicle for enhancing patient satisfaction as well as achieving payment incentives in value-based payment models.¹³ Patient satisfaction has been an interest in patient outcome research for decades but has not been linked to direct reimbursement until recently. With the arrival of pay-for-performance and value-based care, patient satisfaction scores may be included in quality-based payment systems for ambulatory care services and for inpatient care.¹⁴ While performance on these scores is still attributed to individual providers and systems, there is a growing movement in the United States to recognize the contribution of teams in emerging payment models.^{15,16}

Demonstrating clear patient outcomes related to team-based care is imperative to drive further research, health care policy changes, and clinical practice guidelines. Wen and Schulman conducted a systematic

review of the effect of team-based care models on patient satisfaction.¹³ In this meta-analysis examining only randomized controlled trials conducted through 2012, they found an equivocal relationship between team-based care and patient satisfaction. The authors noted limitations within their review, including a lack of definition for “team,” inconsistency between studies describing the team intervention, and wide variation of patient satisfaction measurement tools.

Since that time, the body of knowledge regarding team-based care and team science has greatly expanded¹⁶ and extends outside the confines of randomized controlled trials. In addition to patient satisfaction team composition, and team-based interventions, the review presented herein will examine a broader scope of team-based care studies, including experimental, quasi-experimental and non-experimental (cross-sectional), allowing for a more comprehensive analysis of the research in this area. Unlike the review performed by Wen and Schulman, ours is specifically focused on the hospital setting, an important difference because many factors that affect patient satisfaction — along with reimbursement structures for team-based care, team composition structures, and team interventions¹⁵⁻¹⁷ — greatly differ between inpatient and ambulatory care settings. To prepare for new team-based incentive models, it is critical to understand the impact of team-based care on patient satisfaction and to further understand how team composition and which type of team-based interventions truly impact the patient experience.

METHODS

We adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria for conducting a systematic search of the literature, which can be found within the PRISMA checklist.¹⁸ The heterogeneity of the identified study designs precluded performing a meta-analysis.¹⁹

Inclusion and Exclusion Criteria

Inclusion criteria for the review were: experimental or quasi-experimental or non-experimental (cross-sectional) design; team-based care defined as 2 or more people from at least 2 professions or disciplines working together to provide patient care; patient care took place within any hospital department; and article written in English. International studies were included to allow for comprehensive analysis. Required

outcome measures included directly gathered patient satisfaction data from any patient population.

Reviews, expert opinion, background articles, and conference proceedings were excluded. Studies also were excluded if they only described providers’ impressions of patient satisfaction or provider satisfaction rather than actual measurements of patient satisfaction.

Search Strategies and Study Selection

PubMed, Cochrane Library, CINAHL, Embase, Ovid, gray literature, and Google Scholar databases were searched. Database search duties were split between the first and second authors, and searched from inception through February 2017. Reference lists from retrieved articles were also examined for additional articles. Articles retrieved were initially reviewed for relevance by title and abstract for inclusion of interprofessional patient care teams, patient satisfaction, and the hospital setting. After duplicate articles were removed, the remaining articles were analyzed per the inclusion and exclusion criteria within the full text.

In each database search, both Medical Subject Headings (MeSH) and natural language keywords were utilized (Online Appendix 1). To capture the concept of team-based models of care, the following search terms were used: patient care team, interdisciplinary care team, interdisciplinary health team, medical care team, health care team, interprofessional collaboration, and interprofessionalism. “Critical care” and “hospital based care” were used to search for the hospital care setting. Patient satisfaction was searched using the following terms: patient satisfaction, patient satisfaction rate, patient-centered outcome, patient outcomes, patient experience, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), Press Ganey surveys, and hospital value-based purchasing. All terms were searched as keywords in the text, title, or abstract.

Data Extraction and Quality Assessment

Study design, sample population, team composition, team intervention, patient satisfaction assessment tool, and study results were extracted from each article for further analysis using a standard template. The first author extracted initial data, and the second author verified the extracted data to ensure reliability. When a discrepancy on data points was observed, consensus between both reviewers was achieved.

Team composition was divided into 2 categories: dyad teams (2 people from 2 different health professions) and multiprofessional teams (3 or more members representing at least 3 health professions). Data were gathered from study descriptions of who from the health care team participated and placed into one of the categories.

Team-based care interventions were categorized into the 3 categories previously described by Reeves et al as follows:

- *Interprofessional coordination* — Various individuals representing different health care professions who work together to provide care. The activities, such as communication, are less frequently interprofessional and are not necessarily predetermined as part of regular care.⁸

- *Interprofessional collaboration* — This type of interprofessional work involves health care professionals who come together on a regular basis to intentionally communicate or make decisions regarding patient care. For example, multidisciplinary rounds can be considered a type of interprofessional collaboration.⁸

- *Interprofessional teamwork* — Activities of these care teams are fully interdependent, and teams come together with shared goals, an identity, and mental model to deliver integrated care. Care coordination teams are an example of interprofessional teamwork.⁸

The first and second authors collectively reviewed the methods section of articles to place each of the studies into one of the team intervention categories. When there was discrepancy on category, a consensus between the

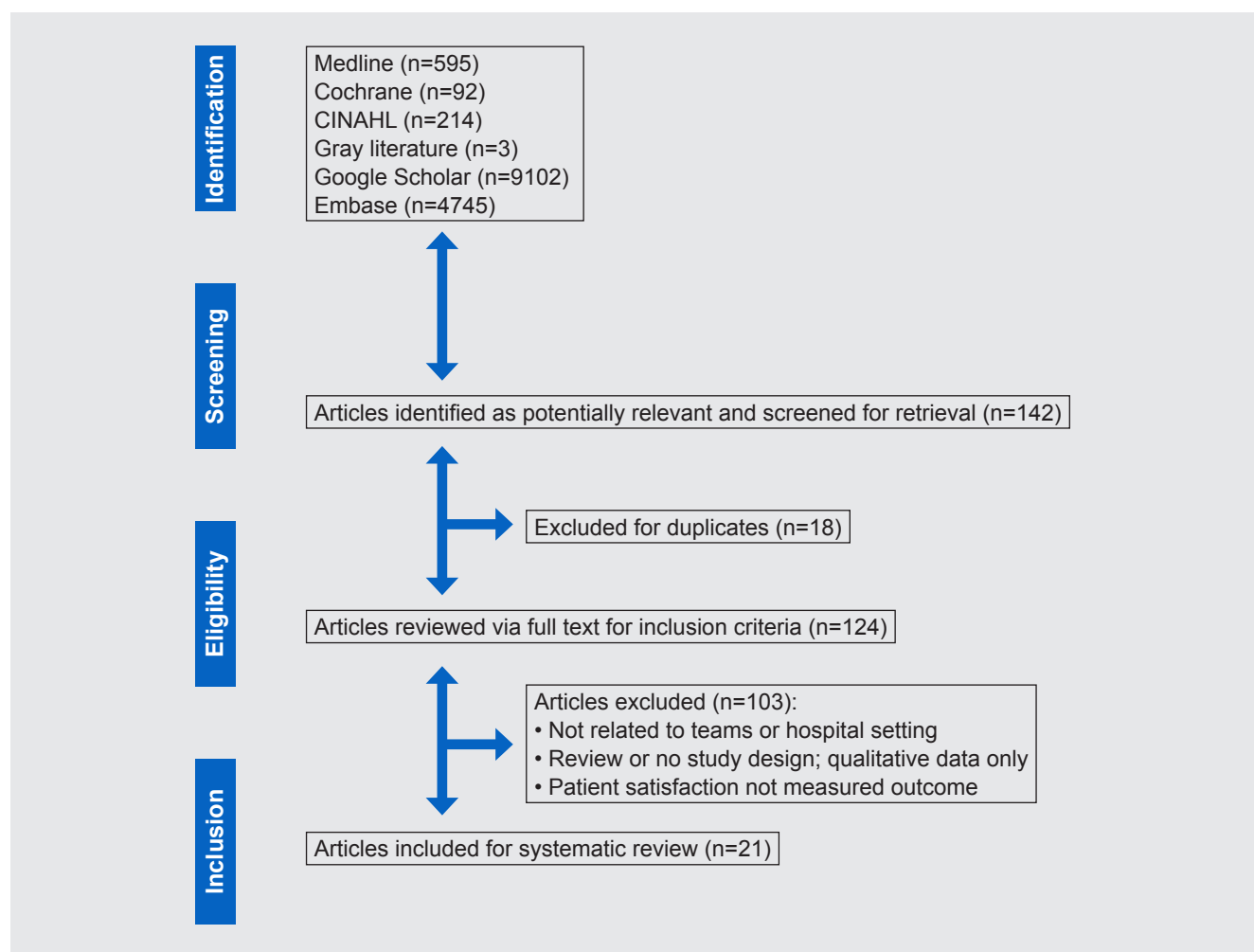


Figure 1. PRISMA flowchart.

reviewers was achieved through joint review of the study intervention and category definitions.

The quality of each article was assessed independently by the first and second author using the modified GRADE criteria, which consist of type of evidence, quality, consistency, directness, and effect size.²⁰ Quality of articles were rated on a scale from 0 to 4 based on the standardized scale (0=very low; 1=low; 2=moderate; 3=high; 4=very high). Cohen's kappa coefficient was used to estimate the consistency of the individual raters.²¹

RESULTS

Study Characteristics

The literature search yielded 15,247 citations. After assessing for relevance, 142 articles were retrieved for full-text screening. After duplicates were removed, 124 articles were screened, with 21 studies subsequently included for analysis based on the inclusion and exclusion criteria (Figure 1).

The 21 reviewed studies were published between 1999 and 2016.²²⁻⁴² Four studies were randomized controlled trials, 16 were quasi-experimental, and 1 used a cross-sectional design (Table 1). The majority of studies were conducted in an academic medical center or tertiary hospital setting (n=16). The remainder occurred in

community hospital settings. Patient populations included adult patients in all studies except one, which focused on pediatric patients.²⁹

Team composition — multiprofessional or dyad — varied among studies (Table 2). The majority of teams were multiprofessional (71% vs 29% dyad). Most multiprofessional teams included more than 3 professions in the team (n=15). Multiprofessional teams routinely consisted of a combination of physicians, nurses, advance practice providers, social workers, case management, and therapy services. A typical composition of dyads was physician and nurse or advanced practice provider. One study included the patient as a member of the team, while another considered the family or caregiver as part of the team.^{26,30}

Type of team-based care intervention also varied. More than half of the studies utilized interprofessional teamwork (n=11, 52%) versus interprofessional coordination (n=7, 33%) or interprofessional collaboration (n=3, 14%) (Figure 2).

Quality assessment per GRADE criteria was overall low to moderate due to the limited amount of randomized controlled trials. Interrater reliability, measured through Cohen's kappa, was calculated at 0.87 (P<0.001).

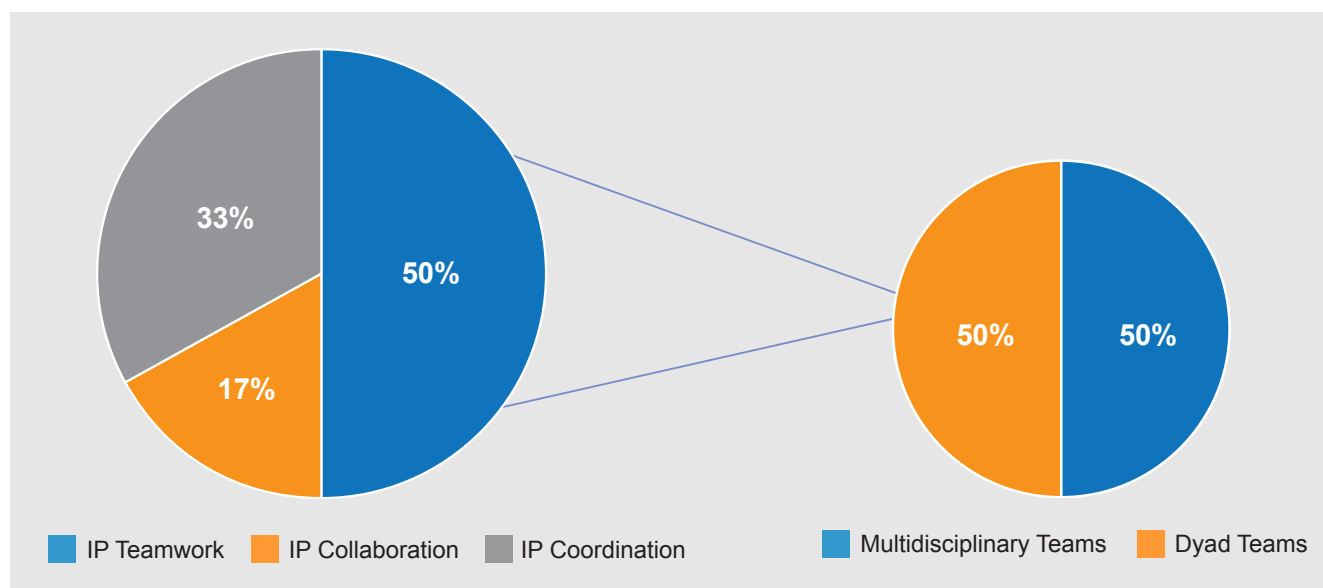


Figure 2. Team intervention type associated with improved patient satisfaction. IP, interprofessional

Table 1. Study Characteristics

Citation	Study Design	Setting	Participants	n*	Intervention
Ahmed et al (2010) ²²	quasi-experimental	AMC	geriatric service patients	control = 383 intervention = 1064	Acute Care for Elderly (ACE) team
Arbaje et al (2014) ²⁷	quasi-experimental	AMC	geriatric service patients	control = 118 intervention = 151	Geriatric Floating Interdisciplinary Transition Team (Geri-FITT) dyad
Auerbach et al (2012) ³⁰	quasi-experimental	AMC	general medicine unit patients	313	Triad for Optimal Patient Safety (TOPS), interprofessional education, and multidisciplinary team champions
DeBehnke et al (2002) ³¹	quasi-experimental	AMC	emergency department patients	454	Physician-registered nurse dyads
Finch et al (1999) ²³	quasi-experimental	rural hospital	discharged patients	121	Multidisciplinary rounds
Forster et al (2005) ²⁵	experimental (RCT)	AMC (Canada)	general medicine unit patients	control=155 intervention=135	Physician-clinical nurse specialist dyads
Gade et al (2008) ²⁸	experimental (RCT)	varied	palliative care patients	control = 23 intervention = 275	Multidisciplinary care team
Hastings et al (2016) ²⁶	quasi-experimental	AMC (Canada)	general medical unit patients	baseline = 26 intervention = 37	Interprofessional coordination and multidisciplinary rounds
Hung et al (2013) ³²	quasi-experimental	urban tertiary care hospital	geriatric patients with acute illness	control = 173 intervention = 17	Mobile Acute Care for Elderly (MACE) unit
Iannuzzi et al (2015) ³³	quasi-experimental	AMC	general medical unit patients	resident team = ~562 MLP team = ~289	Hospitalist-MLP dyad vs hospitalist-resident dyad
Kane et al (2016) ³⁴	quasi-experimental	AMC	general medical unit patients	not provided	Team huddles with “playbook” for bed management and daily multidisciplinary team report for discharges
Kara et al (2015) ³⁵	quasi-experimental	AMC	general medical unit patients and surgical unit patients	110	Accountable care team
Laird-Fick et al (2011) ³⁶	quasi-experimental	community hospital	adult emergency department patients	control = 81 intervention = 86	Interprofessional education and collaboration
San Martin-Rodriguez et al (2008) ³⁷	non-experimental (cross-sectional)	AMC (Spain)	general medical unit patients with cancer	312	Low- vs high-intensity interprofessional teams
Menefee et al (2014) ³⁸	quasi-experimental	rural hospital	general medical unit patients	217	Menefee model and interdisciplinary plan of care
Preen et al (2005) ²⁴	experimental (RCT)	tertiary care hospital (Australia)	patients with chronic cardiorespiratory disease	128	Multidisciplinary discharge planning team
Roy et al (2008) ³⁹	quasi-experimental	AMC	general medical service patients	control = 4202 intervention = 992	Multidisciplinary hospitalist team
Scotten et al (2015) ²⁹	quasi-experimental	AMC	pediatric patients and families	preintervention = 70 postintervention = 41	Multifaceted interprofessional education and collaborative project
Southwick et al (2014) ⁴⁰	quasi-experimental	AMC	hospitalized patients on medicine resident team	control = 44 intervention = 46	Multidisciplinary rounds
Townsend-Gervis et al (2014) ⁴¹	quasi-experimental	suburban hospital	medical/surgical unit patients	not provided	Structured communication tool (SBAR) and interdisciplinary rounds
Wray et al (2016) ⁴²	quasi-experimental	AMC	general medicine patients on resident and nonteaching services	general medicine = 4591 hospitalist = 1811	Physician-only team (general medicine team) vs interprofessional dyad (hospitalist-NP/PA dyad)

AMC, academic medical center; RCT, randomized controlled trial; MLP, midlevel practitioner; NP/PA, nurse practitioner/physician assistant.

Table 2. Team Composition and Intervention

Study	Team Matrix	Team Category	Team Intervention
Ahmed et al (2012) ²²	geriatrician, NP, nurse, patient care assistant, unit clerk, clinical nurse specialist; part-time participation from pharmacist, physical therapist, occupational therapist, social worker, case manager	multiprofessional	teamwork
Arbaje et al (2010) ²⁷	geriatrician, geriatric NP	dyad	teamwork
Auerbach et al (2011) ³⁰	physician, nurse, pharmacist (unit-based or central), staff, patient	multiprofessional	coordination
DeBehnke et al (2002) ³¹	physician, nurse	dyad	teamwork
Finch et al (1999) ²³	physician, social worker, utilization manager, dietician, pharmacist, respiratory therapist	multiprofessional	coordination
Forster et al (2005) ²⁵	physician, residents, staff internist, clinical nurse specialist	dyad	collaboration
Gade et al (2008) ²⁸	physician (palliative care specialist), nurse, social worker, chaplain	multiprofessional	teamwork
Hastings et al (2016) ²⁶	physicians, nurses, allied health staff, family	multiprofessional	coordination
Hung et al (2013) ³²	geriatrician, geriatrics fellow, social worker, clinical nurse specialist	multiprofessional	teamwork
Iannuzzi et al (2014) ³³	hospitalist physician, resident, interns, students, an NP or a PA	dyad	teamwork
Kane et al (2016) ³⁴	physician, residents, case manager, social worker, respiratory therapist pharmacy, nutritionist, nurse, nurse manager, medical director	multiprofessional	coordination
Kara et al (2015) ³⁵	case manager, clinical nurse specialist, pharmacist, nutritionist, hospitalist – all unit-based	multiprofessional	teamwork
Laird-Fick et al (2011) ³⁶	physician (residents), nurses	dyad	collaboration
San Martin-Rodriguez et al (2008) ³⁷	physicians (multispecialty), nurses	dyad	teamwork
Menefee et al (2014) ³⁸	physicians, care manager, social worker, nutritionist, respiratory therapist, pharmacist, patient care assistants, therapists	multiprofessional	teamwork
Preen et al (2005) ²⁴	not specified but includes primary care provider	multiprofessional	collaboration
Roy et al (2008) ³⁹	hospitalist, PA, nurse, care coordinator, pharmacist	multiprofessional	teamwork
Scotten et al (2015) ²⁹	physician, nurse, therapists, informaticists, speech therapists	multiprofessional	coordination
Southwick et al (2014) ⁴⁰	physician, resident, pharmacist, nurse, case manager	multiprofessional	coordination
Townsend-Gervis et al (2014) ⁴¹	nurse, dieticians, pharmacists, social worker, case managers, physician	multiprofessional	coordination
Wray et al (2016) ⁴²	physician-NP/PA team vs physician-only teams	dyad	teamwork

NP, nurse practitioner; PA, physician assistant.

Study Findings

The primary aim of this review was to determine the relationship between team-based models of care and patient satisfaction in the hospital setting. Collectively, 57% of the 21 studies (n=12) found a significant improvement in patient satisfaction with the implementation of team-based care. Additionally,

5 studies found improved but not statistically significant patient satisfaction scores with team-based models of care (81%, n=17) (Table 3). In studies that examined other outcomes as their primary measure(s), patient satisfaction was observed as a secondary outcome and continued to demonstrate improvement.^{22,34,41}

Table 3. Study Results

Citation	Patient Satisfaction Instrument	Patient Satisfaction Outcome	Other Outcomes
Ahmed et al (2012) ²²	HCAHPS, Press Ganey	Press Ganey scores remained greater than 80% HCAHPS scores consistently 9 or 10	LOS, CMI-adjusted LOS, direct costs, and readmission decreased; CMI increased
Arbaje et al (2010) ²⁷	4-question in-house survey with 5-point Likert scale (not validated)	Slightly improved (95.2% vs 93.8%, P=0.21)	CTM = NS (β coefficient: 1.81, P=0.47)
Auerbach et al (2011) ³⁰	HCAHPS and in-house questions	Improved patient satisfaction scores (P<0.05)	LOS and readmission = NS (P=0.78 and P=0.09); care perception = varied; quality of teamwork = varied
DeBehnke et al (2002) ³¹	Press Ganey/HCAHPS	Improved from 78.2 \pm 20.4% to 82.2 \pm 17.2% (P<0.01)	Perception of waiting time and staff attention improved
Finch et al (1999) ²³	11-question in-house survey	Improved from ~82% to ~97% and from Very Good to Excellent	N/A
Forster et al (2005) ²⁵	National Patient Satisfaction Survey (Canadian)	Improved: 8.2 vs 7.6 (P=0.052)	NS for in-hospital and posthospital adverse events (P=0.10 to 0.87), readmission (P=0.16), return to ED (P=0.10), and death (P=0.89)
Gade et al (2008) ²⁸	Modified City of Hope Patient Questionnaire: Place of Care Environment scale, Doctors, Nurses/OHCP Communication scale	Improved: 6.8 vs 6.4 (P<0.001) for facility, and 8.3 vs 7.2 (P<0.001) for communication	Quality of life, survival, and advance directives = NS (P=0.10 to 0.80); decreased cost (\$6766 savings per patient) (P=0.001)
Hastings et al (2016) ²⁶	Validated Canadian Patient Experiences Survey – inpatient care	Family satisfaction improved to 58% from 50%, as did medication information (to 95% from 56%)	Slightly decreased 30-day readmission rates.
Hung et al (2013) ³²	CTM, HCAHPS	Improved mean CTM: 72.5 (19.1 SD) vs 64.9 (16.5 SD) (P<0.001) Improved HCAHPS: 50% vs 44.1% (C)	Improved incidence of adverse events and LOS; readmission = NS (slightly improved)
Ianuzzi et al (2015) ³³	HCAHPS questions CMS 6–8, Press Ganey P1–5 scores for physicians	HCAHPS: resident team had statistically higher scores Press Ganey: NS (P=0.02 to 0.73)	For resident group: lower cost (P=0.57); lower LOS (P<0.001); NS for mortality (P=0.60); and decreased readmission rate (P=0.07)
Kane et al (2016) ³⁴	Press Ganey/HCAHPS	Improved patient satisfaction scores in two categories: 67.1% to 69.5%; 78.9% to 79.4%	Improved discharges by noon per day from 14% to 24%; readmission decreased from 11.3% to 11.2% (P-value not reported)
Kara et al (2015) ³⁵	Interview rounds, HCAHPS	NS (P-value not reported)	Increased ACT scores associated with decreased LOS and CMI-adjusted variable direct cost (P<0.001)
Laird-Fick et al (2011) ³⁶	Validated 25-item provider-patient relationship questionnaire	NS (P-value not reported)	LOS, pain score, and psychological treatment=NS
San Martin-Rodriguez et al (2008) ³⁷	Press Ganey/HCAHPS inpatient survey	Improved (4.50 vs 4.54)	LOS, pain score, and psychological treatment=NS.

Table 3 (cont). Study Results

Citation	Patient Satisfaction Instrument	Patient Satisfaction Outcome	Other Outcomes
Menefee et al (2014) ³⁸	Value-based purchasing internal dataset	Improved (+7.5%)	Decreased readmission rate (-6); LOS unchanged between groups
Preen et al (2005) ²⁴	In-house survey, not validated	Improved (36.5% improved, P=0.02)	N/A
Roy et al (2008) ³⁹	Press Ganey (include HCAHPS) scores only (physician scores and discharge scores)	NS between groups (P-value not reported)	Intervention group = higher LOS (95% CI 95%: -0.4 to 10), lower costs (95% CI: -7.5 to -0.3%); NS for 30-day readmission
Scotten et al (2015) ³⁹	Engagement of Healthcare Provider Services	NS (90.84 vs 90.08; P=0.69)	LOS = NS; readmission rates increased (7.45 vs 12.18; P=0.005)
Southwick et al (2014) ⁴⁰	Self-made survey	NS (P=0.076), intervention 4.3 vs control 4.0 on Likert scale	Improved LOS and 30-day readmission scores
Townsend-Gervis et al (2014) ⁴¹	HCAHPS	Slightly improved (72% to 80%)	Improved Foley catheter removal (P<0.001) and readmission rates (P<0.001)
Wray et al (2016) ⁴²	Picker-Commonwealth Survey/ HCAHPS	Improved (73% vs 68%, P=0.001)	Patient satisfaction scores only were examined; no quality metrics to compare; median LOS similar between groups

ACT, accountable care teams; CMI, case mix index; CTM, care transitions measure; ED, emergency department; HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; LOS, length of stay; OHCP, Other Health Care Providers; NS, not statistically significant; SD, standard deviation.

Studies with improved patient satisfaction were more likely to utilize multiprofessional (n=8, 67%) versus dyad (n=4, 33%) teams. More than half of the team interventions were categorized as interprofessional teamwork (52%, n=11). Within this group, 6 teams were multiprofessional and 5 were dyads (Table 4). Seven studies reported team interventions consistent with interprofessional coordination (33%), all of which were composed of multiprofessional teams. Based on team intervention analysis, studies demonstrating improved patient satisfaction more often incorporated interprofessional teamwork (n=6, 50%) than studies that incorporated interprofessional coordination (n=4, 33%) or interprofessional collaboration (n=2, 17%).

In addition to examining team composition and intervention type as secondary outcomes, the relationship between patient satisfaction and other quality outcomes was analyzed. The majority of studies reviewed (n=18) measured both quality

outcomes (length of stay, adverse events in the hospital, cost, 30-day readmission rate) and patient satisfaction (Table 3). Of the 21 total studies, 5 (24%) showed significant improvement in both patient satisfaction and 1 or more other quality outcomes; 6 (29%) demonstrated improvement in at least 1 quality outcome but did not demonstrate improved patient satisfaction; and 5 found improved patient satisfaction without improvements in other outcomes. The remaining 2 studies did not demonstrate improvements in either category (Table 5).

DISCUSSION

We reviewed existing literature to examine the relationship between team-based care and patient satisfaction. Most studies (57%) demonstrated an improvement in patient satisfaction scores associated with team-based care. Studies that utilized multiprofessional teams (vs dyads) and an interprofessional teamwork intervention were more likely to demonstrate improved patient

Table 4. Team Interventions and Impact on Patient Satisfaction

	Interprofessional Coordination	Interprofessional Collaboration	Interprofessional Teamwork
Improved patient satisfaction	Auerbach et al (2012) ³⁰ Finch et al (1999) ²⁴ Hastings et al (2016) ²⁶ Kane et al (2016) ³⁴	*Forster et al (2005) ²⁵ Preen et al (2005) ²⁴	*DeBehnke et al (2002) ³¹ Gade et al (2008) ²⁸ Hung et al (2013) ³² Menefee et al (2014) ³⁸ *San Martin-Rodriguez et al (2008) ³⁷ *Wray et al (2016) ⁴²
Did not improve patient satisfaction	Scotten et al (2015) ²⁹ Southwick et al (2014) ⁴⁰ Townsend-Gervis et al (2014) ⁴¹	*Laird-Fick et al (2011) ³⁶	Ahmed et al (2012) ²² *Arbaje et al (2010) ²⁷ Kara et al (2015) ³⁶ *Ilanuzzi et al (2015) ³³ Roy et al (2008) ³⁹

*Indicates dyad teams; no asterisk indicates multiprofessional teams.

Table 5. Quality Metrics and Patient Satisfaction

	Improved Patient Satisfaction	No Improved Patient Satisfaction
Improved quality metrics(s)*	Gade et al (2008) ²⁸ Hung et al (2013) ³² Kane et al (2016) ³⁴ Menefee et al (2014) ³⁸ San Martin-Rodriguez et al (2008) ³⁷	Ahmed et al (2012) ²² Ilanuzzi et al (2015) ³³ Kara et al (2015) ³⁵ Roy et al (2008) ³⁹ Southwick et al (2014) ⁴⁰ Townsend-Gervis et al (2014) ⁴¹
No improved quality metrics(s)	Auerbach et al (2012) ³⁰ **DeBehnke et al (2002) ³¹ **Finch et al (1999) ²³ Forster et al (2005) ²⁵ Hastings et al (2016) ²⁶ Preen et al (2005) ²⁴ Wray et al (2016) ⁴²	**Arbaje et al (2010) ²⁷ Laird-Fick et al (2011) ³⁶ Scotten et al (2015) ²⁹

*At least one quality metric improved in primary or secondary outcomes.

**Study did not evaluate quality metric.

satisfaction scores. Additionally, 52% of the studies found improvement in at least 1 quality outcome in correlation with team-based care, but only 24% of the studies found improvement in both patient satisfaction and quality outcomes.

Team-Based Care and Patient Satisfaction

In a prior systematic review performed by Wen and Schulman, a slightly positive, but statistically insignificant, relationship was found between team-based care interventions and patient satisfaction, a measurement of the patient experience.¹³ Since 2012, when their

research was conducted, many more studies including non-randomized control trials have been performed to analyze this question, which we have included herein.

Even more evidence found beyond the studies within this review supports team-based care, a culture that fosters teamwork, and their positive impact on the patient experience. Meterko et al studied the attributes of employees at 125 Veterans Administration hospitals and found a strong positive relationship between a culture of teamwork and patient satisfaction. They postulated that teamwork and a culture in which teams can thrive are the basis for patient satisfaction and an overall positive patient experience.¹⁴

Team Composition and Patient Satisfaction

To understand how teams can be designed to optimize patient satisfaction, we examined the team structure and types of interventions with the most impact on patient satisfaction. Team composition usually included a physician, nurse, and at least 1 other health profession. All but 1 of the 5 studies that showed improvement in both quality metrics and patient satisfaction utilized multiprofessional teams, often with greater than 4 different disciplines. Studies that found an improvement in quality metrics only also utilized multiprofessional teams more frequently than dyad teams (5 vs 1, respectively). Works by Reeves et al and Fiscella et al recommend that larger, more diverse teams might have greater capacity to care for complex patients or provide a more comprehensive appearance to patients.^{8,43} While teamlets (physician and nurse or medical assistant) may have the ability to provide quality patient-centered care, multidisciplinary teams are better equipped to provide integrated and coordinated care for patients with complex chronic disease.⁴³

Team Interventions and Patient Satisfaction

Equally important to the team structure is the process or intervention type. Studies that examined team-based models of care — those using a fully integrated and interdependent process to optimize patient care, described as interprofessional teamwork in the interprofessional literature — demonstrated improved patient satisfaction scores versus the other types of interventions.⁸ In their comprehensive review, Reeves et al provide a conceptual framework that describes

examples in which teams function in a committed way for full integration of care and demonstrate improved patient outcomes and improved team satisfaction.⁸ In previous studies, team effectiveness was linked with integrated, cross-functional teams that coalesce to create their own identity.⁴⁴ According to Lemieux-Charles and McGuire, redesigned care teams with full integration were more likely to positively impact patient outcomes than usual team care.⁴⁵ This calls for further studies on fully integrated interprofessional teamwork and its effect on patient outcomes, especially patient satisfaction.

An equivocal relationship between care quality outcomes and patient satisfaction has been documented.^{16,46,47} Both are linked to reimbursement under the pay-for-performance guidelines and should be considered for promotion of high-value patient-centered care. In our review, team-based care was associated with both patient satisfaction and quality patient outcomes, but the association between improved quality and patient satisfaction was inconsistent (Table 4). Only 5 studies demonstrated improved quality metrics and patient satisfaction. In contrast, a study by Anhang et al did find a strong relationship between hospitals who reported high patient satisfaction scores (as measured by HCAHPS) and quality outcomes, primarily acute myocardial infarction, heart failure, pneumonia, and surgery.⁴⁶ However, in a similar study by Lyu et al, patient satisfaction scores were not statistically correlated with quality outcomes in 31 hospitals, and the authors concluded patient satisfaction is an independent measure and not codependent on quality outcomes.⁴⁷ The discrepancy in the literature is supported by the findings of this review and implores for more research in this area.

The Link to Patient Experience

There are many potential reasons for the lack of association between the patient's perception of care and the measured outcomes. Patient satisfaction can be very subjective and is confounded by many factors outside of specific quality indicators.⁴⁷ Additionally, HCAHPS has been challenged as an inaccurate measurement to account for the numerous factors that contribute to the patient experience, such as teamwork.^{16,47}

One explanation could be related to the degree to which the patient is engaged in their care by the health

care team. Patient activation, a component of patient engagement, is defined as the patient's ability to understand their care and have the knowledge, skills, and confidence to navigate their own care.⁴⁸ Extensive research performed by Hibbard et al demonstrated improved patient outcomes, lower health care costs and higher patient experience scores when patients are highly activated.^{48,49} Patient activation may provide the missing link between patient satisfaction and improved quality. A highly activated patient may perceive they are part of their medical care team and lead to improved patient experiences, thus diminishing the disparity between the patient's perception of quality and actual quality metrics. For example, in this review, both studies that captured the patient's perspective (ie, patient included as team member, family/caregiver involvement, patient perception of team) demonstrated both improved patient satisfaction scores and improved (though not statistically significant) quality metric outcomes.^{26,30} Both of these studies that included the patient as part of the team had similar team interventions: interprofessional coordination. This type of intervention is considered a lower level of integration and patient activation and could account for the marginal significance statistically.

Although significant correlational research has been conducted examining patient activation and patient experience, more studies are needed to explore a causal relationship between the degree of patient activation, patient satisfaction, and quality outcomes to fully understand the elements of the patient experience.

Limitations and Bias

This review included articles with various study designs and did not limit inclusion criteria to randomized controlled trials. The heterogeneity of designs led to the low to moderate quality assessment of the articles. This may have introduced bias and is a limitation of this review.

Another limitation of the review was the predominant use of HCAHPS to measure patient satisfaction. Although HCAHPS is the primary tool used to measure patient satisfaction posthospitalization in the United States, its effectiveness has been questioned because of the many other factors affecting patient satisfaction outside of the provider's control.⁵⁰ In our review, 4 of

the 5 studies demonstrating an association between improved quality metrics and patient satisfaction utilized HCAHPS. However, it is difficult to quantify a relationship between care provided by the medical care team and patient satisfaction, as HCAHPS does not assess the whole team, only the nurse and physician providing care.¹⁵ A more rigorous and comprehensive measurement of the patient experience should include questions about the care team and the attribution the team has on patient satisfaction scores.

CONCLUSIONS

To date, team-based care has demonstrated a positive effect on the health care system and contributes to high-value, patient-centered care. Patient satisfaction is emerging as an important indicator of quality, increasingly linked to reimbursement under the new pay-for-performance payment models. In reviewing reported relationships between team-based care in the hospital setting and patient satisfaction, we found that studies utilizing team-based care had improved patient satisfaction. Team composition and type of team-based intervention, potentially including the patient, may play an important role in patient satisfaction outcomes.

The relationship between other quality outcomes (eg, length of stay, adverse events, hospital readmission) and patient satisfaction appears dichotomous, given that many articles found improved patient satisfaction scores did not always have improved quality metric outcomes in parallel. This observation uncovers a gap in research: the patient's perception of quality does not necessarily match how the health care industry perceives quality. More research should be performed to identify the relationship between the patient experience, team composition, and type of team interventions to identify optimal team based-care models and inform clinical practice guidelines, health care policy, and reimbursement for team-based models of care.

Additionally, the manner in which patient satisfaction is measured and reported as a means for reimbursement should be further analyzed. Current assessments of patient satisfaction do not account for all members of the health care team and therefore do not reflect the impact that team-based models of care have on the patient experience. Through the

impact of outcomes-driven research, development of new interprofessional training programs, team-based clinical practice guidelines, and health policy promoting reimbursement for team care, the overall patient experience can be transformed.

Patient-Friendly Recap

- While use of team-based care approaches is increasing, their ultimate effect on patient satisfaction is unknown.
- The authors reviewed reported studies for methods and results concerning composition of teams, types of intervention, patient satisfaction scores, and outcomes for patients cared for in a hospital.
- They found that health care teams that represented more than two professions, worked closely together, and could address multiple patient issues yielded greater improvement in patient satisfaction.

Author Contributions

Study design: Will, Lamb. Data acquisition or analysis: Will, Johnson. Manuscript drafting: all authors. Critical revision: Will, Lamb.

Conflicts of Interest

None.

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