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A systematic review of evidence on the links between patient experience and clinical safety and effectiveness

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ABSTRACT

Objective: To explore evidence on the links between patient experience and clinical safety and effectiveness outcomes.

Design: Systematic review.

Setting: A wide range of settings within primary and secondary care including hospitals and primary care centres.

Participants: A wide range of demographic groups and age groups.

Primary and secondary outcome measures: A broad range of patient safety and clinical effectiveness outcomes including mortality, physical symptoms, length of stay and adherence to treatment.

Results: This study, summarising evidence from 55 studies, indicates consistent positive associations between patient experience, patient safety and clinical effectiveness for a wide range of disease areas, settings, outcome measures and study designs. It demonstrates positive associations between patient experience and self-rated and objectively measured health outcomes; adherence to recommended clinical practice and medication; preventive care (such as health-promoting behaviour, use of screening services and immunisation); and resource use (such as hospitalisation, length of stay and primary-care visits). There is some evidence of positive associations between patient experience and measures of the technical quality of care and adverse events. Overall, it was more common to find positive associations between patient experience and patient safety and clinical effectiveness than no associations.

Conclusions: The data presented display that patient experience is positively associated with clinical effectiveness and patient safety, and support the case for the inclusion of patient experience as one of the central pillars of quality in healthcare. It supports the argument that the three dimensions of quality should be looked at as a group and not in isolation. Clinicians should resist sidelining patient experience as too subjective or mood-oriented, divorced from the 'real' clinical work of measuring safety and effectiveness.

ARTICLE SUMMARY

Article focus

- Should patient experience, as advocated by the Institute of Medicine and the NHS Outcomes Framework, be seen as one of the pillars of quality in healthcare alongside patient safety and clinical effectiveness?
- What aspects of patient experience can be linked to clinical effectiveness and patient safety outcomes?
- What evidence is available on the links between patient experience and clinical effectiveness and patient safety outcomes?

Key messages

- The results show that patient experience is consistently positively associated with patient safety and clinical effectiveness across a wide range of disease areas, study designs, settings, population groups and outcome measures.
- Patient experience is positively associated with self-rated and objectively measured health outcomes; adherence to recommended medication and treatments; preventative care such as use of screening services and immunisations; healthcare resource use such as hospitalisation and primary-care visits; technical quality-of-care delivery and adverse events.
- This study supports the argument that patient experience, clinical effectiveness and patient safety are linked and should be looked at as a group.

Strengths and limitations of this study

- This study demonstrates an approach to designing a systematic review for the 'catch-all' term patient experience, and brings together evidence from a variety of sources that may otherwise remain dispersed.
- This was a time-limited review and there is scope to expand this search based on the results and broaden the search terms to uncover further evidence.

INTRODUCTION

Patient experience is increasingly recognised as one of the three pillars of quality in healthcare alongside clinical effectiveness and patient safety.[1] In the NHS, the measurement of patient experience data to identify strengths and weaknesses of healthcare delivery, drive-quality improvement, inform

commissioning and promote patient choice is now mandatory.[2–4] In addition to data on harm avoidance or success rates for treatments, providers are now assessed on aspects of care such as dignity and respect, compassion and involvement in care decisions.[4] In England, these data are published in Quality Accounts and the Commissioning for Quality and Innovation payment framework which makes a proportion of care providers' income conditional on the improvement in this domain.[5]

The inclusion of patient experience as a pillar of quality is often justified on grounds of its intrinsic value—that the expectation of humane, empathic care is requires no further justification. It is also justified on more utilitarian grounds as a means of improving patient safety and clinical effectiveness.[6 7] For example, clear information, empathic, two-way communication and respect for patients' beliefs and concerns could lead to patients being more informed and involved in decision-making and create an environment where patients are more willing to disclose information. Patients could have more 'ownership' of clinical decisions, entering a 'therapeutic alliance' with clinicians. This could support improved and more timely diagnosis, clinical decisions and advice and lead to fewer unnecessary referrals or diagnostic tests.[8 9] Increased patient agency can encourage greater participation in personal care, compliance with medication, adherence to recommended treatment and monitoring of prescriptions and dose.[9 10] Patients can be informed about what to expect from treatment and be motivated to report adverse events or complications and keep a list of their medical histories, allergies and current medications.[11]

Patients' direct experience of care process through clinical encounters or as an observer (eg, as a patient on a hospital ward) can provide valuable insights into everyday care. Examples include attention to pain control, assistance with bathing or help with feeding, the environment (cleanliness, noise and physical safety) and coordination of care between professions or organisations. Given the organisational fragmentation of much of healthcare and the numerous services with which many patients interact, the measurement of patient experience may help provide a 'whole-system' perspective not readily available from more discrete patient safety and clinical effectiveness measures.[11]

Focusing on such utilitarian arguments, this study reviews evidence on links that have been demonstrated between patient experience and clinical effectiveness and patient safety.

METHODS

Identifying variables relevant to patient experience

Patient experience is a term that encapsulates a number of dimensions, and in preliminary database searches, this phrase, on its own, uncovered a limited number of useful studies. To broaden and structure the search for evidence, identify search terms and provide a framework for analysis, it was necessary to identify what patient experience entails and outline potential mechanisms through which it is proposed to impact on safety and effectiveness. As such, we combined common elements from patient experience frameworks produced by The Institute of Medicine,[1] Picker Institute[12] and NICE.[13]

Table 1 delineates different dimensions of patient experience and distinguishes between 'relational' and 'functional' aspects.[10 14] Relational aspects refer to interpersonal aspects of care—the ability of clinicians to empathise, respect the preferences of patients, include them in decision-making and provide information to enable self-care.[10] It also refers to patients' expectations that professionals will put their interest above other considerations and be honest and transparent when something goes wrong.[8 15] Functional aspects relate to basic expectations about how care is delivered, such as attention to physical needs, timeliness of care, clean and safe environments, effective coordination between professionals, and continuity.

Using these frameworks and discursive documents in this area of research[9 10 16 17] as a guide, we identified

Table 1 Identifying aspects of patient experience and search terms

Relational aspects	Functional aspects
Emotional and psychological support, relieving fear and anxiety, treated with respect, kindness, dignity, compassion, understanding	Effective treatment delivered by trusted professionals
Participation of patient in decisions and respect and understanding for beliefs, values, concerns, preferences and their understanding of their condition	Timely, tailored and expert management of physical symptoms
Involvement of, and support for family and carers in decisions	Attention to physical support needs and environmental needs (eg, clean, safe, comfortable environment)
Clear, comprehensible information and communication tailored to patient needs to support informed decisions (awareness of available options, risks and benefits of treatments) and enable self-care	Coordination and continuity of care; smooth transitions from one setting to another
Transparency, honesty, disclosure when something goes wrong	

Box 1 Search terms denoting patient experience

Patient-centred care; patient engagement; clinical interaction; patient–clinician; clinician–patient; patient–doctor; doctor–patient; physician–patient; patient–physician; patient–provider; interpersonal treatment; physician discussion; trust in physician; empathy; compassion; respect; responsiveness; patient preferences; shared decision-making; therapeutic alliance; participation in decisions; decision-making; autonomy; caring; kindness; dignity; honesty; participation; right to decide; physical comfort; involvement (of family, carers, friends); emotional support; continuity (of care); smooth transition; emotional support.

words and phrases commonly used to denote aspects of patient experience, examples of which are listed in box 1.

These were combined with search terms representing patient safety and clinical effectiveness outcomes, hypothesised to be associated with patient experience in discursive literature. We searched for a broad range of outcome measures, including both self-rated and 'objective' measurements of health status, physical health and mental health and well-being, the use of preventive health services, compliance or adherence to health-promoting behaviour and resource use.

Combining these two sets of search terms in the EMBASE database, we identified 5323 papers whose abstracts were then reviewed. If deemed relevant, the full article was retrieved to assess whether it met the inclusion criteria.

Given concerns about the sole use of protocol-driven search strategies for complex evidence,[18] for the full-text articles retrieved for review, we used a 'snowballing' approach to identify further studies. This involved sourcing further articles in these studies for assessment and using the 'related articles' function in the Pubmed database. We repeated this for new articles identified until the approach ceased to identify new studies.

Inclusion criteria, assessment of quality and categorisation of evidence

We included studies that measured associations between patients' reporting of their experience and patient safety and clinical effectiveness outcomes. These included studies measuring associations between patient experience and safety or effectiveness outcomes either at a patient level (ie, data on both types of variables for the same patients) or at an organisational level (ie, associations between aggregated measures of patient experience and safety and effectiveness outcomes for the same type of organisation such as a hospital or primary-care practice).

We included studies where the variables denoting patient experience and patient safety and clinical effectiveness were measured in a credible way, through the use of validated tools. For patient experience variables, these include surveys covering several aspects of experience (such as Picker surveys and the Hospital Consumer Assessment of Healthcare Providers and Systems survey) and specific aspects (such as a 'Working Alliance Scale',[19] Multidimensional Health Locus of Control Scale scale[20] or Usual Provider Continuity index[21]). For patient safety and clinical effectiveness, these include, for example, generic health and quality of life surveys (such as Short-Form 36), disease-specific surveys (such as the Seattle Angina Questionnaire[22]), measures of the technical quality of care (such as the Hospital Quality Alliance (HQA) score), reviews of medical records and care provider data.[23] Details of the methods used to measure variables in each study are included in tables 5 and 6.

We included studies where the sample size of patients or organisations appeared sufficiently large to conduct a meaningful statistical analysis (excluding studies with fewer than 50 subjects). When extracting data relevant to our study from systematic reviews, we selected only those studies that met these criteria.

We then searched the studies' results for positive associations (where a better patient experience is associated with safer or more effective care), negative associations (where a better patient experience is associated with less safe or less effective care) and no associations. Associations refer to cases where one measure of patient experience (typically an overall rating of patient experience for a care provider) has a statistically significant association with one or more clinical effectiveness or patient safety variable. If a study showed associations between several aspects of patient experience that appeared to be closely related (eg, 'listening', 'empathy', or 'respect') and an aspect of effectiveness or safety, this was counted as one association found. This was to avoid exaggerating the weight of the evidence by 'over counting' associations.

Two main types of studies emerged in the search—those focusing on interventions to improve aspects of patient experience and those exploring associations between patient experience variables and patient safety and clinical effectiveness variables. To manage the scope of this time-limited review, we decided to restrict analysis of the large number of interventions to the evidence contained within systematic reviews.

RESULTS

Overall, the evidence indicates positive associations between patient experience and patient safety and clinical effectiveness that appear consistent across a range of disease areas, study designs, settings, population groups and outcome measures. Positive associations found outweigh 'no associations' by 429–127. Of the four studies where 'no associations' outweigh positive associations, there is no suggestion that these are methodologically superior. Negative associations were rare. Of the 40 individual studies assessed in table 5 negative associations (between patient experience of clinical team interactions and continuity of care and separate assessment of the quality of clinical care) were found in only one study.[24]

Table 2 Methods used to measure variables

	Number of studies
Patient experience variables	
Survey	31
Interviews	2
Medical records	1
Effectiveness and safety variables	
Survey for self-rated healthcare	12
Other survey	14
Medical records	3
Data-monitoring quality of care delivery (eg, audit, HQA, HEDIS)	3
Care provider outcome data	3
Physical examination	1
Patient interviews	2

HQA, Hospital Quality Alliance; HEDIS, Healthcare Effectiveness Data and Information Set.

Table 2 shows surveys to be the predominant method used to measure variables for individual studies (figure 1).

Table 3 presents the frequency of positive associations and 'no associations' categorised by type of outcomes (for 378 of the 556 cases where sufficient information was available to categorise). These include objectively measured health outcomes (eg, 'mortality', 'blood glucose levels', 'infections', 'medical errors'); self-reported health and well-being outcomes (eg, 'health status', 'functional ability' 'quality of life', 'anxiety'); adherence to recommended treatment and use of preventive care services likely to improve health outcomes (eg, 'medication compliance', 'adherence to treatment' and screening for a variety of conditions); outcomes related to healthcare resource use (eg, 'hospitalisations', 'hospital readmission', 'emergency department use', 'primary care visits'); errors or adverse events and measures of the technical quality of care.

Table 4 shows associations categorised by type of care provider (for the subset of studies focusing on one setting) and for studies focused on chronic conditions.

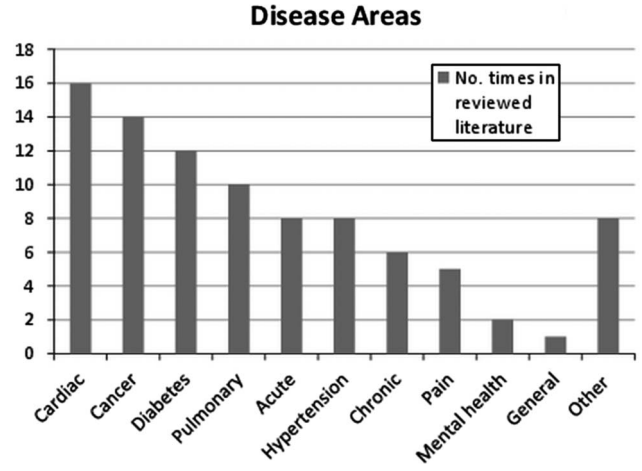

Figure 1 Outlines the disease areas covered.

Tables 5 and 6 present details of all studies identified, specifying the analytical focus of each study, methods to measure variables and positive associations and 'no associations' found.

DISCUSSION

Overall, the evidence indicates associations between patient experience, clinical effectiveness and patient safety that appear consistent across a range of disease areas, study designs and settings.

As table 3 indicates, the evidence shows positive associations found outweigh those not found for both self-assessment of physical health and mental health (61 vs 36) and 'objective' measures of health outcomes (eg, where measures are taken by a clinician or by reviewing medical records) (29 vs 11). For objective measures, one study[25] shows positive associations for ulcer disease, hypertension and breast cancer. Two studies on myocardial infarction show positive associations with survival 1 year after discharge[26] and inpatient mortality.[27] Objective measurement is less frequently explored than self-rated health and is an area that could benefit from further research.

Evidence is strong in the case of adherence to recommended medical treatment. A meta-analysis included in this study showed positive associations between the quality of clinician–patient communications and adherence to medical treatment in 125 of 127 studies analysed and showed the odds of patient adherence was 1.62 times higher where physicians had communication training.[28] Regarding compliance with medication, positive associations found to outweigh those not found.[20 29–35] A review of interventions to increase adherence to medication (not included in this study) showed communication of information, good provider–patient relationships and patients' agreement with the need for treatment as common determinants of effectiveness.[36] There is evidence of better use of preventive services, such as screening services in diabetes, colorectal, breast and cervical cancer; cholesterol testing and immunisation.[24 25 37–39] There is also evidence of impacts on resource use of primary and secondary care (such as hospitalisations, readmissions and primary care visits).[21 29 40–45]

For studies exploring associations between patient experience and technical quality of care measured by other means, the evidence is mixed. Two studies in acute care showed positive associations between overall ratings of patient experience and ratings of the technical quality of care (using HQA measures) for myocardial infarction, congestive heart failure, pneumonia and complications from surgery.[23 46] Another found an association with adherence to clinical guidelines for acute myocardial infarction.[27] A similar study in primary care found positive associations between patient experience of processes and measurement of care quality (from the Healthcare Effectiveness Data and Information Set (HEDIS) system measuring care quality for disease prevention and management in chronic conditions).[24]

Table 3 Associations categorised by type of outcome

	Objective' health outcomes	Self-reported health and wellbeing	Adherence to treatment (including medication)	Preventive care	Healthcare resource use	Adverse events	Technical quality of care	All categories
No of positive associations found	29	61	152	24	31	7	8	312
'No associations'	11	36	7	2	6	0	4	66

However, two other studies found no associations between patients' ratings and ratings based on an assessment of medical records.[47 48]

Some studies show positive associations between patients' perspective or observations of processes of care and the safety of care recorded through other means. Isaac[46] found positive associations between ratings of patient experience and six patient-safety indicators (decubitus ulcer; failure to rescue; infections due to medical care; postoperative haemorrhage, respiratory failure, pulmonary embolism and sepsis). Two studies examining evidence for patients' ability to identify medical errors or adverse events in hospital showed positive associations between patients' accounts of their experience of adverse events and the documentation of events in medical records.[49 50] But another study shows only 2% of patient-reported errors were classified by medical reviewers as 'real clinical medical errors' with most 'reclassified' by clinicians as 'misunderstandings' or 'behaviour or communication problems'.[51] Overall, there is less evidence available on safety compared to effectiveness and this should be a priority for future research in this area.

Research from other studies not included in this review support these findings. For example, research on 'decision aids' to ensure that patients are well informed about their treatments, and that decisions reflect the preferences of patients indicates that patient engagement has a beneficial impact on outcomes. For example, awareness of the risks of surgical procedures resulted in a 23% reduction in surgical interventions and better functional status.[52] Another review showed that provision of good information and emotional support are associated with better recovery from surgery and heart attacks.[53]

Table 4 Weight of evidence by provider and for chronic conditions

Weight of evidence by provider and for chronic conditions	Associations found	No of associations
Primary care	110	48
Hospital	43	17
Chronic conditions	53	9

STUDY STRENGTHS AND LIMITATIONS

This review builds on other studies[9 10 16 17] exploring links between these three domains. This study also demonstrates an approach to designing a systematic search for evidence for the 'catch-all' term patient experience, bringing together evidence from a variety of sources that may otherwise remain dispersed. This approach can be used or adapted for further research in this area.

This was a time-limited review and there is scope to expand this search, based on our results. There may be scope to broaden the search terms and this may uncover further evidence. The first search was confined to one database and the review focused primarily on peer-reviewed literature excluding grey literature. To manage the scope of this review, we restricted the analysis of interventions to improve patient experience to evidence within systematic reviews. While we used some quality criteria to filter studies (including the use of validated tools to measure experience, safety and effectiveness outcomes and sample size), with more time a more detailed formal quality assessment may have added value to the study. Although all positive associations included in the study are statistically significant, the strength of associations vary. Because of time constraints and the heterogeneity of measures used, we did not systematically compare the strengths of positive associations in different studies, but this may be an area for future work. There may also be scope to explore whether future research in this area could go beyond the counting of associations in this study through, for example, meta-analysis. As always, there may be a publication bias in favour of studies showing positive associations between patient experience variables and safety and effectiveness outcomes.[54] In addition, 28 of the 40 individual studies assessed were conducted in the USA and caution is needed about their applicability to other healthcare systems.

CONCLUSION

The inclusion of patient experience as one of the pillars of quality is partly justified on the grounds that patient experience data, robustly collected and analysed, may help highlight strengths and weaknesses in effectiveness

Table 5 Individual studies

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Chang *et al*[48]	Cohort study, 236 patients, USA	Managed care organisation	22 clinical conditions	P	Providers communication (The Consumer Assessment of Healthcare Providers and Systems survey and 'Quality of care')	Technical quality and patient global ratings (medical records and patient interviews)	None	Technical quality of care	0/1
Sequist *et al*[24]	Cross-sectional study, 492 settings, USA	Primary care	Cervical, breast and colorectal cancer, chlamydia, cardiovascular conditions, asthma, diabetes	P	Doctor–patient communication, clinical team interactions, organisational features of care (The Ambulatory Care Experiences survey)	Clinical quality focusing on disease prevention, disease management and outcomes of care (Healthcare Effectiveness Data and Information Set (HEDIS))	Cervical cancer, breast cancer and colorectal cancer screening, Chlamydia screening, Cholesterol screening (cardiac), LDL cholesterol testing (diabetes), eye exams (diabetes), HbA1c testing, nephropathy screening	Cholesterol management, HbA1c control, LDL cholesterol control, blood pressure control	9/4
Burgers *et al*[55]	Survey, 8973 patients, Range	Range of settings	Chronic lung, mental health, hypertension, heart disease, diabetes, arthritis, cancer	P	Coordination of care and overall experience (Commonwealth Fund International Health Policy Survey)	Death score	Death score	None	1/0
Kaplan *et al*[25]	Randomised control trial, 252 patients, USA	Range of settings	Ulcer disease, hypertension, diabetes, breast cancer	P	Physician–patient communication (assessment of audio tape and questionnaire)	Physiological measures taken at visit and patients' self-rated health status survey.	Follow-up blood glucose and blood pressure, functional health status, self-reported health status.	None	4/0
Jha *et al*[23]	Cross-sectional study, 2429 settings, USA	Hospital	Acute myocardial infarction, congestive heart failure, pneumonia complications from surgery	O	Patient communication with clinicians, experience of nursing services, discharge planning (Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey)	Technical quality of care using Hospital Quality Alliance (HQA) score	Technical quality of care in AMI, congestive heart failure (CHF), pneumonia, surgical care	None	4/0

Continued

Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Rao *et al*[47]	Cross-sectional study, 3487 patients, UK	Primary care	Hypertension, Influenza vaccination	P	Older patients' experience of technical quality of care (General Practice Assessment survey)	Technical quality of care—(medical records)	None	Hypertension monitoring and control, influenza vaccination.	0/3
Meterko *et al*[26]	Cohort study, 1858 patients, USA	Veteran Affairs Medical Centres	Acute myocardial infarction	P	Patient-centred care, access, courtesy, information, coordination, patient preferences, emotional support, family involvement, physical comfort (VA Survey of Healthcare Experiences of Patients (SHEP))	Survival 1-year postdischarge	Survival 1-year post discharge	None	1/0
Vincent *et al*[56]	Cohort survey 227 patients, UK	Range of settings	Varied	P	Accountability, explanation, standards of care, compensation (questionnaire)	Legal action	Legal action	None	1/0
Agoritsas *et al*[57]	Cohort patient survey, 1518 patients, Switzerland	Hospital	Varied	P	Global rating of care and respect and dignity questions (Picker survey)	Patient reports of undesirable events (survey)	Neglect of important information by healthcare staff, pain control, needless repetition of a test, being handled with roughness	None	4/0
Flocke *et al*[87]	Cross-sectional study, 2889 patients, USA	Primary care	Varied	P	Interpersonal communication, physician's knowledge of patient, coordination (Components of Primary Care Instrument (CPCI))	Use of preventive care services (screening, health habit counselling services, immunisation services)	Screening, health habit counselling, immunisation	None	3/0
Jackson, J. *et al*[58]	Quantitative cohort study 500 patients, USA	General medicine walk-in clinic	Varied	P	Patient satisfaction (Research and Development (RAND) 9-item survey)	Functional status (Medical Outcomes Study Short-Form Health Survey (SF-6)), symptom resolution, (RAND 9-item survey), follow-up visits	Symptom resolution, repeat visits, functional status	None	3/0

Continued

Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Clark *et al*[41]	Randomised control trial 731 patients, USA	Range of settings	Asthma	P	Patient experience of physician communication (patient interviews and Likert scale)	Emergency department visits, hospitalisations, office phone calls and visits, urgent office visits (survey+medical chart review of 6% of patients to verify responses)	Number of office visits, emergency visits, urgent office visits, phone calls, hospitalisations	None	5/0
Raiz *et al*[20]	Quantitative cohort study, 357 patients, USA	Primary care	Renal transplant	P	Patient faith in doctor (Multidimensional Health Locus of Control Scale (MHLC))	Medication compliance	Remembering medications, taking medications as prescribed	None	2/0
Kahn *et al*[32]	Cohort study, 881 patients, USA	Hospitals	Breast cancer	P	Level of physician support, participation in decision-making and information on side effects (survey)	Medication adherence	Ongoing tamoxifen use	None	1/0
Plomondon *et al*[22]	Cohort study, 1815 patients, USA	Hospital	Myocardial infarction	P	Satisfaction with explanations from their doctor, overall satisfaction with treatment (Seattle Angina questionnaire)	Presence of angina (Seattle Angina Questionnaire)	Presence of angina	None	1/0
Fuertes *et al*[19]	Survey, 152 patients, USA	Hospital	Neurology	P	Physician–patient communication, physician–patient working alliance, empathy, multicultural competence (questionnaire)	Adherence to medical treatment (adherence Self-Efficacy Scale and Medical Outcome Study (MOS) adherence scale)	Adherence to treatment	None	1/0
Lewis *et al*[31]	Qualitative cohort study, 191 patients, USA	Primary care	Pain	P	Doctor–patient communication (survey)	Medication adherence (Prescription Drug Use Questionnaire (PDUQ))	Use of prescribed opioid medications	None	1/0
Safran *et al*[59]	Cross-sectional study, 7204 patients, USA	Primary care	Varied	P	Accessibility, continuity, integration, clinical interaction, interpersonal aspects, trust (The Primary Care Assessment Survey)	Adherence to physician's advice, health status, health outcomes (Medical Outcomes Study (MOS), Behavioural risk factor survey)	Adherence, health status	Health outcomes	2/1

Continued

Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Alamo *et al*[60]	Randomised study, 81, Spain	Primary care	Chronic musculoskeletal pain (CMP), fibromyalgia	P	Patient-centreed-care ('Gatha-Res questionnaire' and follow-up phone call)	Pain (Visual Analogue Scale (VAS) anxiety (Oldberg scale of anxiety and depression (GHQ))	Anxiety, number of tender points (pain)	Pain, pain intensity, pain as a problem, number of associated symptoms, depression, physical mobility, social isolation, emotional reaction, sleep	2/10
Fan *et al*[61]	Survey, 21 689 patients, USA	Primary care	Cardiac care, diabetes, congestive obstructive pulmonary disorder (COPD)	P	Communication skills and humanistic qualities of primary care physician (Seattle Outpatient Satisfaction Survey)	Physical and emotional aspects, coping ability and symptom burden for angina, COPD and diabetes (Seattle Angina Questionnaire (SAQ), Obstructive Lung Disease Questionnaire (SOLDQ), Diabetes Questionnaire (SDQ))	Patient ability to deal with all 3 diseases, education for diabetes patients, angina stability, physical limitation due to angina	Self-reported physical limitation for angina and COPD, symptom burden for diabetes, complications for diabetes	7/4
O'Malley *et al*[38]	Cross-sectional study, 961 patients, USA	Primary care	Varied	P	Patient trust (survey)	Use of preventive care services	Blood pressure measurement, height and weight measurement, cholesterol check, papanicolaou test (pap) tests, breast cancer screening, colorectal cancer screening, discussion of diet, discussion on depression	None	8/0
Little *et al*[62]	Survey, 865 patients, UK	Primary care	varied	P	Patient centredness (Survey)	Enablement, symptom burden, resource use	Enablement, symptom burden, referrals	Re-attendance, investigations	3/2
Levinson *et al*[63]	Qualitative cohort study, 124 physicians, USA	Primary care	Varied	P	Physician–patient communication (assessment of audiotape)	Malpractice	Malpractice claims	None	1/0

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Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Carcaise-Edinboro and Bradley[39]	Cross sectional study, 8488 patients, USA	Primary care	Colorectal cancer	P	Patient-provider communication (Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey)	Colorectal Cancer screening, fecal occult blood testing and colonoscopy (Medical Expenditure Panel Survey)	CRC screening, fecal occult blood testing, colonoscopy	None	3/0
Schneider *et al*[β3]	Cross-sectional analysis study, 554 patients, USA	Primary care	HIV	P	Physician–patient relationship (survey)	Adherence (survey)	Adherence to antiretroviral therapy	None	1/0
Schoenthaler *et al*[β4]	Cross-sectional study, 439 patients, USA	Primary care	Hypertension	P	Patients' perceptions of providers' communication (survey)	Medication adherence (Morisky self-report measure)	Medication adherence	None	1/0
Slatore *et al*[64]	Cross-sectional study, 342 patients, USA	Range of settings	COPD	P	Patient–clinician communication (Quality of communication questionnaire (QOC))	Self-reported breathing problem confidence and general self-rated health (survey)	Confidence in dealing with breathing problems	Self-rated health	1/1
Lee and Lin[65]	Cohort study, 480 patients, Taiwan	Range of settings	Type 2 diabetes	P	Trust in physicians (survey)	Self-efficacy, adherence, health outcomes (Multidimensional Diabetes Questionnaire and 12-Item Short-Form Health survey (SF-12))	Physical HRQoL, mental HRQoL, body mass index HbA1c, triglycerides, complications, self-efficacy, outcome expectations, adherence	None	9/0
Heisler *et al*[β5]	Survey, 1314 patients, USA	Primary care	Diabetes	P	Physician communication, physician interaction styles, participatory decision-making (Questionnaire)	Disease management (surveys and national databases)	Overall self-management, diabetes diet, medication compliance, exercise, blood glucose monitoring, foot care.	Exercise	6/1
Lee and Lin[66]	Cohort study, 614 patients, Taiwan	Range of settings	Type 2 diabetes	P	Patients' perceptions of support, autonomy, trust, satisfaction (Healthcare Climate Questionnaire and Autonomy Preference Index (API))	Glycosylated haemoglobin (HbA1C) (medical records) Physical and mental health-related quality of life (HRQoL) (SF-12)	Physical HRQoL, mental HRQoL	Information preference interaction, HbA1C	2/2

Continued

Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
Kennedy A. *et al*[67]	Randomised control trial, 700 patients, UK	Hospital	Inflammatory bowel Disease	P	Patient-centred-care (interviews)	Resource use, self-rated physical and mental health, enablement (patient diaries, questionnaires, medical records)	Ability to cope with condition, symptom relapses, hospital visits, appointments made	Physical functioning, role limitations, social functioning, mental health, energy/vitality, pain, general health perception, anxiety, number of relapses, number of medically-defined relapses, average relapse duration, frequency of GP visits, delay before starting treatment	4/13
Stewart *et al*[42]	Observational cohort study, 315 patients, Canada	Primary care	General	P	Patient-centred communication (assessment of audiotape and Patient-Centred Communication Score tool)	Discomfort (VAS) symptom severity severity (Visual Analogue Scale), Health Status (Short Form-36 SF-36) Quality of care provision (chart review by doctors)	Symptom discomfort and concern, self-reported health, diagnostic tests, referrals and visits to the family physician	None	5/2
Kinnersley *et al*[68]	Observational study, 143 patients, UK	Primary care	Varied	P	Patient-centredness (assessment of audiotape and questionnaires)	Symptom resolution, resolution of concerns, functional health status (Questionnaire)	None	Resolution of symptoms, resolution of concerns, functional health status	0/3
Solberg *et al*[51]	Survey, 3109 patients, USA	Primary care — multispecialty group	Varied	P	Patient experience of errors (survey)	Review of errors (chart audits and physician reviewer judgements)	None	None	1/0
Isaac *et al*[6]	Cross-sectional study, 927 hospitals, USA	Hospital	Acute myocardial infarction,	O	General patient experiences (Hospital Consumer Assessment	Processes of care (Health Quality Alliance	Decubitus ulcer rates, infections, processes of care for pneumonia,	Failure to rescue	11/1

Continued

Table 5 Continued

Author	Type of study, sample size, country	Setting	Disease focus	Unit of analysis (patient (P) or org (O)	Patient experience focus and method used	Safety and effectiveness measure	Association demonstrated	Association not demonstrated	Assoc. Found vs NOT found
			congestive heart failure, pneumonia complications from surgery.		of Healthcare Providers and Systems survey (HCAHPS))	(HQA) database) and patient safety indicators	CHF and myocardial infarctions, surgical composites, hemorrage, respiratory failure, DVT, pulmonary embolism, sepsis		
Glickman *et al*[27]	Cohort study, 3562 patients, USA	Hospital	Acute myocardial infarction	P	Patient satisfaction (Press-Ganey survey)	Adherence to practice guidelines, outcomes (CRUSADE quality improvement registry).	Inpatient mortality, composite clinical measures, acute myocardial infarction (AMI) survival	None	3/0
Fremont *et al*[69]	Survey, 1346 patients, USA	Hospital	Cardiac	P	Patient-centred care (Picker survey)	Processes of care, functional health status, cardiac symptoms (Medical Outcomes Study questionnaire, London School of Hygiene measures for cardiac symptoms)	Overall health, chest pain, patient reported general physical and mental health status	Mental health, shortness of breath	5/2
Riley *et al*[70]	Survey, 506 patients, Canada	Hospital	Cardiac care—acute coronary	P	Continuity of care (The Heart Continuity of Care Questionnaire, Medical Outcome Study Social Support Survey, Illness Perception Questionnaire)	Participation in cardiac rehabilitation, perception of illness, functional capacity (Duke Activity Status Index (DASI))	Cardiac rehabilitation participation, perceptions of illness consequences	None	2/0
Weingart *et al*[49]	Cohort study, 228 patients, USA	Hospital	Varied	P	Patient experience of adverse events (interviews)	Adverse events (mMedical records and patient interviews)	Adverse events	None	1/0
Weissman *et al*[50]	Survey, 998 patients, USA	Hospital	Varied	P	Patient experience of adverse events (interviews)	Adverse events (medical records)	Adverse events	None	1/0

HRQoL, health-related quality of life.

Table 6 Systematic reviews

Authors	Time span and studies meeting inclusion criteria	Healthcare setting	Disease areas covered	Unit of analysis	Patient experience focus (and measurement methods)	Safety and effectiveness measure—association demonstrated -	Safety and effectiveness measure—association not demonstrated	Assocs found vs not found
Blasi *et al*[71]	1974–1998, 4 of 25	Range of settings	Asthma, hypertension, cancer, insomnia, menopause, obesity, tonsillitis	P	Provider behaviour and communication (grading of consultations)	Health status, symptom improvement, treatment effectiveness, fear of injection, anxiety, ratings of pain, number of doctor visits, pain, speed of recovery	Comfort, recovery time, return visits	9/3
Drotar[29]	1998–2008, 4 of 22	Range of settings	Asthma, cystic fibrosis, diabetes, epilepsy, inflammatory bowel disease, juvenile rheumatoid arthritis	P	Physician and staff behaviour (surveys, interviews, medical records)	Treatment adherence, compliance, office visits, phone calls, hospitalisations	Medication adherence	5/1
Hall *et al*[72]	1990–2009, 10 of 14	Range of settings	Brain injury, musculoskeletal conditions, cardiac conditions, trauma, back, neck and shoulder pain	P	Therapist-patient relationship, therapeutic alliance (surveys, audio/video taped session)	Adherence, employment status, physical training, therapeutic success, perceived effect of treatment, pain, physical function, depression, general health status, attendance, floor-bench lifts, global assessment scores, ability to perform activities of daily living (ADLs), mobility	Weekly physical training, disability, productivity, depression, functional status, adherence	18/6
Stevenson *et al*[73]	1991–2000, 7 of 134	Range of settings	Hypertension, asthma, chronic obstructive pulmonary disorder, ovarian cancer, epilepsy, hyperlipidaemia	P	Doctor–patient communication (surveys)	Self-reported adherence, blood pressure control, general physician practice visits, hospitalisations, emergency room visits for children with asthma, quality of life for COPD patients, oral contraceptive adherence, adherence to antiepileptic drugs, pain control following gynaecological surgery, adherence to medication for depression	Length of visits to doctor for asthma patients, health status and use of healthcare services for epilepsy patients, adherence to Niacin and bile acid sequestrant therapy	9/5
Saultz and Lochner[44]	1967–2002, 41 studies	Range of settings	Varied	P	Continuity of care — ongoing relationship between individual doctor and patient	Hospitalisation rate, hospital readmission, length of stay, influenza immunisation, preventive care, antibiotic compliance, intensive care unit	Diabetes (HbA1C, lipid control, blood pressure control, presence of diabetic complications), blood glucose control, functional ability of	51/30

Continued

Table 6 Continued

Authors	Time span and studies meeting inclusion criteria	Healthcare setting	Disease areas covered	Unit of analysis	Patient experience focus (and measurement methods)	Safety and effectiveness measure—association demonstrated -	Safety and effectiveness measure—association not demonstrated	Assocs found vs not found
					(surveys, continuity of care index)	days, Neonatal morbidity, Apgar score, Birth weight, rates and timeliness of childhood immunisations, health-related quality of life, recommended diabetes care measures, glucose control, PAP tests, mammogram rate, breast exams, surgical operation rates, hypertension control, presence of depression, relationship problems, adverse events in hospitalsed patients, degree of patient enablement, rheumatic fever incidence	elderly patients, compliance with antibiotic therapy, well-child visits, blood pressure checks in women, pregnancy complications, newborn mortality, immunization rates, NICU admissions, Apgar scores, caesarean rate, length of labour, indications for tonsillectomy	
Hall, Roter and Katz[74]	Meta-analysis 41 studies	Range of settings	Varied	P	Clinician–patient communication (surveys, interviews, observations, assessment of video or audio)	Compliance (with 4 variables of PE), recall/understanding (with 4 variables of PE)	Compliance (with 1 variable of PE), recall/understanding (with 1 variable of PE)	8/2
Jackson, C. *et al*[40]	1984–2008, 3 of 17	Range of settings	Inflammatory bowel disease	P	Trust in physician, Patient–physician agreement, adequacy information (surveys)	Adherence to treatment	Compliance	2/1
Sans-Coralles *et al*[43]	1984–2005, 9 of 20	Primary care	No specific disease focus	P	Continuity of care, coordination of care, consultation time, doctor–patient relationship (validated tools in these different domains)	Hospital admissions, length of stay, compliance, recovery from discomfort, emotional health, diagnostic tests, referrals, quality of care for asthma, diabetes and angina, symptom burden, receipt of preventive services	Enablement	13/1
Hsiao and Boult[45]	1984–2003, 3 of 14	Primary care	No specific disease focus	P	Continuity with physician (surveys, interviews, medical	Hospitalisations for all conditions and ambulatory care-sensitive conditions, odds of hospitalisation(2), healthcare	Acute ambulatory care-sensitive conditions, mobility, pain, emotion, activities of daily living,	21/15

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Table 6 Continued

Authors	Time span and studies meeting inclusion criteria	Healthcare setting	Disease areas covered	Unit of analysis	Patient experience focus (and measurement methods)	Safety and effectiveness measure—association demonstrated -	Safety and effectiveness measure—association not demonstrated	Assocs found vs not found
					records, chart reviews)	costs(2), emergency department visits, emergent hospital admissions(2), length of stay, diabetes recognition, mental health(2), pain, perception of health, well-being, BMI, triglyceride concentrations, recovery, clinical outcomes, self-reported health	smoking, BMI, hypertension, hypercholesterolaemia, self-reported health, glycaemic control, diabetes control, frequency of hypoglycaemic reactions, blood sugar, weight	
Arbuthnott *et al*[80]	Meta analysis, 1955–2007, All 48 studies included	Range of settings	Asthma, bacterial infection, fibromyalgia, diabetes, renal disease, hypertension, congestive heart failure, inflammatory bowel disease, breast cancer, HIV and tuberculosis	P	Physician–patient collaboration (Observation, surveys)	Medication adherence, behavioural adherence	Appointment adherence	2/1
Stewart[75]	1983–1993, 21 studies	Range of settings	Peptic ulcers, breast cancer, diabetes, hypertension, headache, coronary artery disease, gingivitis, tuberculosis, prostate cancer	P	Physician–patient communication (surveys, evaluation of audio- or videotape recording)	Peptic ulcer physical limitation, blood glucose levels, blood pressure, headache resolution, physician evaluation of symptom resolution for coronary artery disease, gingivitis and tuberculosis, anxiety level in gynaecological care, radiation therapy, breast cancer care, functional status following radiation therapy for prostate cancer, anxiety after radiation therapy, pain levels and hospital length of stay after intra-abdominal surgery, physical and psychological complaints in breast cancer care	Details not included	16/5
Zolnierek and DiMatteo[28]		Range of settings	No specific disease focus	P	Physician–patient communication	Adherence to treatment recommended by clinician	Adherence (2 observational studies)	125/2

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Table 6 Continued

Authors	Time span and studies meeting inclusion criteria	Healthcare setting	Disease areas covered	Unit of analysis	Patient experience focus (and measurement methods)	Safety and effectiveness measure—association demonstrated -	Safety and effectiveness measure—association not demonstrated	Assocs found vs not found
	Meta analysis 1949–2008, 127 studies				(observation, surveys)			
Beck *et al*[76]	1975–2000, 5 of 14	Primary care	No specific disease focus	P	Physician–patient communication (observation, evaluation of audio and video tapes)	Compliance with doctors' advice, blood pressure, pill count	None	10/0
Cabana and Lee[21]	1966–2002, 7 of 18	Range of settings	Rheumatoid arthritis, epilepsy, breast cancer, cervical cancer, diabetes	P	Continuity of care (validated measures of continuity eg, SCOC)	Hospitalisations, length of stay, emergency department visits, intensive care days, preventive medicine visits, drug or alcohol abuse, outpatient attendance, glucose control for adults with diabetes	None	18/5
Richards *et al*[77]	1997–2002, 2 of 33	Range of settings	Psoriasis	P	Patient's perception of care, satisfaction, interpersonal skills (surveys, interviews)	Treatment adherence, medication use	None	2/0

BMI, body mass index.

and safety and that focusing on improving patient experience will increase the likelihood of improvements in the other two domains.[3]

The evidence collated in this study demonstrates positive associations between patient experience and the other two domains of quality. Because associations do not entail causality, this does not necessarily prove that improvements in patient experience will cause improvements in the other two domains. However, the weight of evidence across different areas of healthcare indicates that patient experience is clinically important. There is also some evidence to suggest that patients can be used as partners in identifying poor and unsafe practice and help enhance effectiveness and safety. This supports the argument that the three dimensions of quality should be looked at as a group and not in isolation. Clinicians should resist sidelining patient experience measures as too subjective or mood-orientated, divorced from the 'real' clinical work of measuring and delivering patient safety and clinical effectiveness.

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