

Online supplement 1

Scoping review: Search strategy

The following databases were searched:

- MEDLINE
- EMBASE
- PsycINFO
- CINAHL
- Social Science Citation Index

Table 1A: *The search terms used and how they were combined*

# ▲	Searches
1	internet/ or blogging/ or social media/
2	(internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps).ti,ab.
3	1 or 2
4	((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 rating?).ti,ab.
5	((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 review?).ti,ab.
6	((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 feedback).ti,ab.
7	((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 appraisal?).ti,ab.
8	((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 comment?).ti,ab.

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- 9 ((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 evaluation?).ti,ab.
- 10 ((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 complain*).ti,ab.
- 11 ((physician? or doctor? or surgeon? or nurse? or hospital? or healthcare or health care) adj2 post*).ti,ab.
- 12 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
- 13 3 and 12
- 14 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 rating?).ti,ab.
- 15 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 review?).ti,ab.
- 16 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 feedback).ti,ab.
- 17 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 comment?).ti,ab.
- 18 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 (criticis* or critique*).ti,ab.
- 19 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 assess*).ti,ab.
- 20 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 evaluation?).ti,ab.
- 21 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 complain*).ti,ab.
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- 22 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 post*).ti,ab.
- 23 ((patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public) adj2 (impression? or perspective? or perception? or opinion? or attitude? or view? or prefer* or judg* or satisf*)).ti,ab.
- 24 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23
- 25 dentists/ or exp nurses/ or exp nursing staff/ or personnel, hospital/ or exp physicians/
- 26 Hospitals/
- 27 (physician? or doctor? or surgeon? or nurse? or hospital?).ti,ab.
- 28 25 or 26 or 27
- 29 3 and 24 and 28
- 30 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 rating?).ti,ab.
- 31 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 review?).ti,ab.
- 32 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 feedback).ti,ab.
- 33 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 appraisal?).ti,ab.
- 34 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 comment?).ti,ab.
- 35 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 evaluation?).ti,ab.
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- 36 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 complain*).ti,ab.
- 37 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) adj2 post*).ti,ab.
- 38 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37
- 39 28 and 38
- 40 exp Internet/ and Patient Satisfaction/ and exp Physicians/
- 41 exp Internet/ and Patient Satisfaction/ and Professional-Patient Relations/
- 42 exp *Internet/ and *Patient Satisfaction/
- 43 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) and (rating? or evaluation? or review? or feedback or appraisal? or comment? or criticis* or critique* or assess* or post*) and (physician? or doctor? or surgeon? or nurse? or hospital?)).ti.
- 44 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) and (rating? or evaluation? or review? or feedback or appraisal? or comment? or criticis* or critique* or assess* or post*) and (patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public)).ti.
- 45 ((internet or online or website? or web-site? or web or digital or blog* or twitter or tweet* or facebook or social media or app or apps) and (impression? or perspective? or perception? or opinion? or attitude? or view? or prefer* or judg* or satisf*) and (patient? or consumer? or user? or client? or stakeholder? or carer? or caregiver? or relative? or family member? or public)).ti.
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46	13 or 29 or 39 or 40 or 41 or 42 or 43 or 44 or 45
47	limit 46 to english language

Online Supplement 2

Main characteristics of included studies

Study by first author	Aim	Method	Country
Adams 2011 ¹	To examine comments made on physician review websites from the perspective of reflexivity in modern society.	Qualitative. Discourse analysis.	England, Holland, USA.

Study by first author	Aim	Method	Country
Adams 2013 ²	To examine websites where patients rate and evaluate healthcare services as mechanisms for transforming citizens into surveillers of public services in order to generate knowledge about the everyday performance of professionals and institutions.	Qualitative. Discourse analysis.	Part of a wider study in England, USA and Holland. This paper focuses on Holland.
Bardach 2013 ³	To compare hospital scores from the most widely used commercial website in the USA to hospital scores from more systematic measures of patient experience (the Hospital Consumer Assessment of Healthcare Providers and Systems; HCAHPS) and outcomes, and to assess what drives variation in the commercial website scores.	Quantitative.	USA
Bardach 2015 ⁴	To investigate if online narrative reviews from patients and surrogates reflect domains in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) and to describe additional potential domains.	Qualitative. Thematic analysis	USA
Bidmon 2014 ⁵	To analyze factors influencing the adoption of and willingness to pay for mobile physician-rating apps.	Quantitative survey and literature review	Germany
Black 2009 ⁶	To evaluate and describe online healthcare provider reviews.	Quantitative. Multivariate analysis and logistic regression analyses.	USA
Brody 2010 ⁷	To present a fully automated method to capture what topics health consumers discuss when reviewing their health providers online.	Quantitative. Sentiment analysis using Latent Dirichlet Allocation.	USA
Brooks 2017 ⁸	To examine the key themes in positive and negative patient feedback on NHS (National Health Service) services in England, and to understand the specific issues within these themes and how they drive positive and negative evaluation.	Mixed methods. Machine learning and qualitative analysis	England
Brown-Johnson 2014 ⁹	To describe and characterize public commenting in the context of a high-profile publication on psychiatric inpatient smoking bans and subsequent news coverage on the topic.	Qualitative. Content analysis.	USA and elsewhere eg UK
Burkle 2015 ¹⁰	To explore the frequency with which patients visit and leave comments on rating site, identify most commonly visited sites, evaluate the nature of comments written and quantify the influence that positive comments, negative comments and physician medical malpractice history might have on patients' decisions to seek care from a particular physician.	Quantitative survey.	USA

Study by first author	Aim	Method	Country
Detz 2013 ¹¹	To examine publicly available, Internet-based reviews of adult primary care physicians, specifically written by patients who report long-term relationships with their physicians.	Qualitative content analysis.	USA
Ellimoottil 2013 ¹²	To describe the landscape of online reviews of urologists by looking at a sample of ratings and written reviews from popular physician review websites.	Mixed methods. .	USA
Emmert & Meier 2013 ¹³	To analyze all physician evaluations that were posted on the German online feedback website, jameda, in 2012. To provide descriptive analysis of (1) both physician and patient characteristics, and (2) the number, distribution, and results of the ratings. To assess (3) the impact of physician and patient characteristics on the overall performance measure, and (4) the correlation between the number of ratings per patient/physician and the overall performance.	Quantitative. Descriptive.	Germany
Emmert 2012 ¹⁴	To determine and structure the quantity and type of information about physicians in the outpatient sector provided on German-language physician rating websites.	Quantitative. Descriptive.	Germany
Emmert 2014 ¹⁵	To explore the concerns of patients who commented on physician care and to address and enhance patient satisfaction.	Mixed methods.	Germany
Emmert 2015 ¹⁶	To present a comprehensive analysis of the ratings of dentists on a German physician rating website over a 2-year period.	Quantitative, correlation.	Germany
Emmert 2013 ¹⁷	To estimate the current level of awareness and use of physician-rating websites in Germany and to determine their impact on physician choice making and the key predictors which are associated with the knowledge and the use of physician-rating websites.	Quantitative, cross-sectional survey.	Germany
Emmert 2016 ¹⁸	To examine which health care providers use online rating websites and for what purposes, and whether health care providers use online patient ratings to improve patient care.	Quantitative, online-based cross-sectional survey	Germany
Frost 2015 ¹⁹	To (1) evaluate the prevalence of orthopedic surgeon ratings on physician rating websites in the United States and (2) evaluate factors that may affect ratings, such as sex, practice sector (academic or private), years of practice, and geographic location.	Quantitative descriptive study	USA

Study by first author	Aim	Method	Country
Galizzi 2012 ²⁰	To explore the extent to which doctor rating websites are known and used among a sample of respondents from London. To understand the main predictors of what makes people willing to use doctor rating websites.	Quantitative cross-sectional study	England
Gao 2012 ²¹	To describe trends in patients' online ratings over time, across specialties, to identify what physician characteristics influence online ratings, and to examine how the value of ratings reflects physician quality.	Quantitative descriptive study.	USA
Gao 2015 ²²	To provide one of the first analyses of how online ratings reflect physician quality as perceived by a broader population of patients.	Quantitative correlation	USA
Gilbert 2015 ²³	To assess radiologist representation on rating sites.	Quantitative descriptive study.	USA
Glover 2015 ²⁴	To examine the extent to which hospitals utilize social media and whether user-generated metrics on Facebook® correlate with a Hospital Compare® metric, specifically 30-day all cause unplanned hospital readmission rates.	Quantitative. Retrospective cross-sectional study.	USA
Grabner-Krauter 2015 ²⁵	To explore how certain characteristics of physician reviews affect the evaluation of the review and users' attitudes toward the rated physician.	Quantitative survey.	Austria
Gray 2015 ²⁶	To measure the association between US physician website ratings and traditional quality measures of clinical and patient experience.	Quantitative. Regression analyses.	USA
Greaves, Lavery 2014 ²⁷	To describe the frequency of tweets sent to hospitals in the English National Health Service and to examine whether they contain information about quality of care. To compare sentiment on Twitter about hospitals with established survey measures of patient experience and standardised mortality rates.	Mixed methods. Qualitative content analysis and sentiment analysis.	England
Greaves, Pape, King 2012 ²⁸	To describe patterns observed and analyse associations with unsolicited ratings posted on NHS Choices for all acute hospitals in England and conventional measures of patient satisfaction obtained through formal surveys. To compare the strength of associations between NHS Choices ratings and clinical outcomes and associations between patient survey measures of experience and clinical outcomes.	Quantitative. Cross-sectional observational study.	England
Greaves, Pape, King 2012 ²⁹	To examine hospital-level associations between web-based patient ratings on the NHS Choices Website and objective measures of quality.	Quantitative. Cross-sectional observational study.	England

Study by first author	Aim	Method	Country
Greaves, Pape, Lee 2012 ³⁰	To examine the usage of NHS Choices and associations between web-based patient ratings and conventional measures of patient experience and clinical quality in primary care.	Quantitative. Cross-sectional observational study.	England
Greaves, Ramirez-Cano 2013 ³¹	To use machine learning to understand patients' unstructured comments about their care.	Quantitative. Sentiment analysis.	England
Hanauer 2014 ³²	To understand, within the context of other types of rating sites, parents' awareness, perceptions, and use of physician-rating sites for choosing primary care physicians for their children.	Quantitative. Cross-sectional, nationally representative survey.	USA
Hanauer 2014 ³³	To survey a nationally representative sample of the US population about their knowledge and use of online ratings for selecting a physician for themselves.	Quantitative, experimental 5x2 factorial design.	USA
Hao 2015 ³⁴	To examine and describe online doctor reviewing in China.	Quantitative. Descriptive statistical study.	China
Hao 2016 ³⁵	To automatically extract hidden topics from Web-based physician reviews using text-mining techniques to examine what Chinese patients have said about their doctors and whether these topics differ across various specialties.	Quantitative. Descriptive statistics and Latent Dirichlet Allocation.	China
Hawkins 2015 ³⁶	To assess the use of Twitter as a supplemental data stream for measuring patient perceived quality of care in US hospitals and compare patient sentiments about hospitals with established quality measures. To provide a current characterisation of US hospitals on Twitter, explore the unsolicited patient experience topics discussed by patients, and determine if Twitter data are associated with quality of care, as compared with other established metrics.	Quantitative. Machine learning approach/ sentiment analysis.	USA
Hopper 2015 ³⁷	To test the usefulness of sentiment analysis and time-to-next-complaint methods in quantifying text-based information located on the internet.	Quantitative. Sentiment analysis.	USA
Jans 2015 ³⁸	To find out how many patient ratings are necessary to outweigh an expert opinion's impact on the decision making process.	Quantitative. Experiment.	The Netherlands
Johnson 2013 ³⁹	To survey physician leaders' about their perceptions of rating systems, measuring performance and the quality of individual doctors.	Quantitative. Survey.	USA

Study by first author	Aim	Method	Country
Kadry 2011 ⁴⁰	To (1) determine the most frequently visited physician-rating websites with user-generated content, (2) evaluate the available information on these websites, and (3) analyze 4999 individual online ratings of physicians.	Quantitative, descriptive evaluation.	USA
Kanouse 2016 ⁴¹	To examine the effects of providing patient comments along with standardized performance information in a web-based public report.	Quantitative. Experimental design.	USA
Kilaru 2015 ⁴²	To characterise the content of online reviews and explore their perspectives on US emergency department (ED) care.	Qualitative. Modified grounded theory.	USA
Kinast 2014 ⁴³	To identify the reasons why patients write positive and negative online reviews of ophthalmologists.	Quantitative. Logistic regression.	USA
Kleefstra 2016 ⁴⁴	To explore whether and how patient reviews of hospitals, as reported on rating sites, have the potential to contribute to health care inspector's daily supervision of hospital care.	Qualitative. Semistructured interviews; inductively analysed.	The Netherlands
Lagu 2010 ⁴⁵	To describe the structure and content of physician-rating websites and to assess the extent to which a patient might find them valuable.	Quantitative descriptive study.	USA
Lagu 2013 ⁴⁶	To better understand the content of narrative feedback and determine how it might complement other forms of publicly reported quality data, like patient experience data collected by the HCAHPS	Mixed methods	England and USA
Lagu 2016 ⁴⁷	To determine if it is feasible to use social media platforms for learning about and improving hospital quality.	Mixed methods.	USA
Lewis 2015 ⁴⁸	To characterize the online presence of plastic surgeons in Southern California as portrayed by physician rating websites.	Quantitative descriptive study.	USA
Li 2015 ⁴⁹	To examine how the proportion and position of negative reviews on such websites influences readers' willingness to choose the reviewed physician.	Quantitative. Experimental 5x2 factorial design. Questionnaire.	USA
Lopez 2012 ⁵⁰	To explore the content of Internet reviews about primary care physicians.	Qualitative. Content analysis.	USA
MacDonald 2015 ⁵¹	To determine how the public views dental care in Quebec.	Mixed methods.	Canada
McCaughey 2014 ⁵²	To examine the relationship of social media channel utilization by health care organizations and the brand rating of those organizations, as measured by patients who have completed the HCAHPS survey.	Quantitative descriptive study.	USA

Study by first author	Aim	Method	Country
Merrell 2013 ⁵³	To help physicians and allied health professionals explore the vast array of feedback websites to identify promising websites, and to enhance their practices.	Quantitative. Descriptive study	USA
Nakhasi 2016 ⁵⁴	To explore whether Twitter is a relevant data source to learn about patient safety and capture the patient's voice.	Qualitative content analysis	USA (Tweets most likely to be from USA.)
Patel 2015 ⁵⁵	To explore and describe general practitioners' attitudes toward online patient feedback, specifically their concerns.	Qualitative, descriptive.	England
Patel 2016 ⁵⁶	To explore patients' views toward giving Web-based feedback and ratings to general practitioners (GPs), within the context of other feedback methods available in primary care in England, and in particular, paper-based feedback cards.	Qualitative. Thematic analysis.	England
Paul 2013 ⁵⁷	To propose a joint probabilistic model that captures both the sentiment and aspects latent in the free text of online provider reviews. To elucidate the factors that most affect consumer sentiment regarding interactions with their doctor.	Quantitative. Sentiment analysis.	USA
Ranard 2016 ⁵⁸	To compare the content of all Yelp narrative reviews of hospitals to domains of the HCAHPS survey. To identify which Yelp topics best correlated with positive or negative Yelp review ratings and to correlate Yelp ratings with the HCAHPS survey overall ratings.	Quantitative. Latent Dirichlet Allocation	USA
Rastegar-Mojarad 2015 ⁵⁹	To create a corpus of patient experience (COPE) and report descriptive statistics to characterize COPE.	Quantitative. Natural Language Processing.	USA
Reimann 2010 ⁶⁰	To examine the extent to which PRSs currently represent the constructs of patient experience and satisfaction as measured by research instruments.	Mixed methods.	Germany and USA
Riemer 2016 ⁶¹	To investigate patterns of ratings of dermatologists on commonly used feedback websites to better understand the information available to patients online.	Quantitative. Exploratory study.	USA
Rothenfluh 2016 ⁶²	To explore the extent to which consumer decision-making based on Web-based reviews is the same for consumer services (ie, choice of a hotel) and health services (ie, choice of a pediatrician), while providing an in-depth understanding of potential differences or similarities.	Qualitative. Thematic analysis.	Switzerland
Samora 2016 ⁶³	To understand the ethical and professional implications of physician behavior changes secondary to online physician-rating Web sites.	Quantitative. Survey.	USA

Study by first author	Aim	Method	Country
Segal 2012 ⁶⁴	To determine if surgeon volume, as a proxy for clinical outcomes and patient safety, correlates with online reputation.	Quantitative. Descriptive study.	USA
Shepherd 2015 ⁶⁵	To ascertain how social media users with experience of mental disorder relate to each other and the social space during internet based interactions and to uncover the potential role of resources such as Twitter for the provision of feedback on and engagement with mental health service user experience.	Qualitative. Content analysis	UK
Smith 2016 ⁶⁶	To identify qualitative themes associated with patient reviews of dermatologic care on consumer reporting websites.	Mixed methods.	USA
Sobin 2014 ⁶⁷	To evaluate patterns in online ratings of otolaryngologists.	Quantitative. .	USA
Speed 2016 ⁶⁸	To examine the ways in which anonymity and its attendant risks and dangers are conceptualised on different sides of the NHS/community relationship.	Qualitative thematic analysis	UK
Sundstrom 2016 ⁶⁹	To examine the role of health as a connective narrative among individuals organizing collectively in an online community. The "We are the 99 percent" Tumblr blog emerged as a spontaneous community platform of the Occupy Wall Street movement in the US.	Qualitative content analysis.	USA
Terlutter 2014 ⁷⁰	To analyse patients' knowledge and use of online feedback websites; describe users and nonusers in terms of sociodemographic variables, psychographic variables, and health status; and assert whether these variables can also serve as predictors of usage and nonusage.	Quantitative. Survey.	Germany
Thackeray 2013 ⁷¹	To establish the frequency of various forms (eg, spectators, creators, or critics) of online health-seeking behaviors.	Quantitative. Telephone survey.	USA
Timian 2013 ⁷²	To ascertain if Facebook "Likes" are associated with hospital quality and patient satisfaction.	Quantitative. Exploratory.	USA
Trehan 2016 ⁷³	To evaluate factors associated with positive online patient ratings and written comments regarding hand surgeons.	Quantitative. Exploratory study.	USA
van de Belt 2015 ⁷⁴	To identify the added value of social media for two types of supervision by the Dutch Healthcare Inspectorate (DHI), the regulatory body charged with supervising the quality and safety of health care services in the Netherlands.	Mixed methods. Exploratory study	The Netherlands

Study by first author	Aim	Method	Country
Wallace 2014 ⁷⁵	To demonstrate how the proposed state-of-the-art probabilistic model, that jointly captures latent aspects and sentiment, can leverage a small amount of data annotated by experts to guide topic/sentiment discovery.	Quantitative. Probabilistic model based on factorial Latent Dirichlet Allocation.	USA
van Velthoven 2018 ⁷⁶	To identify the self-reported behaviour of the public in reading and writing online feedback in relation to health services.	Quantitative. Face-to-face cross sectional survey	UK
Yaraghi 2018 ⁷⁷	To measure the relative importance of Web-based quality ratings from governmental and commercial agencies on individuals' choice of primary care physicians	Choice-based experiment	USA
Zhang 2018 ⁷⁸	To analyse negative online reviews about physicians; to identify potential ways to improve patient satisfaction and patient-doctor relationships	Content analysis	China

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