The use of electronic health records in the exam room and patient satisfaction: a systematic review

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CRD summary
This review found that use of electronic health records by physicians during consultations was associated with mostly neutral or positive effects on patient satisfaction. Although the authors' conclusions reflected the evidence presented, the results should be interpreted with some caution and the reliability of the results is unclear.

Authors' objectives
To evaluate the impact on patient satisfaction of physician use of electronic health records during exam room consultations.

Searching
MEDLINE, EMBASE, CINAHL, The Cochrane Library, PsycINFO, Proceedings First and Proquest Digital Dissertations were searched for relevant studies in English from January 2000 until March 2008; the authors stated that Medical Subject headings associated with relevant keywords were used. Web of Science Citation Index was searched for articles that cited those selected to identify additional relevant studies.

Study selection
Studies that described use of electronic health records in either an examination room or an outpatient office setting performed in USA and that measured patient satisfaction as an outcome were eligible for inclusion.

All of the included studies took place on a single site and included university-based departments, hospital teaching clinics and a Veterans Affairs clinic. Physician computer use in the examining room included use of non-commercial and commercial electronic health records systems. The questionnaire and survey respondents included patients with a mean age range of 46 to 72 years and parents of paediatric populations. Most studies examined patient satisfaction; one study evaluated physicians' perception of patient satisfaction.

Two reviewers independently performed the study selection. Any disagreements were resolved by a third reviewer.

Assessment of study quality
Study validity was assessed by consideration of individual study characteristics presented as a tabulated summary. This included sampling methods, independent and dependent variables, validation of questionnaires, blinding of data collectors and methodological issues that included consideration of confounders in the studies.

The authors did not report how many reviewers performed the assessment.

Data extraction
Two reviewers independently extracted data as reported in the included studies. A third reviewer reviewed the tables of extracted data to confirm accuracy of data extraction.

Methods of synthesis
Percentage responses from questionnaires were statistically pooled to calculate an average mean difference (MD) with 95% confidence intervals (CI) using a random effects model. Other results of the review were summarised in a narrative synthesis grouped by study design.

Results of the review
Seven studies (n=1,175 questionnaires or surveys completed) were included in the review: three cross-sectional studies and four pre- and post-intervention studies. Methodological quality of studies varied; problems with some studies
included non-consideration of confounding factors (two studies), non-validation of questionnaires or surveys (one study) and lack of clarity in terms of blinding of analysts or assessors (all studies). There was a lack of information provided regarding physician experience with computer systems.

The three cross-sectional studies indicated either a neutral effect (two studies) or a positive effect on patients' attitudes about physician use of electronic health records during outpatient visits.

Pooled results of some pre- and post-intervention studies indicated higher levels of satisfaction by patients after electronic health records were produced (MD 3.7%, 95% bootstrap CI 2.9% to 5.2%; three studies). Satisfaction was rated higher in two additional studies before the addition of electronic health records in the exam room. Overall, two studies found no effect on patient satisfaction, one found positive results and the fourth study found a negative effect as a result of implementation of electronic health records.

One study found that physicians perceived a negative effect on patients satisfaction with use of electronic health records in the exam room.

**Authors' conclusions**

Overall, studies that examined use of electronic health records by physicians found mostly neutral or positive effects on patient satisfaction; more research was required for a definitive answer.

**CRD commentary**

The review addressed a clear question. Inclusion criteria reflected the broad scope of the review. There was no attempt to search for unpublished studies, so there was a risk of publication bias. The review was limited to studies conducted in USA and published in English, so there was a risk of language biases and the review may be relevant only to physicians in USA. The reviewers took steps to minimise errors and bias in study selection and data extraction; use of similar steps during the methodological quality assessment was unclear. The extent to which it was appropriate to statistically combine some results was unclear given the disparity in the questionnaires administered, the unknown experience with computers of physicians under study and potential sources of bias and confounding in the studies. There were no tests for statistical heterogeneity published in the review. The authors correctly identified limitations of the review in terms of definition of patient satisfaction and a lack of good-quality studies. The results of the review and the conclusions drawn may only be applicable to physicians using electronic health records in exam rooms in USA because of differences in electronic health records use in Europe.

Although the authors' conclusions reflected the evidence presented, the results should be interpreted with some caution and the reliability of the results is unclear.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that more rigorous studies were required to quantify and describe the impact of use of electronic health records by physicians during exam room consultations.

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**Bibliographic details**


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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.