Factors affecting front line staff acceptance of telehealth technologies: a mixed-method systematic review
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CRD summary
This review concluded that the lack of acceptance by staff could be a key barrier to the successful implementation of telehealth. Implementation should include education and support for new ways of working. The conclusion reflects the evidence presented and appears to be reliable, bearing in mind the limitations of the evidence.

Authors' objectives
To synthesise qualitative and quantitative evidence on the acceptance, by front-line staff, of telehealth technologies, to inform their implementation, for patients with chronic obstructive pulmonary disease or chronic heart failure.

Searching
The authors searched seven databases, including CINAHL, EMBASE and MEDLINE, for articles published in English, from 2000 to January 2012. Search terms were reported. Searches were made in specialist journal indices; reference lists and citations; NHS Evidence; Cochrane Central Register of Controlled Trials; and IEEE Xplore. The OpenDOAR search engine was used to search university institutional repositories.

Study selection
Studies of any design were eligible if they reported on the attitudes of front-line health care staff, to the use of telehealth to deliver care to patients with chronic obstructive pulmonary disease (COPD) or chronic heart failure. Front-line staff were defined as personnel involved in the direct delivery of telehealth or associated patient care. Telehealth included video-phone links and remote monitoring equipment, supported by peripherals.

Most of the included studies were conducted in the UK, with other studies from Denmark, Canada, the Netherlands or Australia. The participants included nurses, general practitioners, hospital clinicians and social care staff, as well as patients and carers. The methods used to collect the data included interviews, questionnaires, focus groups and direct observation.

Two reviewers selected studies for inclusion; disagreements were resolved by discussion with the review team.

Assessment of study quality
Quantitative studies were assessed using the Canadian Quality Assessment Tool for Quantitative Studies. Qualitative studies were assessed using the Critical Appraisal Skills Programme checklist.

The authors did not state how many reviewers assessed quality.

Data extraction
The data were extracted using a tool designed for both qualitative and quantitative data. The results were extracted verbatim and grouped into themes.

The data were extracted by one reviewer and discussed by the review team.

Methods of synthesis
Thematic analysis and narrative synthesis were used to synthesise the data, focusing on exploring relationships within and between studies. Perceived barriers and facilitators to the acceptance of telehealth were grouped under the headings: concerns about technology; service design; and impact on staff, including staff-patient relationships.

Results of the review
Ten studies (14 papers) were included. The quality of the studies was described as generally adequate. Eight papers focused on chronic obstructive pulmonary disease, three on heart failure, and three on both conditions.
Ten facilitators and 15 barriers were identified. The most common facilitators of staff acceptance were easy to use, reliable equipment and collaboration. The most common barriers were negative impact of service change or implementation, negative impact on staff-patient relationships, low expectations of outcomes or need, and negative impact on staff autonomy or credibility.

The authors noted that studies often contrasted staff and patient perspectives and staff acceptance was not the main focus, which meant that the available data were limited.

**Authors' conclusions**
The lack of acceptance by staff could be a key barrier to the successful implementation of telehealth.

**CRD commentary**
The review question and inclusion criteria were clear and the search was thorough. The restriction to publications in English meant that some studies may have been missed. Measures were taken to minimise reviewer error and bias in most review processes, but this was not explicitly reported for quality assessment. Appropriate methods were used to assess the quality of quantitative and qualitative studies. The methods of synthesis were also appropriate, but limited study details and limited reporting of the thematic analysis, mean that the process was not fully transparent.

The authors' conclusions reflect the evidence presented and appear to be reliable, taking into account their caveats about the limitations of the studies.

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

**Practice**: The authors stated that staff should be involved in the design and implementation of telehealth services and support should be given to staff to ensure that they are able to use their skills, judgement and knowledge. They suggested that it could be helpful to address service needs and implement the required infrastructure before investing in equipment.

**Research**: The authors stated that there was a need for research to identify the best ways of overcoming the barriers to staff acceptance of telehealth.

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