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Qualitative studies enrich telemonitoring research, practice, and technology design

See linked article by Ure et al. on pg 57

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Telemonitoring of serious chronic conditions continues to gain traction in practice despite the dearth of consistent research to support its use, our limited understanding of the behavioral mechanisms underlying most interventions, and the lack of consensus on the workflows and process that should guide its implementation. The study by Ure et al.¹ reported in this issue of the *PCRJ* underscores the value of qualitative methods to fill some of these gaps – and in ways that exceed the capacity of much revered randomised controlled trials (RCTs).

An example of the limited picture painted by individual RCTs when considered in isolation is the oft-cited study of heart failure patients by Chaudrey et al.² published recently in the *New England Journal of Medicine*. Rather than recognising that their purely quantitative

design was vulnerable to important confounding factors that randomisation could not eliminate, the authors chose to use their findings as fodder to question the effectiveness of telemonitoring as a whole whilst overriding smaller studies, meta-analyses, and exploratory subgroup analyses supporting its use.³⁻⁵ Many of the confounders that might explain the negative findings in Chaudry's study – such as the need for manual entry of readings into the touchpad of patients' home phones and the lack of real-time self-care instruction and clinical feedback – could have been identified and easily eliminated, with a potentially significant reduction in the high attrition rate experienced throughout the study.

The report by Ure et al.¹ illustrates the value of mixed methods during the evaluation of telemonitoring interventions for people living with chronic conditions. In this case, by conducting a preparatory qualitative study, the authors were able to detect and address, in advance, key human and technological issues that could threaten the validity of their RCT. As has been shown elsewhere, small sophisticated studies can help ensure that both patients and clinicians are keen to use the interventions before committing to a potentially expensive and time-consuming RCT.^{6,7} They can also uncover apparently trivial challenges for the successful implementation of telemonitoring programmes that RCTs are unlikely to reveal – such as the need for appropriate balance between self-care and professional support, the introduction of interventions to overcome the prejudices of health professionals towards telemonitoring technologies, and effective measures to prevent patients from under-reporting their symptoms for fear of bothering their health care providers, or to let technological readings override their judgment.

The study also reveals technological nuances that are rarely considered or reported by RCTs that could have a major impact on their validity. These include the need to reduce uncertainty around data transmission, to simplify self-assessment of symptoms by

debilitated patients, and to overcome concerns about increased workloads by improving clinician user interfaces.

The study by Ure *et al.*¹ is a welcome addition to a growing body of literature that invites health researchers to expand their horizons beyond the confines of single methods, and to embrace the richness of insights offered by the combination of qualitative and quantitative tools, particularly when tackling complex areas such as the evaluation of telemonitoring during the management of chronic diseases. By abandoning the methodological zealotry of the past which has forced researchers to pledge exclusive allegiance to qualitative or quantitative approaches, we might begin to assemble a holistic view of the myriad pieces that make telemonitoring whole and that can only become apparent when sought through multiple lenses and perspectives. Otherwise, we will be condemned to continue reporting a litany of unsophisticated implementation efforts which have gone awry.

Conflicts of interest The authors declare that there are no conflicts of interest in relation to this article.

Commissioned article; not externally peer-reviewed; accepted 7th February 2012; online 29th February 2012

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<http://dx.doi.org/10.4104/pcrj.2012.00023>

Prim Care Respir J 2012; 21(1): 10-11

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Lower respiratory tract infection in the community: prognosis predictably difficult to predict

See linked article by Francis *et al.* on pg 65

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Community acquired pneumonia (CAP) is a leading cause of morbidity, with an annual incidence estimated at 5-11 per thousand adult population (higher in the young and the elderly). The diagnosis of CAP in hospital is made with a chest radiograph. In the community, the diagnosis relies upon a combination of symptoms suggestive of an acute lower respiratory tract infection (LRTI), presence of signs on chest examination, and systemic features (e.g. temperature >38.0 deg C). Diagnosing CAP in the community setting is therefore more problematic.¹ In all settings

the primary aim when treating CAP is to prevent death. Whilst mortality due to CAP in adults managed in the community in the UK is low (<1%), this is higher in patients admitted to hospital (5.7-14%) and higher still at 5-year follow-up (35.8-39.1%).

In order to identify patients at both high and low risk of mortality, CAP severity scores have been developed to complement clinical judgement. The CURB-65 score,² endorsed by the British Thoracic Society (BTS), consists of five elements – Confusion; Urea [$>7\text{mmol/l}$]; Respiratory Rate [≥ 30 breaths/min]; Blood pressure [systolic $<90\text{mmHg}$ and/or diastolic $\leq 60\text{mmHg}$]; age ≥ 65 years – and has been shown in prospective studies to predict 30-day mortality in hospitalised patients with CAP.^{3,5} Recent systematic reviews and meta-analyses showed that CRB-65 (CURB-65 minus serum urea) is a useful indicator of severity in hospitalised patients,⁶ and in this group, equivalent to CURB-65 in predicting 30-day mortality.⁷

Currently, clinical judgement in combination with CRB-65 is advocated in assessing the severity of CAP in community settings in the UK.⁸ Studies in support of this recommendation have included few patients in the community,^{9,10} and there is little data validating severity assessment tools in LRTI (without localising chest signs) in patients in primary care. The question therefore remains as to whether CRB-65 alone in this context accurately predicts patient outcomes.

The study by Francis *et al.*¹¹ in this issue of the *PCRJ* set out to determine a) whether primary care clinicians routinely recorded elements of the CRB-65 score and b) whether the score accurately predicted prognosis in adults with LRTI in the community. Primary care