

# Attitudes of UK-based wound specialists towards the use of mobile applications in wound care delivery: a cross-sectional survey. Part 2 qualitative findings

## KEY WORDS

- ▶▶ Digital
- ▶▶ Attitudes
- ▶▶ Barriers
- ▶▶ Enablers
- ▶▶ Integration
- ▶▶ Wound care

**Introduction:** This survey of wound care specialists in the UK was the first study to establish the prevalence of mobile wound app use and the perceived barriers to their implementation in wound care. This article presents the qualitative findings of the study. **Method:** A cross-sectional survey of UK-based wound clinicians was undertaken to explore the current usage of mobile applications in the field of wound care. A 40 question SurveyMonkey survey was distributed via closed Facebook groups for clinicians working in UK-based wound care services. Data analysis included thematic analysis of free text responses. The STROBE checklist was considered within the methodology of the study. **Results:** Overall, n=250 survey responses were received. Complete survey responses were received from n=153 wound clinicians. This included responses from n=121 nurses and n=29 podiatrists and from clinicians from all four devolved nations of the UK. **Conclusions:** Barriers affecting the implementation of mobile applications in wound care services include a lack of interoperability between mobile applications and other IT infrastructure, poor Wi-Fi signal, negative attitudes towards technology, a lack of workforce diversity and bureaucratic obstructions. **Implications for practice:** Clinical leaders in wound care should consider the factors identified within this study when developing implementation strategies for new mobile application technologies in wound care services.

This article presents the qualitative findings of the first national cross-sectional survey exploring the use of mobile applications within wound care in the UK. The quantitative data yielded from this study, published earlier this year, identified that around 21–24% of clinicians reported using mobile applications for wound care at the time. Almost all (99.5%) of clinicians have access to a smartphone with most (58.7%) having both a personal and work smartphone. UK-based clinicians currently use mobile smartphones regularly, including within their clinical work, but do not currently use wound care focussed mobile applications. Barriers affecting the implementation of mobile applications in wound care services include a lack of interoperability between mobile applications and other IT infrastructure, poor Wi-Fi signal, negative attitudes towards technology, a lack of workforce diversity and bureaucratic obstructions (Wynn and Clark, 2022).

The cross-sectional survey of UK-based wound clinicians sought to establish the current usage of this technological in UK wound services in addition to attitudes towards mobile applications, potential barriers and enablers to implementation. Furthermore, we sought to identify methodologies used for common clinical procedures that could be enhanced using mobile applications, such as wound measurement, clinical documentation and photography. Understanding the current prevalence of and attitudes towards the use of this technology may provide data to support the integration and further investigation of its value in clinical practice, and how it can be best used to improve patient outcomes.

No major studies have evaluated barriers and enablers to the use of this technology within UK healthcare settings. This study sought to address these questions.

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## METHODS

The details of the methodology used within this study were described in detail in the Part 1 findings (Wynn and Clarke 2022).

### Study aim

To determine the prevalence of mobile application technology use among wound care clinicians working within the UK and identify enablers of and potential barriers to the implementation of this technology.

### Ethical considerations

This study was approved by the Cardiff Medical School ethics committee before the start of data collection. Participants were asked to read a participant information sheet before consenting digitally to take part in the study.

### Data analysis

Survey data were analysed using summary statistics. In addition, qualitative thematic and content analysis was undertaken for free-text responses where appropriate. Themes were identified using principles of thematic analysis described by Braun and Clarke (2006). This approach includes six key stages. Familiarisation with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes and presentation of the findings (Braun and Clarke, 2006). Themes of relevance were defined as semantic patterns indicating barriers or enablers to the adoption of mobile application technology in wound care. An inductive coding method was used to analyse free-text responses to open questions. This approach allows the data to define the themes (Braun and Clarke 2006). Inductive coding, in contrast to deductive coding, allows themes to be derived directly from the qualitative data rather than being informed by a predetermined theoretical framework (Seale, 2018). According to Seale (2018) deductive approaches are appropriate when previous research or literature is available allowing construction of a thematic framework before data analysis. This approach can be used to test, update or expand on existing findings (Seale, 2018). Fereday and Muir-Cochrane (2006) argue that ideally a hybrid approach to thematic analysis

using both inductive and deductive coding should be used where possible if sufficient literature is available to allow construction of a codebook in advance of the data analysis. Within this study a solely inductive approach was taken due to both the lack of pre-existing data to construct a codebook with and consideration of the results yielded from the quantitative aspect of the study exploring attitude domains derived from literature, about the use of digital health technologies more broadly. Other benefits of an inductive approach include the potential identification of themes that may bear little relation to the original questions asked within the main survey (Nowell et al, 2017). This may help establish theoretical frameworks on which future research could be based. Respondents were not asked to review the coding to determine if accurate interpretation of the responses was achieved. The results must be interpreted with caution due to both the limited quality and length of responses; further studies are needed to investigate the indicative themes identified within this survey in further depth.

## RESULTS

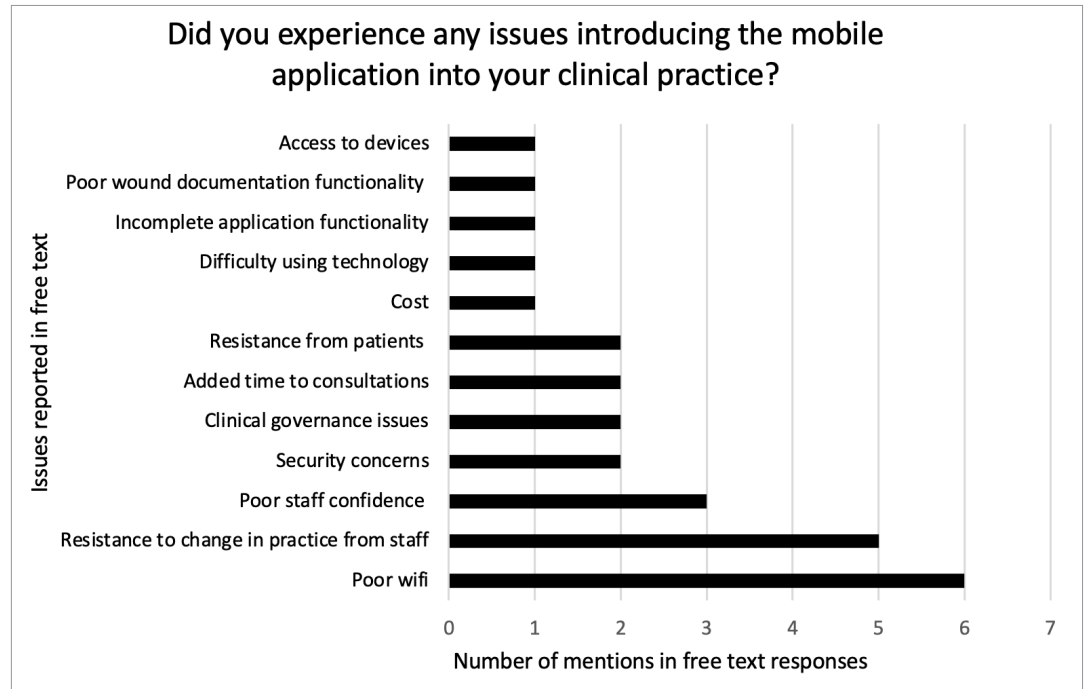
Most respondents (n=23; 58.9%) who had implemented mobile applications into their clinical practice reported that they experienced issues during the implementation period. Qualitative data from free text responses identified several issues experienced by health professionals implementing mobile applications (*Figure 1*).

Notably, the data indicated areas that have adopted mobile applications experience reductions in service efficiency due to the service being relied on to provide imaging services using the mobile application:

*"Only a few areas have it [mobile application] so we were often used as a photography service inappropriately".*

Interoperability with other digital technology was also highlighted as an issue impacting on efficiency, with health professionals having to convert digital records produced on mobile applications into paper records. This had the impact of requiring more time to undertake routine clinical documentation processes:

Figure 1. Self-reported issues encountered while implementing mobile applications



*"...trust at time was not on electronic records. Therefore, had issues trying to print off the assessment and recommendations by a computer/printer in order to file in the notes for staff to have access to. The process ended up being more time consuming than normal assessment"*

Thematic analysis of open-ended question identifying enablers and barriers not explored in Likert statements

Initial coding identified 20 codes indicative of barriers and five codes indicative of enablers. During subsequent rounds of analysis four themes were identified related to barriers and one theme related to enablers. A second review of the data extracts was performed to ensure congruency with the final themes was established.

**BARRIERS**

**Digital competence and maturity**

This theme incorporated responses related to the digital competence of both healthcare professionals and patients in addition to how the maturity of digital infrastructure may influence the adoption of mobile application technology by patients or healthcare professionals.

When assessed in further depth, it was clear that some respondents had interpreted this issue from the perspective of patients and linked IT infrastructure issues to the use of mobile technology, stating that patients using this technology would require IT support that is not currently a part of NHS IT infrastructure:

*"Patient attitudes towards technology, older patients are more reluctant to use a smart phone and download an app, they also require tech support"*

Detail was also provided in relation to challenges associated with wireless signal strength. Respondents identified that this is of unique importance in the context of community-based care:

*"Inadequate signal strength in rural areas"*

*"Lack of support rural area lack of connectivity"*

Responses also indicated issues related to the functionality of wound care mobile applications did not meet their needs. For example, it was reported that wound applications may not currently include all elements of the wound care minimum data set:

*"The app needs to include the minimal data set for wound assessment"*

Issues related to patient competence in the use of mobile applications and interoperability were the two most reported barriers, representing n=10 (14.1%) and n=9 (12.7%) of all responses, respectively. Respondents suggested that data security issues may also be a barrier. It was clear from the responses that issues associated with interoperability are already established and challenges associated with this had been experienced by the respondents:

*"The main issue would be how you upload the pictures, I work in [the] community and an acute setting, they both have different IT systems, can imagine it wouldn't be straightforward"*

It was also clear that respondents had experienced difficulties associated with the use of mobile applications by patients. Respondents reported that patients may struggle to photograph wounds in hard to access anatomical locations and struggle to use technology more generally. This may potentially impact the quality of clinical data produced by patients using these devices:

*"Patient reliability/mobility re use of technology — we have large % of elderly in our patient cohort — many struggle with using technology and even those that can embrace it struggle to reach feet to be able to take photos. Many do not have carers/family willing/able to help. Also, for some patients, I would have my doubts on the reliability of how they are taking measurements."*

*"Patient mobility to access site of wound especially elderly patient with [a] plantar foot ulcer and their ability to use technology"*

#### **Negative attitudes towards technology**

Responses indicating attitudes towards technology that were not specific to mobile applications were considered consistent with this theme. Although these responses were unrelated specifically to mobile applications, attitudes expressed within these responses were considered to represent

potential barriers to the adoption of mobile application technology.

Respondents expressed concerns that the use of technology to perform clinical tasks might have the effect of reducing the competence of nurses performing these tasks manually. It was also reported that the current demography of the nursing profession may limit adoption of new technologies:

*"The fact that it deskills clinicians. We need to get the basics right and be skilled at wound measurements and assessments and tissue type analysis before we jump on the electronic bandwagon. I think many nurses don't get the basics right."*

*"Nursing is populated by middle-aged women who don't like technology. Every hospital, clinic, laptop smartphone etc uses a different system it would have learned and relearnt"*

#### **HIERARCHY**

This theme included responses indicating challenges to healthcare professionals trying to implement mobile applications due to bureaucratic issues and healthcare hierarchy. Little detail was provided within responses related to this theme, for example:

*"Management don't like change"*

One respondent indicated that conflict between wound care specialists and managers may create barriers to the implementation of technology:

*"Management don't like change and [the] TVNs put up barriers, experience means a lot"*

Another respondent indicated that, although there may be interest among healthcare professionals to implement new technology, the nature of healthcare hierarchies makes it challenging to change working practices. It was clear from the response that the respondent had experience in both senior management and more junior clinical roles allowing recognition of the bureaucratic challenges inherent in changing practices in the NHS:

*"Decision making at a level above my influence. I have previously lead a TVN team and pre*

*COVID I was investigating a wound app. In a more junior role now (relocated) I do not have the power!"*

#### ADMINISTRATION

Responses indicating issues related the administration of mobile application technology in wound care including financial issues or other routine day-to-day considerations were included within this theme.

Financial barriers, a perceived increase in time required to deliver care using mobile applications and concerns about infection control were reported by respondents. However, it was unclear exactly what these infection control concerns were related to as there was a lack of detail in the responses. This was also the case for responses about increases in time required for care, no detail was provided explaining how this may occur when using the mobile applications.

#### ENABLER

##### Digital coherency

A small number of responses (n=5; 7%) identified enablers to the implementation of mobile application technology. Digital coherency was identified as the prevailing enabler. Specifically, national consistency in the technologies used and guidance regarding the use of mobile applications were reported by four respondents as a potential enabler.

#### DISCUSSION

Overall, attitudes were overwhelmingly positive regarding the use of mobile applications in wound care. However, the data suggest that hesitancy may be caused by issues with the current functionality of wound applications. The lack of inclusion of data on the minimum data set (MDS) for generic wound assessment, which was established via a consensus study by Coleman et al (2017), was cited as a barrier to using wound applications. It is, however, unclear if this is the case for all currently available applications for use by wound clinicians. Inclusion of national standard data sets for wound assessment is evidently an issue that application developers must consider to aid uptake of the technology. Clinical teams implementing mobile applications for wound care should seek to publish quality improvement projects (QIP) to highlight where and how improvements in the use and design

of applications can be made to maximise their use for health professionals and patients.

Barriers related to bureaucracy reported in free-text responses reflect challenges identified following a 2020 consultation by the Department of Health and Social Care (DHSC) investigating bureaucracy in the NHS. Specifically, "time consuming procurement processes" were identified as an issue, making procurement of new services or infrastructure (such as mobile applications and related digital systems) often too time consuming (DHSC, 2020). Notably, the DHSC report highlighted that wider system culture and support can impact leaders at all levels and may lead to a paralysis of decision making. These issues were reflected in free-text responses, which indicated that managers could be obstructive when more junior staff sought to implement mobile applications into their wound care services. To reduce the burden of excess bureaucracy the DHSC (2020) recommended further digitalisation of services. It is clear further study of the nature of bureaucratic obstacles during the implementation of digital processes is required to achieve this aim.

Currently, most mobile applications for use by wound clinicians are produced in the US (Shamloul et al, 2019). It is possible that these applications are not fully adapted to meet the clinical standards and processes for wound care documentation in the UK, such as the MDS, this may limit perceptions of clinical effectiveness by UK-based wound healthcare professionals. Application developers should consider this when seeking to implement this technology into UK wound services and should work with healthcare professionals to ensure the applications meet their specific requirements.

Concerns were also reported by respondents about the clinical effectiveness of wound care services being compromised by an over-dependence on technology to carry out basic clinical tasks such as wound assessment. These concerns are supported by previous reviews that indicate current deficits in the evidence-base underlying many wound care applications (Shamloul et al, 2019; Bondini et al, 2020). This may explain concerns about the quality of care being compromised by potentially poorly

functioning applications (Shamloul et al, 2019; Bondini et al, 2020). The impact of technology on the skills of healthcare professionals have already been described within the medical profession (Lu, 2016). Worryingly, increases in the use of smart technology to perform clinical tasks is reportedly difficult to reverse even in cases where the technology has been shown to be ineffective or no more effective than traditional approaches (Lu, 2016). There are currently no studies reporting the nature of these issues in wound care specialities. Strategies proposed by Lu (2016) to prevent potentially detrimental over-dependence on technology include provision of adequate training on digital skills and recognising the limitations of technology, stressing the importance of evidence to support clinical activity including the use of technology and encouraging autonomy in clinical decision making. This may allow an optimal combination of human intelligence with technology to optimise clinical outcomes and maximise uptake of potentially valuable mobile application technologies for wound care.

Challenges related to signal strength and use of applications by older patients, reported by respondents, suggested that patients may require technical support, indicating healthcare IT infrastructure may need to extend to deal with IT issues faced by patients using technology in their own homes. Digital skills training for patients is also necessary to ensure parity of access to mobile application technologies, which may be useful for patients with wounds via functions such as remote consultations or surgical site surveillance achieved via images submitted digitally by patients (Gunter et al, 2018; Shamloul et al, 2019).

### Study limitations

A power calculation was not possible to determine a sample size required to create a representative sample. Response rates could not be determined due to the recruitment strategy used for the study, which relied on health professionals who are members of closed Facebook groups responding via a shared link. Given that the survey was shared via social media, the survey may be biased in favour of health professionals who are already familiar with mobile technology.

### CONCLUSION

The qualitative data from this survey highlighted key barriers and enablers to the implementation of this technology. Barriers included limited digital competency and maturity, negative attitudes towards technology and administrative challenges associated with implementations. Digital coherency within organisations including the compatibility of technologies between organisations was highlighted as an enabler to adoption of mobile applications.

Future studies should investigate these themes in greater depth using robust qualitative methodologies to help better understand the nature of these barriers and enablers to support ongoing digital innovation within UK wound care services.

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