

Patient Trust and Usability Challenges in Remote Patient Monitoring Platforms for Chronic Disease

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Abstract — Remote patient monitoring platforms are increasingly deployed to support self-management among patients with chronic conditions such as heart failure and diabetes, yet sustained engagement with these tools varies considerably across patient populations. This study investigates how patient trust and perceived usability jointly influence continued platform use among older adults managing chronic disease at home. We conducted a mixed-methods evaluation combining usage log analysis with semi-structured interviews across two remote monitoring programs, examining how interface design, alert frequency, and clinician responsiveness shaped participants' willingness to rely on the technology for daily health decisions. Findings show that trust was less dependent on technical accuracy of readings than on participants' confidence that clinical staff would act promptly on concerning data, suggesting that workflow integration matters as much as sensor performance. Usability concerns clustered around alert fatigue and ambiguous error messages, which participants associated with declining engagement over time. We propose design and workflow recommendations, including tiered alert thresholds and explicit feedback loops confirming clinician review, aimed at sustaining long-term adherence. These findings inform the design of remote monitoring programs intended to support chronic disease management beyond initial adoption periods.

Index Terms — remote patient monitoring, digital health, patient trust, usability, chronic disease management

I. INTRODUCTION

Remote patient monitoring platforms are increasingly deployed to support self-management among patients with chronic conditions such as heart failure and diabetes, promising earlier detection of clinical deterioration without requiring frequent in-person visits [1]. Sustained engagement, however, varies considerably across patient populations, and engagement decline over time is frequently reported even where initial adoption rates appear satisfactory [2]. Older adults managing chronic disease at home represent a population of particular interest, since they are simultaneously a primary target for these platforms and a group for whom usability barriers may compound pre-existing health complexity.

Prior evaluations of remote monitoring engagement have tended to emphasize either technical accuracy of sensor readings or interface usability in isolation, with comparatively less attention paid to patient trust as a distinct construct mediating continued reliance on the technology for daily health decisions [3]. Trust in this context may depend less on whether a device measures correctly and more on whether patients believe clin-

ical staff will act on concerning readings in a timely manner [4]. This distinction has direct implications for where design and workflow investment should be prioritized.

This study investigates how patient trust and perceived usability jointly influence continued platform use among older adults managing chronic disease at home, combining usage log analysis with semi-structured interviews across two remote monitoring programs.

II. RELATED WORK

Technology acceptance research in digital health has extensively studied perceived usefulness and ease of use as predictors of initial adoption, but longitudinal engagement research suggests these constructs explain adoption more successfully than they explain sustained use over months of daily interaction. Separate literature on clinician workflow integration has examined alert fatigue among care teams responsible for reviewing monitoring data, but has given less attention to how patients themselves interpret clinician responsiveness, or its absence, as a signal about whether continued engagement with the platform is worthwhile.

III. METHODOLOGY

The study employed a mixed-methods evaluation combining usage log analysis with semi-structured interviews conducted with participants across two remote monitoring programs supporting heart failure and diabetes self-management.

A. Engagement Trajectory Modeling

Daily platform interaction logs were used to construct an engagement trajectory for each participant, allowing comparison between early-adoption engagement levels and engagement observed after an extended use period, expressed as a retention ratio R relative to each participant's own peak weekly interaction count I_{max} over a rolling four-week window I_t :

$$R = \frac{\frac{1}{4} \sum_{t=T-3}^T I_t}{I_{max}} \quad (1)$$

Interview transcripts were then analyzed thematically and compared across participants with high versus low retention ratios to identify trust- and usability-related themes distinguishing the two groups.

Table 1. Engagement and trust outcomes across monitoring programs

Am. Med. Inform. Assoc., vol. 16, no. 4, pp. 550-560, 2009.

Program	Retention Ratio	Alert Fatigue Reports	High Trust
Heart failure program	0.71	34%	58%
Diabetes program	0.64	41%	52%
Combined sample	0.68	37%	55%

IV. RESULTS

Table 1 summarizes engagement and trust-related outcomes across the two monitoring programs studied.

Usability concerns clustered around alert fatigue and ambiguous error messages, and participants who reported these concerns most frequently also exhibited lower retention ratios in the corresponding usage logs.

V. DISCUSSION

Findings indicate that trust was less dependent on technical accuracy of readings than on participants' confidence that clinical staff would act promptly on concerning data, suggesting that workflow integration matters as much as sensor performance for sustaining engagement. Tiered alert thresholds and explicit feedback loops confirming clinician review emerged as design and workflow recommendations most consistently associated with participants describing stronger ongoing trust in the platform. These findings suggest that engagement decline observed in prior remote monitoring evaluations may be attributable in part to unaddressed trust erosion rather than usability failure alone.

VI. CONCLUSION

This study found that patient trust and perceived usability jointly shape sustained engagement with remote patient monitoring platforms among older adults managing chronic disease, with clinician responsiveness emerging as a stronger driver of trust than technical measurement accuracy. Design and workflow recommendations centered on tiered alerting and explicit review feedback loops offer a practical pathway toward sustaining adherence beyond initial adoption periods.

REFERENCES

- [1] S. Noah et al., "Impact of remote patient monitoring on clinical outcomes," NPJ Digit. Med., vol. 1, art. 20172, 2018.
- [2] J. Kruse et al., "Telehealth and patient satisfaction: A systematic review," BMJ Open, vol. 7, no. 8, e016242, 2017.
- [3] D. Lupton, "Digital health: Critical and cross-disciplinary perspectives," Routledge, 2018.
- [4] A. Sujan et al., "Trust, technology and clinical responsiveness in remote monitoring," J. Med. Internet Res., vol. 23, no. 4, e24999, 2021.
- [5] P. Nair and O. Bennett, "Usability barriers in chronic disease telemonitoring among older adults," Int. J. Med. Inform., vol. 165, art. 104822, 2022.
- [6] F. Or and B. Karsh, "A systematic review of patient acceptance of consumer health information technology," J.