CODESIGNING A MOBILE HEALTH APPLICATION TO IMPROVE ENGAGEMENT AND OUTCOMES IN DIALYSIS CARE: A MULTI-SITE EVALUATION IN SOUTH AFRICA

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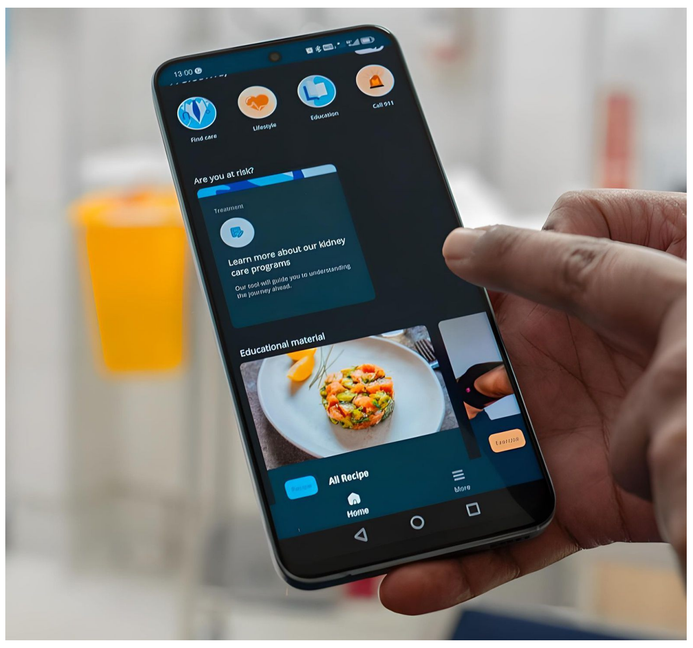
BACKGROUND

Chronic Kidney Disease (CKD) and End-Stage Kidney Disease (ESKD) represent escalating global health challenges, requiring long-term, complex, and resource-intensive care, particularly for patients on dialysis. To address these needs, National Renal Care (NRC) co-developed a mobile health (mHealth) application with patients in 2022, aimed at enhancing education, improving communication, and supporting self-management. This study evaluates the impact of the mHealth application on patient engagement and clinical outcomes among dialysis patients.



METHODS

A mixed-methods study was conducted across 87 NRC sites in South Africa, including 76 in-centre haemodialysis units and 11 home therapy programs. A retrospective analysis of usage and clinical data was performed for the period October 2023 to November 2024. The app's performance was assessed across five domains: user engagement, user satisfaction and experience, clinical outcomes, health system integration, and reach/adoption. Quantitative metrics included app interaction data and clinical indicators. The user's evaluation of the app was captured via the validated Mobile App Rating Scale (Mars and uMARS).

RESULTS

MOBILE APPLICATION REGISTERED USERS

By November 2024, 3,410 dialysis patients had registered on the mobile application.

DEMOGRAPHIC OF REGISTERED USERS

The mean age was 57.6 years, with 60.5% male and 39.5% female users.

CO-MORBITITIES

Hypertension (51%) and diabetes (20%) were the most prevalent comorbidities, reflecting the substantial multimorbidity burden in this population. The mean duration on dialysis was 4.62 years (SD ±4.28).

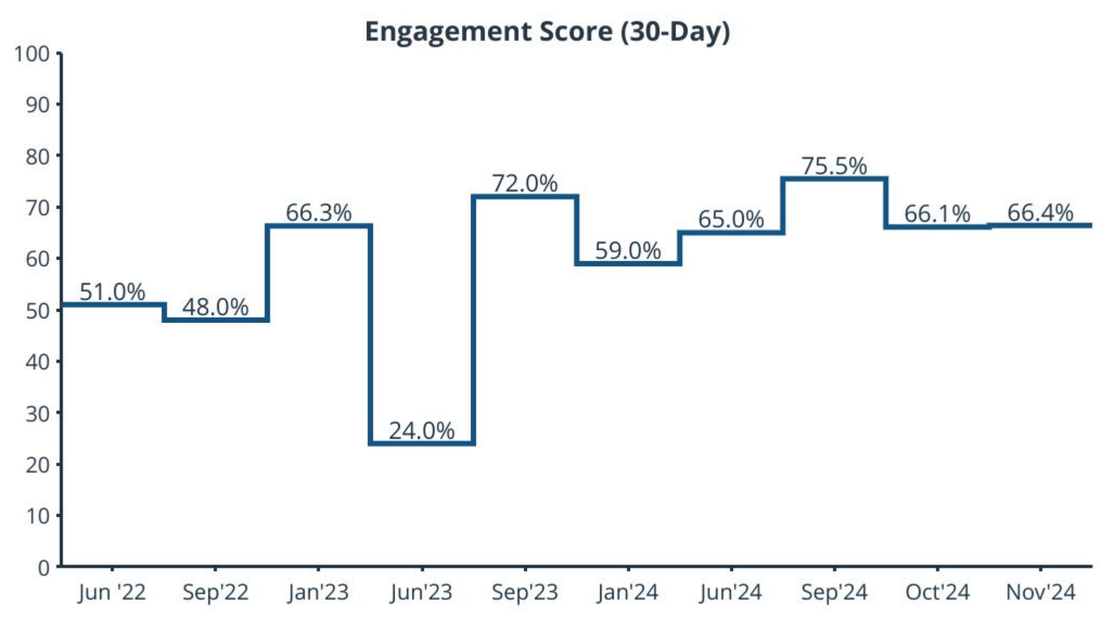
According to the uMARS survey, the app received a mean quality score of 3.57, a subjective quality score of 3.94, and a perceived impact score of 3.81 out of 5.

	Mobile Application User Rating Scale (MARS) (n=22)	Mobile Application User Rating Scale (uMARS) (n=39)
Engagement	3.87	3.28
Functionality	4.02	3.56
Aesthetics	4.06	3.67
Information	3.79	3.78
App quality mean score	3.93	3.57
App subjective quality scale	3.47	3.94
Perceived impact scale	4.2	3.81

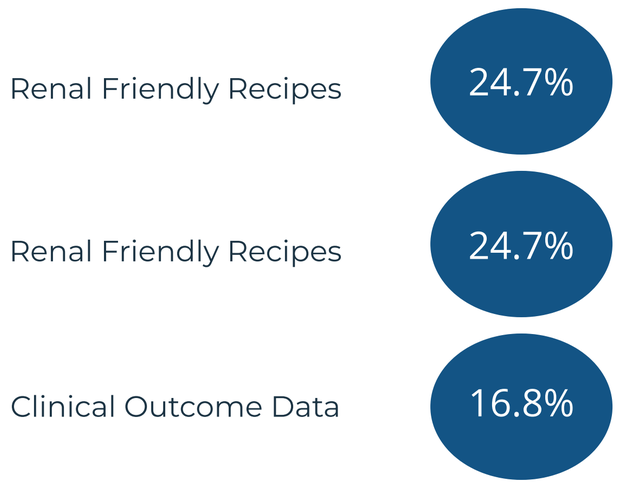
Analysis of clinical data revealed measurable benefits among high app users, defined as those accessing the application more than four times per month. This group demonstrated a 2.8% higher proportion of patients achieving target haemoglobin levels (10–12 g/dL, NS), a 4.5% increase in the proportion of patients within the target albumin range (>35g/dl, p = 0.009), and a 1.0% increase in those within the target calcium range (2.1-2.4mmol/l, NS).

Mobile Application Engagement	Albumin (>35g/dl, p=0.009)	Calcium (2.1 - 2.24 mmol/l)	Haemoglobin (10-12g/dl)
Low app users (<4 engagements per month)	76.1%	58.9%	48.6%
High all users (>4 engagements per month)	80.6%	59.9%	51.4%
Difference (12 months)	4.5% (p=0.009)	1.0%	2.8%

The average 30-day patient engagement rate was 66.4%, with a mean session duration of 18.4 minutes. This reflects strong patient interaction and sustained usage, underscoring the importance of designing data around what matters most to patients.



The most frequently used features included renal-friendly recipes (24.7%), educational articles (24.7%), and access to clinical outcome data (16.84%). Symptom tracking was utilised by 12.5% of users.



CONCLUSION

The codesigned mHealth application demonstrates substantial potential to enhance patient engagement and to support clinical improvements in dialysis care. By prioritising features that reflect what matters most to patients, the platform enabled a more personalised, participatory approach to CKD management. These findings support the value of digital health tools that can play a role in bridging gaps in chronic care. It provided timely, accessible, and patient-centred support. The study underscores the value of a mobile app like mHealth in enhancing care delivery for patients with kidney failure.

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