# EVALUATION OF A TELEMONITORING SYSTEM BASED ON A MOBILE MEDICAL APP IN A COHORT OF PERITONEAL DIALYSIS PATIENTS: A PILOT STUDY

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## INTRODUCTION

Medical apps for mobile technology are becoming increasingly available and can assist in recording data for clinical assessment or monitoring. Since a number of studies have shown potential for clinical benefits of mobile app interventions, we tested the use of a novel medical app in a renal population of peritoneal dialysis (PD) patients. Using only free online resources, we developed an intuitive medical app to empower patients to take an active role in their health. The app allows PD patients to record all the information needed for their monthly visits, including ultrafiltration, weight, blood pressure and the presence or absence of specific symptoms. This information is then automatically transmitted to the PD clinic in either a table format or graphs.

## METHODS

We screened all patients who attended our PD clinic between January 2015 and November 2015.

From a total of 63 consecutive PD patients, 44 patients were excluded because they did not have regular access to the internet. Seven patients were excluded as they refused to give informed consent for the study.

Consequently, 12 (7 M/5 F) consecutive patients, aged between 24 and 74 years (median 51 years) formed the final study cohort. This remote monitoring group answered daily symptom question and took daily weight, ultrafiltration, and blood pressure readings for a mean follow-up of 54+/- 34 days. The self-administered KDQOL-SF Instrument was used to assess quality of life.

Continuous variables were reported as mean +/- SD. Categorical data were reported either as frequencies per 100 patient-days or percentages. Student's t-test was used for normal distribution variables and Wilcoxon test for not normally distributed variables.

*Patients used their smartphone/tablet (A) to download the Peritoneal Dialysis Medical App (B) through a QR-Code (C).*

*Then using this App (D), they were able to automatically transmit to the PD clinic their daily dialysis data (E).*


C



| | |
|---|---|
| Date | Friday, April 29, 2016 |
| Ultrafiltrato (mL) | -853 |
| Peso (Kg) | 67 |
| Nome e Cognome * | g c |
| Pressione | 115/70 |
| Clicca su tutte le risposte corrette | • Test con striscia reattiva eseguito: NEGATIVO<br>• Sto bene |

E

| Main characteristics of the remote telemonitoting group | |
|---|---|
| *Gender* | M 7/F 5 |
| *Age (years)* | 50+/-12 |
| *Dialysis vintage (months)* | 23+/-2.3 |
| *Type of mobile technology* | Mobile phone 7<br>Mobile phone/tablet 4 |
| *Follow-up time (days)* | 54+/-34 |
| *Number of records* | 651 |
| *Total data entries* | 3906 |
| *Missing readings* | 0.6 per 100 patient-days |
| *Percentage of errors* | 2.1% |

## RESULTS

Enrolled patients were significantly younger than other screened patients (51 vs. 74, p <0.05) and showed a better socioeconomic status and a higher degree of instruction.

Seven of 12 patients used a mobile phone, whereas the remainder used both mobile phones and other devices.

Missing readings throughout the study period showed a frequency of 0.6 per 100 patient-days.

On a total of 651 recordings, including 3906 data entry, readings were reported erroneously in only 2.1% of cases. There was no significant difference in QoL during the study period, but significant changes were reported for the items of emotional well-being and patient satisfaction.

## CONCLUSION

*A mobile App was successfully adopted as a telemonitoring system for a cohort of PD patients with an impressive compliance and an acceptable percentage of errors in data collection.*

*The mobile App helped patients to improve both their self-care knowledge and satisfaction.*

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