Service Priorities and Programmes

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An innovative program using smart-phone based telemonitoring in improving blood pressure control and chronic disease self-management for hypertensive patients in primary care

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Introduction

Hypertension is a key risk factor for cardiovascular disease and results in largest cause of morbidity and mortality worldwide. Hong Kong Population Health Survey revealed that around 27% of the population aged 15 or above had increased blood pressure (BP). Only about 40% hypertensive patients receiving treatment attained good control of blood pressure. Many organization, include World Health Organization are recognizing the potential value of electronic health (eHealth) and mobile health (mHealth). Recent meta-analysis concluded that home telemonitoring may represent a useful tool to improve blood pressure (BP) control. There is currently no published local study evaluating the usefulness of smart-phone based telemonitoring in improving BP control and enhancing self-management in hypertensive patients.

Objectives

To evaluate whether hypertensive patients who participate in smart phone based telemonitoring of BP will have increased reduction in blood pressure and better self management behaviour from baseline to 6 months follow up.

Methodology

105 hypertensive patients, recruited from a primary care clinic, satisfied the eligibility criteria and passed competency test in self-blood pressure measurement. All had mobile applications downloaded to their smartphones and taught the functions for recording home BP readings. Aside from automated message response features based on inputted BP readings, the apps also has reminder prompts to facilitate BP readings recordings. Mean clinic and home systolic and diastolic BP readings, self-efficacy for managing chronic disease (SEM-CD) score were performed at baseline, 3-months and 6-months post-intervention. Regular HBP monitoring was defined as measurement of home BP reading of more than 3 times per week.

Result

51 male (48.6%) and 54 female (51.4%) patients, with mean age 57 (SD 8.9) years old completed the study. Their mean (SD) body mass index was 27.1 (4.6) kg/m2, while 26.7% also had diabetes mellitus and 31.4% had hyperlipidaemia. The baseline mean systolic (SD) and diastolic BP (SD) at clinic and home were 129.9 (11.8) / 81.2 (8.5) mmHg and 127.2 (11.1) / 77.2 (8.1) mmHg respectively. Both clinic and home mean BPs were statistically reduced at 3 and 6 months post-intervention. The mean difference in clinic systolic BP reduction were -3.3 (p=.017) and -1.1 (p=.392) mmHg while mean difference in clinic diastolic BP reduction were -2.4 (p=.001) and -1.4 (p=.028) mmHg at 3 months and 6 months from baseline, respectively. The mean difference in home systolic BP reduction were -5.9 (p=.000) and -4.5 mmHg (p=.000) while mean difference in home diastolic BP reduction were -3.3 (p=.000) and -3.0 (p=.000) mmHg at 3 months and 6 months from baseline, respectively. The proportion of patients performed regular HBP monitoring increased from 54.3% at baseline to 67.6% at 3 months (p=0.02) and 66.7% at 6 months (p=0.06). (SEM-CD) score was improved at 3 and 6 months, with statistical improvement at 3 months. In conclusion, smart phone-based telemonitoring was efficacious in reducing BP and enhancing self-management behavior in hypertensive patients.