#2389_ IMPACT OF TELEHEALTH CARE ON CLINICAL OUTCOMES IN HEART FAILURE

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Background

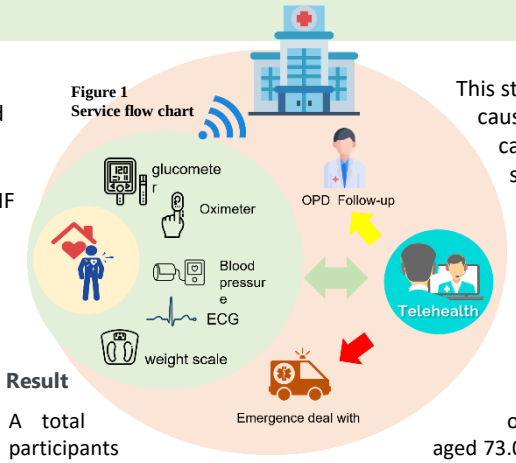
Heart failure is high incidence and mortality rates, limited Physical activity, decreased quality of life, and increased healthcare expenses , which are the major risk factors. There is an unmet need to implement a Telehealth Care HF Program (TC) to improve the outcomes in such patient populations.

Methods

A retrospective observational study, using electronic medical record data. Enrolled patients who were screened on a daily basis, based on (ICD-10) code with I50. A total of 916 patients were included from 2016 to 2020. Among them, 110 participated in TCHFP, and 477 patients did not. ,with 138 patients excluded due to discharge, and 137 patients excluded due to hospitalization for reasons other than heart failure. Among the remaining patients, 54 died within 7 days after discharge. After using propensity score matching (PSM), 11 items were paired including gender, age, comorbidities, and physiological measures. The study included a remote care group of 105 patients and a control group of 105 patients. A total of 210 patients were included in the study. First, one-year all-cause mortality rate and readmission rate, second is the cardiovascular mortality rate and readmission rate.

Patients received TC visits for heart failure management via Bluetooth-enabled equipment like blood pressure meters, glucometers, oximeters, weight scales, and electrocardiograms that uploaded data to the hospital. Abnormal data was recorded and immediately alerted nurses for effective management. Patients could easily initiate phone consultations or receive emergency care and regular biweekly follow-up calls with referrals to suitable long-term care resources based on their needs. Usual care (UC) provides the self-care note of heart failure sheet and the first appointment with the outpatient department after discharge. (Figure 1)

Figure 1
Service flow chart



Result

A total of 587 participants aged 73.0±15.5, women (48.2%), and married (89.4%). Comorbidity like diabetes (53.5%) and coronary heart disease (60.8%), chronic obstructive pulmonary disease (15.2%), hypertension (80.9%), Hemodialysis (5.5%), cerebrovascular accident (33.4%), and atrial fibrillation (39.5%). (Table 1)

Table Baseline demographics and characteristics

Variables	Total	UC	TC	t test / χ2 test
Number of Patients	587	477	110	P-Value
Age (mean ± SD)	73.0(15.5)	73.7(15.4)	70.2(15.7)	0.037
SEX (n,%)				0.648
Female	289(48.2)	237(49.7)	52(47.3)	
Male	298(50.8)	240(50.3)	58(52.7)	
Married	525(89.4)	423(88.7)	102(92.7)	0.213
Education (n,%)				
High school graduate or above	208(35.4)	148(31.0)	60(54.5)	0.000*
Occupation (n,%)	137(23.3)	98(20.5)	39(35.5)	0.001*
Somker (n,%)	199(33.9)	156(32.7)	43(39.1)	0.202
Alcohol (n,%)	112(19.1)	90(18.9)	22(20.0)	0.785
BMI (mean ± SD)	25.3(5.2)	25.5(5.4)	24.4(4.4)	0.048
SBP mmHg (mean ± SD)	138.9(28.1)	140.1(28.1)	133.4(27.1)	0.022*
DBP mmHg (mean ± SD)	73.8(15.6)	73.7(15.6)	74.7(15.9)	0.544
Heart rate		85.7(22.7)	85.8(23.7)	
LVEF		46.3(13.2)	43.5(15.4)	
EF >=40%	396(67.5)	336(70.4)	60(54.5)	0.001*
EF< 40%	191(32.5)	141(29.6)	50(45.5)	
Numbe of Comobidity				
Number <=3	309(52.6)	242(50.7)	67(60.9)	0.054
Number >=4	278(47.4)	235(49.3)	43(39.1)	
Comobidity (n,%)				
DM	314(53.4)	258(54.1)	56(50.9)	0.547
CAD	357(60.8)	289(60.0)	68(61.8)	0.812
MI	130(22.1)	100(21.0)	30(27.3)	0.151
COPD	89(15.2)	77(16.4)	12(10.9)	0.168
HTN	475(80.9)	399(83.6)	76(69.1)	0.000*
HD	32(5.5)	29(6.1)	3(2.7)	0.163
CVA	196(33.4)	169(35.4)	27(24.5)	0.029*
AF	232(39.5)	185(38.8)	47(42.7)	0.446
CKD	166(28.3)	151(31.7)	15(13.6)	0.000*

This study demonstrated that heart failure patients who received TC experienced reduced rates of all-cause mortality and readmission within one year(Figure 2). Furthermore, they also had lower rates of cardiovascular disease and heart failure-related readmission within one year. However, there was no significant difference in cardiovascular disease mortality compared to TC within one year. The study utilized Kaplan-Meier time-event curves for survival analysis of all-cause mortality, all-cause readmission rate, cardiovascular and heart failure readmission rate, and significant differences were observed (Table 2, Figure 3).

Figure 2 Cox proportional-hazards models for mortality and readmission

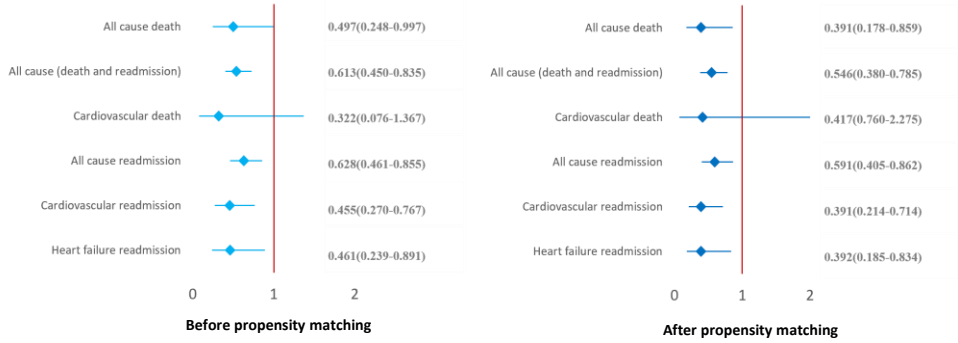


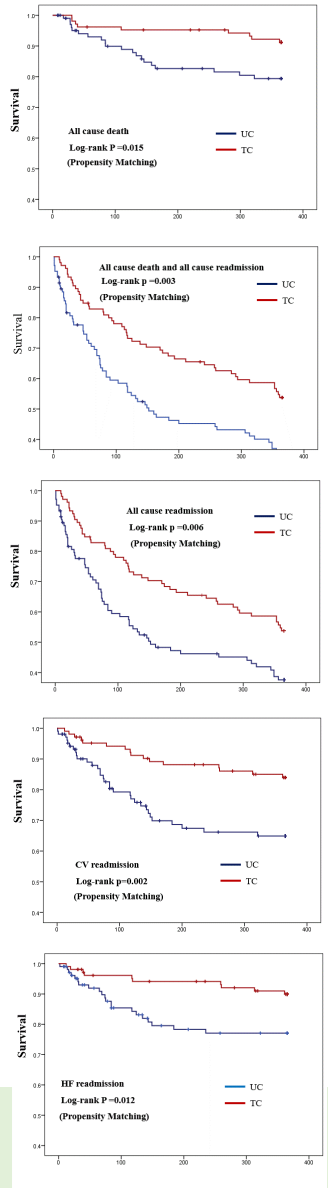
Table 2 Cox proportional-hazards models for mortality and readmission after matching

Outcomes of within one year	UC	TC	χ2 test	HR* (95% CI)	P-value
All cause death	20(19.0%)	9(8.6%)	0.028*	0.391(0.178-0.859)	0.019*
All cause death and all cause readmission	70(66.7%)	50(47.6%)	0.005*	0.546(0.380-0.785)	0.001*
Cardiovascular death	4(3.8%)	2(1.9%)	0.407	0.417(0.760-2.275)	0.312
All cause readmission	62(59.0%)	48(45.7%)	0.053	0.591(0.405-0.862)	0.006*
Cardiovascular readmission	32(30.5%)	16(15.2%)	0.009*	0.391(0.214-0.714)	0.002*
Heart failure readmission	21(20%)	10(9.5%)	0.032*	0.392(0.185-0.834)	0.015*

Conclusion

This study shows that receiving TC reduces all-cause mortality and readmission rates and improves clinical prognosis.

Figure 3 Kaplan-Meier time-event curves for mortality and readmission



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