



Effect of Introducing Transtheory-based Digital Multimedia Nursing and Health Education Model on Improving the Self-Care of Older Adult Patients with Chronic Obstructive Pulmonary Disease

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is an irreversible chronic disease that causes progressive obstruction of airflow in the airways. As a result, pulmonary function and physical activity levels are lowered and activities of daily living are restricted. Digital multimedia technology-based nursing should be developed and investigated to align with the times. To determine the effect of the digital multimedia nursing health education model on self-care management for older patients with COPD.

METHOD

A experimental design was adopted. Simple random sampling was performed to divide the subjects into the traditional teaching material-based intervention group and digital teaching material-based intervention group. A total of 51 patients with COPD and aged ≥60 years were recruited from the outpatient department of a hospital in northern Taiwan. The two groups respectively received health education through traditional paper teaching materials and digital multimedia teaching materials;50 minute interventions were conducted once per week for 8 weeks, and measurements were taken before the intervention, 8 and 12 weeks after the intervention. Regarding the performance indicators, a paired t test and generalized estimating equation (GEE) were used to analyse differences in the COPD Assessment Test (CAT) 、self-care efficiency scale for COPD and COPD knowledge scale.

RESULTS

Homogeneity in the characteristics of the two groups was assessed using the Mann–Whitney U test. In the pre-test, no statistically significant difference was observed except for hypertension ($p < 0.001$) and disease onset prevention on the self-care efficiency scale ($p = 0.047$). The t-test results indicated a statistically significant difference in CAT scores between the T2 and T0 groups only. A significant difference in the self-care efficiency scale scores was observed between the groups. A significant difference was observed between the two groups in terms of total score, self-care and monitoring, medication, and nutrition knowledge on the COPD knowledge scale. The effectiveness of time trend intervention in the two groups was tested by GEE, and no significant impact was observed. However, among the main performance indicators of the three scales, GEE analysis mainly effects on the total scores of the Chronic Pulmonary Obstructive Pulmonary Disease Assessment Scale (T2), the Self-care Efficacy Scale and the Chronic Pulmonary Obstruction Knowledge Scale, the risk factors that trigger symptoms, self-care and iHowever, among the main performance indicators of the three scales, GEE analysis mainly acts on the total scores of the Chronic Pulmonary Obstructive Pulmonary Disease Assessment Scale (T2), the Self-care Efficacy Scale and the Chronic Pulmonary Obstruction Knowledge Scale, the risk factors that trigger symptoms, self-care and indicators such as monitoring (T2), medication and nutritional awareness all reached statistically significant differences. The CAT scale (T1) and the self-care efficacy scale (T1) did not reach statistically significant differences.

Table 1
Homogeneity Test Analysis of Outcome Indicators (baseline) ($N = 51$)

Table 2 Homogeneity Test Analysis of Outcome Indicators (baseline) ($N = 51$)			
items	Mann-Whitney U Test	Z	p
COPD Assessment Scale	316.00	-0.151	0.880
Self-Care Efficacy Scale- total score	228.00	-1.814	0.070
disease attack management	239.50	-1.602	0.109
disease attack prevention	219.00	-1.987	0.047*
COPD Knowledge Scale- total score	247.50	-1.463	0.144
symptom-triggering risk factors	265.50	-1.597	0.110
self-care efficacy and monitoring	314.50	-0.192	0.848
medication and nutritional awareness	247.00	-1.482	0.138
Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Z: Mann-Whitney U Test			

Table 2
Analysis of GEE performance indicators ($N = 51$)

Dependent variables:	B	SE	95% Wald CI		Hypothesis test	
			Lower	Upper	Wald χ^2	p
<i>COPD Assessment Scale</i>						
(Intercept)	13.792	1.75	10.365	17.219	62.211	< 0.001***
Group	-0.421	2.40	-5.131	4.288	0.031	0.861
T1	-1.417	1.56	-4.474	1.641	0.825	0.364
T2	-4.125	1.56	-7.183	-1.067	6.992	0.008**
Group*T1	-1.213	2.14	-5.415	2.989	0.320	0.572
Group*T2	0.310	2.14	-3.892	4.512	0.021	0.885
(Scale)	73.368					
<i>Self-Care Efficacy Scale</i>						
(Intercept)	35.417	1.63	32.221	38.613	471.776	< 0.001***
Group	5.843	2.24	1.450	10.235	6.797	0.009**
T1	14.458	1.92	10.703	18.214	56.937	< 0.001***
T2	14.125	1.92	10.369	17.881	54.342	< 0.001***
Group*T1	-0.718	2.63	-5.88	4.44	0.074	0.785
Group*T2	-0.977	2.63	-6.138	4.185	0.138	0.711
(Scale)	63.810					
disease attack management						
Group	1.981	1.14	-0.244	4.207	3.046	0.081
T1	5.167	0.96	3.286	7.047	28.996	< 0.001***

CONCLUSIONS

This study verified that both types of interventions can improve the self-management results of older adult patients with COPD. Clinically, digital multimedia material can be used for other diseases to provide patients with more choices for obtaining disease information.

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