Improvement of Tobacco-Cessation Rate Using Mobile Nursing Information System Assistance

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Abstract — **Clinical nursing system is important to nurses to deal with lots of daily affairs. There are many problems and efficient issues within these daily affairs. Smoking become a world wide problem that people get worse health due to smoke raising rate in a country trend level. Tobacco-cessation rate is an indicator, which decides patient's lung health. This study tried to use the modern mobile nursing information system (MNIS) to achieve health education to patients and improve tobacco-cessation rate. This research adapted the completely randomized design as experimental design. It compared if there was any difference between with and without tobacco-cessation rate via mobile nursing health education involved. There were 83 patients' data were collected in a central teaching hospital of Taiwan. The data collected period was Jan 1st 2015 to Dec 31st 2015. The experimental data showed that MNIS effectively helping patient to decrease asthma severity, increasing pulmonary function and decreasing emergency visit, and hospitalization rate. To keep good relationship with patients, and also enhance medication compliance and self-managing responsibility. Future research is suggested to take a time serious further analysis.**

Keywords - Mobile nursing; Asthma control; Information system assistance; Tobacco-cessation rate; Dynamic medical care

I. INTRODUCTION

Clinical nursing system is important to nurses to deal with lots of daily affairs. There are many problems and efficient issues within these daily affairs. Smoking become a world wide problem that people get worse health due to smoke raising rate in a country trend level. Tobacco-cessation rate is an indicator, which decides patient's lung health. This study tried to use the modern mobile nursing information system to achieve health education to patients and improve tobacco-cessation rate.

Nurses communicating with patients always need information techniques to support their health education to patients. Sharpe and Hemsley [1] proposed the views of hospitals nurses on the feasibility of using mobile desk to enhance nurse-patient communication with individuals. They applied an online survey and analyzed the collected data. They found mobile desk with patients would improve the communication and care but patients would concern the privacy problem.

Handler et al. [2] discussed use and perceived benefits of mobile devices by physicians in preventing adverse drug event in the nursing home. They found NH physicians who use mobile devices would be reducing adverse drug events (ADEs). Doyle et al. [3] explored the model of Rogers' Diffusion of Innovation to guide implementation of mobile devices in nursing environment. They found mobile devices appeared to provide benefits to nursing environment and it would be effect. Wu [4] used smart mobile devices in health education through practices via social networks. She

introduced tablet PC and used Google+ in health education practices. She found social networks can improve interaction among peers. However, in this study we did not apply the social networks yet. Cato et al. [5] proposed a mobile health decision-support system for screening and management tobacco use. Their research purpose was to describe nurse using mobile health decision-support system for guideline-based screening and management of tobacco use. They used randomized experimental design to 14,115 patients, and found decision-support system had the potential affecting nurse take care of patients, reducing barriers, training and familiarity with medical resources.

Haines-Saah et al. [6] proposed a research that picture me smokefree, which was a qualitative study using social media and digital photography to engage young adults in tobacco reduction and cessation. They found young adults had high rates of tobacco use, hence, the online forums intending to provide peer support and motivation. A total of 60 young adults ages 19-24 years who self-identified as current cigarette smokers from British Columbia, Canada, and participated in an online photo group on Facebook over a period of 12 consecutive weeks. The data collection methods were tracking online activities. They found Facebook was accessible, which was low-cost platform for engaging young adults to quit or reduce tobacco use. Schauer et al. [7] stated that cigarette smoking was the reason which causing COPD. They assessed prevalence among adult smokers with and without COPD. Their data were analyzed from 20,021 adults from National Adult Tobacco Survey. They found among

smokers, those with COPD were more likely than those without COPD (95.4% vs. 85.8%).

Although some literature and research studies have discussed and investigated the relationship between tobacco reduction and health education or social network smoke quitting, there are still a few studies attempting to propose a mobile health education on mobile nursing information system assistance. This research tries to study the improvement of tobacco-cessation rate in mobile nursing environment.

II. STARISTICAL METHODS

This research adapted the completely randomized design as experimental design. Due to the research purpose was to compare if there was any difference between with and without tobacco-cessation rate via mobile nursing health education involved. Table I was the statistical hypothesis and experimental design of discussion on any significant difference of health education intervention with and without mobile nursing information system assistance (MNISA). Table II was to compare if there was any significant

correlation of oral steroids intervention with a year ago and a year later via McNemar test. This study would also display the describtive statistis results.

III. DATA COLLECTION AND ANALYSIS

There were 83 patients' data were collected in a central teaching hospital of Taiwan. The data collected period was Jan 1st 2015 to Dec 31st 2015. The describtive statistis results were shown in table III. LIA is light intermittent asthma; LPA is light persistent asthma; MPA is moderate persistent asthma; HPA is heavy persistent asthma. A year ago, 15.2% MPA patients would turn to LIA in a year. 45.5% would turn to LPA. Not change in MPA was 36.4%. 3% patients would become worse. In the same way, HPA would turn into LIA (12%), LPA(42.2%), MPA(39.8%) and HPA(6.0%). In whole aspect, over 50% patients would become better, and Tobacco-Cessation Rate (TCR) would be increased.

TABLE I. THE STATISTICAL HYPOTHESIS AND EXPERIMENTAL DESIGN OF DISCUSSION ON HEALTH EDUCATION INTERVENTION WITH AND WITHOUT MNISA

Experimental Purpose	To know if there are significant difference of health improvement with and without MNISA
Experimental Design	The Completely Randomized Design
Statistical Methods	T-test, n = 83
Number of Subjects	83
Indicators	Number of emergency, number of hospitalization, severity, PEF value, number of types of drugs
Factors	Number of emergency, number of hospitalization, severity, PEF value, number of types of drugs
Levels	A year ago; a year later
Notations	μ_b : mean of indicator in a year ago μ_a : mean of indicator in a year later
Hypothesis	H₀ : $\mu_b = \mu_a$ H₁ : $\mu_b \neq \mu_a$

TABLE II. THE STATISTICAL HYPOTHESIS AND EXPERIMENTAL DESIGN OF DISCUSSION ON ORAL STEROIDS INTERVENTION WITH A YEAR AGO AND A YEAR LATER

Experimental Purpose	To know if there was any significant correlation of oral steroids intervention with a year ago and a year later
Experimental Design	The Completely Randomized Design
Statistical Methods	McNemar test, n = 83
Number of Subjects	83
Indicators	number of subjects
Factors	with, without had oral steroids medicine
Levels	A year ago; a year later
Notations	μ_b : number of subjects since a year ago μ_a : number of subjects in a year later
Hypothesis	H₀ : $\mu_b = \mu_a$ H₁ : $\mu_b \neq \mu_a$

TABLE III. BASIC DESCRIPTIVE STATISTICS OF PATIENTS OF HEALTH EDUCATION (N=83)

A year ago	A year later	(1)LIA	(2) LPA	(3)MPA	(4)HPA	Total
(3) MPA	Individuals	10	30	24	2	66
	Percentages	15.2%	45.5%	36.4%	3.0%	100.0%
(4) HPA	Individuals	0	5	9	3	17
	Percentages	0.0%	29.4%	52.9%	17.6%	100.0%
Total	Individuals	10	35	33	5	83
	Percentages	12.0%	42.2%	39.8%	6.0%	100.0%

LIA is light intermittent asthma; LPA is light persistent asthma; MPA is moderate persistent asthma; HPA is heavy persistent asthma

IV. RESULTS AND DISCUSSION

Fig.1 showed a part of health education materials. Nurse has to explain the operation method of medical products to the patients.

This study analyzed the 83 patients' data. Table IVshowed the results on health education intervention with and without MNISA. In this table, a year later outperformed a year ago in the indicator of severity, PEF value, and number of types of drugs. It showed that significant difference of health education intervention with and without MNISA. Table V showed the results on oral steroids intervention with a year ago and a year later. In table V, in the same patients, the patient needn't take the oral steroids in a year later. The data significant correlation of oral steroids intervention with a year ago and a year later via McNemar test.

Fig.1 Health Education Materials

TABLE IV. THE RESULTS ON HEALTH EDUCATION INTERVENTION WITH AND WITHOUT MNISA (N=83)

Item	A year ago		A year later		t	P
	mean	SD	mean	SD		
Number of emergency	.1	.52	.0	.15	-1.540	.127
Number of hospitalization	.3	1.06	.1	.30	-1.644	.104
Severity	3.2	.41	2.4	.78	-9.723	< .001
PEF value	303.8	101.45	386.0	122.55	9.001	< .001
Number of types of drugs	1.8	.72	1.2	.74	-6.047	< .001

TABLE V. ORAL STEROIDS INTERVENTION WITH A YEAR AGO AND A YEAR LATER (N=83)

A year ago	A year later	Yes	No	Total	P [*]
Yes	Individuals	21	6	27	< .001
	Percentages	32.8%	31.6%	32.5%	
No	Individuals	43	13	56	
	Percentages	67.2%	68.4%	67.5%	
Total	Individuals	64	19	83	
	Percentages	100.0%	100.0%	100.0%	

[*]McNemar Test.

V. CONCLUSION

Tobacco-cessation rate is an indicator, which decides patient's lung health. This study tried to use the modern mobile nursing information system to achieve health education to patients and improve tobacco-cessation rate. MNISA effectively helping patient to decrease asthma severity, increasing pulmonary function and decreasing emergency visit, and hospitalization rate. To Keep good relationship with patients, and also enhance medication compliance and self-managing responsibility. Future research is suggested to take a time serious further analysis.

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