Brief Communication

The Effect of Smoking Cessation Services for the Inpatients on Smoking Abstinence Rate in a Taiwanese Population

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Strong motivations to quit smoking are highly correlated with successful smoking cessation. In addition, inpatients may have high motivations to quit smoking. Thus, this study aimed to clarify the effect of providing smoking cessation services to inpatients based on abstinence rate. This cross-sectional study enrolled 2,972 participants who received smoking cessation services at the E-Da Hospital between January 2015 and June 2016. After excluding participants who died, were lost to follow-up, or refused telephonic follow-up at 3 and 6 months after the first service, 1,288 participants with complete data were included for final analysis. All participants received smoking cessation counseling, and the pharmacotherapy for smoking cessation was the unnecessary options for them. Successful smoking cessation was evaluated via self-reported 7-day point-prevalence abstinence at 3 and 6 months from the telephonic interview. The 7-day point-prevalence smoking abstinence rate at 3 and 6 months was 49.9% (635/1,288) and 50.4% (649/1,288), respectively. After adjusting for age, gender, pharmacotherapy, and number of counseling sessions, smoking cessation services for inpatients were found to be independently associated with higher successful smoking cessation rate at 3 months (odds ratio [OR]: 1.45; 95% confidence interval [CI]: 1.05 – 2.01) and 6 months (OR: 1.40; 95% CI: 1.01 – 1.94) than those for outpatients. In addition, older age and number of counseling sessions were positively correlated with successful smoking cessation rate at 3 and 6 months.

Key words: smoking cessation, abstinence rate, inpatients, smoking counseling

Introduction

Cigarette smoking is an important risk factor for cancers, chronic obstructive pulmonary disease, heart disease, and stroke.[1] In addition, cigarette smoking is correlated with increased rate of acquiring coronavirus disease 2019 (COVID-19) and increased mortality from COVID-19.[2] To reduce the

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prevalence of cigarette smoking, the Health Promotion Administration (HPA) in Taiwan launched the smoking cessation project. The project aimed to provide face-to-face counseling and pharmacotherapy to assist smokers visiting outpatient clinics. In 2002, the project was extended from outpatients to inpatients.

Strong motivations to quit smoking are highly correlated with successful smoking cessation.[3] Compared with outpatients, inpatients may have higher motivation to quit smoking because of relatively serious illnesses.[4,5] Thus, the aim of this study is to clarify the effect of providing smoking cessation services to inpatients by assessing the abstinence rate.

Materials and Methods

This cross-sectional study was conducted by using the case management dataset of smoking cessation services. A total of 2,972 participants who were received smoking cessation services at the E-Da Hospital between January 1, 2015, and June 30, 2016 was enrolled. After excluding participants who died, were lost to follow-up, or refused telephonic follow-up at 3 and 6 months after the first interview, 1,288 subjects with complete data were included in the final analysis. This study was approved by the institutional review board of the E-Da Hospital (EMRP-109-070). As this study was a secondary data analysis that did not include any personal identification information, the requirement for informed consent was waived.

All participants should receive smoking cessation counselling with/without pharmacotherapy for smoking cessation. The face-to-face counseling was delivered by the same experienced educator certified by the Taiwan HPA. The content of the counseling included basic data (age, the amount of cigarette smoking, smoking years, status of alcohol drinking, educational level, and underlying disease), past experience of smoking cessation,

assessment of nicotine dependence, motivation, willingness to receive pharmacotherapy, and methods to reduce nicotine withdrawal symptoms. At the E-Da Hospital, the pharmacotherapy prescribed for smoking cessation was nicotine gum, nicotine patch, and/or varenicline. Patients were classified as either inpatients or outpatients. Successful smoking cessation was assessed using the self-reported 7-day point-prevalence abstinence at 3 and 6 months from the telephonic interview.[6]

The SPSS software (v.17.0; SPSS, Chicago, Illinois, USA) was used for statistical analyses. The $\chi 2$ and Student's t-test were used for comparing categorical and continuous variables, respectively. Multivariate logistic regression analyses were used to test whether the two patient types were significantly associated with successful smoking cessation, with the covariates being age, gender, number of counseling sessions, patient types, and pharmacotherapy.

Results

Of the 1,288 participants, 1,171 were males and 117 were females, of ages 48.8 ± 12.7 years. The 7-day point-prevalence smoking abstinence rate at 3 and 6 months was 49.9% (635/1,288) and 50.4% (649/1,288), respectively. At the 3- and 6-month follow-up, 110 (59.1%) and 110 (59.1%) inpatients reached successful smoking cessation, with 525 (47.6%) and 539 (48.9%) outpatients reaching this endpoint, respectively (Table 1).

After adjusting for age, gender, number of counseling sessions, and pharmacotherapy, inpatients were independently associated with higher successful smoking cessation at 3 months (odds ratio [OR]: 1.45; 95% confidence interval [CI]: 1.05 – 2.01) and 6 months (OR: 1.40; 95% CI: 1.01 – 1.94) than outpatients were. In addition, older age and number of counseling sessions were positively related with successful smoking cessation at 3 and 6 months (Table 2).

Table 1. Comparisons of clinical variables between inpatients and outpatients.

Variables	Inpatients (n = 186)	Outpatients (n = 1,102)	*p* value
Age (years)	48.1 ± 12.5	53.0 ± 12.8	< 0.001
Male gender	160 (86.0%)	1,011 (91.7%)	0.012
Counseling sessions (numbers)	1.8 ± 1.1	1.8 ± 1.2	0.507
Pharmacotherapy	95 (51.1%)	638 (57.9%)	0.082
Successful smoking cessation at 3 months	110 (59.1%)	525 (47.6%)	0.004
Successful smoking cessation at 6 months	110 (59.1%)	539 (48.9%)	0.010

Data are shown as means ± standard deviations or numbers (%).

Table 2. Association of clinical variables with successful smoking cessation at 3 and 6 months follow-up on binary logistic regression.

Variables	Successful smoking cessation at 3 months		Successful smoking cessation at 6 months	
	OR (95% CI)	*p* value	OR (95% CI)	*p* value
Age (years)	1.01 (1.01 – 1.02)	0.003	1.01 (1.00 – 1.02)	0.008
Gender (male vs. female)	0.97 (0.65 – 1.44)	0.966	0.94 (0.64 – 1.40)	0.775
Counseling sessions (numbers)	1.56 (1.39 – 1.74)	< 0.001	1.43 (1.28 – 1.59)	< 0.001
Patient types (inpatients vs. outpatients)	1.45 (1.05 – 2.01)	0.026	1.40 (1.01 – 1.94)	0.043
Pharmacotherapy (yes vs. no)	0.87 (0.70 – 1.10)	0.251	0.99 (0.79 – 1.24)	0.927

Data are shown as the adjusted odds ratios (OR) with 95% confidence intervals (95^ CI).

Discussion

This study demonstrated that for inpatients, smoking cessation services led to better outcome regarding smoking abstinence rate at 3 and 6 months than for outpatients. In addition, older age and number of counseling sessions were positively related to the smoking abstinence rate.

As cigarette smoking was associated with multiple severe diseases, smoking cessation plays an important role in reducing the incidence and recurrence of such diseases.[1] This study demonstrated the crucial factors affecting smoking cessation in participants, including number of counseling sessions and patient type. For inpatients, acute serious illnesses were associated with higher motivation to quit smoking.[7] Healthcare providers could consider initiating smoking cessation services for inpatients. In addition, increased number of counseling sessions was associated with higher smoking abstinence rate. This finding was similar as previous study and the possible reasons were explained by enhancing motivation, providing the ways to manage withdrawal symptoms, and prevent relapse of smoking.[8] Frequent counseling seemed effective for helping smokers quit and could be implemented in clinical practice. Even though age was associated positively with the smoking abstinence, the socioeconomic factors, which were interacted with the factor of age on the smoking abstinence, were not available in this study. Further analysis including the socioeconomic factors should be delivered. Although this study showed that inpatients who received smoking cessation services had higher abstinence rate at 3 and 6 months than outpatients, further studies are required to investigate the long-term effect of these services.

Author Contributions

The corresponding author attests that all listed authors meet the authorship criteria and

that no other authors meeting the criteria have been omitted. WCH conceived the idea for this study. WCH, WLC and WWH contributed to data collection. WCH, WLC and WWH contributed to data cleaning. WCH and WLC planned and designed the study. WCH and WLC analyzed the data. WCH illustrated the figures. WCH wrote the initial draft of the manuscript. All authors contributed to interpreting the study findings and revising the manuscript. All authors have approved the final version of the manuscript.

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Institutional Review Board Statement

This study was approved by the institutional review board of the E-Da Hospital (EMRP-109-070).

Informed Consent Statement

As this study was a secondary data analysis that did not include any personal identification information, the requirement for informed consent was waived by the institutional review board of the E-Da Hospital.

Data Availability Statement

The datasets analysed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have declared no competing interests related to this work.

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