Effect of Tobacco Restriction on Length of Hospital Stay of Psychiatric Patients

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Abstract: *Purpose*: The objective of the study was to compare the length of hospital stay of smokers, former smokers, and nonsmokers admitted to the psychiatric unit before and after an increase in the severity of smoking restriction.

Design and Methods: A cross-sectional study was conducted with 270 patients (smokers, former smokers, and nonsmokers) hospitalized in a psychiatric ward of a general hospital. They were divided into two groups: (1) 101 patients allowed one cigarette per hour (from 8:00 a.m. to 10:00 p.m.) and (2) 169 patients whose restriction was changed to eight cigarettes/day.

Findings: The smokers hospitalized after the change in the patients' access to cigarettes presented shorter length of hospitalization (13.8 days) than with smokers hospitalized and allowed one cigarette per hour (17.1 days). Regardless of the restriction in place, the smokers' average length of hospital stay (14.9 days) is shorter than the average for former smokers (17.7 days) and for nonsmokers (17.6 days).

Practice Implications: The restriction on smoking may be an important tool of care in psychiatric services; however, the way it is implanted, the support resources available, and the training of nurses to enable them to deal with patients during the course of implementation must be revised.

Keywords: Tobacco control, psychiatry, psychiatric department hospital, psychiatric nursing.

INTRODUCTION

For many years, smoking was considered a socially acceptable habit; it was a symbol of social status intensely encouraged by commercial advertising, which contributed to the elevated prevalence of smokers in the world population [1].

In the psychiatric field, smoking established itself expressively not only because of its social acceptance, but also due to the interest of tobacco industries in this population that became the target of advertisements. The support of tobacco industries added to a belief in the effect of self-medication provided by smoking upon psychiatric symptoms and this contributed to the inclusion of cigarettes into this context. The cigarette became one of the tools of care, utilized to control the patient's behavior and to facilitate the professional-patient relationship [2-3].

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With the recognition of the link between smoking and the emergence and worsening of smoking-related diseases in the mid-1950s, medical organizations became aware of the necessity of controlling the use of tobacco. In Brazil, the recent law 12.456/11 comes to the forefront; considered a milestone in Brazilian politics for prohibiting the use of tobacco in closed spaces; it eliminated smoke-free indoor environments, going against what the law 9294/96 predicted. In New York (United States), for instance, one of the most rigorous anti-smoking laws is in place: It prohibits smoking not only in collective and closed spaces but also in parks and in places located 22 km away from the beaches, with fines for individuals who violate it [1,4-7].

With the anti-smoking policies, positive results are noticed through a decrease in the prevalence of the use of tobacco by the general population [8]. Among patients with mental disorders, however, this reduction is not noticeable. The frequency of smokers in the psychiatric population is two to three times higher than in the general population [9-12].

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The prohibition on smoking in collective spaces, stated in the Brazilian law 12.456/11 [6], is a challenge to the professionals in psychiatry. Besides having to deal with the difficulty faced by psychiatric patients who quit smoking, they face the disruption of a culture of care in which the cigarette has always been accepted, including for use by the professionals in this field.

The impact of the restriction on smoking in psychiatric services is a recent subject in the international scientific literature [13-16], and is yet to be identified in national publications.

As the smoking ban represents a cultural change in the psychiatric services, it may face resistance from patients and professionals. Considering the difficulty that the restriction on smoking during hospitalization may represent to psychiatric patients, this study aims at answering the following question: Does the restriction on smoking make a difference in the length of hospital stay?

This study aimed at comparing the length of hospital stay of smokers, former smokers, and nonsmokers admitted to the psychiatric unit of a general hospital before and after an increase in the severity of smoking restriction.

MATERIAL AND METHODS

Design and Setting

A cross-sectional study took place in the psychiatric ward of a general, public, and state hospital in the inner part of the state of São Paulo, Brazil.

Participants and Procedures

We selected a random sample (precision of 95% and maximum error of 10%) composed of 270 patients (smokers, former smokers, and nonsmokers), hospitalized in the psychiatric ward from August 2010 to February 2012, and diagnosed with mental disorders (DSM-IV). They all agreed to participate in the study.

Out of the total number of individuals hospitalized during the period studied (n = 433), 163 (37.6%) were excluded. Out of the 163 excluded: 19.7% refused to participate; 21.5% had difficulty in communicating verbally, showed persecutory symptoms, hostility or hetero-aggressiveness; 23.3% were under 15 years of age; 11% were diagnosed with mental retardation; 24.5% were discharged without previous planning, upon request or were transferred to other services.

During data collection (August 2010 to February 2012), the multidisciplinary team of the psychiatric ward (nurses, doctors, social workers, psychologists, occupational therapists) determined the modification of the rule for the patients' access to cigarettes. This, in turn, affected the grouping of the individuals, given that the 270 patients with mental disorders (smokers, former smokers, and nonsmokers) were intentionally divided in two groups (G1 and G2). The determining factor in the distribution of the individuals into each of the groups was the period in which hospitalization occurred and, consequently, the smoking restriction in place.

G1 was composed of 101 patients with mental disorders (smokers, former smokers, and nonsmokers), hospitalized at the beginning of the data collection (August 2010 to February 2011), when smoking was allowed in the bathroom of the patient's room, one cigarette per hour, from 8:00 a.m. to 10:00 p.m.

G2 was composed of 169 patients with mental disorders (smokers, former smokers, and nonsmokers), hospitalized when the rules changed and smoking was permitted at six pre-determined times (two cigarettes at the first and the last scheduled times, and only one cigarette at the other scheduled times, totaling eight cigarettes per day). In addition, a member of the nursing team had to accompany patients that were allowed to smoke outside their rooms in certain areas of the hospital.

In both study time points (before and after modification of the restriction), cigarettes were provided in the schedules allowed only to those patients who smoked prior to hospitalization. The patient or family members bring the product that is under the control of the nursing staff. On a daily basis, the exact number of cigarettes that could be smoked by patients throughout the day was made available to the professionals on duty. The patients actually complained for not having extra cigarettes.

This study was approved by the Research Ethics Committee of the Nursing School of Ribeirão Preto (1173/2010). Upon explanation of the ethical aspects, the individuals signed two copies of the Term of Free and Informed Consent.

Measures

The socio-demographic and clinical data, and the characterization of the use of tobacco were obtained

through the "Instrument for Identifying Smokers in a Psychiatric Ward of a General Hospital – ISPW", devised for this study. The ISPW variables used in this study are presented in Table **1**. We collected data on the patients' length of hospital stay as indicated in their medical records.

Table 1: Variables Obtained through the "Instrument for Identifying Smokers in a Psychiatric Ward of a General Hospital – ISPW"

Variables	
Socio-demographic	Sex
	Age
Clinical	Medical diagnosis
	Previous psychiatric hospitalizations
Characterization of the use of tobacco	Current condition
	Smoking time (onset of tobacco use to the current moment)

Data Analysis

The data were analyzed by Stata, version 10.10. We performed descriptive analysis, chi-square test, Fisher's exact test, and the Student's *t*-test in populations with equal and unequal variances for the comparison of population averages, with a maximum probability of error (alpha) of 5%.

RESULTS

Characterization of the Study Individuals

Out of the 270 individuals in this study, 191 (70.7%) were female, with average age of 38.9 years. The prevalent diagnostic groups were schizophrenia (36.3%), mood disorders (35.2%), and personality disorders (12.2%). Half of the patients were in their first hospitalization.

The individual profiles in Group 1 (n = 101) and Group 2 (n = 169) did not differ in terms of diagnoses (chi-square, p = .08), sex (Fisher, p = .78), and age (Fisher, p = .83).

Out of the total sample, 96 (35.6%) were smokers, 38 (14.1%) were former smokers, and 136 (50.4%) were nonsmokers. Among the smokers, there is a higher proportion of male individuals (Fisher, p = .01), but there is no difference among the smokers, former smokers, and nonsmokers in relation to age (Fisher, p = .18) and diagnosis (chi-square, p = .08). The average of smoking time (onset of tobacco use to the current moment) was 26.5 days, and SD was 4.9 years.

The distribution of smokers, former smokers and nonsmokers in both groups was similar: Group 1 (33.7% smokers, 15.8% former smokers, and 50.5% nonsmokers) and Group 2 (36.7% smokers, 13% former smokers, and 50.3% nonsmokers).

Impact of the Smoking Restriction on the Length of Hospital Stay

The average length of stay of the 270 individuals in this study was 16.7 days (0 – 107 days, SD: 11.5). Following the change in the smoking restriction, the length of hospital stay (Table **2**) was shortened for the two groups compared.

The length of hospital stay of smokers in Group 1 (one cigarette each hour) was compared with smokers in Group 2 (eight cigarettes a day). The same was done for former smokers and nonsmokers. For a Student's t distribution with 94 degrees of freedom and a level of significance of .05, there was evidence that the averages of length of hospital stay of smokers before and after the change in the patients' access to cigarettes are different (p = .03).

Table 2: Length of Hospital Stay of Smokers, Former Smokers, and Nonsmokers Admitted to the Psychiatric Unit before and after an Increase in the Severity of Smoking Restriction

Tobacco use	Length of hospital stay				Student t test p-value*
	1 cigarette each hour		8 cigarettes a day		
	Mean	Standard deviation	Mean	Standard deviation	
Smoker	17.1	9.4	13.8	8.0	.03*
Former smoker	16.9	8.9	18.4	8.7	.30
Nonsmoker	19.3	16.6	16.7	11.7	.14
Total	18.2	3.4	15.9	10.2	.06

*significant at the 5% level.

Table 3: Length of Hospital Stay of Smokers, Former Smokers and Nonsmokers, Regardless of the Restriction Rule in Place

Patients	Length of hospital stay (Days)				T tests for means		
	Mean	Median	Standard deviation	Confidence interval (95%)	Degrees of freedom (df)	observed t	p-value
Smokers (n= 96)	14.9	13.0	8.6	13.2 – 16.7	132.0	1.68	.04*
Former smokers (n= 38)	17.7	14.5	8.7	14.9 – 20.6			
Smokers (n= 96)	14.9	13.0	8,6	13.2 – 16.7	226.8	1.85	.03*
Nonsmokers (n= 136)	17.6	14.0	13.8	15.4 – 20.0			
Former Smokers (n= 38)	17.7	14.5	8.7	14.9 – 20.6	94.6	0.03	.49
Nonsmokers (n= 136)	17.6	14 .0	13.8	15,4 – 20.0			

*significant at the 5% level.

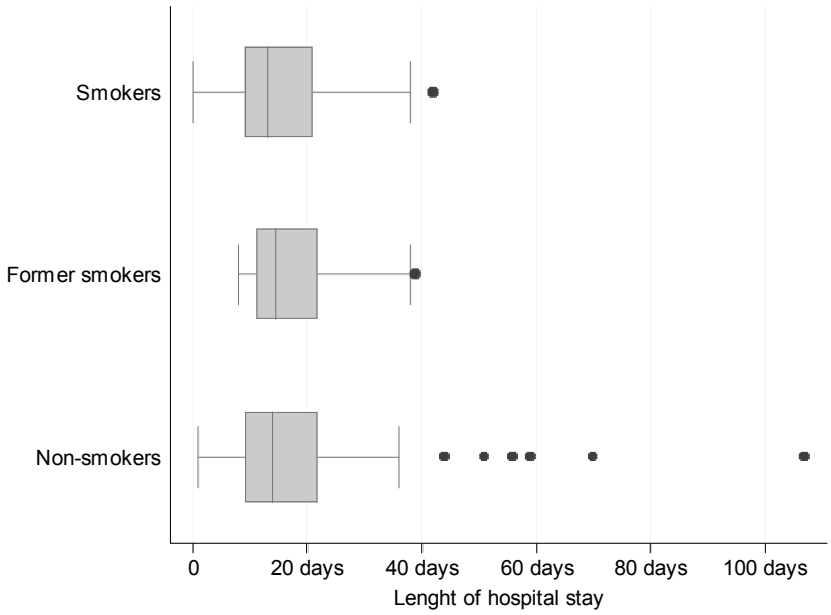

Figure 1: Distribution of the length of hospital stay of patients with mental disorders who are also smokers, former smokers or nonsmokers.

Comparison of the Length of Hospital Stay between Smokers and Nonsmokers

There are differences in the average length of hospital stay among smokers, former smokers, and nonsmokers, regardless of the restriction rule in place (Table **3**; Figure **1**).

The procedure for comparing these three population averages would have been the analysis of variance (ANOVA). However, considering that the variance is not equal in the group of smokers, former smokers, and nonsmokers, as observed from the SD of the sample, Student's *t*-test was applied for the averages taken2×2.

Upon administering the Student's *t*-test on two populations with equal variances, verified from the SD of the sample, there was evidence that the smokers' average length of hospital stay is shorter than the average of the former smokers (p = .04).

After comparing the average length of hospital stay between smokers and nonsmokers using the Student's

t-test for populations with unequal variances, there was evidence of a difference between the smokers' average length of hospital stay and that of the nonsmokers (p = .03).

In relation to the comparison of the average length of hospital stay of the former smokers and the nonsmokers, performed through the Student's *t*-test in populations with unequal variances, there was no evidence of statistical difference (p = .49).

DISCUSSION

Approximately one third of the individuals in this study use tobacco, a higher proportion than that found in the Brazilian population (17.5%) [4]. This discovery coincides with the results of an important study done in the United States with a sample of 4411 individuals, in which the number of smokers among psychiatric patients was two times higher than in the general population [12].

The present study shows that the patients with mental disorders that also smoked, regardless of the rule of access to cigarettes, presented a shorter hospital stay in comparison with other individuals. This result is similar to the one found in a study performed with 60 individuals in a psychiatric ward in New York, in which the length of hospitalization of the nonsmokers (28.5 days) was approximately two times higher than that of the smokers (17 days) [17]. A study conducted with 362 psychiatric patients in Minnesota, United States, also showed a shorter length of hospitalization among smokers [18].

The study conducted in New York investigated the symptoms of abstinence and the severity of the individuals' psychiatric symptoms during three consecutive days, with the first assessment taking place within 48 hours after admittance into the hospital. Results show that the smokers presented more hostility, tension, and anxiety than other people did. These symptoms are characteristic of nicotine abstinence, and may be added to other symptoms reported by these individuals, such as depression, irritability, impatience, and nervous behavior [17].

In light of this, we believe that the smokers' shorter length of hospital stay might be related to the difficulty they had with limited use of cigarettes during hospitalization. The experience of abstinence symptoms reinforces this difficulty, which suggests that the offer of a nicotine replacement therapy, along with the implementation of the smoking restriction, might help patients overcome such difficulty.

One consequence of the restriction on smoking, depending on the difficulty faced by the patient with mental disorder, is the resistance in relation to hospitalization. Studies conducted in psychiatric wards in the United States and Canada revealed a higher frequency of discharge upon request among smokers. The smokers that did not receive nicotine replacement therapy were twice more prone to abandoning hospitalization by requesting for discharge than the smokers who received replacement therapy. One of the studies showed that the use of the nicotine therapy replacement is associated with a behavioral change related to smoking (reduction of cigarette intake), and with an increase in motivation to quit the habit (increase in the number of attempts to remain in abstinence) [13,19-20].

The psychiatric patients' resistance to hospitalization is reflected on the discourse of the individuals in this study, investigated from a different perspective [21]; they reported a desire to leave, and of being discharged upon request due to the limitation on the quantity of cigarette intake.

Besides the difficulty that psychiatric patients have in limiting cigarette intake, note that the smokers in this study demand more time from the professionals, especially from the nursing staff. Once the patients needed to go out to smoke, they had to be escorted to a designated or allowed outdoor area. Consequently, staff deficiency is observed in carrying out other routine activities on the ward.

The smoker-patient requires more attention from the team, as he/she asks for cigarettes all the time, and tries to convince the staff to obtain this privilege; he/she also asks other patients for cigarettes, which might generate conflictive situations.

From the nurses' registration notes, before and 3 months after the restriction on smoking showed higher need for interventions from the nursing staff after the restriction, especially when dealing with patients that had difficulty in accepting the limitation on the use of cigarettes [18].

Longitudinal studies conducted in the United States and Canada show that the greater the severity of the restriction, the shorter the duration of the smokers' hospitalization [13,18].

An explanation on the smokers' longer length of hospital stay when the restriction measures are less severe is founded on the interference of tobacco with medication, which would postpone the recovery from a psychiatric bout [13].

It is recognized that tobacco reduces the concentration of psychiatric medication in the bloodstream by around 30%. The curtailment of the therapeutic dose occurs because tobacco is metabolized by the same enzyme (CYP1A2) that metabolizes some psychiatric medication, such as antipsychotics (Clozapine, Chlorpromazine, Fluphenazine, Haloperidol, Olanzapine), antidepressants (Amitriptyline, Clomipramine, Fluvoxamine, Imipramine, Nortriptyline, Trazodone), and anxiolytics (Alprazolam, Diazepam, Lorazepam). The interference with medication worsens the mental disorder, and in turn, the patient needs more time to recover from the psychiatric bout [9-10,22-25].

Drawing on clinical research, it was discovered that to experience the therapeutic effects of Olanzapine, smokers need a dose up to 100% higher than the dose commonly administered to nonsmokers [24].

At first, the restriction on smoking might bring some difficulties to the patients; however, once it is implanted, along with resources of support and guidance, it might have beneficial effects on the individuals. A study performed with schizophrenics admitted into a psychiatric hospital in Israel showed that after being submitted to interventions (counseling sessions in which they talked about difficulties and resources to deal with the craving) to reduce the quantity of cigarette intake, there was significant reduction in psychiatric symptoms [15].

The reduction in psychiatric symptoms as a consequence of the reduction in the quantity of cigarettes, may increase the psychiatric patient's motivation to quit smoking. Various studies conducted in the United States and Sweden revealed that the restriction on smoking (partial and total) was followed by changes in the behavior related to smoking (spontaneous reduction in the quantity of cigarettes, increase in the number of attempts to quit smoking), and changes in the thought process (increase of the expectancy of success in remaining in abstinence, and increase in motivation) [14,16, 20,26].

LIMITATIONS OF THIS STUDY

(1) The period of data collection with patients in Group 2 (11 months) was longer than the collection of data from patients in Group 1 (6 months). (2) Each patient could smoke up to the maximum number of cigarettes allowed each day. The cigarettes were delivered at designated times only if the patient asks. The total number of cigarettes smoked by each patient throughout the day was not recorded. (3) Possible confounding variables were not controlled in the statistical analysis: psychiatric diagnosis, onset of illness, number of previous psychiatric-related hospitalizations, degree of nicotine dependence, and how long the patient has been smoking.

CONCLUSION

Smoking has an impact on the length of hospital stay of psychiatric patients. In particular, patients who are smokers have shorter lengths of hospital stay in comparison with patients who are former smokers and nonsmokers.

The increase in the severity of the restriction on smoking was followed by a shortening in the smokers' length of hospital stay, which reveals the difficulty that this restriction represents to these patients.

The restriction on smoking represents a challenge to the professionals not only because of the disruption of a culture of care but also because of its interference with the services rendered in the psychiatric units, showed by such patients' shorter length of hospital stay, which coincides with the increase in the severity of the restriction.

The restriction on smoking may be an important tool of care in psychiatric services; however, the way it is implanted, the support resources available, and the professionals' training to enable them to deal with the patients effectively must be revised.

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CONFLICT OF INTEREST STATEMENT

The authors report no actual or potential conflicts of interest.

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