




# The need for smoking cessation counselling and nicotine withdrawal therapy for hospitalised patients: A smoking point prevalence study at Groote Schuur Hospital, Cape Town, South Africa

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**Background.** South Africa has high tobacco-attributable mortality and a smoking prevalence of 32.5% in males and 25.6% in females. There are limited data on smoking prevalence and desire to quit in hospitalised patients, who have limited access to smoking cessation services.

**Objectives.** To determine smoking prevalence and the extent of nicotine withdrawal symptoms, using a hospital-wide inpatient survey.

**Methods.** A 1-day point prevalence survey was conducted at Groote Schuur Hospital, Cape Town. All wards except the haematology isolation, active labour and psychiatry lock-up wards were evaluated. Smoking status, withdrawal symptoms and desire to quit were established.

**Results.** Smoking status was confirmed in 85.8% of inpatients ( $n=501/584$ ), of whom 31.9% ( $n=160$ ) were current smokers; 43.5% ( $n=101/232$ ) of male and 21.9% ( $n=59/269$ ) of female inpatients were smokers. Documentation and confirmation of smoking status was highest in the maternity wards (100%) and lowest in the surgical wards (79.6%) and intensive care units (70.0%). Smoking prevalence ranged from 47.6% in male surgical patients to 15.2% in maternity patients. Of the smokers, 54.5% reported being motivated to quit, with a median (interquartile range) Fagerström test for nicotine dependence score of 4 (2 - 6), and 31.4% reported moderate to severe cravings to smoke, highest in the surgical wards.

**Conclusion.** Smoking prevalence was higher in hospitalised patients than in the local general population. Many inpatients were not interested in quitting; however, a third had significant nicotine withdrawal symptoms. All inpatients who are active smokers should be identified and given universal brief smoking cessation advice. Patients with severe withdrawal symptoms should be allowed to smoke outside, and nicotine withdrawal pharmacotherapy should be provided to those who are bedbound or express a desire to stop smoking during the current admission.

**Keywords.** In-hospital smoking cessation, hospitalised, nicotine withdrawal.

*Afr J Thoracic Crit Care Med* 2024;30(2):e1360. <https://doi.org/10.7196/AJTCCM.2024.v30i2.1360>

## Study synopsis

**What the study adds.** A single data point prevalence study of active smokers at Groote Schuur Hospital, Cape Town, was conducted. The prevalence of smoking was higher in the hospitalised patients than in the general community, but not all smokers were identified by the clinicians. Although symptoms of nicotine withdrawal were severe in some patients, motivation to quit smoking was not related to the degree of withdrawal being experienced. Many patients were not motivated to quit smoking.

**Implications of the findings.** Better identification of inpatient smokers is required, and all should be given smoking cessation advice. Withdrawal symptoms can be severe in some patients, and those who are not interested in stopping smoking should be allowed to smoke outside or be provided with nicotine withdrawal pharmacotherapy while in hospital. Those who are willing to quit should be supported as well as possible, including provision of nicotine replacement therapy or varenicline, and followed up after discharge as best practice.

Tobacco use is associated with very high tobacco-attributable mortality in South Africa (SA), specifically in the mixed ancestry and black African populations.<sup>[1]</sup> The harms of tobacco smoking

are well established, and of particular concern in Africa are the colliding epidemics of tobacco smoking, HIV, tuberculosis and chronic obstructive pulmonary disease.<sup>[2]</sup> Smokers who are admitted

to hospital are subjected to enforced tobacco abstinence owing to government restrictions on smoking indoors, and are required to smoke outside with permission from nursing staff. Fires in hospital wards have been caused by patients smoking under their bed sheets.

International best practice identifies hospitalised smokers as a group as at high risk for nicotine withdrawal and complications, but also highly likely to succeed in quitting if in-hospital cessation programmes are supported by adequate counselling, nicotine withdrawal treatment and follow-up.<sup>[3]</sup> The subsequent benefits of smoking cessation in terms of reducing future health risks are unquestionable. However, there are no in-hospital smoking cessation programmes in SA, and there is no access to nicotine replacement therapy for patients with nicotine withdrawal symptoms.

The estimated smoking prevalence in SA adults is 17.6% (95% confidence interval (CI) 16.3 - 18.9), but it varies between populations and provinces. Western Cape Province has the highest overall prevalence of smoking: 32.5% for men (95% CI 32.5 - 43.7) and 25.6% for women (95% CI 20.6 - 31.4).<sup>[4]</sup> Published data from the Groote Schuur Hospital (GSH) outpatient smoking cessation clinic have shown that ~50% of current smokers have high addiction levels and >25% have very high dependence levels (Fagerström test for nicotine dependence (FTND) score >8).<sup>[5]</sup> There are no data from SA on the prevalence of smoking in hospitalised patients, or on which patient group (e.g. pregnant women, coronary care unit patients, vascular surgery patients or medical inpatients) has the highest smoking prevalence.

An accurate estimate of the prevalence and distribution of smoking among inpatients is therefore required to inform the need for and extent of intervention strategies. As provision of nicotine replacement therapy for all smokers has been denied on a cost basis, hospital policy should facilitate smoking outside the building to curb severe withdrawal symptoms. It is unethical not to manage nicotine withdrawal in bed-bound smokers, and all smokers should at least be provided with brief smoking cessation advice and support to quit if they wish to do so.

We hypothesised that smoking rates are higher in hospitalised patients than in the background community, and that a limited number of patients would have severe nicotine withdrawal symptoms along with a variable desire to quit smoking. We therefore set out to complete a single-day point prevalence study of all hospitalised patients in a multidisciplinary tertiary hospital (GSH) in Cape Town, to determine the prevalence and distribution of smokers across the hospital and the extent and severity of nicotine withdrawal symptoms to inform future hospital policies.

## Methods

A single-day point prevalence study of all patients admitted to GSH was conducted. A team of trained medical student researchers identified every patient currently admitted in the hospital on 9 September 2022. For every patient, an attempt was made to document their smoking status. Patient folders were scrutinised for documentation of smoking status. Patients without documentation were then informed about the study, and if they consented, questions about their smoking status and patterns were asked. For active smokers, the presence of any symptoms suggestive of nicotine withdrawal was then enquired about. Patients who had stopped smoking immediately prior to admission were included as active smokers, given the risk for nicotine withdrawal.

Motivation to quit was evaluated using a simple 10-point Likert scale (motivated defined as scoring  $\geq 7$ ), nicotine dependence was evaluated using the FTND, and symptoms of nicotine withdrawal were evaluated using a modified four-axis Minnesota withdrawal scale to simplify patient interaction. Patients were asked about: (i) their desire or craving to smoke; and being (ii) angry/irritable/frustrated; (iii) anxious/nervous; and (iv) sad/depressed in mood. These subjective entities were rated with scores of 0 (none), 1 (slight), 2 (mild), 3 (moderate) and 4 (severe).

If patients could not answer questions (owing to being intubated, confused, or having a low level of consciousness), the hospital notes were the only source of information to identify whether the patient was an active smoker. Patients in haematology isolation wards, acute psychiatry lock-up wards and active labour wards were not included in the survey. The survey was undertaken when there were no COVID-19 restrictions in place and active cases of COVID-19 in the hospital did not require any changes to the hospital workflow, i.e. admissions, surgery, isolation, etc.

Permission to engage with patients and conduct the study was provided by the GSH administration and the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee (ref. no. HREC214/2017), and informed consent was provided by all smokers prior to further in-depth questioning. All smokers were provided with an 'in-hospital' focused smoking cessation pamphlet, and those identified with symptoms suggestive of severe nicotine withdrawal were brought to the attention of the attending medical staff.

All available patients were surveyed on a ward-by-ward basis to capture the entire hospital population. Data were presented using descriptive statistics, and appropriate parametric and non-parametric analyses were used to determine differences between groups.

## Results

A total of 584 patients were documented in the hospital on 9 September 2022. All wards except the haematology isolation, active labour and acute psychiatric lock-up wards were surveyed, and 503 patients (86.1%) had their smoking status confirmed by either in-person conversation or medical file review. Smoking status could not be confirmed in 81 patients owing to a low level of consciousness/confusion/intubation, etc. and lack of smoking status/history documentation in the patient's folder. A further two patients had incomplete data entry, leaving 501 inpatients for full data analysis.

A total of 160 hospitalised patients (31.9%) were identified as active smokers. Overall, 43.5% ( $n=101/232$ ) of male inpatients and 21.9% ( $n=59/269$ ) of female inpatients were smokers. Of these, 34.4% ( $n=55/160$ ) did not provide consent for further interaction with the researchers or to receive smoking cessation counselling. A final total of 105 smokers were recruited for additional engagement to complete the smoking survey and were provided with brief counselling.

Documentation of smoking status varied significantly across the various hospital inpatient wards. The maternity wards had the most comprehensive documentation of smoking status (100%) and the intensive care/high-care units the lowest (70.0%). The surgical wards were significantly poorer in terms of documentation of smoking status (79.6%) compared with the medical wards (91.4%) ( $p<0.001$ ). The median (range) age of the smokers was 47 (14 - 77) years, which

was comparable to the 47 (21 - 96) years for non-smokers. The mean (standard deviation (SD)) age of patients in the surgical wards was significantly lower at 46.9 (17.3) years than that in the medical wards (51.1 (17.9) years) ( $p=0.02$ ).

The prevalence of smoking was numerically higher in the surgical compared with the medical wards, including both genders, but this did not reach statistical significance (Table 1). The maternity wards had the lowest prevalence of smoking at 15.2%. Only male gender (odds ratio (OR) 2.64; 95% CI 1.7 - 4.1) was associated with smoking status, not age or ward type.

Of the 160 inpatient smokers, 105 (65.6%) provided informed consent to further engagement around willingness to quit and potential nicotine withdrawal symptoms. The mean (SD) age of initiating smoking was 16.7 (5.9) years. The median (interquartile range (IQR)) number of cigarettes smoked per day during the 3 months prior to admission was 6 (4 - 15), with a median (IQR) of 15.5 (6 - 30.5) pack-years of consumption. The current (past 3 months) cigarette consumption reported by the patients (median (IQR) 6 (4 - 15) per day) was lower than that during their years of smoking overall (10 (5 - 20) per day) ( $p=0.0002$ ). This held true for both medical (10 v. 14/day;  $p=0.006$ ) and surgical (5.5 v. 10/day;  $p=0.008$ ) patients.

A total of 83 of the patients who were interviewed about their smoking (79.0%) reported having thought about quitting, with a median (range) of 2 (0 - 10) attempts to quit during the past year. The median (IQR) FTND score was 4 (2 - 6) (Fig. 1). Severe nicotine dependence (score  $\geq 7$ ) was documented in 20.6% of inpatient smokers, and 54.5% of smokers were currently motivated to quit (Likert scale score  $\geq 3$ ), with 18.8% 'not at all interested'. There was no correlation between desire to quit and nicotine dependence.

On assessment of symptoms of nicotine withdrawal using a modified Minnesota

withdrawal scale, the overall median (IQR) score was 2 (0 - 5), indicating mild symptoms. The 'desire or craving to smoke' was moderate to severe in 31.4% of smokers ( $n=33$ ), 57.6% of whom were in surgical wards. The distributions of the individual scores are depicted in Fig. 2.

To evaluate the potential identifiers of patients with nicotine withdrawal-related symptoms, we correlated the severity of cravings with the FTND score, the number of cigarettes smoked daily, and the motivation to quit. There was a strong positive correlation between the FTND score and presence/intensity of cravings to smoke (Pearson  $r=0.41$ ;  $p<0.001$ ). There was no correlation between the number of cigarettes smoked daily and the cravings reported, and there was also no correlation between the presence of cravings and the motivation to quit. No gender differences were associated with the presence of cravings, motivation to quit, or

the FTND score. The odds of having cravings to smoke were higher in the surgical wards than in the medical wards (OR 1.38; 95% CI 1.06 - 1.83), with a mean 'cravings' score of 2 in the surgical wards compared with 1 in the medical wards ( $p=0.017$ ).

## Discussion

The prevalence of smoking in hospitalised patients in the present study was high, although inadequately documented in many wards. The presence of withdrawal symptoms was not ubiquitous, although it was significantly higher in surgical compared with medical wards. Only half of the inpatient smokers expressed a current motivation to quit, with ~20% reporting no interest at all in quitting. One-third of the smokers had significant nicotine withdrawal symptoms, but could not be provided with nicotine withdrawal pharmacotherapy. Support of hospitalised smokers is an ethical imperative

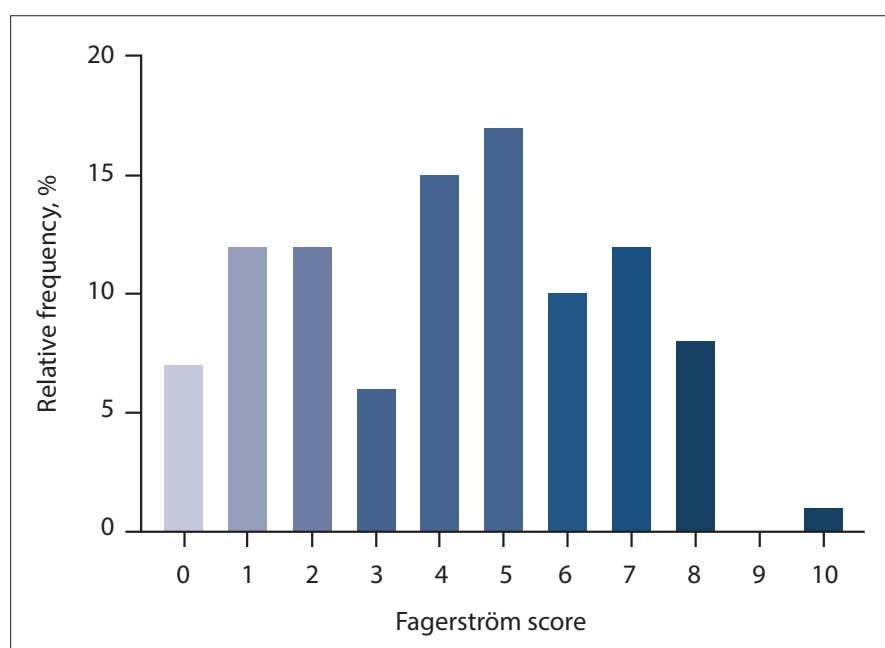


Fig. 1. Distribution of nicotine dependence scores as defined by the Fagerström test for nicotine dependence in hospitalised smokers. (Interpretation of the score: 0 - 1 = low, 2 - 3 = average, 4 - 5 = above average, 6 - 7 = high, 8 - 10 = extreme nicotine dependence.)

Table 1 Comparison of hospital ward types and smoking status by gender

Ward type	Gender, % female	Overall smokers, %	Male smokers, %	Female smokers, %
Medical ( $n=266$ patients)	50.6	31.7	43.3	20.3
Surgical ( $n=201$ )	47.5	36.9	47.6	25.0
ICU/HCU ( $n=50$ )	45.7	37.1	31.6	43.8
Maternity ( $n=46$ )	100	15.2	n/a	15.2
Ophthalmology ( $n=17$ )	47.1	23.5	33.3	12.5

ICU/HCU = intensive care unit/high-care unit; n/a = not applicable.

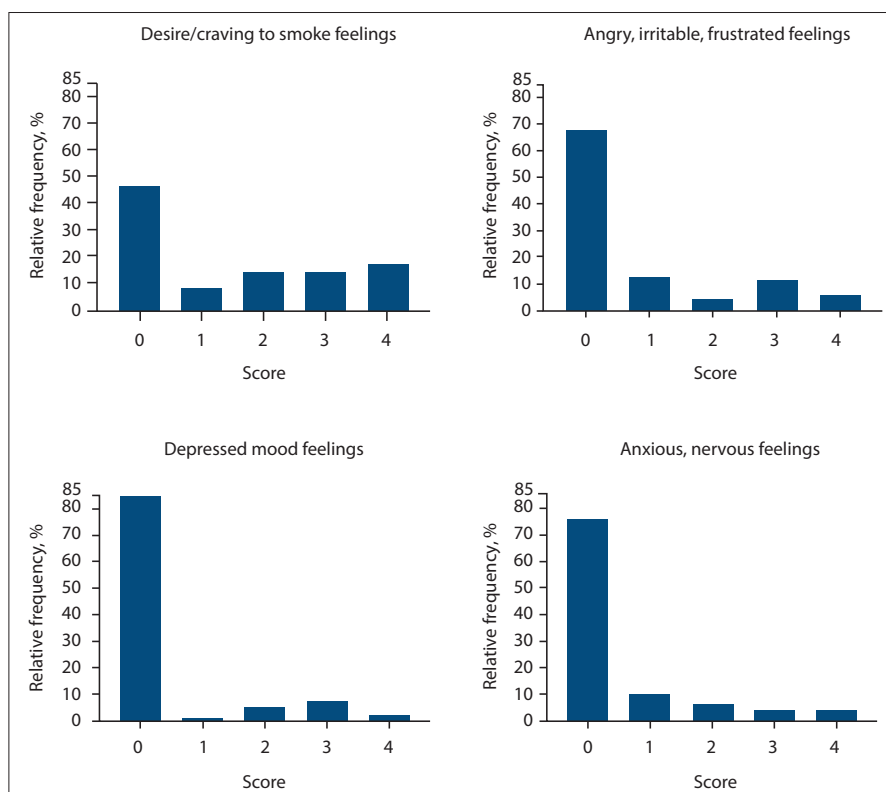


Fig. 2. Presence and severity of symptoms potentially related to nicotine withdrawal reported by hospitalised smokers. (Scoring system: 0 = none, 1 = slight, 2 = mild, 3 = moderate, 4 = severe.)

and should be tailored to the wards and the unique requirements of hospitalised smokers, but for this to happen, smoking status must be established routinely.

The present study suggests that the prevalence of smoking in hospitalised patients is higher than the background estimates for the local Cape Town population. Although prevalence data on hospitalised smokers are lacking from Africa in general and from other low- to middle-income countries, there are supporting findings from a recent national observational study in the UK that found the prevalence of smoking to be higher than in the background population.<sup>[6]</sup> In contrast, a multi-hospital study in Spain found that smoking rates were similar in hospitalised individuals compared with the general population.<sup>[7]</sup> Two small studies in Brazil showed that smoking rates in hospitalised patients varied, with a 13.2% smoking prevalence in cardiovascular disease wards<sup>[8]</sup> and a 17% prevalence in a general tertiary hospital.<sup>[9]</sup> Smoking prevalence is clearly dependent on the hospitalised population being evaluated. At GSH in the present study, lower rates (~15%) were seen in the generally younger obstetrics group, in comparison with

the nearly 50% smoking prevalence in the male surgical wards.

Unfortunately for many patients, documentation in the clinical records was insufficient to determine the patient's smoking status. For example, it was noted that in the obstetric wards, there was a pre-printed clerking book with tick boxes and checklists including smoking status. In the general surgical wards, the clerking notes were very 'problem orientated', often not documenting smoking status. Uniform clerking sheets (provided they are filled out) would improve comprehensive documentation of issues pertinent to the patient. In patients with reduced level of consciousness/confusion/intoxication or intubated and sedated, for example, the ability to document smoking status is dependent on obtaining collateral history. Establishing smoking status is important in patients with reduced levels of consciousness, as nicotine withdrawal is associated with delirium and often unrecognised.<sup>[10,11]</sup> As it is not possible to obtain this information from the patient, the attending clinician has to establish this history from the patient's family members.

For many patients, hospitalisation is an opportunity for smoking cessation.

The phrase 'teachable moment'<sup>[12]</sup> is often used, which is pejorative but also belies the complexity of smoking cessation in hospital and in the context of low-income settings. The success of in-hospital smoking cessation is limited, and a multidisciplinary approach with provision of pharmacological support and follow-up after discharge is required.<sup>[3]</sup> Our local clinic data also indicate that smoking is often a coping mechanism for life stressors, and 'teaching' is not an appropriate response.<sup>[5]</sup> For ~20% of patients in the present study there was no expressed interest in stopping smoking, so initiation of a programme would be likely to have limited success.

It could further be argued that provision of nicotine replacement therapy to prevent withdrawal is futile, and allowing the patient to exit the building to smoke would be the most cost-effective option to reduce cravings. This would obviously be done in conjunction with simple brief smoking cessation advice. For patients with significant nicotine withdrawal symptoms who are unable to exit the building to smoke, nicotine replacement therapy or other pharmacotherapy must be provided to alleviate withdrawal symptoms, without the intention of this being a smoking cessation intervention upon discharge. For those patients with a desire to stop smoking during the current admission, counselling and the provision of nicotine withdrawal pharmacotherapy to manage cravings would be with the express goal of sustained smoking cessation upon discharge.

In the present study, the proportion of smokers in the hospital was higher than in the background population at ~32%, with nearly half of the male patients in surgical wards being current smokers. It was noticeable that reported cigarette consumption was on average lower during the 3 months prior to admission. This decrease was seen in both surgical and medical ward patients, and is likely to be driven by patients admitted with relapsing or chronic illness rather than, for example, acute trauma. Further studies are required to better understand the phenomenon and its implications. It is important that all staff in every ward be adequately trained to provide brief smoking cessation counselling, cognisant that the goals of the advice are dependent on the individual patient's situation. Similarly, recognising that withdrawal symptoms may result in disruptive

behaviour and not allowing the patient to exit the building to smoke is counterproductive. Appreciation and understanding of withdrawal symptoms should be non-judgemental and actively managed, as one would do for a patient with alcohol or cocaine/heroin withdrawal.

### Study limitations

This study has several limitations. The survey was done on a single day, so the balance of preoperative/postoperative patients may be biased given that the survey took place on a Friday. There are inherent limitations to the scoring instruments used, especially in ill hospitalised patients. Symptoms of nicotine withdrawal could overlap with alcohol/drug withdrawal symptoms and are confounded by acute medical/surgical conditions, so it is not possible to be 100% certain that all the symptoms reported would be relieved by nicotine replacement therapy or being allowed to smoke. It was not possible to identify the primary diagnosis of each patient to ensure that every smoker in a surgical ward in fact had a surgical problem. Furthermore, patients' ability to exit the building and the attending staff's willingness to facilitate smoking outside the building were not evaluable. Patients who were not in their hospital bed, having gone for a 'smoke break' to combat withdrawal symptoms, may not have been captured, resulting in an underestimation of withdrawal symptoms. In future, a detailed survey of wards with a high smoking prevalence should be undertaken to identify barriers to smoking outside the building, unless nicotine withdrawal interventions are provided to smokers.

### Conclusions

There was found to be a higher prevalence of inpatient smokers in a multidisciplinary tertiary SA hospital than in the general population. Severe nicotine dependence was documented in a fifth of inpatient smokers, and a third had experienced withdrawal symptoms with moderate or severe cravings to smoke. A comprehensive approach to inpatient smoking is required to address withdrawal symptoms and engage in formal smoking cessation in those who are interested, founded on complete documentation of smoking status and provision of brief counselling to all smokers.

**Declaration.** None.

**Acknowledgements.** The authors thank the GSH administration and ward staff who permitted the survey to be conducted.

**Author contributions.** Study design: RNvZS, FL, GS. Data collection: GS, JK, AA, QB, KD, AG, KM, AS, TT. Data analysis: RNvZS. All authors contributed to manuscript preparation and review.

**Funding.** None.

**Conflicts of interest.** None.

1. Sitas F, Egger S, Bradshaw D, et al. Differences among the coloured, white, black, and other South African populations in smoking-attributed mortality at ages 35-74 years: A case-control study of 481,640 deaths. *Lancet* 2013;382(9893):685-693. [https://doi.org/10.1016/S0140-6736\(13\)61610-4](https://doi.org/10.1016/S0140-6736(13)61610-4)
2. Van Zyl Smit RN, Pai M, Yew WW, et al. Global lung health: The colliding epidemics of tuberculosis, tobacco smoking, HIV and COPD. *Eur Respir J* 2010;35(1):27-33. <https://doi.org/10.1183/09031936.00072909>
3. Rigotti NA, Clair C, Munafo MR, Stead LF. Interventions for smoking cessation in hospitalised patients. *Cochrane Database Syst Rev* 2012, Issue 5. Art. No.: CD001837. <https://doi.org/10.1002/14651858.CD001837.pub3>
4. Reddy P, Zuma K, Shisana O, Kim J, Sewpaul R. Prevalence of tobacco use among adults in South Africa: Results from the first South African National Health and Nutrition Examination Survey. *S Afr Med J* 2015;105(8):648-655. <https://doi.org/10.7196/SAMJnew.7932>
5. Tadzimirwa GY, Day C, Esmail A, et al. Challenges for dedicated smoking cessation services in developing countries. *S Afr Med J* 2019;109(6):431-436. <https://doi.org/10.7196/SAMJ.2019.v109i6.13631>
6. Mangera Z, Lewis A, Hutchinson J, Searle L, Agrawal S. Smoking prevalence in UK hospital admissions from a national observational study. *Eur Respir J* 2017;50(Suppl 61):PA1268. <https://doi.org/10.1183/1393003.congress-2017.PA1268>
7. Martínez C, Fu M, Castellano Y, et al. Smoking among hospitalised patients: A multi-hospital cross-sectional study of a widely neglected problem. *Tob Induc Dis* 2018;16:34. <https://doi.org/10.18332/tid/92927>
8. Ferreira AS, Campos AC, dos Santos IP, Beserra MR, Silva EN, Fonseca VA. Smoking among inpatients at a university hospital. *J Bras Pneumol* 2011;37(4):488-494. <https://doi.org/10.1590/s1806-37132011000400011>
9. De Oliveira MV, de Oliveira TR, de Castro Pereira CA, Bonfim AV, Leitao Filho FS, Voss LR. Smoking among hospitalised patients in a general hospital. *J Bras Pneumol* 2008;34(11):936-941. <https://doi.org/10.1590/s1806-37132008001100008>
10. Park H, Kim KW, Yoon IY. Smoking cessation and the risk of hyperactive delirium in hospitalised patients: A retrospective study. *Can J Psychiatry* 2016;61(10):643-651. <https://doi.org/10.1177/0706743716652401>
11. Mayer SA, Chong JY, Ridgway E, Min KC, Commichau C, Bernardini GL. Delirium from nicotine withdrawal in neuro-ICU patients. *Neurology* 2001;57(3):551-553. <https://doi.org/10.1212/wnl.57.3.551>
12. Shi Y, Warner DO. Surgery as a teachable moment for smoking cessation. *Anesthesiology* 2010;112(1):102-107. <https://doi.org/10.1097/ALN.0b013e3181c61cf9>

Received 4 August 2023. Accepted 25 March 2024. Published 4 July 2024.