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## **The impact of a smoke-free psychiatric hospitalisation on patient smoking outcomes: a systematic review**

**Running title:** Smoke-free psychiatric hospitalisation

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## **Abstract**

**Objective:** Smoke-free policies have been introduced in inpatient psychiatric facilities in most developed nations. Such a period of supported abstinence during hospitalisation may impact smoking behaviours post-discharge, yet little quantitative evidence exists. The aim of this review was to provide the first synthesis of the research evidence examining the impact of a smoke-free psychiatric hospitalisation on patients' smoking-related behaviours, motivation, and beliefs.

**Method:** We conducted a systematic review of electronic databases PubMed, MEDLINE, PsycINFO and EMBASE from inception to June 2013. Studies were included if they were conducted in an inpatient psychiatric facility with a smoke-free policy, and if they examined any change in patients' smoking-related behaviours, motivation or beliefs either during admission, post-discharge or both. Risk of bias was assessed using the Cochrane Collaboration Risk of Bias Tool (Higgins and Green, 2011).

**Results:** Fourteen studies were included in the review. Of the four studies that assessed change in smoking from admission to post-discharge, two indicated a significant decline in cigarette consumption up to three months post-discharge. Positive changes in motivation to quit and beliefs about quitting ability were identified in two studies. One study reported an increase in the rate of quit attempts, and one reported a decline in nicotine dependence levels.

**Conclusion:** A smoke-free psychiatric hospitalisation may have a positive impact on patients' smoking-related behaviours, motivation and beliefs, both during admission and up to three months post-discharge. Further controlled studies with more rigorous designs are required to confirm this potential.

**Keywords:** Smoke-free Policy, Psychiatric Department, Hospital, Smoking, Tobacco

## **Introduction**

Smoking remains the leading preventable cause of death and disease in western nations (US Department of Health and Human Services, 2004). People with a mental disorder smoke at higher rates (Lawrence et al., 2009; Morgan et al., 2012) are more dependent on nicotine (Australian Institute of Health and Welfare, 2007), and are less likely to quit than the general population of smokers (Diaz et al., 2006; Hagman et al., 2008). As a result, persons with a mental disorder are more likely to suffer smoking-related diseases, and consequently die 12-15 years earlier than persons without such disorders (Lawrence et al., 2013). Some of the highest levels of smoking have been observed among patients hospitalised for psychiatric treatment (Lineberry et al., 2009; Benowitz et al., 2009).

Smoking bans have been introduced in general hospital settings in a number of countries (House of Commons Health Committee, 2005). Such bans seek to protect patients, staff and visitors from the harmful effects of second hand smoke exposure (Tobacco Advisory Group, 2005), and have been found to be associated with reductions in staff smoking (Callinan et al., 2010; Fathallah et al., 2012). In addition, clinical practice guidelines recommend the provision of behavioural and pharmacological nicotine dependence treatment in order to manage the impacts of smoking bans for patients, and to aid the likelihood of their successful smoking cessation (Fiore et al.,

2008). Evidence from general hospital settings suggests that a period of such supported abstinence during a smoke-free hospitalisation may be beneficial in increasing motivation to quit (Williams and Jones, 2012) and the likelihood of remaining abstinent for up to 12 months post-discharge (Duffy et al., 2010; Williams and Jones, 2012; Rigotti et al., 2000). Recent systematic review evidence further suggests that the provision of nicotine replacement therapy (NRT) and smoking cessation counselling during a smoke-free hospitalisation can increase patient cessation rates by 54% at 12 months post-discharge (Rigotti et al., 2012).

Clinical practice guidelines similarly recommend the introduction of smoke-free policies incorporating complete smoking bans and the provision of nicotine dependence treatment within psychiatric facilities (American Psychiatric Association, 1996; Tobacco Advisory Group, 2005). While the introduction of smoking bans in these settings has often been delayed and/or reported to be difficult (Campion et al., 2008; Ratschen et al., 2009), evidence suggests that when staff leadership is cohesive, enforcement of the ban is consistent, and appropriate nicotine dependence treatment is systematically provided to patients, smoking bans have not led to increased patient aggression or discharge against medical advice (Lawn and Pols, 2005; Moss et al., 2010; Lawn and Campion, 2010).

Although a smoke-free psychiatric hospitalisation may positively impact on patients' smoking behaviours, as evidenced among smokers in general hospital settings (Duffy et al., 2010; Rigotti et al., 2000; Williams and Jones, 2012), few studies have examined the impact of a smoke-free psychiatric hospitalisation on patients' smoking outcomes. The aim of this systematic review was to provide the first synthesis of the evidence examining the impact of smoke-free policies on patient smoking behaviours, motivation and beliefs both during and post-discharge from an inpatient psychiatric facility.

## **Material and methods**

A systematic review was conducted in June 2013 in line with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement (Moher et al., 2009). A PRISMA checklist (Table A1) for the review is included in Appendix 1. The electronic databases PubMed, MEDLINE, PsycINFO and EMBASE were searched from inception to June 2013 using the following terms: ("smoking" AND "psychiatric department, hospital" AND "patient discharge"), ("tobacco" AND "mental health" AND "admission" OR "discharge"), ("psychiatric" AND "smoke-free policy" OR "smoking ban" AND "inpatient"), ("smoking" AND "mental health" AND "hospitalized OR hospitalised"), ("smoking" AND "psychiatric" AND "restricted"), ("tobacco dependence treatment" AND "psychiatric" AND "hospital"), ("smoking cessation

treatment” AND “psychiatric” AND “hospital”). Individual searches of each database were conducted and the results combined. Results were restricted to studies with humans, and those written in English. Articles were excluded if they did not report original data (e.g. review articles). The reference lists of prior reviews and key articles were searched for papers relevant to the study aims.

This review is registered on the National Institute for Health Research international prospective register of systematic reviews (PROSPERO), registration number: CRD42012002770, available at: <http://www.crd.york.ac.uk/PROSPERO/>.

Included papers were required to examine changes in patients’ reported smoking-related behaviours (including abstinence from cigarettes, quit attempts, cigarette consumption, nicotine dependence and use of smoking cessation supports), motivation or beliefs during or following an admission to an adult inpatient psychiatric facility with a policy incorporating restrictions on smoking. Papers were excluded if they surveyed clinical staff only. Study findings were examined with regard to risk of bias (Higgins and Green, 2011) and with respect to a number of aspects of smoke-free policies, including: the nature of the smoking restrictions (‘complete – all buildings and grounds’, ‘incomplete with smoking permitted outdoors’, ‘incomplete with smoking permitted indoors’, or ‘incomplete with smoking permitted in designated rooms or at designated times’); adherence to such restrictions (‘adherence evident’, ‘non-adherence evident’ or

‘not reported’); and provision of nicotine dependence treatment (‘psychological only’, ‘pharmacological only’, ‘combined’ or ‘not reported’).

A data extraction form was developed based on guidance literature (Popay et al., 2006) with data being extracted independently by the first and second authors (ES and JB) and analysed by systematic narrative synthesis.

#### *Assessment of risk of bias*

Risk of bias in the included studies was examined using the ‘Cochrane Collaboration tool for assessing risk of bias’ (Higgins and Green, 2011). The tool comprises five domains of bias: selection, performance, detection, attrition and reporting, with a sixth domain for ‘other biases’. Reviewers are required to make a judgement of risk of bias with supporting statements for each domain (‘low risk’, ‘high risk’, or ‘risk unable to be determined’). Given this review was not limited to randomised controlled trials; the tool was modified by the study authors for the purpose of assessing non-randomised and non-comparative studies. For assessing selection bias, the categories ‘random sequence generation’ and ‘allocation concealment’ were replaced with ‘comparability of groups’ (in the case of studies with multiple groups) and ‘sample representativeness’ respectively. Comparability of groups included an examination of whether the authors

provided adequate detail that the groups were comparable on relevant prognostic factors at baseline (e.g. age, gender, length of admission, level of smoking, psychological distress, etc.). Sample representativeness included an examination of whether the authors provided adequate detail that the included sample was representative of the target population. Given that participants in the included studies would most likely be aware of the hospitals' smoke-free policy (i.e. not blinded to the intervention), the domains for performance and detection bias were combined into a single domain named 'blinding', which assessed blinding of outcome assessors. For the other domains, criteria for determining risk of bias were retained as per the original tool (Higgins and Green, 2011). Risk of bias was assessed independently by the first author (ES) and by a research assistant, and discrepancies were resolved via consensus with the second author (JB). Assessors were not blinded to study authors, institution or journal as they were familiar with the literature. No studies in the review were excluded from the narrative synthesis on the basis of risk of bias.

## **Results**

Figure 1 describes the results of the search and paper selection process. The search identified a total of 334 papers, of which 156 were unique, and 178 were duplicates. By reviewing the title, abstracts and reference lists of the 156 papers, 86 were identified as

potentially relevant and 70 were excluded as they were not relevant to the search topic. The first author reviewed the 86 articles and their reference lists, resulting in 71 being excluded (25 did not examine patients' smoking-related behaviours, 21 in inpatient psychiatric facilities without a smoke-free policy, 21 no original data, 4 surveyed clinical staff only). The remaining 15 publications (based on 14 studies) were included in this review (Table 1). As the publication by Shmueli, Fletcher, Hall et al (2008) reported on the same sample as Prochaska, Fletcher, Hall et al (2006), both papers were considered as one study, and have been cited as the earlier study (Prochaska et al., 2006).

### *Study characteristics*

A description of the 14 included studies is provided in Table 1 regarding: study location, design, setting and sample; the nature of the smoke-free policy (including the type of smoking restriction, adherence with the policy, and provision of nicotine dependence treatment); the smoking-related outcomes assessed and measures used, and the study findings.

Seven studies were conducted in the United States (Downey et al., 1998; Jones et al., 2004; Patten et al., 1995; Prochaska et al., 2006; Resnick and Bosworth, 1989; Smith et

al., 2012; Smith and Grant, 1989), three in Switzerland (Etter et al., 2008; Keizer et al., 2009; Keizer and Eytan, 2005), two in the United Kingdom (Ratschen et al., 2010; Smith and O'Callaghan, 2008), and two in Australia (Hehir et al., 2012; Siru et al., 2010). None of the studies involved randomised controlled trials. Six studies were conducted as cross-sectional surveys at a single time point (Hehir et al., 2012; Keizer and Eytan, 2005; Ratschen et al., 2010; Smith and O'Callaghan, 2008; Smith et al., 2012; Smith and Grant, 1989) and four as cross-sectional surveys at multiple time points in the same facility and at various stages of smoke-free policy implementation (Etter et al., 2008; Keizer et al., 2009; Patten et al., 1995; Resnick and Bosworth, 1989). Four studies used repeated measures designs, two of which examined changes in smoking-related behaviours over time in a single group (Jonas and Eagle, 1991; Prochaska et al., 2006) and two examined changes in smoking-related behaviours over time in two groups (Downey et al., 1998; Siru et al., 2010), one of which used general hospital patients as a comparison group (Siru et al., 2010). The number of patients included in the studies ranged from 15-467. Where reported, length of admission ranged from 1-990 days.

### *Level of smoking restriction in place, and adherence*

Six studies were conducted in facilities with complete smoking bans, (Jonas and Eagle, 1991; Prochaska et al., 2006; Ratschen et al., 2010; Siru et al., 2010; Hehir et al., 2012; Smith et al., 2012), and eight in facilities with incomplete bans, four of which banned smoking indoors only (Etter et al., 2008; Patten et al., 1995; Resnick and Bosworth, 1989; Smith and Grant, 1989), three restricted smoking to designated smoking rooms (Keizer et al., 2009; Smith and O'Callaghan, 2008; Keizer and Eytan, 2005), and one restricted smoking to five pre-determined intervals per day (Downey et al., 1998). Five studies were conducted in facilities which introduced or had a change in a smoke-free policy during the study period from none/minimal to more thorough restrictions on smoking (Downey et al., 1998; Etter et al., 2008; Keizer et al., 2009; Keizer and Eytan, 2005; Patten et al., 1995; Resnick and Bosworth, 1989).

Of the six studies conducted in facilities with complete bans one indicated that all participants abstained from smoking during admission (Jonas and Eagle, 1991), and two indicated some level of non-adherence (Ratschen et al., 2010; Smith et al., 2012). Of the eight studies conducted in facilities with incomplete bans, five indicated some level of non-adherence (Etter et al., 2008; Patten et al., 1995; Resnick and Bosworth, 1989; Smith and O'Callaghan, 2008; Smith and Grant, 1989). Six studies did not provide comment on policy adherence (Downey et al., 1998; Hehir et al., 2012; Keizer et al.,

2009; Keizer and Eytan, 2005; Prochaska et al., 2006; Siru et al., 2010). Evidence of non-adherence typically comprised patient self-report that they themselves had smoked in prohibited areas of the facility (Ratschen et al., 2010; Smith and O'Callaghan, 2008; Smith and Grant, 1989), were aware of family or friends smuggling cigarettes onto the ward (Resnick and Bosworth, 1989), were exposed to continued smoking by other patients (Smith et al., 2012), or were aware of sharing of cigarettes between patients, and between patients and staff (Etter et al., 2008). One study used medical records to identify that several patients had smoked in a prohibited area during their admission (Patten et al., 1995).

#### *Provision of nicotine dependence treatment*

In ten of the 14 studies, facilities were reported as providing nicotine dependence treatment to patients as part of routine care, including NRT and brief advice to quit (Etter et al., 2008; Jonas and Eagle, 1991; Patten et al., 1995; Prochaska et al., 2006; Ratschen et al., 2010; Resnick and Bosworth, 1989; Siru et al., 2010; Smith and Grant, 1989; Hehir et al., 2012; Smith et al., 2012). In six of these, complete smoking bans were implemented (Jonas and Eagle, 1991; Prochaska et al., 2006; Ratschen et al., 2010; Siru et al., 2010; Hehir et al., 2012; Smith et al., 2012), and smoking was banned indoors only for the remaining four facilities (Etter et al., 2008; Patten et al., 1995;

Resnick and Bosworth, 1989; Smith and Grant, 1989). None of the four studies that were conducted in facilities which permitted smoking in designated rooms, or at designated times, reported the provision of routine nicotine dependence treatment (Downey et al., 1998; Keizer et al., 2009; Keizer and Eytan, 2005; Smith and O'Callaghan, 2008). Rates of receipt of nicotine dependence treatment are provided in Table 1, and overall indicated suboptimal treatment.

#### *Risk of bias in included studies*

Figure A1 and Table A2 in Appendix 1 describe the assessed risk of bias for each included study. Most studies were small, and incomplete in their reporting of outcomes. Consequently, risk of bias was mostly unable to be determined, or determined to be high. Only studies large enough to report statistical comparisons are considered in depth below (in addition to information already provided in Table 1).

*i) Changes in smoking behaviour during admission*

*a) Facilities with complete smoking bans*

Two studies with complete smoking bans assessed smoking behaviour during admission (Ratschen et al., 2010; Smith et al., 2012), with one of these (Smith et al., 2012) large enough to conduct statistical comparisons. The study conducted by Smith et al (2012) indicated that patient's cigarette consumption was significantly lower during admission than pre-admission ( $p < .05$ ). Although combined nicotine dependence treatment was available, usage was not reported (Smith et al., 2012).

*b) Facilities with incomplete smoking bans*

Of the three studies with indoor smoking bans that examined changes in smoking behaviour during admission (Etter et al., 2008; Patten et al., 1995; Smith and Grant, 1989), only one conducted a statistical analysis of the results. Etter et al (2005) reported a significantly larger proportion of participants making a quit attempt, from 2.2% when smoking was permitted in designated rooms to 18.4% when smoking was banned indoors ( $p = .01$ ; Table 1) (Etter et al., 2008). Although the increased proportion of participants making a quit attempt in this study was accompanied by an increase in

patients receiving NRT and advice to quit (both  $p$ 's < .001), non-adherence to the policy was reported (Etter et al., 2008).

Three studies with designated smoking rooms examined changes in smoking behaviour during admission (Keizer et al., 2009; Keizer and Eytan, 2005; Smith and O'Callaghan, 2008). Of these, two reported statistical analyses. Keizer et al (2005) reported that relative to pre-admission, 43.2% of patients increased and 27.3% decreased their daily cigarette consumption during admission (Keizer and Eytan, 2005). These rates were 25.5% and 37.3% respectively in the 2009 follow-up study (Keizer et al., 2009), with changes reaching significance for heavy smokers ( $p = .001$ ; Table 1) (Keizer et al., 2009).

## *ii) Changes in smoking behaviour post-discharge*

### *a) Facilities with complete smoking bans*

Four studies with complete smoking bans examined changes in smoking behaviours post-discharge (Jonas and Eagle, 1991; Prochaska et al., 2006; Siru et al., 2010; Hehir et al., 2012). All three studies that used repeated-measures designs to examine smoking from admission to discharge reported that the majority (89.6% (Siru et al., 2010); 80% (Jonas and Eagle, 1991); and 76% (Prochaska et al., 2006)) of participants resumed

smoking within five days post-discharge (Table 1). However, both the more recent and larger studies reported significant reductions in daily cigarette consumption at 14 days (Siru et al., 2010) and three months (Prochaska et al., 2006) post-discharge relative to pre-admission levels. Both were conducted in facilities that provided combined nicotine dependence treatment, with the majority of participants in both studies having used NRT during admission (60%: (Siru et al., 2010), 70%: (Prochaska et al., 2006)), however receipt of advice to quit was low (2%: (Prochaska et al., 2006), 20% (Siru et al., 2010)), and neither study provided details of smoke-free policy adherence. Jonas and Eagle (1991) reported no change in cigarette consumption from the time of admission to 6-18 months post-hospitalisation. Of these three studies, only one study biochemically validated self-reported abstinence, reporting that 4% of participants were abstinent at three months post-discharge (Prochaska et al., 2006), and self-reported abstinence was 10.3% at eight weeks in one study (Jonas and Eagle, 1991), and 6.3% at six months post-discharge in the other (Siru et al., 2010). The remaining study reported that 58% of patients ( $n = 12$ ) were abstinent post-discharge, however, this study was of cross-sectional design, had a small sample size, and patients were discharged to the care of facilities that imposed smoking restrictions and provided combined nicotine dependence treatment, and thus were effectively still in institutional care (Hehir et al., 2012).

*b) Facilities with incomplete smoking bans*

Patten et al (1995) reported that all participants ( $n = 15$ ) resumed smoking immediately after discharge; however 5.3% self-reported abstinence at 16-18 months. This study reported provision of combined nicotine dependence treatment, with 26% of participants reporting using NRT during admission; however non-adherence with the smoke-free policy was evident.

*iii) Changes in smoking-related motivations or beliefs during admission*

*a) Facilities with complete smoking bans*

Four studies with complete smoking bans examined smoking-related motivations or beliefs during admission (Hehir et al., 2012; Prochaska et al., 2006; Ratschen et al., 2010; Siru et al., 2010). Of these, the only study to examine such changes using a repeated measures design and statistical analyses reported that participants expected to be significantly more successful ( $p < .05$ ), and perceived significantly less difficulty in staying quit following a quit attempt at discharge compared to on admission ( $p < .01$ ) (Prochaska et al., 2006). In this study, the majority of participants (70%) used NRT during hospitalisation, and nicotine doses predicted these increased expectations of success with quitting ( $p < .05$ ; Table 1) (Prochaska et al., 2006).

*b) Facilities with incomplete smoking bans*

Four studies with incomplete smoking bans examined smoking-related motivations or beliefs during admission (Downey et al., 1998; Keizer et al., 2009; Resnick and Bosworth, 1989; Smith and Grant, 1989). In the largest and most recent study, Keizer et al. (2009) found a significantly larger proportion of participants in the contemplation and preparation/decision stages of change when smoking was unrestricted (4.9%) as compared to when smoking was permitted only in designated rooms (18.5%;  $p = .02$ ), indicating an increase in motivation to quit. However, authors did not report provision of nicotine dependence treatment, or adherence to the smoking ban. In the earlier study of Downey et al (1998) which permitted smoking at designated times, participants admitted to the facility during the 'restricted' period when smoking was limited to five intervals per day reported a significant decline on the 'action' stage of change scale from admission to discharge, suggesting a decline in motivation to quit. However participants admitted during the unrestricted 'ad lib' period reported a significant increase in motivation to quit ( $p < .05$ ). In the two older and smaller cross-sectional studies with indoor bans, the majority of patients reported that the smoke-free policy would lead them to reduce their smoking, or try to quit post-discharge (Resnick and Bosworth, 1989; Smith and Grant, 1989). In both studies, nicotine gum was made available to patients; however rates of receipt were not reported, and non-adherence to

the smoke-free policy was evident (Resnick and Bosworth, 1989; Smith and Grant, 1989).

## **Discussion**

The findings of this review suggest that a smoke-free psychiatric hospitalisation may have the potential to impact positively on patients' smoking behaviours, and on smoking related motivation and beliefs. Positive changes in smoking-related outcomes identified included declines in daily cigarette consumption post-discharge (Prochaska et al., 2006; Siru et al., 2010), increases in patient's motivation to quit (Prochaska et al., 2006; Keizer et al., 2009), and an increase quit attempts (Etter et al., 2008), however one older study indicated a decline in motivation to quit (Downey et al., 1998). Of the 14 included studies, many were small, and incomplete in their reporting of outcomes, thus limiting the ability to draw firm conclusions regarding the impact of smoking bans on patients smoking behaviour.

Recently conducted, larger studies appeared more likely to have been undertaken in facilities with comprehensive restrictions on smoking and which provided combined pharmacological and behavioural nicotine dependence treatment. These studies also appeared to be associated with more positive smoking outcomes; however, limitations in the data available precluded any quantitative assessment of this trend. Studies conducted in the 1980's and 90's being undertaken at a time where smoking restrictions

were still being introduced in general medical settings and rare in inpatient psychiatric facilities may have some bearing on this finding (House of Commons Health Committee, 2005). Specifically, both studies that reported significant declines in patients' daily cigarette consumption up to three months post-discharge were conducted more recently, and in facilities with complete smoking bans and concurrent provision of combined pharmacological and behavioural nicotine dependence treatment (Prochaska et al., 2006; Siru et al., 2010). Furthermore, two studies reported more positive smoking outcomes when stricter smoking rules were introduced, including significantly larger proportions of patients making a quit attempt (Etter et al., 2008), and reporting a desire to quit (Keizer et al., 2009). Additionally, in one of these studies, the larger proportion of patients making a quit attempt was accompanied by higher rates of patients receiving NRT and advice to quit (Etter et al., 2008). Conversely, of the four studies conducted in facilities that permitted smoking in designated rooms or at designated times, three reported increases in cigarette consumption (Keizer et al., 2009; Keizer and Eytan, 2005; Smith and O'Callaghan, 2008) and one reported a reduction in motivation to quit (Downey et al., 1998). None of these four studies reported provision of nicotine dependence treatment, and one study suggested continued exposure to cigarette smoke on the unit, despite the introduction of the smoking restrictions (Smith and O'Callaghan, 2008). These findings also suggest that adherence to the smoking ban, and receipt of nicotine dependence treatment during a smoke-free psychiatric hospitalisation may be

important factors that influence patients' smoking behaviours, as evidenced in general medical settings (Rigotti et al., 2000; Williams and Jones, 2012).

The findings of this review suggest that smoking bans generally, and complete bans in particular, may have a beneficial effect in terms of helping patients initiate changes in their smoking behaviour. However, none of the identified studies suggested significant increases in smoking cessation post-discharge. Such findings suggest that the smoking bans, of either form, may have had a limited longer term beneficial effect. The extent to which such outcomes were a function of the effectiveness of smoking bans per se, or of the manner of their implementation in the specific study facilities is unknown as the included studies did not adequately describe the extent of smoke-free policy adherence and provision of nicotine dependence treatment, key determinants of the likely success of a smoking ban (Bowman and Stockings, 2012; Lawn and Campion, 2010; Rigotti et al., 2000). Where these details were reported, patient receipt of NRT and brief advice to quit were suboptimal, and in half the studies, smoking continued to occur on the unit despite the smoking restrictions (Etter et al., 2008; Patten et al., 1995; Ratschen et al., 2010; Resnick and Bosworth, 1989; Smith and O'Callaghan, 2008; Smith et al., 2012; Smith and Grant, 1989), which may have impacted post-discharge smoking behaviours. The limited findings for cessation post-discharge should also be considered in light of the knowledge that smokers with a mental disorder have greater difficulty in quitting than the general population (Cooper, 2012), and as such it is not surprising that few

participants successfully abstained from smoking without further cessation aids post-discharge. These findings are consistent with previous research conducted in general medical settings indicating that a post-discharge effect on smoking rates is most likely to occur when cessation support is provided to patients post-discharge, in addition to that provided during the inpatient stay (Rigotti et al., 2012). Consequently, the positive changes in smoking behaviour identified in this review are perhaps of greater importance, particularly so given that no studies reported that the purpose of the smoking restrictions were to encourage cessation post-discharge. These findings further highlight the opportunity provided by a smoke-free psychiatric admission in initiating smoking cessation treatment among smokers with a mental disorder.

An important limitation of this review is the lack of adequately powered, high quality, controlled studies in this field, which precluded any quantitative examination of the results. Ideally, future research in this area should describe the level of smoking restriction imposed, and the nicotine dependence treatment routinely provided by the facility. Patient receipt of nicotine dependence treatment (including the type/s of NRT used, daily dosage and length of use), its adequacy in managing nicotine withdrawal and details of patient adherence to the smoking restrictions should be collected either through medical record audit, patient observation, or self-report. Examination of such factors may assist in developing a greater understanding of the potential impact of admission to a smoke-free hospital on patients' post-discharge smoking behaviour.

Consistent with health policy initiatives, total smoking bans in general medical settings reduce second-hand smoke exposure (Tobacco Advisory Group, 2005), and are associated with reductions in smoking and improvements in health behaviour among staff and clients (Duffy et al., 2010; Gadomski et al., 2010). Psychiatric treatment settings carry equal legislative responsibility to provide a safe and healthy environment for their staff and clients (Tobacco Advisory Group, 2005). Implementation of total smoking bans in inpatient psychiatric settings, including routine identification and treatment of tobacco use, is imperative in achieving this goal (Royal College of Physicians and Royal College of Psychiatrists, 2013) and for providing an opportunity for patients to address their tobacco smoking in a supportive environment (Prochaska, 2009). However, it is apparent that continued cessation support following discharge is needed to increase the likelihood of cessation being maintained.

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## **Declaration of Interest**

All authors declare that they have no conflicts of interest.

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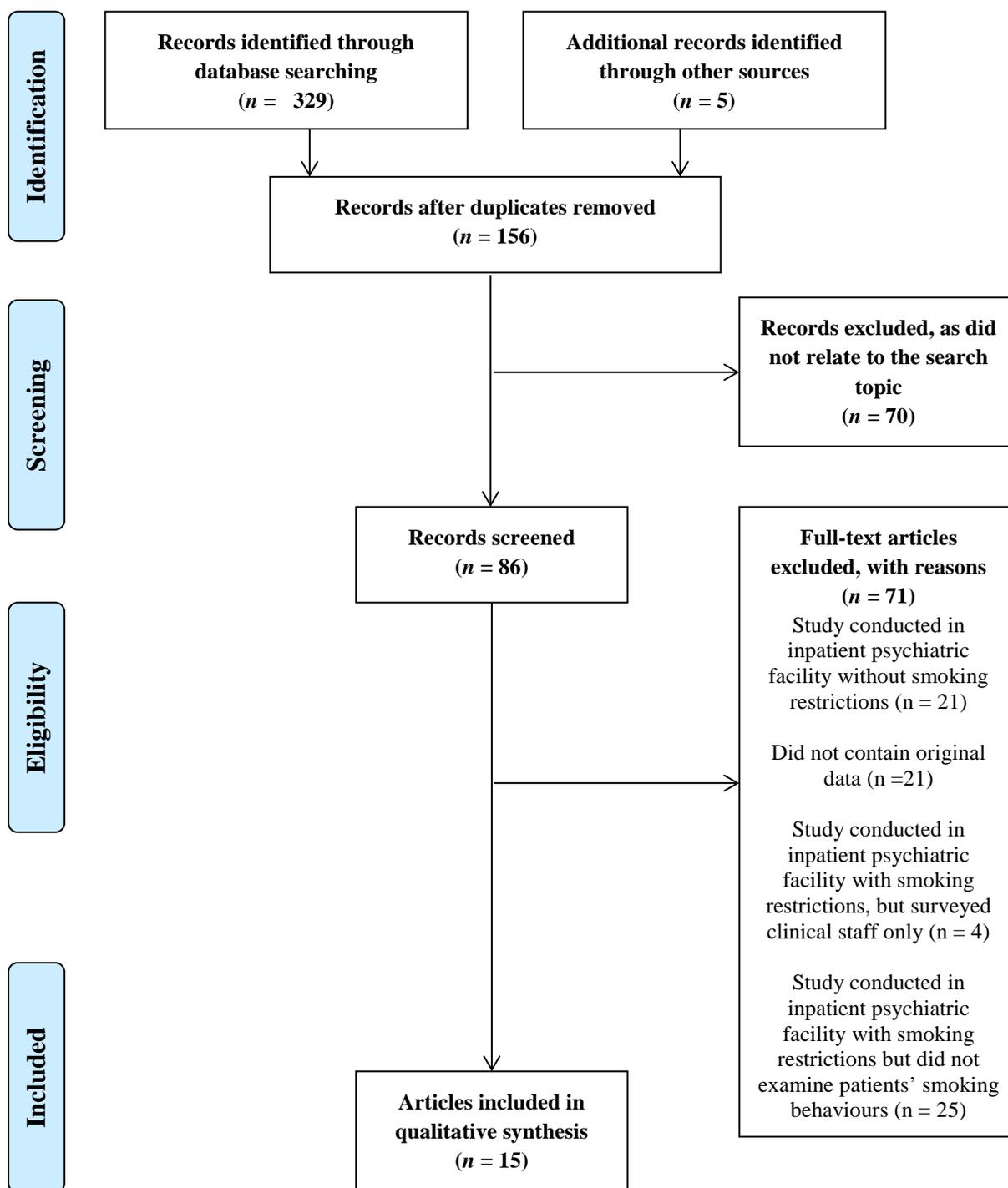


Figure 1. PRISMA flowchart of the study selection process

Table 1. Characteristics and findings of studies included in the review

<i>Study, location, design, setting and sample</i>	<i>Nature of the smoke-free policy</i>	<i>Smoking related outcomes and measures</i>	<i>Findings</i>
<b>1. Resnick and Bosworth (1989), United States</b>			
<p><b>Design:</b> Cross-sectional surveys of patients conducted at two time-points: one month pre-ban, one month post-ban.</p> <p><b>Setting:</b> 12-bed, acute, locked psychiatric unit of a university hospital.</p> <p><b>Sample:</b> N = 165 (116 pre-ban, 49 post-ban) Smokers: 71%</p>	<p><b>Type:</b> Incomplete ban (smoking banned indoors).</p> <p><b>Detail:</b> In the pre-ban period, smoking was permitted in a designated day room from 8am to 11pm. Post-ban, smoking was banned indoors only.</p> <p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Pharmacological only (nicotine gum).</p>	<p><b>Outcomes:</b> Smoking-related beliefs only.</p> <p><b>Measures:</b> Non-standardised items regarding patients' perceived impact of the smoking ban on future smoking behaviours, and smoking group attendance.</p>	<ul style="list-style-type: none"> <li>• During the pre-ban period, 29% reported the restricted policy would lead them to quit, 30% reported it would lead them to try and reduce and 38% reported it would not affect their smoking.</li> <li>• The percentage reporting wanting to attend a smoking cessation group was higher when smoking was permitted in a designated room (60%) than when smoking was banned indoors (32%). No significance test conducted.</li> <li>• Doses of PRN NRT were lower in the one month period when smoking was permitted in a designated room (7) than when smoking was banned indoors (176). No significance test conducted.</li> <li>• Occasionally, cigarettes were smoked on the ward, or smuggled in by visitors.</li> </ul>
<b>2. Smith and Grant (1989), United States</b>			
<p><b>Design:</b> Cross-sectional survey of patients discharged from the third through to fifth weeks following smoke-free policy implementation.</p> <p><b>Setting:</b> 42-bed, 3 unit (2 general units, 1 intensive care unit), private psychiatric facility.</p> <p><b>Sample:</b> N = 32 Smokers: 40.6%</p>	<p><b>Type:</b> Incomplete ban (smoking banned indoors).</p> <p><b>Detail:</b> Smoking banned indoors only.</p> <p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Pharmacological only (nicotine gum).</p>	<p><b>Outcomes:</b> Smoking-related behaviours and beliefs.</p> <p><b>Measures:</b> Non-standardised items regarding change in smoking behaviour during admission, and beliefs regarding future smoking behaviours post-discharge.</p>	<ul style="list-style-type: none"> <li>• Two patients reported refraining from, or reducing their smoking during admission and 54% indicated they expected to reduce their smoking post-discharge.</li> <li>• Only 14 (43.8%) patients indicated they had been informed of the smoking ban by staff prior to admission.</li> <li>• The majority (12/13) of the smokers reported smoking during their hospital stay. Several patients acknowledged violating the ban and smoked in a prohibited area during their admission.</li> </ul>

<b>3. Jonas and Eagle (1991),</b> United States			
<p><b>Design:</b> Repeated measures design, comprising surveys of a single group of patients during admission and six to 18 months post-discharge.</p> <p><b>Setting:</b> Short-term psychiatric unit of a general hospital.</p> <p><b>Sample:</b> N = 39 Age: M = 32.5 Gender: 76.9% female Admission length: M = 14.1 days</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients.</p> <p><b>Adherence:</b> Evident.</p> <p><b>Nicotine dependence treatment:</b> Combined (nicotine gum and education in its use).</p>	<p><b>Outcomes:</b> Smoking-related behaviours only.</p> <p><b>Measures:</b> Daily cigarette consumption, abstinence from cigarettes.</p>	<ul style="list-style-type: none"> <li>• All participants abstained from smoking during admission and were observed using nicotine gum at least twice, by a staff member.</li> <li>• 80% resumed smoking immediately after discharge, and 89.7% (35/39) resumed smoking within 8 weeks post-discharge.</li> <li>• 10.3% were abstinent at 8 weeks post-discharge, and were lighter smokers on admission.</li> <li>• No difference in the number of cigarettes smoked from admission to discharge.</li> <li>• Resumption of smoking post-discharge was not associated with any demographic factors.</li> </ul>
<b>4. Patten et al (1995),</b> United States			
<p><b>Design:</b> Cross-sectional survey of patients at two time points: three months prior and three months post smoke-free policy implementation, with a follow-up interview conducted at 16-18 months post-discharge for patients in the post-implementation period.</p> <p><b>Setting:</b> 28-bed, locked psychiatric unit.</p> <p><b>Sample:</b> N = 362 (184 pre-ban, 178 post-ban, 19 of which completed the follow-up interview). Age: 11-82 (M = 39.3)</p>	<p><b>Type:</b> Incomplete ban (smoking banned indoors).</p> <p><b>Detail:</b> In the pre-ban period, smoking was permitted in a designated room. In the post-ban period, smoking was banned indoors only.</p> <p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Combined (nicotine gum, weekly nicotine dependence support group, self-help materials).</p>	<p><b>Outcomes:</b> Smoking-related behaviours only.</p> <p><b>Measures:</b> Smoking status, daily cigarette consumption, use of smoking cessation supports, self-reported abstinence from cigarettes.</p>	<ul style="list-style-type: none"> <li>• No difference in smoking status or daily cigarette consumption from the pre to post-ban periods.</li> <li>• A small number (0.8%) of medical records indicated a patient smoked in prohibited area of the hospital during their hospital stay.</li> <li>• Of the 19 patients who were followed up by telephone 16-18 months post-discharge in the post-ban period, five (26%) reported using nicotine gum in hospital, 21% reported participating in a smoking cessation program post-discharge, three patients (15.8%) used NRT post-discharge (all used gum).</li> <li>• All 19 smokers reported returning to smoking immediately after discharge, and 18 of the 19 (95%) reported current smoking. Two patients (10.5%) reported not smoking at six and 12 months post-discharge.</li> </ul>

Gender: 59.2% female  
 Admission length: 1-53 days  
 (M = 12.5)  
 Smokers: 43.3%  
 Inclusion criteria: All smokers  
 admitted to the facility during  
 the study period.  
 Participation rate: 100%

**5. Downey et al (1998),**  
 United States

**Design:** Two group repeated  
 measures design, with surveys  
 conducted upon admission and  
 discharge for patients in the  
 ‘ad lib’ and ‘restricted’  
 smoking periods.

**Setting:** University psychiatry  
 unit.

**Sample:**

N = 42 (20 in the ‘ad lib’  
 period, 22 in the ‘restricted’  
 period).  
 Age: M = 34.6  
 Gender: 57% female  
 Admission length: M = 9.9  
 days  
 Inclusion criteria: All smokers  
 admitted to the facility during  
 the study period.  
 Participation rate: 100%

**Type:** Incomplete ban (smoking  
 permitted at designated times).

**Detail:** In the ‘ad lib’ period, patients  
 were permitted to smoke unrestricted.  
 During the ‘restricted’ period, smoking  
 was restricted to five predetermined  
 intervals per day.

**Adherence:** Not reported.

**Nicotine dependence treatment:** Not  
 reported.

**Outcomes:** Smoking-related  
 motivation only.

**Measures:** Stage of Change  
 visual analog scale (Rustin and  
 Tate, 1993).

- ‘Restricted’ smokers showed a statistically significant decrease on the ‘action’ stage of change scale from admission to discharge, while ‘ad lib’ smokers showed a significant increase ( $p < .05$ ).

**6. Keizer and Eytan (2005),**  
 Switzerland

**Design:** Cross-sectional  
 survey of patients admitted  
 over a three-week period.

**Type:** Partial ban (smoking permitted  
 in designated rooms).

**Detail:** Smoking only permitted in

**Outcomes:** Smoking-related  
 behaviours only.

**Measures:** Smoking status,

- 70.5% of stable smokers on admission reported varying their smoking behaviour during admission.
- Relative to pre-admission, 43.2% increased and 27.3%

<p><b>Setting:</b> Nine 15-20 bed units (half acute, half long-term) of a general university psychiatric hospital.</p> <p><b>Sample:</b> N = 91 Age: 37.6 Gender: 47.3% female Smokers: 72% Inclusion criteria: All patients admitted to the facility during the study period Participation rate: 79%</p>	<p>designated areas.</p> <p><b>Adherence:</b> Not reported.</p> <p><b>Nicotine dependence treatment:</b> Not reported.</p>	<p>daily cigarette consumption, nicotine dependence (two items from the Heaviness of Smoking Index [HSI](Kozlowski et al., 1994)).</p>	<p>decreased daily cigarette consumption during admission.</p> <ul style="list-style-type: none"> <li>• Mean daily cigarette consumption was reported to be higher during admission (26.2) than the week pre-admission (23.7) but was not statistically significant (<math>p = .09</math>).</li> <li>• Patients with lower baseline HSI scores had the greatest reported increase in smoking from pre-admission to admission (<math>p = .005</math>), and this effect was stronger for males than females (<math>p = 0.035</math>).</li> <li>• Heavy smokers (47%) were more significantly more likely to decrease their cigarette consumption during admission than light smokers (10%), and light smokers (80%) were more likely to increase than heavy smokers (17%; <math>p = .001</math>).</li> </ul>
<p><b>7. Prochaska et al (2006)</b> (includes Shmueli et al., 2008) United States</p>			
<p><b>Design:</b> Repeated measures design comprising surveys of a single group of patients during admission, and at one week, one month and three months post-discharge.</p> <p><b>Setting:</b> University-based inpatient psychiatry unit.</p> <p><b>Sample:</b> N= 100 Age: M = 38.7 Gender: 39% female Admission length: 1-37 days (M = 6.4) Smokers: 35% Inclusion criteria: &gt; 18 years, current smoker</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients on buildings and grounds.</p> <p><b>Adherence:</b> Not reported.</p> <p><b>Nicotine dependence treatment:</b> Combined (NRT [patch, gum], advice to quit, and tobacco treatment provision entered on discharge plan).</p>	<p><b>Outcomes:</b> Smoking-related behaviours, motivation and beliefs.</p> <p><b>Measures:</b> Smoking history questionnaire (years of smoking, daily cigarette consumption, previous quit attempts), nicotine dependence (Fagerstrom Test for Nicotine Dependence; FTND (Fagerstrom et al., 1996)), Thoughts about Abstinence Questionnaire (Hall et al., 1990), Nicotine Withdrawal Checklist [NW] (Shiffman et al., 2002), use of post-discharge cessation supports, quit attempts, abstinence from</p>	<ul style="list-style-type: none"> <li>• 70% used NRT during hospitalisation (60% patches, 21% gum and 19% combination) and 2% received advice to quit. Daily NRT dose was 12.6mg, and median NRT replacement level was 70%. Only 4% were prescribed NRT on discharge. Nicotine dose predicted increased feelings of success with quitting during hospitalisation.</li> <li>• Compared to admission, upon discharge participants expected to be significantly more successful in their quit attempt (<math>p &lt; .05</math>), and perceived significantly less difficulty in staying smoke-free following a quit attempt (<math>p &lt; .01</math>). There was also a statistically significant decrease in the number of patients having no abstinence goal, and significant increases in patients reporting both intermediate goals, and goals to quit for good (<math>p &lt; .001</math>).</li> <li>• All patients returned to smoking within the three month study period, with 76% resuming smoking on the day of discharge. Patients who were heavier smokers on admission (<math>p = .047</math>), had higher FTND scores (<math>p = .043</math>),</li> </ul>

Participation rate: 87%	cigarettes (validated with expired breath carbon monoxide [CO]).	<p>greater cravings to smoke during hospitalisation (<math>p = .014</math>), fewer lifetime quit attempts (<math>p = .034</math>) and less desire to quit (<math>p = .002</math>) were significantly more likely to return to smoking on the day of discharge.</p> <ul style="list-style-type: none"> <li>• There was a statistically significant decline in number of cigarettes smoked from pre-admission to 3 months post-discharge (<math>p &lt; .001</math>).</li> <li>• Nearly half (48%) reported a quit attempt post-discharge, and 4% were biochemically confirmed abstinent at 3 months. Use of NRT post-hospitalisation was associated with making a quit attempt post-hospitalisation (OR: 6.9, <math>p &lt; .001</math>).</li> </ul>	
<b>8. Etter et al., 2008, Switzerland</b>			
<p><b>Design:</b> Four cross-sectional surveys of patients: pre-partial smoking ban (2003), two months post implementation of the partial smoking ban (2004), 20 months post implementation of the partial smoking ban (2005) and three to five months post implementation of the total smoking ban (2006).</p> <p><b>Setting:</b> 2 units (1 short stay unit, 1 medium stay unit each comprising 16 beds) of a 10 unit 166-bed university hospital psychiatry department.</p> <p><b>Sample:</b> N = 467 (106 [2003]), 108 [2004], 119 [2005], 134 [2006]</p>	<p><b>Type:</b> Incomplete ban (smoking banned indoors).</p> <p><b>Detail:</b> In the no ban period (2003), patients could smoke anywhere, unrestricted. During the partial ban (2004-2005), smoking was permitted inside a designated smoking room. During the total ban (2006), smoking was banned indoors only.</p> <p><b>Adherence:</b> Non-adherence evident</p> <p><b>Nicotine dependence treatment:</b> Combined (NRT [patch, gum], advice to quit)</p>	<p><b>Outcomes:</b> Smoking-related behaviours only.</p> <p><b>Measures:</b> Smoking status, daily cigarette consumption, quit attempts.</p>	<ul style="list-style-type: none"> <li>• No change in smoking status or cigarette consumption across the four time points.</li> <li>• The proportion of smokers who attempted to quit during their hospital stay was higher (18.4%) during the total ban (2006) than during the partial ban (2005; 2.2%; <math>p = .01</math>).</li> <li>• Patients' reported receipt of NRT was higher in the total ban period (2006; 52.2%) than the no ban period (2003; 5.1%, <math>p &lt; .002</math>). Receipt of advice to quit was also higher during the total ban period (2006; 42.6%) than the no ban period (2003; 15.4%; <math>p = .006</math>).</li> <li>• In the total ban period (2006), 22.1% of patients reported the restricted smoking rules in the hospital were not respected, and 11.5% reported they were exposed to smoke in bedrooms, 26.9% in dining rooms and 34.6% in corridors, all areas where smoking was prohibited.</li> <li>• In the total ban period (2006), over half (52.2%) the patients reported that other patients provided them with cigarettes, 14.6% of patients reported that staff provided them with cigarettes, and 22.4% reported that hospital staff forbade them to smoke.</li> </ul>

Age: M = 39.9  
 Gender: 40.8% female  
 Smokers: 79.6%  
 Inclusion criteria: All patients admitted to the facility during the study period.  
 Participation rate: 86%

**9. Smith and O'Callaghan (2008), United Kingdom**

<p><b>Design:</b> Cross-sectional survey of patients over a one month period.</p>	<p><b>Type:</b> Incomplete ban (smoking permitted in designated rooms).</p>	<p><b>Outcomes:</b> Smoking-related behaviours only.</p>	<ul style="list-style-type: none"> <li>• Overall reported rate of smoking remained constant between pre-admission and the time of interviewing.</li> <li>• From pre-admission to the time of interviewing, 14% reported an increase in smoking, and 23% reported a decrease.</li> <li>• Two patients reported resuming smoking, two reported smoking uptake, and two reported both increasing and decreasing smoking during admission relative to pre-admission.</li> <li>• Policy non-compliance was reported by 22.2% of the total sample.</li> </ul>
<p><b>Setting:</b> 13 wards (10 general, three functional old age wards) of a public mental health trust.</p>	<p><b>Detail:</b> Smoking permitted in two designated smoking rooms per ward, smoking banned in all other indoor areas.</p>	<p><b>Measures:</b> Smoking status, non-standardised items regarding change in smoking behaviour during admission.</p>	
<p><b>Sample:</b>        N = 135        Age: 18-86 (M = 49.7)        Gender: 47.4% female        Smokers: 54.1%        Participation rate: 55.6%</p>	<p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Not reported</p>		

**10. Keizer et al (2009), Switzerland**

<p><b>Design:</b> Cross-sectional surveys of patients pre (2001) and post smoking-ban implementation (2005).</p>	<p><b>Type:</b> Incomplete ban (smoking permitted in designated rooms).</p>	<p><b>Outcomes:</b> Smoking-related behaviours and motivation.</p>	<ul style="list-style-type: none"> <li>• Relative to pre-admission, average number of cigarettes smoked per day during admission increased by 3.2 in the pre-ban period (2001) and decreased by 6.2 post-ban (2005), however was not statistically significant.</li> <li>• In the post-ban period relative to pre-admission, 25.5% of smokers increased and 37.3% decreased cigarette consumption during admission.</li> <li>• In the post-ban period (2005), reductions in daily cigarette consumption from pre-admission to during admission were significantly only for heavy smokers (<math>p = .001</math>).</li> </ul>
<p><b>Setting:</b> Nine, 15-20 bed units (half acute, half long-term) of a general university psychiatric hospital.</p>	<p><b>Detail:</b> In the pre-ban period (2001) there were no compulsory smoking rules. Post-ban (2005), smoking was restricted to one designated ventilated room per unit.</p>	<p><b>Measures:</b> Daily cigarette consumption, nicotine dependence (HSI; (Kozlowski et al., 1994)), Stages of Change scale (DiClemente et al., 1991), non-standardised items regarding reasons for changing smoking behaviour during</p>	
<p><b>Sample:</b></p>	<p><b>Adherence:</b> Not reported.</p>		

<p>N = 224 (91 pre-ban [2001], and 134 post-ban [2005])  Gender: 47.3% female  Smokers: 72.1%  Inclusion criteria: All patients admitted to the facility during the study period.  Participation rate: 79%</p>	<p><b>Nicotine dependence treatment:</b> Not reported.</p>	<p>admission.</p>	<ul style="list-style-type: none"> <li>• Significantly larger proportions of participants the ‘contemplation’ and ‘preparation/decision’ stages of change for quitting when smoking was restricted to designated rooms (2005; 18.5%) than when smoking was unrestricted (2001; 4.9%; <math>p = .02</math>), and significantly larger proportions of patients who ‘would like to stop smoking’ when smoking was restricted to designated rooms (2005; 43.5%) than when smoking was unrestricted (2001; 24.5%; <math>p = .02</math>).</li> <li>• The most frequently cited reason to reduce smoking in hospital was the smoking restrictions.</li> <li>• 50.5% viewed hospitalisation as clearly stimulating smoking, and this did not change from pre to post-ban (<math>p = .53</math>).</li> <li>• 44.9% reported perceiving “very much” or “an enormous quantity” of smoke on the ward.</li> </ul>
<p><b>11. Ratschen et al (2010),</b>  United Kingdom</p>			
<p><b>Design:</b> Cross-sectional survey of patients over a six week period.</p> <p><b>Setting:</b> Two acute mental health wards (32 beds) and one intensive care unit (10 beds)</p> <p><b>Sample:</b>  N = 15  Age: 27-61 (M = 42.3)  Gender: 40% female  Admission length: 2-990 days (M = 151)  Inclusion criteria: Current smoker  Participation rate: 53.6%</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients on buildings and grounds.</p> <p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Combined (NRT [patch], advice to quit).</p>	<p><b>Outcomes:</b> Smoking-related behaviours and beliefs.</p> <p><b>Measures:</b> Non-standardised items regarding change in smoking behavior during admission and beliefs about future use of smoking cessation supports, nicotine dependence (HSI; (Kozlowski et al., 1994)).</p>	<ul style="list-style-type: none"> <li>• Compared to pre-admission, seven patients reported smoking less, six reported smoking more, and two equally as much while in hospital.</li> <li>• Patients’ self-reported mean nicotine dependence levels were lower during hospitalisation (HSI = 0.71, <math>SD = 1.86</math>) than prior to admission HSI = 2.0, <math>SD = 1.5</math>). No significance test conducted.</li> <li>• The majority reported they would take up offers of smoking cessation support on the ward, despite no patients using the NRT provided on the ward, or receiving advice to quit.</li> <li>• Participants generally stated they had been informed of the policy.</li> <li>• Two patients (13.3%) reported covert smoking in a prohibited area.</li> </ul>

<b>12. Siru et al (2010),</b> Australia			
<p><b>Design:</b> Repeated measures design comprising surveys of patients upon admission, and at five days, 14 days and six-months post-discharge, with general hospital patients as a comparison group.</p> <p><b>Setting:</b> Departments of psychiatry, orthopaedics and plastic surgery of a teaching hospital.</p> <p><b>Sample:</b> N = 64 (mental health sample), 43 (non-mental health sample). Age: M = 37.3 Gender: 46.9% female Admission length: Md = 11 days Inclusion criteria: All smokers admitted to the facility during the study period.</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients on buildings and grounds.</p> <p><b>Adherence:</b> Not reported.</p> <p><b>Nicotine dependence treatment:</b> Combined (NRT [patch, inhaler], non-NRT interventions, advice to quit).</p>	<p><b>Outcomes:</b> Smoking-related behaviours and beliefs.</p> <p><b>Measures:</b> Daily cigarette consumption, abstinence from cigarettes, non-standardised items regarding beliefs about future smoking behaviours, use of cessation supports post-discharge.</p>	<ul style="list-style-type: none"> <li>• 59.4% used any type of NRT (50% used patches, 23.4% used inhalers) and 20.3% received advice to cut down. One person was prescribed NRT on discharge.</li> <li>• 70.3% reported they were somewhat to very likely to stay off cigarettes following discharge, which did not differ from the comparison group (65.1%; <math>p = 0.37</math>).</li> <li>• 68.8% reported intent to cut down or continue not smoking post-discharge, which did not differ from the comparison group (67.5%; <math>p = 0.93</math>).</li> <li>• 89.6% returned to smoking within five days of discharge, which did not differ from the comparison group (92.1%; <math>p = 1.0</math>).</li> <li>• Post-discharge NRT use was 20.8% at five days, 15.2% at 14 days, and 18.5% at six months.</li> <li>• A significant reduction in cigarette consumption was found between baseline and 14 days post discharge (<math>p = .015</math>) and did not differ from the comparison group.</li> <li>• Abstinence rates were 7.8% at five days, 4.7% at 14 days and 6.3% at six months and did not differ from the comparison group (7.0%, 0%, and 2.3% respectively).</li> </ul>
<b>13. Hehir et al (2012),</b> Australia			
<p><b>Design:</b> Four focus groups, one cross-sectional survey of patients during admission, and one cross-sectional survey of patients discharged to medium secure mental health facilities.</p> <p><b>Setting:</b> Long term, 106-bed forensic mental health inpatient facility.</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients on buildings and grounds.</p> <p><b>Adherence:</b> Not reported.</p> <p><b>Nicotine dependence treatment:</b> Combined (nicotine dependence assessment, NRT [patch, lozenge,</p>	<p><b>Outcomes:</b> Smoking-related behaviours and beliefs.</p> <p><b>Measures:</b> Smoking status, use of cessation supports, non-standardised items regarding beliefs about current and future smoking behaviour.</p>	<ul style="list-style-type: none"> <li>• A large number of smokers in the focus group reported a sense of achievement at having stopped smoking during admission, and many indicated intent to quit post-discharge.</li> <li>• In the patient survey, the majority (92%) of smokers were informed of the smoke-free policy on admission, 88% were offered, and 73% used NRT.</li> <li>• 81% of smokers agreed admission to a smoke-free facility was a good opportunity to quit, however 36% reported</li> </ul>

<p><b>Sample:</b> N = 81 (focus group = 21, patient survey during admission = 45, patient survey post-discharge = 15). Age: 78% between 30-49 Gender: 6.7% female Smokers: 84% Admission length: 68.9% admitted for 1 year or more Inclusion criteria: All clinically stabilised patients who spoke English.</p>	<p>inhaler], information about smoking cessation).</p>	<p>they planned to continue smoking upon discharge.</p> <ul style="list-style-type: none"> <li>• In the post-discharge sample, 67% reported intent to quit upon discharge, and 58% (<math>n = 12</math>) remained non-smokers.</li> </ul>	
<p><b>14. Smith et al (2012), United states</b></p>			
<p><b>Design:</b> Cross sectional survey of patients.</p> <p><b>Setting:</b> Intermediate to long term psychiatric facility.</p> <p><b>Sample:</b> N = 100 Smokers: 60% Admission length: M = 4 years, Md = 1.47 years</p>	<p><b>Type:</b> Complete ban.</p> <p><b>Detail:</b> Smoking prohibited for all patients on buildings and grounds.</p> <p><b>Adherence:</b> Non-adherence evident.</p> <p><b>Nicotine dependence treatment:</b> Combined (NRT, counselling).</p>	<p><b>Outcomes:</b> Smoking-related behaviours only.</p> <p><b>Measures:</b> Smoking status, daily cigarette consumption, use of cessation supports during admission.</p>	<ul style="list-style-type: none"> <li>• Of the 63% classified as smokers pre-admission, 67% (<math>n = 42</math>) reported current smoking, and 33.3% (<math>n = 21</math>) quit on admission.</li> <li>• Self-reported number of cigarettes smoked during admission (M = 12.1) were significantly lower than pre-admission (M = 31.0; <math>p &lt; .05</math>).</li> <li>• Of those who quit upon admission (<math>n = 21</math>), 29% (<math>n = 6</math>) used NRT, and 29% (<math>n = 6</math>) received counselling.</li> <li>• Patients reported that smoking continued to occur inside buildings (59%) and on grounds (49%).</li> </ul>

Note: M = Mean  
Md = Median  
PRN = Pro re nata (*as needed*)  
NRT = Nicotine replacement therapy  
FTND = Fagerstrom test for nicotine dependence (Fagerstrom et al., 1996)  
HSI = Heaviness of smoking index