SMOKE-FREE PSYCHIATRIC HOSPITALS: A PLATFORM TO INITIATE SMOKING CESSATION TREATMENT

Emily Alice Louise Stockings
BPsyc(Hons)

Submitted for the Degree of Doctor of Philosophy
School of Psychology
Faculty of Science & IT
University of Newcastle

March, 2014
STATEMENT OF ORIGINALITY

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library**, being made available or loan and photocopying subject to the provisions of the Copyright Act 1968.

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Thesis by Publication

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I hereby certify that this thesis is in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to the joint publications.

Emily Stockings: _______________________________

March, 2014
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LIST OF PUBLICATIONS INCLUDED IN THE THESIS


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Papers:


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Conference presentations:


ADDITIONAL PUBLICATIONS


I, Emily Stockings, am the primary author of five co-authored papers that form the chapters of this thesis. I have been responsible for the development of ideas, research design, data collection and analysis, and have led the writing of these Chapters. My supervisors Jenny Bowman, John Wiggers and Amanda Baker, and co-authors Margarett Terry, Richard Clancy, Jenny Knight and Paula Wye assisted in the development of ideas and research design, and contributed to the writing and critical intellectual appraisal of each Chapter. Judith Prochaska contributed to the design, selection of papers for inclusion, and the writing and critical intellectual appraisal of Chapter 1. Kim Colyvas provided statistical advice, and assisted with general statistical interpretations for Chapters 2 and 5. Kate Bartlem and Kathleen McElwaine were involved in subject recruitment, prepared the dataset for analysis, conducted preliminary analyses and contributed to the writing and critical intellectual appraisal of Chapters 2 and 3. Paula Bridge was involved in subject recruitment and contributed to the writing and critical intellectual appraisal of Chapter 3. Lyndell Moore was involved in the study design, development of the intervention content and data collection tools, undertook subject recruitment and contributed to the writing and critical intellectual appraisal of Chapters 4 and 5. Maree Adams was involved in the study design, development of the intervention content and data collection tools, and contributed to the acquisition of data and the writing of Chapter 5.
## CO-AUTHOR STATEMENT

<table>
<thead>
<tr>
<th>Name of co-author</th>
<th>Signature of co-author:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Jenny Bowman</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Amanda Baker</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Margarett Terry</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Richard Clancy</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Jenny Knight</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Paula Wye</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Judith Prochaska</td>
<td></td>
<td>31.01.14</td>
</tr>
<tr>
<td>Kim Colyvas</td>
<td></td>
<td>07.02.14</td>
</tr>
<tr>
<td>Kate Bartlem</td>
<td></td>
<td>10.02.14</td>
</tr>
<tr>
<td>Kathleen McElwaine</td>
<td></td>
<td>05.02.14</td>
</tr>
<tr>
<td>Paula Bridge</td>
<td></td>
<td>07.02.14</td>
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</table>
CO-AUTHOR STATEMENT

Lyndell Moore 04.02.14

Maree Adams 10.02.14

Signature of PhD candidate

Name Signature Date:

Emily Stockings

Signature of Assistant Dean (Research and Training) (ADRT)

Name Signature Date:

AProf Jenny Cameron
Persons with a mental disorder smoke at higher rates and suffer disproportionate tobacco-related morbidity and mortality than the general population. Targeted, intensive cessation treatment may be required to reduce the tobacco-related burden experienced by this group. A smoke-free psychiatric hospitalisation - where nicotine withdrawal can be managed in the absence of environmental cues to smoke - has been identified as an opportunity to address smoking among persons with a mental disorder. The broad aim of this thesis was to explore smoke-free psychiatric inpatient settings as a platform to initiate smoking cessation treatment, and to test the efficacy of linking hospital-based to community-based smoking cessation treatment in reducing tobacco consumption among persons with a mental disorder. The studies comprising the chapters of this thesis aimed to: 1) determine the impact of admission to a smoke-free psychiatric facility on patients’ smoking-related behaviours, motivations and beliefs; 2) examine the quality of implementation of a smoke-free policy in an Australian inpatient psychiatric facility, including patients’ self-reported adherence to the smoking ban; their perception of staff support for the smoke-free policy; their receipt of nicotine dependence treatment; and their acceptability of the smoke-free policy; 3) examine the smoking-related characteristics of patients admitted to an inpatient psychiatric facility with a smoke-free policy in Australia, including their readiness to quit smoking, previous quitting behaviours, and factors associated with readiness to quit; and 4) determine the efficacy of a smoking cessation intervention initiated during a smoke-free psychiatric hospitalisation and continued post-discharge in reducing tobacco consumption among smokers with a mental disorder.
Smoking remains a leading global cause of morbidity and mortality. Persons with a mental disorder smoke at higher rates, are more nicotine dependent, less likely to quit and more likely to die from smoking-related disease than the general population. Given a complex interaction of biological, psychological and social factors contributing to excess tobacco use among persons with a mental disorder, interventions designed to reduce smoking among general population smokers may not be efficacious among this group, and targeted, intensive cessation interventions may be required.

Smoking bans have been introduced in many general hospital settings internationally, including inpatient psychiatric settings, and are often accompanied by behavioural and pharmacological nicotine dependence treatment. A period of such supported abstinence has been identified as an opportunity to initiate smoking cessation, and has been associated with reductions in smoking among patients in general hospital settings. While evidence indicates that the implementation of such smoke-free policies in inpatient psychiatric settings has been delayed, and/or difficult, initiating smoking cessation treatment during a smoke-free psychiatric hospitalisation and providing ongoing community-based smoking cessation support post-discharge may offer the greatest opportunity for persons with a mental disorder to address their smoking.

The broad aims of this thesis were to explore smoke-free psychiatric inpatient settings as a platform to initiate smoking cessation treatment, and to test the efficacy of linking hospital-based nicotine dependence treatment to ongoing, community-based smoking cessation support post-discharge in reducing smoking behaviours among persons with a mental disorder. Chapter 1 describes a systematic review examining the impact of
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admission to a smoke-free psychiatric hospital on patients’ smoking-related behaviours, motivations and beliefs both during admission and post-discharge. Results of included papers were explored based on the degree of smoking restrictions imposed, the provision of nicotine dependence treatment, and the risk of methodological bias in each study. While the risk of bias in included studies was generally found to be high, the available evidence indicates that reductions in patients’ cigarette consumption and increases in beliefs regarding their quitting ability may occur up to three months post-discharge, but not beyond; suggesting the need for continued cessation support post-discharge. Facilities with complete smoking bans and those that provided nicotine dependence treatment appeared to be associated with more positive smoking outcomes. However, few studies provided detailed information regarding adherence to the smoking ban and provision of nicotine dependence treatment to adequately assess if these factors were responsible for changes in patient smoking-related behaviours.

Chapters 2 and 3 describe the results of a survey conducted among patients of a smoke-free inpatient psychiatric facility in Australia. Given the limitations of previous research identified in Chapter 1, the aim of Chapter 2 was to examine key quality of implementation indicators of the smoke-free policy, including patients’ self-reported adherence to the smoking ban; their perception of staff support for the smoke-free policy; their receipt of nicotine dependence treatment; and the association between these factors and patients’ acceptability of the smoke-free policy. By assessing such indicators, potential barriers to the successful implementation of smoke-free policies in inpatient psychiatric settings were identified, as were strategies that may enhance the opportunity provided by a smoke-free psychiatric hospitalisation to initiate smoking
cessation treatment. Overall, adherence to the smoking ban was poor, and nicotine dependence treatment was variable. The smoke-free policy in the study unit was acceptable to less than half of participants, and least so to smokers. Modifiable factors pertaining to policy implementation, including staff support of the smoke-free policy, and patient adherence to the smoking ban, predicted patient acceptability.

Chapter 3 presents the smoking-related results of the survey of psychiatric inpatients described in Chapter 2 and examined smokers’ readiness to quit smoking, their previous quitting behaviours, and factors associated with readiness to quit and making a recent quit attempt. The findings of the survey in Chapter 3 confirmed the high prevalence of smoking and levels of nicotine dependence among persons hospitalised for psychiatric treatment, however also indicated that most smokers had made a number of recent, unsuccessful attempts to quit. Readiness to quit was found to predict making a quit attempt in the previous 12 months. These findings counter common staff perceptions that smokers with a mental disorder do not want, or do not attempt to quit, and further support the assertion that intensive smoking cessation interventions, comprising behavioural and pharmacological support should be provided to smokers with a mental disorder.

Chapters 4 and 5 describe a randomised controlled trial that examined the efficacy of a multimodal smoking cessation intervention, initiated during a smoke-free psychiatric hospitalisation and continued for four months post-discharge in reducing tobacco consumption among smokers with a mental disorder. Chapter 4 describes the protocols and methodologies employed in the trial, and Chapter 5 describes the primary and secondary smoking-related outcomes. At end-of-treatment, patients who received
ongoing treatment for their smoking post-discharge had significantly higher rates of biochemically validated seven day point-prevalence abstinence than those in the treatment as usual control condition. At the six month follow-up, patients in the intervention condition were significantly more likely to have reduced their tobacco consumption by 50% or greater since baseline, were more likely to have made a quit attempt, and had lower levels of nicotine dependence than smokers in the control condition. The findings of this trial indicated that a smoking cessation intervention, initiated during a smoke-free psychiatric hospitalisation, and continued for up to four months post-discharge is an effective treatment model for reducing tobacco consumption among persons with a mental disorder. However, the trial produced limited results for smoking cessation beyond end-of-treatment, indicating that further research, incorporating more intensive and extended cessation support may be needed to reduce the prevalence of smoking among persons with a mental disorder.

The concluding chapter of this thesis provides an overview and synthesis of the main findings of these five papers, and discusses their implications for future research and the development of effective intervention strategies for smokers with a mental disorder. Overall, this thesis represents a significant step forward in understanding the smoking-related characteristics, motivations and behaviours of smokers with a mental disorder, and contains one of only two trials conducted internationally to test the efficacy of initiating smoking cessation treatment during a smoke-free psychiatric hospitalisation and continuing such care post-discharge. This thesis highlights the importance of providing tailored, intensive smoking cessation support to smokers with a mental disorder, and provides promising results for the feasibility, acceptability and efficacy of
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smoking cessation interventions initiated in the psychiatric inpatient setting and continued post-discharge for reducing smoking behaviours among this vulnerable group. In order for sustained, large scale changes in smoking rates among persons with a mental disorder to occur, three main areas need to be addressed in future research:

1. Identifying strategies to increase effective implementation of smoke-free policies in inpatient psychiatric facilities, particularly in regards to increasing staff support for smoke-free policies, increasing patient adherence to smoking bans, and increasing staff provision of nicotine dependence treatment to patients.

2. Testing the efficacy of extended, more intensive evidence-based smoking cessation interventions for reducing the prevalence of smoking among persons with a mental disorder.

3. Identifying pathways for continued smoking cessation support post-discharge, and to identify methods of effective integration of smoking care within mental health services.
INTRODUCTION: LINKING MENTAL HEALTH INPATIENTS TO POST-DISCHARGE SMOKING CESSATION SUPPORTS
INTRODUCTION: Linking mental health inpatients to community cessation supports

1. Introduction

Despite significant reductions in population smoking rates in developed nations over the last 50 years, tobacco remains the second leading risk factor for death and disease, and was responsible for more than five and a half million deaths globally in 2010 [1]. Global tobacco attributable mortality has been projected to increase from 5.4 million in 2005 to 8.3 million in 2030 and be responsible for 10% of all deaths [2]. The health risks associated with tobacco are well known, and include ischaemic heart disease, stroke, peripheral vascular disease, cancer and respiratory diseases [3]. Tobacco dependence is now increasingly recognised as a chronic disease [4, 5], and the risk of tobacco-related disease can be reduced by providing smoking cessation treatment [6].

While reductions in global smoking rates have occurred [7], rates of smoking remain disproportionately high for disadvantaged subgroups, particularly persons with a mental disorder [8, 9]. Currently, in Australia, the prevalence of smoking in the general population is 15% [10]. However, for persons with a mental disorder, smoking rates range from 35% to 88% depending on diagnosis and setting [11-15]. Smokers with a mental disorder also smoke more heavily, are more nicotine dependent, less likely to quit, and suffer greater health and financial burden due to smoking than smokers in the general population [13, 16, 17]. Little research has been conducted on smoking behaviour among persons with a mental disorder, and few studies have rigorously examined the efficacy of smoking cessation interventions among this population. This introduction will: provide an overview of the research on smoking among persons with a mental disorder; provide a critical analysis of existing smoking cessation intervention trials for smokers with a mental disorder; identify smoke-free psychiatric inpatient
settings as a potential platform from which to initiate smoking cessation treatment; and provide a rationale for, and overview of the research contained in this thesis.

2. Smoking among persons with a mental disorder

2.1 Prevalence of mental disorders and mental health treatment

Mental illness comprises a broad category of disorders including psychotic disorders such as schizophrenia, schizoaffective disorders and other related psychosis, mood disorders including major depression and bipolar disorder, anxiety and personality disorders [18]. The World Health Organisation (WHO) world mental health surveys estimated that the prevalence of lifetime mental disorders as classified by the Diagnostic and Statistical Manual-IV (DSM-IV) ranges between 18.1-36.1% [19]. Some of the most commonly experienced mental disorders are anxiety and mood disorders, with estimated global 12-month point prevalence averaging 12% and 6% respectively [19]. In Australia, surveys conducted by the Australian Institute of Health and Welfare (AIHW) in 2007 estimated that 45% of the population had experienced a mental disorder at some point in their lifetime [20]. The 12-month point prevalence of such disorders was 20%, of which 14.4% were anxiety disorders, 6.2% were mood disorders and 5.1% were substance use disorders [21]. Of the persons with a 12-month mental disorder, over a third (35%) had accessed mental health care services in 2007 [21]. In terms of acute bed-based mental health treatment, there were 223,621 admitted patient mental health separations, accounting for 2.5% of total hospital separations for the period of 2010-11 [22]. Of these, specialist psychiatric care was provided to 59.5%
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(132,917), or 1.5% of total hospital admissions. Bed-based psychiatric treatment is most commonly provided for patients presenting with a depressive episode (16.7%) or psychotic disorder (16.1%) [22]. Data from the 2010 Survey of High Impact Psychosis (SHIP) indicated that of the persons with a current psychotic disorder residing in Australia, over one third (38.4%) had one or more admitted psychiatric patient episodes in 2010, with an average length of admission of 40 days [23]. The rate of hospitalisations for bed-based psychiatric treatment in Australia has increased by 1.6% annually in the five years leading up to 2010-11 [22].

2.2 Prevalence of smoking and nicotine dependence

Population based studies of smoking prevalence have estimated rates of smoking among persons with a mental disorder to be at least double general population estimates [8, 24], with smoking prevalence increasing as the number of lifetime mental disorders increases [24]. Prevalence of smoking among persons with a mental disorder residing in the community has been estimated to range from 33-36.2% in New Zealand [25] and Australian samples [8] to 44.3-47.0% in the United States (US) [24] and United Kingdom (UK) [26]. Prevalence of smoking has been shown to vary depending on diagnosis and setting, with rates found to range between 36-39% for persons with anxiety and personality disorders [13], 36-49% for persons with depressive and mood disorders [13, 24, 27] and between 70-88% for persons with psychotic disorders (including schizophrenia and schizoaffective disorders) and persons with co-morbid mental health and substance use disorders [15, 27, 28]. Some of the highest reported rates of smoking have been identified among individuals hospitalised for psychiatric
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treatment, with rates of smoking ranging from 45.9-81.8% for this group [11, 13, 29] compared to persons with a lifetime mental disorder residing in the community [24, 30]. In addition to increased smoking prevalence, smokers with a mental disorder also inhale more deeply and absorb greater levels of nicotine per cigarette [31-33], and are more nicotine dependent than smokers in the general population [13, 28, 34, 35]. In the US, a national survey of alcohol and related conditions conducted in 2001-02 found that the prevalence of nicotine dependence as determined by the DSM-IV was higher among individuals with any mood, anxiety or personality disorder (29.2%, 25.3%, and 27.3%, respectively) compared to the general population sample (12.8%;[34]).

2.3 Health burden

The 2010 Global Burden of Disease study identified tobacco as the second leading risk factor for death and disability, accounting for 5,695,349 deaths and 6,297,287 years of life lost due to disability in 2010 alone [1]. Mortality attributable to tobacco use has been projected to increase to 8.3 million in 2030 and be responsible for 10% of all deaths globally [2]. Tobacco-related health risks include ischaemic heart disease, stroke, peripheral vascular disease, throat, oesophageal and lung cancers, and respiratory diseases [3]. In Australia, 15,500 deaths were attributable to tobacco in 2003 [36], and while the overall burden of disease from smoking dropped from 10% of the total burden in 1996 to 8% in 2003, it remained the largest single risk factor contributing to disease and death [37]. Given their disproportionate rates of smoking, persons with a mental disorder are more likely to suffer and die from tobacco-related disease, most commonly chronic pulmonary illness, cardiovascular disease, and cancer [38-40]. Persons with a
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mental disorder also suffer a reduced quality of life [41], and have increased use of health care services [21]. As a result of the disproportionate burden of tobacco consumption among this group, persons with a mental disorder have been estimated to have a reduced life expectancy of 12-25 years compared to the general population, with most excess deaths attributable to cardiovascular disease [40-42].

2.4 Costs

Direct financial costs due to smoking among persons with a mental disorder are substantial. In Australia, hospital systems bear a large proportion (38%) of smoking-related costs [36]. In NSW, smoking contributed to 42,000 hospitalisations, equating to over AUD$176 million in hospital-related costs for the period of 2006-07 [43]. The annual financial costs of the disproportionate prevalence of smoking among persons with a mental disorder in Australia, including health system costs, reduced productivity and tobacco excises has been estimated to be over AUD$3.5 billion [44]. Due to the disproportionately high rate of smoking among persons with a mental disorder, personal financial costs are correspondingly higher. Disadvantaged smokers, including those with lower incomes, minority status and higher levels of nicotine dependence experience greater levels of social-induced deprivation (i.e. prioritising the purchase of cigarettes over household essentials) due to tobacco smoking [45], and the recent increases in tobacco excises in Australia, resulting in higher purchase prices for tobacco, further enhance this effect [46]. SANE Australia estimated that persons with a mental disorder pay approximately AUD$2.8 billion a year in tobacco excises [44]. Further, cigarette smoking enhances P450 liver cytochrome enzyme activity, increasing the
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metabolism of common psychiatric medications including antipsychotics (e.g., clozapine), and antidepressants (e.g., fluvoxamine) resulting in higher required doses and associated pharmaceutical costs [47, 48]. Tobacco-related costs comprise a significant portion of income for persons with a mental disorder, many of whom are unemployed and rely on government disability support pensions [21]. It has been estimated that persons with a mental disorder spend up to 30% of their pension on tobacco products [17, 49].

2.5 Motivation to quit, quit attempts, and quit rates

A common perception held among staff working in mental healthcare settings is that smokers with a mental disorder are not willing, or motivated to quit [50-52]. However, the limited evidence available suggests that smokers with a mental disorder are as equally motivated to quit as smokers in the general population [21, 53, 54]. US population level data indicates that smokers with a mental disorder residing in the community make a similar [55] or an even greater number [56] of quit attempts than smokers without such disorders, and there is some evidence to suggest that smokers hospitalised for acute psychiatric treatment have also made repeated attempts to quit smoking throughout their lifetime [57, 58]. Despite these consistent efforts, smokers with a mental disorder are significantly less likely to quit smoking than smokers among the general population [13, 28, 35, 55]. A meta-analysis examining smoking behaviours among male smokers with schizophrenia found that cessation rates in this group (18%) were significantly lower than those achieved among the general population (38%) [28]. Similarly low quit rates have also been found for psychiatric inpatients (24.7%),
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particularly those with a psychotic disorder (9.5%) and comorbid substance use disorders (10.4%; [13]) relative to smokers residing in the community without such disorders [59]. Further, a study of smoking characteristics and quitting behaviours among psychiatric outpatients with a severe mental disorder in the US found that while smokers with a mental disorder were three times as likely to ever smoke, and five times as likely to be a current smoker, they were about one-fifth as likely to stop smoking than the general population [35]. Importantly, the rate of smoking decline over time among persons with a mental disorder has been demonstrated to be significantly lower than among the general population [60]. An analysis of nationally representative surveys of community residing individuals in the US found that between the years 2004 and 2011, smoking rates declined significantly from 19.2% to 16.5% for persons in the general population, however changed only marginally from 25.4% to 24.9% among persons with a mental disorder, suggesting that cessation interventions targeting the general population have not been effective in reducing smoking rates among persons with a mental disorder [60].

2.6 Factors which mitigate against smoking cessation

Biological, social and psychological factors contribute to the disproportionately high rate of smoking among persons with mental disorder, however the interactions between these factors are complex and direct causes are unlikely to be determined [61]. Nicotine acts on the brain’s nicotinic acetylcholine receptors, facilitating the release of neurotransmitters including dopamine, resulting in pleasure, reward, stimulation and mood modulation [62]. Repeated exposure to nicotine results in changes in the brain’s
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nicotinic receptors and neural plasticity, including an up-regulation of nicotinic acetylcholine receptors, leading to a tolerance of many of the effects of nicotine and consequently, the development of nicotine addiction [62]. Thus, when nicotine is not available, withdrawal symptoms including irritability, anxiety, poor concentration, sadness and agitation can develop [62]. Researchers suggest that persons with a mental disorder may have an increased genetic vulnerability to the effects of nicotine, and experience greater reward or pleasure than smokers without such disorders [61]. It has also been suggested that persons with a mental disorder may initiate smoking in an attempt to self-medicate, or cope with psychiatric symptoms [63]. Indeed, recent qualitative studies of smokers with a mental disorder have identified that smoking is commonly used as a tool to cope and manage stress among this group [64, 65]. Ritualistic habits such as sitting down and rolling a cigarette have been identified as calming among some smokers [64]. Further, the process of breathing deeply when inhaling tobacco smoke has been reported to be relaxing, and in some cases, has been considered by smokers to be more effective in managing negative affect than anti-depressant medication [64]. In support of this pattern of behaviour, it has been identified that depressive affect precedes smoking onset, and predicts transition from cigarette use to nicotine dependence [66]. It has also been demonstrated that smoking for reduction in negative affect is greater among smokers with more severe depressive symptoms, supporting the self-medication hypothesis [67]. For persons suffering an anxiety disorder, it has been hypothesised that elevations in cortisol levels in response to stressful events via the hypothalamic-adrenal-pituitary (HPA) axis may enhance both tolerance and sensitisation to the effects of nicotine, potentially accounting for higher levels of smoking among persons with anxiety disorders, who may attempt to self-
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regulate or cope with emotional distress through smoking [68]. There is also some
evidence that nicotine can improve cognitive functioning in persons with schizophrenia,
including sustained attention [69] and an improved ability to filter out irrelevant
auditory information [70], however the possibility of these effects being due to the
reversal of withdrawal symptoms cannot be ruled out.

Potential social contributors to the disproportionate rate of smoking among persons with
a mental disorder are equally complex and may include poverty and financial stress,
unemployment, homelessness, lower levels of education, access to health services and
social support networks, and peer pressure [20, 21]. Persons with a mental disorder are
also more likely to be exposed to cultural norms of smoking at home, and in the
workplace [71]. However, recent evidence suggests that both mental illness and
socioeconomic status are independently associated with smoking and lower likelihood
of smoking cessation, suggesting that the association between mental illness and
smoking may not be explained by these socioeconomic factors [72].

Importantly, smokers with a mental disorder have reduced access to smoking cessation
resources [73], and are also less likely to receive support for nicotine addiction when in
contact with healthcare services, both in outpatient [74] and inpatient mental healthcare
settings [74, 75]. Psychiatrists have been found to be less likely to use tobacco treatment
resources with their patients than other physicians [76], and to have the lowest
awareness of tobacco treatment guidelines among physicians working in tobacco
sensitive specialities (such as cardiology and oncology) [76, 77]. For smokers
hospitalised for psychiatric treatment, additional social and cultural influences on
smoking are apparent. A long standing culture of tobacco smoking exists within
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inpatient psychiatric institutions, where smoking has long been accepted and even condoned [51, 61]. Cigarettes have, even recently, been used as a means of behaviour modification, and smoking has often been found to serve as a common social activity for patients and staff in inpatient psychiatric settings [61, 78, 79], thereby reinforcing the ‘smoking culture’ within inpatient psychiatry.

3. Smoking cessation interventions

3.1 Types and efficacy of smoking cessation interventions

Smokers with a mental disorder are often excluded from smoking cessation intervention trials, and as such, the efficacy of such interventions among this population has not been subject to large scale systematic reviews or meta-analyses [80]. However, a large evidence base exists for the efficacy of smoking cessation treatments for smokers in the general population.

3.2 Pharmacological interventions

The efficacy of pharmacotherapy for smoking cessation is well established [81]. Typically, pharmacotherapy comprises nicotine replacement therapy (NRT), nicotine antagonists (such as the antidepressant bupropion) and nicotine receptor partial agonists (such as varenicline). Evidence regarding the efficacy of bupropion and varenicline in increasing quit rates among smokers in the general population is well established [82, 83], and is growing for persons with a mental disorder [84]. However, there remains
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some contention as to the safety of varenicline in psychiatric populations, with post-marketing reports detailing serious side effects, including depressed mood, agitation and suicidal ideation and behaviour [82, 85]. NRT is the most widely accepted and recommended form of pharmacotherapy for smoking cessation [81], and clinical practice guidelines recommend NRT as a first line treatment for people seeking pharmacological assistance to quit smoking [4]. NRT works by temporarily replacing much of the nicotine usually inhaled in cigarettes, thus reducing the desire to smoke, and symptoms of nicotine withdrawal. Due to the limited bioavailability and potential toxicity associated with ingesting nicotine via the gastrointestinal tract, NRT is formulated to be absorbed through the oral or nasal mucosa (via chewing gum, lozenges, sublingual tablets, inhaler and nasal spray) and through the skin (via transdermal patches). The 2012 updates of smoking cessation interventions conducted by the Cochrane Collaboration Tobacco Addiction Review Group found that the absolute risk ratio of abstinence for any form of NRT was 1.60 (95% confidence interval (CI): 1.53 to 1.68), thus increasing the rate of quitting by 50-70% [81]. Risk ratios (RR) were fairly consistent across the different forms of NRT, the highest of which was for nicotine inhaler (RR: 2.02, 95% CI: 1.49 to 2.73), followed by lozenges (RR: 1.90, 95% CI: 1.36 to 2.67), nicotine patch (RR: 1.95, 95% CI: 1.40 to 1.60), and nicotine gum (RR: 1.49, 95% CI: 1.40 to 1.60). The review also identified that combining slow-release nicotine patch with faster acting forms of NRT (such as nicotine gum or lozenge) was more effective than a single type of NRT [81].
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3.3 Psychological interventions

Psychological interventions for smoking cessation may include individual, group, online or telephone-based counselling, and are typically based on principles underlying treatments such as cognitive behaviour therapy (CBT), and motivational interviewing [86-89]. Such treatments may involve topics such as challenging maladaptive thinking patterns and negative behaviours, exploring ambivalence and barriers towards smoking cessation, identifying and managing high risk situations, withdrawal management, and coping and problem solving strategies [89]. Additional strategies may include group bonding, ‘buddy’ systems [90], and withdrawal-oriented therapy, which primarily focuses on managing the physiological symptoms associated with smoking cessation such as agitation, as well as strategies for relapse prevention [91]. There is a consistent evidence base that such psychological interventions significantly increase the likelihood of smoking cessation relative to less intensive supports, whether delivered as individual face-to-face [89], telephone-based [87] or group-based counselling [88], or via the provision of written self-help material [92]. A meta-analysis of 58 trials found that individual smoking cessation counselling among general population smokers increased the odds of successful smoking cessation by 1.7 compared to no intervention [5]. Motivational interviewing techniques have also been found to significantly increase the chance of cessation success among smokers in the general population (RR: 1.27, 95% CI: 1.14 to 1.42), and have been found to be more effective when delivered by clinicians in primary care settings (RR: 3.49, 95% CI: 1.53 to 7.94) and when sessions last 20 minutes or longer (RR: 1.31; 95% CI: 1.16 to 1.49) [86]. A systematic review and meta-analysis of 53 trials examining the effectiveness of group-based therapy for smoking
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cessation found that attendance at a group program increased the likelihood of cessation compared to both no intervention controls (odds ratio (OR): 2.17, 95% CI: 1.37 to 3.45) and self-help programs alone (OR: 2.04, 95% CI: 1.60 to 2.60) [88]. Similarly, a systematic review and meta-analysis of 77 trials of telephone counselling for smoking cessation identified that multiple sessions of proactive telephone counselling significantly increased the likelihood of smoking cessation (RR: 1.37, 95% CI: 1.26 to 1.50) [87]. Further, self-help materials have been found to be effective in improving smoking cessation rates among general population smokers, and are particularly effective when the material is tailored to the characteristics of the individual (OR: 1.42, 95% CI: 1.26 to 1.61) [92].

3.4 Combination interventions

Clinical practice guidelines often recommend that pharmacological and behavioural smoking cessation interventions be delivered in combination on the basis that they may have an additive or multiplicative effect on the chances of quitting [5, 93]. A recent systematic review and meta-analysis of 41 trials examining the efficacy of combined pharmacological and behavioural supports for smoking cessation found a significant beneficial effect of combined therapies relative to usual care or brief advice (RR: 1.82, 95% CI: 1.66 to 2.00) [93], with stronger effects for patients in healthcare rather than community settings, and in trials where cessation advice was linked with usual care rather than provided by specialist counsellors. The review also identified some evidence of a dose-response relationship whereby trials offering more sessions, and those with greater treatment adherence produced larger effect sizes [93].
3.5 Smoking cessation interventions for smokers with a mental disorder

Clinical practice guidelines similarly recommend the provision of combined pharmacological and psychological cessation treatments to aid smoking cessation among persons with a mental disorder [5]. However, given that smokers with a mental disorder consume greater numbers of cigarettes per day, inhale more deeply, absorb greater amounts of nicotine per cigarette and are more nicotine dependent than smokers without such disorders [13, 28, 35], more intensive, tailored cessation treatment may be required to reduce smoking prevalence among this group [56]. Several randomised controlled trials (RCTs) have examined the efficacy of combined pharmacological and psychological smoking cessation interventions among adults with a mental disorder in community or outpatient settings, however due to heterogeneous samples, differences in intervention type, delivery and duration; it is difficult to draw solid conclusions regarding the efficacy of such interventions, exemplifying the need for further research in this area.

In 2005, Evins and colleagues conducted a RCT examining the efficacy of adding CBT to sustained release bupropion among 53 clinically stable male and female outpatients with depressed-type schizophrenia who were willing to make a quit date within four weeks of study enrolment [94]. Participants allocated to the intervention condition received 300mg bupropion plus one weekly session of CBT for 12 weeks, and controls received the same weekly CBT plus placebo for 12 weeks. Intervention group participants were more likely than controls to be abstinent a week after the designated quit date (36% vs. 7%), at the end of the 12-week intervention (16% vs. 0%), and had
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higher rates of four-week continuous abstinence (16% vs. 0%), however these differences were not sustained beyond end of treatment.

In 2006, Hall and colleagues [95] conducted a RCT of 322 outpatients with current unipolar depression at four mental health outpatient services in the US. Participants were randomly assigned to a control condition, comprising a brief self-help guide and a referral list of smoking cessation sources in the area, or an intervention condition where participants received computerised motivational feedback, six weeks of psychological counselling, nicotine patches and the optional use of sustained release bupropion. Overall, participants allocated to the intervention condition demonstrated better smoking cessation outcomes, including higher rates of seven-day point prevalence abstinence at months 12 (14.1% vs. 9.4%) and 18 (18.4% vs 13.2%) following treatment, a greater number of quit attempts, and longer periods of total abstinence than controls [95]. While willingness to quit was not included in the eligibility criteria, smoking cessation treatment in the intervention condition was only provided to participants who scored a high level of motivation to quit at study intake, potentially influencing the cessation outcomes among this group.

A similar RCT conducted by Baker and colleagues [96] examined the efficacy of a combined pharmacological and behavioural smoking cessation intervention among 298 outpatients with non-acute psychotic disorders. Participants were randomly allocated to a treatment as usual control condition, or an intervention condition where participants received eight weekly sessions of motivational interviewing and individual CBT, provision of NRT and self-help material. No significant difference in continuous or seven-day point prevalence abstinence was found between treatment conditions at three,
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six or 12 month follow-up assessments, however intervention participants were significantly more likely to reduce their consumption of cigarettes by 50% or greater compared to controls at 12 month follow-up (31.3 % vs. 17.9%). Furthermore, seven-day point prevalence abstinence rates were higher among intervention participants who completed all eight treatment sessions compared to those attending 5-7 sessions at the three (30.0% vs. 2.4%), six (18.6% vs. 2.4%) and 12 month follow-up assessments (18.6% vs 7.1%). Additionally, the use of NRT at the three month follow-up was associated in a net reduction of 8.14 cigarettes consumed per day, suggesting favourable smoking reduction outcomes for smokers with a psychotic disorder when engaged in extended smoking cessation treatment. However, similar to the studies conducted by Evins et al [94] and Hall et al [95], participants in this trial [96] were required to express an interest in quitting for trial entry, potentially influencing the cessation outcomes.

Evins and colleagues [97] conducted a similar RCT examining the efficacy of a combined psychosocial and pharmacological smoking cessation intervention among 51 clinically stable outpatients with schizophrenia. Both groups received 12 weeks individual CBT and NRT and were required to set a quit date. The experimental group additionally received 12 weeks of 300mg bupropion. Participants allocated to the bupropion condition had a higher rate of 50-100% reduction in daily cigarette consumption at week 12 (60% vs. 31%), and were more likely to achieve continuous abstinence at the eight week assessment relative to controls (52% vs 19%). However these differences were not sustained when participants ceased using NRT, and continuous abstinence rates did not differ between the treatment and control groups respectively at weeks 12 (36% vs. 19%), 24 (20% vs. 8%), or 52 (12% vs. 8%).
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To date, only one published study has explored inpatient psychiatry as a setting for initiating smoking cessation treatment among smokers with an acute mental disorder [98]. In their study, Prochaska and colleagues recruited patients from a locked inpatient psychiatric facility with a smoke-free policy in the US, who were randomised to a treatment as usual control, or a multimodal smoking cessation intervention. The intervention was initiated during the patient’s admission to the psychiatric facility and comprised access to NRT, computerised motivational feedback, stage-tailored written self-help material, a 15-30 minute face-to-face consultation with a study counsellor and a letter mailed to the participant’s designated community-based healthcare provider requesting further cessation support. The inpatient intervention was repeated at three and six months post-discharge, and a 10-week supply of nicotine patches was provided once participants were ready to quit, for up to six months post-discharge. Validated abstinence rates at 18 months post-discharge were higher among patients receiving the multimodal smoking cessation treatment (20%) relative to usual care controls (7.7%).

While this study provides initial evidence for the efficacy of initiating smoking cessation treatment during a smoke-free psychiatric hospitalisation in reducing tobacco consumption among smokers with a mental disorder, further studies are needed to determine if this approach is acceptable, feasible and effective in inpatient psychiatric facilities elsewhere.
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4. Addressing smoking in hospital settings

4.1 The introduction of smoking bans

A 2005 report produced by the Tobacco Advisory Group of the Royal College of Physicians outlined the dangers caused by second hand smoke exposure [99]. The report identified that passive smoking was shown to cause lung cancer and ischaemic heart disease, and to potentially cause chronic obstructive pulmonary disease, asthma and stroke in adults [99, 100]. In the UK in 2003 alone, passive smoking was found to contribute to over 12,000 deaths, 500 of which were caused by exposure to environmental tobacco smoke in the workplace [99]. Partial restrictions on smoking, including ventilation measures may eliminate visible smoke, however, do not sufficiently reduce levels of environmental tobacco smoke to protect the health of individuals [99, 100]. Thus, smoking bans have been widely recommended as the only means to truly protect non-smokers from the damaging effects of environmental tobacco smoke in public places and workplaces [99, 100]. Evidence indicates that smoking bans may also reduce the prevalence of smoking and cigarette consumption among continuing smokers [101], and reduce national cigarette sales [102]. Consequently, restrictions on smoking in public places and workplaces – including hospitals and inpatient psychiatric facilities – have been introduced in most developed nations [103, 104]. While the degree of smoking bans imposed in workplaces can vary depending on local jurisdictions and policies, clinical practice guidelines recommend that policy makers adopt the ‘gold standard’ of prohibiting smoking both in buildings and surrounding outdoor areas [99]. In New South Wales (NSW), Australia, the Smoke-Free
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Workplace Policy (1999) [105] prohibits smoking inside all hospital buildings (including psychiatric units), and on hospital grounds.

4.2 Provision of nicotine dependence treatment

In hospital settings, clinical practice guidelines strongly encourage supplementing smoking bans with appropriate cessation supports for smokers [4, 106]. Clinicians in hospital settings are well poised to deliver smoking cessation treatment, however often lack knowledge and confidence regarding how to appropriately identify smokers and what treatments are most efficacious [107]. Consequently, in many developed nations, smoking cessation clinical practice guidelines have been introduced in hospital settings to guide clinicians in the consistent identification, documentation, and treatment of all smokers admitted to healthcare facilities [4, 106, 108, 109]. Such guidelines typically require treating staff to identify and record smoking status upon admission; provide smokers with behavioural and pharmacological nicotine dependence treatment during admission, including brief advice to quit and NRT, and include a smoking cessation treatment plan in the discharge treatment summary. Such provision of nicotine dependence treatment to smokers during a smoke-free hospitalisation helps manage the adrenergic effects of nicotine withdrawal during admission, and may increase the likelihood of cessation post-discharge [4]. In NSW, Australia, the Guidelines for the Management of Nicotine Dependent Inpatients (2002) [110] require staff to provide nicotine dependence treatment to all smokers admitted to hospitals in the state, including: documentation of smoking status and assessment of nicotine dependence on admission, provision of brief advice to quit, provision of NRT (including nicotine patch,
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lozenge, gum and inhaler) during admission and for three days upon discharge, and a smoking cessation treatment plan on the electronic discharge summary. These two components – smoking bans and the provision of nicotine dependence treatment – are henceforth collectively referred to as ‘smoke-free policies’.

**4.3 Smoke-free hospitals: a teachable moment**

For many smokers, a smoke-free hospital admission provides an opportunity to initiate a quit attempt in a supportive environment away from contextual cues to smoke, and may help prompt patients to address their smoking behaviour post-discharge [111]. Stopping smoking during hospitalisation also offers the advantage of doing so at a time where behavioural and pharmacological support is available from treating clinicians [4]. Hospitalisation itself has been found to raise awareness of health concerns, potentially increasing patients’ receptivity to quitting messages [112]. Among general medical patients, hospitalisation has been associated with an increase in readiness to quit on the transtheoretical ‘stages of change’ scale [112, 113]. Further, abstaining from smoking during a hospital admission has been found to be associated with a greater likelihood of remaining abstinent up to six months post-discharge [114]. As such, a smoke-free hospitalisation has been identified as a ‘teachable moment’ for smoking cessation [112, 115], and may represent a potential platform from which smoking cessation interventions may be initiated.
5. Addressing smoking in inpatient psychiatric settings

5.1 Difficulties implementing smoke-free policies in inpatient psychiatric settings

Psychiatric inpatient settings represent a unique challenge for the implementation of smoke-free policies. These institutions, along with prisons and long-term residential facilities, function as both workplaces and residences. Consequently, the right for non-smoking employees and patients not to be exposed to environmental tobacco smoke is sometimes considered to be in conflict with smokers’ perceived rights to smoke. Consequently, inpatient psychiatric facilities, particularly those which accommodate involuntary patients, have often been made exempt from smoking bans [99, 116, 117].

Where smoking bans have been introduced in inpatient psychiatric settings, they have often been met with resistance from staff [9, 118] and patients [119, 120], and as such, implementation of, and adherence to smoking bans has been reported to be difficult [117, 121, 122]. Medical record audits of the provision of nicotine dependence treatment in inpatient psychiatric facilities in the US and Australia have indicated that the recording of nicotine dependence or withdrawal occurs rarely, if ever, and provision of nicotine dependence treatment is negligible (0-0.5%) [75, 123]. Additionally, studies conducted in Denmark [120], the US [124], UK [125] and Australia [126] have indicated that smoking continues to occur in ‘smoke-free’ inpatient psychiatric settings, exposing staff, patients and visitors to the harmful effects of environmental tobacco smoke.

Barriers to the effective implementation of smoking bans, and provision of nicotine dependence treatment in inpatient psychiatric settings are many and complex, and
INTRODUCTION: Linking mental health inpatients to community cessation supports

include the perception among staff that smoking bans will disrupt the ward’s treatment milieu, and that negative psychiatric symptoms, particularly aggression and agitation, will be exacerbated with the restriction of smoking [127]. However, review evidence has indicated that smoking bans can be implemented in inpatient psychiatric settings with no changes in patients’ levels of aggression, use of seclusion, provision of as-needed medications or discharge against medical advice [126, 128]. Another potential barrier to the successful implementation of smoke-free policies in these settings is the commonly held perception among mental health staff that their patients are not motivated or able to quit [50-52]. However, most of the existing research examining the introduction of smoking bans in inpatient psychiatric facilities has focused solely on staff attitudes, and patients’ behavioural responses to the bans [126], with little consideration given to patient attitudes, their quitting intentions and the effect such a smoke-free psychiatric hospitalisation may have on their future smoking behaviours.

5.2 The need for integrated smoking care

While policy and legislative changes regarding the provision of smoking care in inpatient psychiatric settings mean that admission to hospital may be opportune time to address smoking, the efficacy of such an intervention is limited if no continuation of care is provided post discharge. It has been suggested that smoke-free policies in inpatient psychiatric settings have had little effect on long-term smoking cessation due to the lack of coordination between inpatient and community mental health services [6]. A recent Cochrane review of smoking cessation interventions delivered in the general hospital setting found that, despite the potential offered by a smoke-free hospitalisation

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In providing smoking cessation treatment, interventions delivered during hospitalisation were only effective in reducing smoking behaviour if combined with at least one month follow-up support post-discharge [129]. The review found no evidence to support the efficacy of interventions delivered in the hospital setting alone [129]. The authors estimated that by integrating inpatient smoking care with community-based smoking cessation support post-discharge, the odds of smoking cessation increased by 37% at 6-12 months post-discharge compared to inpatient smoking care alone. A similar trend may be evident for patients hospitalised for psychiatric treatment, however research examining the efficacy of such an integrated model of smoking cessation treatment in inpatient psychiatric settings is lacking.

6. Summary of limitations of existing research

The literature reviewed in this chapter highlighted the disproportionate rate of smoking among persons with a mental disorder and the corresponding health, social and financial burden suffered by this group. The review indicated that although a smoke-free psychiatric hospitalisation may be an opportune moment to initiate smoking cessation treatment among smokers with a mental disorder [130]; few studies have examined the impact of a smoke-free psychiatric hospitalisation on patient’s smoking-related behaviours, motivations or beliefs. Further, despite issues relating to the quality of implementation of such a policy, including low levels of: patient adherence [120, 124-126]; staff support [9, 118] and provision of nicotine dependence treatment [75, 123], no studies have examined how these quality of implementation issues impact on patients’ acceptability of smoke-free policies. Examining if these modifiable
implementation factors have an impact on patients’ smoking behaviours or their acceptability of smoke-free policies may assist in the identification of strategies to improve the implementation of smoke-free policies in inpatient psychiatric settings, and hence maximise the intended benefits of such policies for patients.

The literature review also identified that despite commonly held staff perceptions that smokers with a mental disorder are unmotivated or unwilling to quit [50-52], few studies have assessed the actual smoking behaviours and quitting intentions of a particularly high risk group: smokers hospitalised for psychiatric treatment. Previous studies investigating interest in quitting among persons with a mental disorder have, for the most part, been restricted to considering specific diagnostic subgroups in community settings; particularly patients with schizophrenia and depression [57, 131-135]. Additional knowledge of the smoking behaviours and quitting intentions among the high risk group of people with acute mental disorders in inpatient psychiatric facilities is needed, given their particularly high rates of smoking and the requirement for clinical staff in such facilities to systematically provide nicotine dependence treatment to all smokers.

Only limited research has previously reported the efficacy of smoking cessation interventions for smokers with a mental disorder. Such research has found that interventions incorporating a combination of behavioural and pharmacological supports have modest success in increasing cessation rates and reducing daily cigarette consumption [94-98, 136]. Most of the studies were limited to: examining the efficacy of smoking cessation treatments among a particular diagnostic group (most commonly
schizophrenia and other psychoses [84, 137]); patients without active co-morbid substance misuse (other than tobacco); either non-acute outpatients or people residing in the community [84, 94, 97, 136, 138, 139]; and to participants who were willing to quit smoking, or to set a quit date [84, 137]. As a consequence of such design elements, knowledge of the efficacy of interventions for the high risk group of patients in inpatient facilities is lacking. Assessment of the efficacy of strategies for offering cessation support to all such smokers rather than specific diagnostic groups or only those expressing an interest in quitting is required to identify models of care that align to the recommendations of clinical practice guidelines.

7. Aims of the thesis

To address the gaps identified in the existing literature, the aims of this thesis were to:

1) Explore the impact of a smoke-free psychiatric hospitalisation on post-discharge smoking behaviours among smokers with a mental disorder, and to explore the association between such impacts and the level of smoking restrictions imposed (total or partial ban) and the provision of hospital-based nicotine dependence treatment. This research question is addressed by a systematic literature review of studies that have examined changes in smoking behaviours among patients admitted to an inpatient psychiatric facility with a smoke-free policy.

2) Examine the quality of implementation of a smoke-free policy in an inpatient psychiatric facility, including staff support for the policy, patient adherence to the smoking ban, and provision of nicotine dependence treatment to
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patients, and to determine the association between such quality indicators and patient acceptability of the smoke-free policy. This research question is addressed by a study involving a cross-sectional survey of current inpatients of an Australian inpatient psychiatric facility with a smoke-free policy.

3) Explore smoking behaviours and quitting intentions among psychiatric inpatients, and the factors associated with previous quit attempts, and readiness to quit. This research question is addressed by a study involving a cross-sectional survey that examined the smoking-related characteristics of psychiatric inpatients.

4) Examine the efficacy of an integrated smoking cessation intervention for smokers with a mental disorder. This research question is addressed through a randomised controlled trial of a combined behavioural and pharmacological smoking cessation intervention, initiated during a smoke-free psychiatric hospitalisation and continued for up to four months post-discharge.

5) Based on the findings of the studies undertaken to address the above aims, propose recommendations for future practice and research regarding the implementation of smoke-free policies in inpatient psychiatric settings, the provision of evidence-based smoking cessation treatments in such settings, and opportunities to link hospital-based with community-based smoking cessation treatment for smokers with a mental disorder.

This thesis comprises six chapters that address the above aims. Five of these chapters have been written in the style of a journal article in accordance with the University of
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Newcastle rules regarding ‘submission by publication’ (Appendix 1). Four papers based on the chapters of this thesis have been published in peer-reviewed journals. A further one has undergone peer review, has been revised accordingly, and has been re-submitted for consideration in the journal.
CHAPTER 1: THE IMPACT OF A SMOKE-FREE PSYCHIATRIC HOSPITALISATION ON PATIENT SMOKING OUTCOMES: A SYSTEMATIC REVIEW

Emily A. Stockings\textsuperscript{1,2}, Jenny A. Bowman\textsuperscript{1,2}, Judith J. Prochaska\textsuperscript{3}, Amanda L. Baker\textsuperscript{1,4}, Richard Clancy\textsuperscript{1,4}, Jenny Knight\textsuperscript{5}, Paula M. Wye\textsuperscript{1,2,5}, Margarett Terry\textsuperscript{6}, John H. Wiggers\textsuperscript{1,2,5}.

\textsuperscript{1} University of Newcastle, University Drive, Callaghan, New South Wales, (NSW) Australia, 2308
\textsuperscript{2} Hunter Medical Research Institute (HMRI), Level 3 John Hunter Hospital, Lookout Road, New Lambton Heights
\textsuperscript{3} Stanford Prevention Research Center, Department of Medicine, Stanford University, Stanford, CA, United States.
\textsuperscript{4} Centre for Translational Neuroscience and Mental Health (CTNMH), Mater Hospital Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
\textsuperscript{5} Hunter New England Population Health (HNEPH), Longworth Ave, Wallsend, NSW, Australia, 2287.
\textsuperscript{6} Mental Health and Substance Use Service (MHSUS), Mater Hospital, Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.


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http://anp.sagepub.com/.
CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes

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 [140].

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
CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes

up to three months post-discharge. Further controlled studies with more rigorous
designs are required to confirm this potential.
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

**Introduction**

Smoking remains one of the leading preventable causes of death and disease in western nations [141]. People with a mental disorder smoke at higher rates [8, 23] are more dependent on nicotine [142], and are less likely to quit than the general population of smokers [35, 143]. 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 [40]. Some of the highest levels of smoking have been observed among patients hospitalised for psychiatric treatment [11, 13].

Smoking bans have been introduced in general hospital settings in a number of countries [103]. Such bans seek to protect patients, staff and visitors from the harmful effects of second hand smoke exposure [99], and have been found to be associated with reductions in staff smoking [104, 144]. 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 [4]. 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 [145] and the likelihood of remaining abstinent for up to 12 months post-discharge [114, 145, 146]. 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 37% at 12 months post-discharge [147].

Clinical practice guidelines similarly recommend the introduction of smoke-free policies incorporating complete smoking bans and the provision of nicotine dependence
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

Treatment within psychiatric facilities [99, 148]. While the introduction of smoking bans in these settings has often been delayed and/or reported to be difficult [121, 149], 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 [126, 150, 151].

Although a smoke-free psychiatric hospitalisation may positively impact on patients’ smoking behaviours, as evidenced among smokers in general hospital settings [114, 145, 146], 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 [152]. A PRISMA checklist (Table 13) for the review is included in Appendix 3. 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
CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes

“(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 [140] 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
CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes

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

A data extraction form was developed based on guidance literature [153] 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 [140]. 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 assessor. For the other domains, criteria for determining risk of bias were retained as per the original tool [140]. 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 with 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 et al [154] reported on the same sample as Prochaska et al [14], both papers were considered as one study, and have been cited as the earlier study [14].
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

<table>
<thead>
<tr>
<th>Identification</th>
<th>Screening</th>
<th>Eligibility</th>
<th>Included</th>
</tr>
</thead>
</table>
| Records identified through database searching  
(n = 329)  | Records after duplicates removed  
(n = 156) | Records excluded, as did not relate to the search topic  
(n = 70) | Articles included in qualitative synthesis  
(n = 15) |
| Additional records identified through other sources  
(n = 5) | | | |
| Records screened  
(n = 86) | | Full-text articles excluded, with reasons  
(n = 71) |
| | | Study conducted in inpatient psychiatric facility with smoking restrictions but did not examine patients’ smoking behaviours  
(n = 25)  |
| | | Study conducted in inpatient psychiatric facility without smoking restrictions  
(n = 21) |
| | | Did not contain original data  
(n = 21) |
| | | Study conducted in inpatient psychiatric facility with smoking restrictions, but surveyed clinical staff only  
(n = 4) |

*Figure 1. PRISMA flowchart of the study selection process*
CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes

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 [14, 38, 119, 155-158], three in Switzerland [12, 159, 160], two in the United Kingdom [125, 161], and two in Australia [53, 162]. None of the studies involved randomised controlled trials. Six studies were conducted as cross-sectional surveys at a single time point [125, 157, 158, 160-162] and four as cross-sectional surveys at multiple time points in the same facility and at various stages of smoke-free policy implementation [12, 119, 156, 159]. Four studies used repeated measures designs, two of which examined changes in smoking-related behaviours over time in a single group [14, 163] and two examined changes in smoking-related behaviours over time in multiple groups [53, 155], one of which used general hospital patients as a comparison group [53]. The number of patients included in the studies ranged from 15-467. Where reported, length of admission ranged from 1-990 days.
Table 1. Characteristics and findings of studies included in the review

<table>
<thead>
<tr>
<th>Study, location, design, setting and sample</th>
<th>Nature of the smoke-free policy</th>
<th>Smoking related outcomes and measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resnick and Bosworth (1989), United States [119]</td>
<td>Type: Incomplete ban (smoking banned indoors).</td>
<td>Outcomes: Smoking-related beliefs only.</td>
<td>• 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.</td>
</tr>
<tr>
<td>Design: Cross-sectional surveys of patients conducted at two time-points: one month pre-ban, one month post-ban.</td>
<td>Detail: In the pre-ban period, smoking was permitted in a designated day room from 8am to 11pm. Post-ban, smoking was banned indoors only.</td>
<td>Measures: Non-standardised items regarding patients’ perceived impact of the smoking ban on future smoking behaviours, and smoking group attendance.</td>
<td>• 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.</td>
</tr>
<tr>
<td>Setting: 12-bed, acute, locked psychiatric unit of a university hospital.</td>
<td>Adherence: Non-adherence evident.</td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>Sample: N = 165 (116 pre-ban, 49 post-ban)</td>
<td>Nicotine dependence treatment: Pharmacological only (nicotine gum).</td>
<td></td>
<td>• Occasionally, cigarettes were smoked on the ward, or smuggled in by visitors.</td>
</tr>
</tbody>
</table>
### 2. Smith and Grant (1989), United States [158]

**Design:** Cross-sectional survey of patients discharged from the third through to fifth weeks following smoke-free policy implementation.

**Setting:** 42-bed, 3 unit (2 general units, 1 intensive care unit), private psychiatric facility.

**Sample:**
N = 32  
Smokers: 40.6%

- **Type:** Incomplete ban (smoking banned indoors).
- **Detail:** Smoking banned indoors only.
- **Adherence:** Non-adherence evident.
- **Nicotine dependence treatment:** Pharmacological only (nicotine gum).
- **Outcomes:** Smoking-related behaviours and beliefs.
- **Measures:** Non-standardised items regarding change in smoking behaviour during admission, and beliefs regarding future smoking behaviours post-discharge.

- Two patients reported refraining from, or reducing their smoking during admission and 54% indicated they expected to reduce their smoking post-discharge.
- Only 14 (43.8%) patients indicated they had been informed of the smoking ban by staff prior to admission.
- 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.

### 3. Jonas and Eagle (1991), United States [163]

**Design:** Repeated measures design, comprising surveys of a single group of patients during admission and six to18 months post-discharge.

**Setting:** Short-term psychiatric unit of a general hospital.

**Sample:**
N = 39  
Age: M = 32.5  
Gender: 76.9% female  
Admission length: M = 14.1 days

- **Type:** Complete ban.
- **Detail:** Smoking prohibited for all patients.
- **Adherence:** Evident.
- **Nicotine dependence treatment:** Combined (nicotine gum and education in its use).
- **Outcomes:** Smoking-related behaviours only.
- **Measures:** Daily cigarette consumption, abstinence from cigarettes.

- All participants abstained from smoking during admission and were observed using nicotine gum at least twice, by a staff member.
- 80% resumed smoking immediately after discharge, and 89.7% (35/39) resumed smoking within 8 weeks post-discharge.
- 10.3% were abstinent at 8 weeks post-discharge, and were lighter smokers on admission.
- No difference in the number of cigarettes smoked from admission to discharge.
- Resumption of smoking post-discharge was not associated with any demographic factors.

**Design:** 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.

**Setting:** 28-bed, locked psychiatric unit.

**Sample:**
N = 362 (184 pre-ban, 178 post-ban, 19 of which completed the follow-up interview).
Age: 11-82 (M = 39.3)
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%

<table>
<thead>
<tr>
<th>Type</th>
<th>Outcomes</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete ban (smoking banned indoors).</td>
<td>Smoking-related behaviours only.</td>
<td>Smoking status, daily cigarette consumption, use of smoking cessation supports, self-reported abstinence from cigarettes.</td>
</tr>
<tr>
<td>In the pre-ban period, smoking was permitted in a designated room. In the post-ban period, smoking was banned indoors only.</td>
<td>• No difference in smoking status or daily cigarette consumption from the pre to post-ban periods.</td>
<td>• A small number (0.8%) of medical records indicated a patient smoked in prohibited area of the hospital during their hospital stay.</td>
</tr>
<tr>
<td>Adherence: Non-adherence evident.</td>
<td>• 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).</td>
<td>• 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.</td>
</tr>
<tr>
<td>Nicotine dependence treatment: Combined (nicotine gum, weekly nicotine dependence support group, self-help materials).</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

**CHAPTER 1: Impact of a smoke-free psychiatric hospitalisation on smoking outcomes**
### 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 [164].

- ‘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 \[160\]

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

**Setting:** Nine 15-20 bed units (half acute, half long-term) of a general university psychiatric hospital.

**Sample:**
- 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%

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

**Detail:** Smoking only permitted in designated areas.

**Adherence:** Not reported.

**Nicotine dependence treatment:** Not reported.

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

**Measures:** Smoking status, daily cigarette consumption, nicotine dependence (two items from the Heaviness of Smoking Index [HSI][165]).

- 70.5% of stable smokers on admission reported varying their smoking behaviour during admission.
- Relative to pre-admission, 43.2% increased and 27.3% decreased daily cigarette consumption during admission.
- 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 (\(p = .09\)).
- Patients with lower baseline HSI scores had the greatest reported increase in smoking from pre-admission to admission (\(p = .005\)), and this effect was stronger for males than females (\(p = 0.035\)).
- 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%; \(p = .001\)).

---

7. Prochaska et al (2006) (includes Shmueli et al., 2008 \[154\]) United States \[14\]

**Design:** Repeated measures design comprising surveys of a single group of patients during admission, and at one week, one month and three months post-discharge.

**Setting:** University-based inpatient psychiatry unit.

**Type:** Complete ban.

**Detail:** Smoking prohibited for all patients on buildings and grounds.

**Adherence:** Not reported.

**Nicotine dependence treatment:** Combined (NRT [patch, gum], advice

**Outcomes:** Smoking-related behaviours, motivation and beliefs.

**Measures:** Smoking history questionnaire (years of smoking, daily cigarette consumption, previous quit attempts), nicotine dependence

- 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.

- Compared to admission, upon discharge participants expected to be significantly more successful in their quit
Sample:
N = 100
Age: M = 38.7
Gender: 39% female
Admission length: 1-37 days (M = 6.4)
Smokers: 35%
Inclusion criteria: > 18 years, current smoker
Participation rate: 87%

(Fagerstrom Test for Nicotine Dependence; FTND [166]), Thoughts about Abstinence Questionnaire [167], Nicotine Withdrawal Checklist [NW] [168], use of post-discharge cessation supports, quit attempts, abstinence from cigarettes (validated with expired breath carbon monoxide [CO]).

• 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 (p = .047), had higher FTND scores (p = .043), greater cravings to smoke during hospitalisation (p = .014), fewer lifetime quit attempts (p = .034) and less desire to quit (p = .002) were significantly more likely to return to smoking on the day of discharge.

• There was a statistically significant decline in number of cigarettes smoked from pre-admission to 3 months post-discharge (p < .001).

• 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, p < .001).

8. Etter et al., 2008.
Switzerland [159]

Design: 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

Type: Incomplete ban (smoking banned indoors).

Detail: 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.

Outcomes: Smoking-related behaviours only.

Measures: Smoking status, daily cigarette consumption, quit attempts.

• No change in smoking status or cigarette consumption across the four time points.

• 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%; p = .01).

• Patients’ reported receipt of NRT was higher in the total
to five months post implementation of the total smoking ban (2006).

**Setting:** 2 units (1 short stay unit, 1 medium stay unit each comprising 16 beds) of a 10 unit 166-bed university hospital psychiatry department.

**Sample:**
N = 467 (106 [2003]), 108 [2004], 119 [2005], 134 [2006])
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%

During the total ban (2006), smoking was banned indoors only.

**Adherence:** Non-adherence evident

**Nicotine dependence treatment:** Combined (NRT [patch, gum], advice to quit)

• During the total ban (2006), smoking was banned indoors only.

• Adherence: Non-adherence evident

• Nicotine dependence treatment: Combined (NRT [patch, gum], advice to quit)

During the total ban (2006), smoking was banned indoors only.

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

**Measures:** Smoking status, non-standardised items regarding change in smoking behaviour during admission.

- Overall reported rate of smoking remained constant between pre-admission and the time of interviewing.
- From pre-admission to the time of interviewing, 14% reported an increase in smoking, and 23% reported a decrease.
- Two patients reported resuming smoking, two reported smoking uptake, and two reported both increasing and decreasing smoking during admission relative to pre-

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**Design:** Cross-sectional survey of patients over a one month period.

**Setting:** 13 wards (10 general, three functional old age wards) of a public mental health trust.

**Sample:**

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

**Detail:** Smoking permitted in two designated smoking rooms per ward, smoking banned in all other indoor areas.

**Adherence:** Non-adherence evident.

9. Smith and O’Callaghan (2008), United Kingdom [161]
Nicotine dependence treatment: Not reported

Policy non-compliance was reported by 22.2% of the total sample.

Design: Cross-sectional surveys of patients pre (2001) and post smoking-ban implementation (2005).

Setting: Nine, 15-20 bed units (half acute, half long-term) of a general university psychiatric hospital.

Sample: 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%

Type: Incomplete ban (smoking permitted in designated rooms).

Detail: 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.

Adherence: Not reported.

Nicotine dependence treatment: Not reported.

Outcomes: Smoking-related behaviours and motivation.

Measures: Daily cigarette consumption, nicotine dependence (HSI; [165]), Stages of Change scale [169], non-standardised items regarding reasons for changing smoking behaviour during admission.

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.

In the post-ban period relative to pre-admission, 25.5% of smokers increased and 37.3% decreased cigarette consumption during admission.

In the post-ban period (2005), reductions in daily cigarette consumption from pre-admission to during admission were significantly only for heavy smokers (p = .001).

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%; p = .02), 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%; p = .02).

The most frequently cited reason to reduce smoking in hospital was the smoking restrictions.

50.5% viewed hospitalisation as clearly stimulating smoking, and this did not change from pre to post-ban (p =
### 11. Ratschen et al (2010), United Kingdom [125]

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

**Setting:** Two acute mental health wards (32 beds) and one intensive care unit (10 beds)

**Sample:**
- 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%

**Type:** Complete ban.

**Detail:** Smoking prohibited for all patients on buildings and grounds.

**Adherence:** Non-adherence evident.

**Nicotine dependence treatment:**
- Combined (NRT [patch], advice to quit).

**Outcomes:** Smoking-related behaviours and beliefs.

**Measures:** Non-standardised items regarding change in smoking behaviour during admission and beliefs about future use of smoking cessation supports, nicotine dependence (HSI; [165]).

- Compared to pre-admission, seven patients reported smoking less, six reported smoking more, and two equally as much while in hospital.
- Patients’ self-reported mean nicotine dependence levels were lower during hospitalisation (HSI = 0.71, SD = 1.86) than prior to admission HSI = 2.0, SD = 1.5). No significance test conducted.
- 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.
- Participants generally stated they had been informed of the policy.
- Two patients (13.3%) reported covert smoking in a prohibited area.

### 12. Siru et al (2010), Australia [53]

**Design:** 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.

**Type:** Complete ban.

**Detail:** Smoking prohibited for all patients on buildings and grounds.

**Adherence:** Not reported.

**Nicotine dependence treatment:**

- 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.
- 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%; p = 0.37).
**Setting:** Departments of psychiatry, orthopaedics and plastic surgery of a teaching hospital.

**Sample:**
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.

**Type:** Complete ban.
**Detail:** Smoking prohibited for all patients on buildings and grounds.
**Adherence:** Not reported.
**Nicotine dependence treatment:** Combined (nicotine dependence assessment, NRT [patch, lozenge, inhaler], information about smoking cessation).
**Outcomes:** Smoking-related behaviours and beliefs.
**Measures:** Smoking status, use of cessation supports, non-standardised items regarding beliefs about current and future smoking behaviour.

- 68.8% reported intent to cut down or continue not smoking post-discharge, which did not differ from the comparison group (67.5%; \( p = 0.93 \)).
- 89.6% returned to smoking within five days of discharge, which did not differ from the comparison group (92.1%; \( p = 1.0 \)).
- Post-discharge NRT use was 20.8% at five days, 15.2% at 14 days, and 18.5% at six months.
- A significant reduction in cigarette consumption was found between baseline and 14 days post discharge (\( p = 0.015 \)) and did not differ from the comparison group.
- 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).


**Design:** 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.

**Setting:** Long term, 106-bed forensic mental health inpatient facility.

**Sample:**
N = 81 (focus group = 21, patient survey during admission = 45, patient survey

**Outcomes:** Smoking-related behaviours and beliefs.

- 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.
- 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.
- 81% of smokers agreed admission to a smoke-free facility was a good opportunity to quit, however 36% reported they planned to continue smoking upon discharge.
- In the post-discharge sample, 67% reported intent to quit upon discharge, and 58% (\( n = 12 \)) remained non-smokers.
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.


| Design: | Cross sectional survey of patients. |
| Setting: | Intermediate to long term psychiatric facility. |
| Sample: | N = 100
Smokers: 60%
Admission length: M = 4 years, Md = 1.47 years |

| Type: | Complete ban. |
| Detail: | Smoking prohibited for all patients on buildings and grounds. |
| Adherence: | Non-adherence evident. |
| Nicotine dependence treatment: | Combined (NRT, counselling). |
| Outcomes: | Smoking-related behaviours only. |
| Measures: | Smoking status, daily cigarette consumption, use of cessation supports during admission. |

- Of the 63% classified as smokers pre-admission, 67% (n = 42) reported current smoking, and 33.3% (n = 21) quit on admission.
- Self-reported number of cigarettes smoked during admission (M = 12.1) were significantly lower than pre-admission (M = 31.0; p <.05).
- Of those who quit upon admission (n = 21), 29% (n = 6) used NRT, and 29% (n = 6) received counselling.
- Patients reported that smoking continued to occur inside buildings (59%) and on grounds (49%).

Note: M = Mean
Md = Median
PRN = Pro re nata (as needed)
NRT = Nicotine replacement therapy
FTND = Fagerstrom test for nicotine dependence [166]
HSI = Heaviness of smoking index [165]
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

*Level of smoking restriction in place, and adherence*

Six studies were conducted in facilities with complete smoking bans, [14, 53, 125, 157, 162, 163], and eight in facilities with incomplete bans, four of which banned smoking indoors only [119, 156, 158, 159], three restricted smoking to designated smoking rooms [12, 160, 161], and one restricted smoking to five pre-determined intervals per day [155]. 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 [12, 119, 155, 156, 159].

Of the six studies conducted in facilities with complete bans, one indicated that all participants abstained from smoking during admission [163], and two indicated some level of non-adherence [125, 157]. Of the eight studies conducted in facilities with incomplete bans, five indicated some level of non-adherence [119, 156, 158, 159, 161]. Six studies did not provide comment on policy adherence [12, 14, 53, 155, 160, 162].

Evidence of non-adherence typically comprised patient self-report that they themselves had smoked in prohibited areas of the facility [125, 158, 161], were aware of family or friends smuggling cigarettes onto the ward [119], were exposed to continued smoking by other patients [157], or were aware of sharing of cigarettes between patients, and between patients and staff [159]. One study used medical records to identify that several patients had smoked in a prohibited area during their admission [156].
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*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 [14, 53, 119, 125, 156-159, 162, 163]. In six of these, complete smoking bans were implemented [14, 53, 125, 157, 162, 163], and smoking was banned indoors only for the remaining four facilities [119, 156, 158, 159]. 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 [12, 155, 160, 161]. Rates of receipt of NRT and brief advice to quit are included in Table 1, and overall indicated suboptimal treatment.

*Risk of bias in included studies*

Table 14 and Figure 4 in Appendix 3 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).
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

1) *Changes in smoking behaviour during admission*

   a) *Facilities with complete smoking bans*

Two studies with complete smoking bans assessed smoking behaviour during admission [125, 157], with one of these [157] 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 [157].

b) *Facilities with incomplete smoking bans*

Of the three studies with indoor smoking bans that examined changes in smoking behaviour during admission [156, 158, 159], only one conducted a statistical analysis of the results. Etter et al (2008) 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) [159]. 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 [159].

Three studies with designated smoking rooms examined changes in smoking behaviour during admission [12, 160, 161]. Of these, two reported statistical analyses. Keizer and Eytan (2005) reported that relative to pre-admission, 43.2% of patients increased and 27.3% decreased their daily cigarette consumption during admission [160]. These rates
were 25.5% and 37.3% respectively in the 2009 follow-up study [12], with changes reaching significance for heavy smokers ($p = .001$; Table 1) [12].

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

* a) Facilities with complete smoking bans

Four studies examined changes in smoking behaviours post-discharge [14, 53, 162, 163]. All three studies that used repeated measures designs to examine smoking from admission to discharge reported that the majority (89.6% [53]; 80% [163]; and 76% [14]) of participants resumed smoking within five days post-discharge (Table 1). However, both of the more recent and larger studies reported significant reductions in daily cigarette consumption at 14 days [53] and three months [14] 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%: [53], 70%: [14]), however receipt of advice to quit was low (2%: [14], 20% [53]), 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 [163]. Of these three studies, only one study biochemically validated self-reported rates of abstinence, reporting that 4% of participants were abstinent at three months post-discharge [14], and self-reported abstinence was 10.3% at eight weeks in one study [163], and 6.3% at six months post-discharge in the other [53]. The remaining study reported that 58% of patients ($n = 12$) were abstinent post-discharge, however, this
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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 [162], and thus were effectively still in institutional care.

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 policy was evident [156].

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 [14, 53, 125, 162]. 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 \( p < .01 \) [14]. In this study, the majority of participants
(70%) used NRT during hospitalisation, and nicotine doses predicted these increased feelings of success with quitting ($p < .05$; (Table 1) [14].

\[\textit{Facilities with incomplete smoking bans}\]

Four studies with incomplete smoking bans examined smoking-related motivations or beliefs during admission [12, 119, 155, 158]. 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 [155], 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 ($p < .05$). 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 [119, 158]. 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 [119, 158].
CHAPTER 1: *Impact of a smoke-free psychiatric hospitalisation on smoking outcomes*

**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 [14, 53], increases in patient’s motivation to quit [12, 14], and an increase quit attempts [159], however one older study indicated a decline in motivation to quit [155]. 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 and 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 [103]. 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 combined pharmacological and behavioural nicotine dependence treatment [14, 53]. Furthermore, two studies reported more positive smoking outcomes when stricter smoking rules were introduced, including significantly
larger proportions of patients making a quit attempt [159], and reporting a desire to quit [12]. 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 [159]. Conversely, of the four studies conducted in facilities that permitted smoking in designated rooms or at designated times, three reported increases in cigarette consumption [12, 160, 161] and one study reported a reduction in motivation to quit [155]. 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 [161]. 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 [145, 146].

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, as implemented in the study facilities 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 [146, 151, 170]. 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 [119, 125, 156-159, 161], 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 [171], 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 [147]. 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 [99], and are associated with reductions in 
smoking and improvements in health behaviour among staff and clients [114, 172]. 
Psychiatric treatment settings carry equal legislative responsibility to provide a safe and 
healthy environment for their staff and clients [99]. Implementation of total smoking 
bans in inpatient psychiatric settings, including routine identification and treatment of 
tobacco use, is imperative in achieving this goal [173] and for providing an opportunity 
for patients to address their tobacco smoking in a supportive environment [111]. 
However, it is apparent that continued cessation support following discharge is needed 
to increase the likelihood of cessation being maintained.

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CHAPTER 2: QUALITY OF IMPLEMENTATION OF A SMOKE-FREE POLICY IN AN INPATIENT PSYCHIATRIC FACILITY: ASSOCIATION WITH PATIENT ACCEPTABILITY

Emily A. Stockings¹,², Jenny A. Bowman¹,², Kate M. Bartlem¹,²,³, Kathleen McElwaine²,³, Amanda L. Baker⁴, Margaret Terry⁵, Richard Clancy¹,³, Jenny Knight³, Paula M. Wye¹,²,³, Colyvas, Kim¹, Wiggers, John¹,²,³

¹ University of Newcastle, University Drive, Callaghan, New South Wales, (NSW) Australia, 2308
² Hunter Medical Research Institute (HMRI), Level 3 John Hunter Hospital, Lookout Road, New Lambton Heights
³ Hunter New England Population Health (HNEPH), Longworth Ave, Wallsend, NSW, Australia, 2287.
⁴ Centre Translational Neuroscience and Mental Health (CTNMH), Mater Hospital Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
⁵ Mental Health and Substance Use Service (MHSUS), Mater Hospital, Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.


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CHAPTER 2: Quality of implementation of a smoke-free policy in inpatient psychiatry

Abstract

We surveyed psychiatric inpatients within one facility (May 2009-2010) to determine the quality of smoke-free policy implementation and association with patient acceptability. Smokers’ policy adherence was limited (83.5% smoked). Most used nicotine replacement therapy (75.3%); however receipt of cessation advice was low (36.1%). Overall, 45.9% of participants reported a positive view of the policy in the unit (29.9% smokers; 64.3% non-smokers). The likelihood of smokers having a positive view was associated with their own adherence and perceived staff support for the policy. The study findings highlight the importance of abstinence from smoking among inpatients, and clinical staff supporting smoke-free policies in strengthening acceptability of smoke-free policy implementation.

Declaration of interest: None.
CHAPTER 2: Quality of implementation of a smoke-free policy in inpatient psychiatry

Introduction

Smoking rates among persons with a mental disorder have remained stagnant for the past 20 years [174]. The Royal College of Psychiatrists recently identified effective smoking cessation treatment for persons with a mental disorder to be a public health priority, particularly in healthcare settings [173]. Admission to an inpatient psychiatric facility with a smoke-free policy represents a valuable opportunity for providing such care. However, the quality of implementation of smoke-free policies is reported to be suboptimal, with inconsistent leadership, inadequate provision of nicotine dependence treatment, and low levels of patient adherence [151]. A number of studies have suggested that patient acceptance of smoke-free policies is low [125, 162]. However, no studies have directly assessed the extent to which the quality of policy implementation may be associated with patient support for such a policy. In this context, we conducted a survey of psychiatric inpatients within a facility with a smoke-free policy to determine their: 1) adherence to the smoke-free policy; 2) perception of staff support for the policy; 3) receipt and effectiveness of nicotine dependence treatment; and 4) acceptability of the policy, and its association with these policy implementation quality factors.

Methods

Patients aged ≥ 18 years admitted for > 3 days to an inpatient psychiatric facility in Australia were interviewed over a 12-month period (May 2009-2010). Detail of
CHAPTER 2: Quality of implementation of a smoke-free policy in inpatient psychiatry

the setting and participants have been described previously [175]. The facility introduced a smoke-free policy in 2006, comprising a total smoking ban in buildings and grounds, and provision of nicotine dependence treatment, including nicotine replacement therapy (NRT) and brief advice to quit (details, Appendix 8).

The survey included: socio-demographic, clinical and smoking characteristics (smoking status and Fagerstrom Test for Nicotine Dependence [FTND]; [176]; and three indicators of policy implementation quality: 1) adherence to the ban (including awareness of other patients smoking [yes, no], awareness of staff smoking [yes, no] and smoker’s own adherence to the ban [yes, no]); 2) perceived staff support for the policy (all staff positive, most staff positive, unsure, most staff negative, all staff negative); and 3) patient receipt and perceived effectiveness of nicotine dependence treatment (including brief advice to quit [yes, no], NRT [yes no], and effectiveness of NRT in reducing cravings to smoke [not at all, a little, a fair bit, a lot]) (independent variables). The primary outcome was patient acceptability of the smoke-free policy within their current unit of admission (very positive, somewhat positive, neutral, somewhat negative, and very negative).

IBM® SPSS® Statistics release version 19.0.0 [177] was used to analyse the data. Descriptive statistics were used to report patient characteristics, smoking behaviours, adherence to the smoking ban, perceived staff support for the policy, receipt of NRT and quit advice, and acceptability of the policy. Chi-square analyses explored socio-demographic and clinical differences between participants and non-participants, and associations between the independent
variables (adherence to the smoking ban, perceived staff support for the policy and receipt of nicotine dependence treatment), and acceptability of the policy to participants who were smokers. Independent variables found to be associated with patient acceptability of the policy at $p < .10$ in chi-square analyses were entered into a multi-variable binary logistic regression model to further examine their association [178]. Details of variable transformations for the conduct of these analyses are included in Appendix 4.

**Results**

A flow diagram of participant recruitment is shown in Figure 5, Appendix 4. Of the 757 patients admitted during the study period, 263 (34.7%) were approached, of which 49 (18.6%) were ineligible and 15 (5.7%) declined participation, leaving 199 (93.0% consent rate) who consented to the survey, with interviews completed for 181 patients (90.9% response rate; 23.9% of admitted patients).

Participants were mostly male (56.9%), aged 40.9 years ($SD = 14.2$), single (75.1%), and not of Aboriginal or Torres Strait Islander descent (96.1%). The most common diagnoses were mood disorders (42.0%), and psychosis (38.1%). Average length of stay was 36.2 days ($SD = 49.8$). There were no differences in patient characteristics between those who did and did not complete the survey. Just over one half of survey participants identified themselves as smokers; 53.6% ($n = 97$), the majority of whom (54.6%) had FTND scores $\geq 6$ (high nicotine dependence). Almost all smokers (83.5%) did not adhere to the ban and reported
that they smoked in hospital buildings and/or grounds during their admission (Table 2). However 75.3% received NRT, of whom half reported it had limited effectiveness in reducing nicotine cravings and 36.1% received brief advice to quit (Table 15, Appendix 4).

**Table 2.** Adherence to, and acceptability of the smoke-free policy

<table>
<thead>
<tr>
<th></th>
<th>Smokers</th>
<th>Non-smokers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 97)</td>
<td>(n = 84)</td>
<td>(n = 181)</td>
</tr>
<tr>
<td>Aware of patients smoking:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All areas</td>
<td>86.6 (84)</td>
<td>88.1 (74)</td>
<td>87.3 (158)</td>
</tr>
<tr>
<td>In unit</td>
<td>86.3 (82)</td>
<td>85.4 (70)</td>
<td>85.9 (152)</td>
</tr>
<tr>
<td>On hospital grounds</td>
<td>50.0 (48)</td>
<td>41.0 (34)</td>
<td>45.8 (82)</td>
</tr>
<tr>
<td>Aware of staff smoking:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All areas</td>
<td>20.6 (20)</td>
<td>19.0 (16)</td>
<td>19.9 (36)</td>
</tr>
<tr>
<td>In unit</td>
<td>12.5 (12)</td>
<td>7.2 (6)</td>
<td>10.1 (18)</td>
</tr>
<tr>
<td>On hospital grounds</td>
<td>16.8 (16)</td>
<td>19.3 (16)</td>
<td>18.0 (32)</td>
</tr>
<tr>
<td>Adhered to the smoking ban</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15.5 (15)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No</td>
<td>83.5 (81)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Perceived staff acceptability of the smoke-free policy*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most-all staff positive</td>
<td>45.4 (44)</td>
<td>63.1 (53)</td>
<td>53.6 (97)</td>
</tr>
<tr>
<td>Most-all staff negative or unsure</td>
<td>53.6 (52)</td>
<td>35.7 (30)</td>
<td>45.3 (82)</td>
</tr>
<tr>
<td>Acceptability of smoke-free policy in current unit of admission***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat-very positive</td>
<td>29.9 (29)</td>
<td>64.3 (54)</td>
<td>45.9 (83)</td>
</tr>
<tr>
<td>Neutral</td>
<td>13.4 (13)</td>
<td>23.8 (20)</td>
<td>18.2 (33)</td>
</tr>
<tr>
<td>Somewhat- very negative</td>
<td>54.6 (53)</td>
<td>10.7 (9)</td>
<td>34.3 (62)</td>
</tr>
</tbody>
</table>

* Numbers vary due to missing data
^ Data are numbers (%)
* Significant difference between smokers and non-smokers; \(p < .05\)
*** Significant difference between smokers and non-smokers; \(p < .0001\)

Just over half (53.6%) of participants perceived all or most staff to hold a positive view towards the smoke-free policy (Table 2), with smokers less likely to report this perception than non-smokers (45.4% vs. 63.1%, \(\chi^2 (1) = 5.8, p = .016\)). Just under half (45.9%) reported the smoke-free policy within their current unit of
admission to be positive, with smokers less likely to hold this view (29.9% vs. 64.3%; $\chi^2 (1) = 39.6, p < .0001$).

Logistic regression analyses revealed that smokers were more likely to hold positive views towards the smoke-free policy in the unit if they perceived staff to be supportive of the policy ($OR = 5.4, p = .02, 95\% CI = 1.2$ to $11.2$) and, if they themselves had not smoked during admission ($OR = 6.4, p = .01, 95\% CI = 1.4$ to $15.8$).

**Discussion**

The study findings highlight the importance of abstinence from smoking among inpatients, and clinical staff supporting smoke-free policies, in strengthening acceptability of smoke-free policy implementation in inpatient psychiatric facilities. The quality of implementation of the smoke-free policy in the facility was limited. The large majority of smokers continued to smoke, indicating a failure to enforce the total smoking ban. While most used NRT it had limited effectiveness in reducing nicotine cravings, and a minority received smoking cessation advice. Although some level of staff endorsement of the policy was indicated by the provision of NRT to patients, the lack of enforcement of the smoking ban suggested that this support was either limited and/or staff found enforcement difficult to enact. Strong and consistent leadership, staff education, and including provision of nicotine dependence treatment in the formal roles of treating staff have been suggested to be important factors for smoke-free policy
success in inpatient psychiatric settings [4, 151]. Further research is needed to
determine the effectiveness of such systems-level strategies in improving smoke-
free policy implementation in psychiatric settings, and in particular to identify
strategies effective in increasing enforcement of smoking bans. Smokers’
perceived ‘rights’ to smoke during admission, and staff misperceptions that
persons with a mental disorder do not want to quit, or that quitting smoking will
increase patient aggression [179], may contribute to the suboptimal levels of
enforcement in these settings.

This study is limited to a single inpatient psychiatric setting in NSW, Australia,
and as such, the extent to which the findings may be generalised is unknown.
Statistical power may have been compromised due to the small sample size, and
potential biases due to self-reported data cannot be discounted. However, the
sample was representative of the patient population during the survey period, and
the findings reported here indicating limited policy adherence and moderate levels
of patient support for the smoke-free policy are consistent with previous studies
[125, 162].

The potential benefits for patient and staff well-being of fully and consistently
implemented smoke-free policy within psychiatric hospital settings are
significant. In addition to reduced risk of harm from environmental tobacco
smoke, adequately addressing nicotine dependence and inpatient abstinence from
smoking may positively influence post-discharge quit attempts and cessation
[114]. Further research is required to explore how the benefits of a stay in a truly
CHAPTER 2: *Quality of implementation of a smoke-free policy in inpatient psychiatry*

smoke-free hospital environment can be better afforded to smokers with mental disorder.

**Acknowledgements**

The authors would like to acknowledge the assistance of the research team at the University of Newcastle, particularly Paula Bridge, Lyndell Moore, Maree Adams and Samantha McCrabb for their assistance with data collection and entry. The authors would also like to acknowledge the staff and patients of the Mater Mental Health Service, Waratah.
CHAPTER 3: READINESS TO QUIT SMOKING AND QUIT ATTEMPTS AMONG AUSTRALIAN MENTAL HEALTH INPATIENTS

Emily A. Stockings¹,², Jenny A. Bowman¹,², Kathleen McElwaine²,³, Amanda L. Baker, Amanda³, Margaret Terry⁵, Richard Clancy¹,⁴, Kate M. Bartlem¹,²,³, Paula M. Wye¹,²,³, Paula Bridge¹, Jenny Knight³, John H. Wiggers¹,²,³

¹ University of Newcastle, University Drive, Callaghan, New South Wales, (NSW) Australia, 2308
² Hunter Medical Research Institute (HMRI), Level 3 John Hunter Hospital, Lookout Road, New Lambton Heights
³ Hunter New England Population Health (HNEPH), Longworth Ave, Wallsend, NSW, Australia, 2287.
⁴ Centre for Translational Neuroscience and Mental Health (CTNMH), Mater Hospital Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
⁵ Mental Health and Substance Use Service (MHSUS), Mater Hospital, Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.


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CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Abstract

Introduction: Mental health inpatients smoke at higher rates, and are more nicotine dependent than general population smokers. However, provision of nicotine dependence treatment in inpatient settings is low, with barriers to the provision of such care including staff views that patients do not want to quit. This paper reports the findings of a survey of mental health inpatients at a large psychiatric hospital in New South Wales, Australia, assessing the smoking and quitting motivations and behaviours of those identifying as smokers.

Methods: Smokers \( n = 97 \) were surveyed within the inpatient setting using a structured survey tool, incorporating the Fagerstrom Test for Nicotine Dependence, Reasons for Quitting Scale, Readiness and Motivation to Quit Smoking Questionnaire, and other measures of smoking and quitting behaviour.

Results: Approximately 47\% of smokers reported having made at least one quit attempt within the past 12 months, despite nearly three quarters (71.2\%) being classified as in a ‘precontemplative’ stage of change at the time of the survey. Multinomial logistic regressions revealed that self-reporting ‘not enjoying being a smoker’ and having made a quit attempt in the last 12 months predicted having advanced beyond a precontemplative stage of change. A high self-reported desire to quit predicted a quit attempt having been made in the last 12 months.

Conclusions: The majority of smokers had made several quit attempts, with a large percentage occurring recently, suggesting that actual quitting behaviour should be considered as an important indication of ‘desire to quit’. This paper provides further
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

data supporting the assertion that multimodal smoking cessation interventions combining psychosocial and pharmacological support should be provided to psychiatric inpatients who smoke.
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Introduction

Smoking rates among persons with a mental illness are two to three times higher than in the general population [142]. Smokers with mental illness are also more dependent on nicotine [142], less likely to quit smoking [35, 143], and more likely to suffer smoking related illnesses and increased medical morbidity [38, 180] than other smokers. The highest rates of smoking and nicotine dependence have been found among mental health inpatients [13] with smoking prevalence reported to be as high as 42-80% [13, 123, 181, 182]. Despite this burden of illness, little else is known about the smoking characteristics of this vulnerable sub-group of smokers, including their quitting motivations and behaviours.

Although the advent of smoke-free policies and smoking bans in health care facilities in developed western nations may have increased attention to tobacco use in general health care settings [117, 118, 183], there seems to have been a slower adoption of change in mental health care settings and lower levels of attention to addressing tobacco use for mental health patients [75, 122, 123]. This is evidenced by smoke-free policy exemptions [117], and low levels of policy compliance and nicotine dependence treatment in mental health hospitals [50, 75, 123]. Australian and international data suggest that a perception commonly held by mental health staff that mental health patients are not motivated or willing to quit [50-52] may contribute to the poor provision of nicotine dependence treatment in both inpatient and community psychiatric settings [50, 184, 185].

‘Motivation to quit’ is an important construct in the smoking cessation process [186]; although the literature reflects some lack of consensus about how such ‘motivation’ is
defined and measured [187, 188]. In the general population, ‘high’ motivation levels as measured by self-reported determination to quit have been associated with seeking out and using evidence based cessation support [189]. Further, a range of motivational factors including explicit self-reported ‘wanting to quit’, financial and health concerns and expectancies, and attitudes to smoking, have been found to predict making a quit attempt, among general population smokers [188].

In contrast to the views commonly reported by mental health clinicians [50, 52], the limited research which has investigated ‘motivation to quit’ among smokers with a mental illness suggests that substantial proportions of such smokers do want to quit [54, 190]. Utilising the Transtheoretical model of behaviour change [113], the prevalence of future ‘readiness to quit’ among community samples of persons with schizophrenia and related psychotic disorders [132-135], and those with depression [57, 131, 191], has ranged between 21 and 49%; similar to that indicated for general population smokers (26-41%) [134, 135]. Research has also found between 19 and 38% of smokers with a mental illness to be contemplating quitting within the next month [12, 52, 53, 182]. Further, research has demonstrated that such motivation can be translated into successful quitting; with quit rates of up to 22% being achieved among such persons when combined psychosocial and pharmacological interventions are utilised [137].

Studies such as those cited above however, investigating interest in quitting among persons with a mental illness, have for the most part been restricted to considering specific diagnostic subgroups in community settings; particularly patients with schizophrenia and depression [57, 131-135]. A broader understanding of quit intentions among persons with a mental illness is required, and may be particularly important for
inpatient clinical staff, given their role in implementing systematic provision of nicotine
dependence treatment for diagnostically heterogeneous patient populations. The few
studies which have examined motivation to quit among mental health inpatient samples
[53, 181, 182] have been somewhat limited in their assessment - using a variety of stage
of change measures, with comparisons between studies difficult. To the authors’
knowledge, no studies have examined predictors of readiness to quit or quit attempts
among mental health inpatients. Among psychiatric outpatients however, who may in
essence be the same patient population though in a different stage of wellness and
treatment, research has suggested a positive linear relationship between the number of
previous quit attempts and levels of intrinsic motivation and stage of change for quitting
among those with schizophrenia [132, 133]. Further, a greater endorsement of the ‘cons’
of smoking has been associated with contemplating quitting, and a greater desire for
abstinence among outpatients with depression [57].

Understanding patient interest in quitting, quitting behaviours, reasons for quitting and
associated factors may assist clinical staff in addressing tobacco use in inpatient
settings, and aid the development and delivery of more effective nicotine dependence
treatment for persons with a mental illness. Given the limitations of previous research,
and particularly the paucity of research undertaken within inpatient psychiatric settings,
a study was undertaken to: 1) examine readiness to quit, quitting behaviours and reasons
for quitting among a diagnostically heterogeneous sample of smoking patients in a large
public inpatient psychiatric hospital in New South Wales (NSW), Australia; and 2)
explore whether a range of socio-demographic, clinical and smoking-related factors
predict readiness to quit, and a quit attempt in the last 12 months.
Methods

Design and setting

A cross-sectional survey was administered to inpatients at a large public acute adult inpatient psychiatric hospital with a total smoke free policy in NSW, Australia. The smoke-free policy included a total smoking ban in all hospital buildings and grounds. Voluntary patients, or those able to access leave, were able to leave the hospital grounds to smoke. Area health guidelines required staff to provide nicotine dependence treatment (including nicotine replacement therapy) to all smokers [110] (details, Appendix 8); however previous research in this setting has suggested such treatment to be inconsistent [75]. The hospital had six psychiatric units of which three were sampled for this study: one co-morbid acute mental health and substance use unit, and two acute mental health units. Three units were excluded: two psychiatric emergency care units and one geriatric unit. Ethics approval for the study was obtained from the Hunter New England Human Research Ethics Committee, HREC reference no: 08/04/16/5.10 and the University of Newcastle Human Research Ethics Committee reference no: H-2008-0191.

Procedure

The survey was undertaken across a 12-month period (May 2009 to May 2010) at a rate determined by the availability of interview staff – who undertook interviews on average one day per week. All inpatients present on a day when interviewing was being conducted in that unit were eligible to participate in the study if the clinical opinion of nursing staff indicated they were well enough to do so. Trained interviewers
systematically approached such patients utilising a ward list, and asked them to participate in a survey about their smoking status and views of the hospital’s smoke-free policy. The surveys were conducted in a quiet area of the unit separated from other patients and took up to 20 minutes to complete. Smokers were defined as those participants who self-reported being regular or occasional smokers on admission to hospital. The aim was to continue recruitment until a total of 100 smokers had been surveyed across the three units, drawing approximately one third of this number from each.

Measures
The survey included items regarding: tobacco use, as measured by cigarettes per day, quit attempts (lifetime and in the last 12 months) and nicotine dependence (Fagerstrom Test for Nicotine Dependence: FTND) [176]; readiness to quit as measured by a modified version of Prochaska and DiClemente’s transtheoretical model [113], the Readiness and Motivation to Quit Smoking Questionnaire (RMQ) [192], self-reported non-smoker desire to quit (1-10 scale) [193], and the Reasons for Quitting Scale (RFQ) [194]. The survey tool also included several items developed by researchers specifically for this project, including a perceived level of addiction to cigarettes scale (1 “not at all strong” to 10 “extremely”), and several ‘smoking identity’ items, based on the PRIME theory of addiction [195], including perceived identity as a smoker, enjoyment of smoking, and ability to imagine life as a non-smoker.
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

For all patients admitted to the three study units throughout the course of the survey, aggregated data were available regarding socio-demographic and clinical characteristics including age, gender, marital status, mental health diagnosis, cultural identification, and admission length from medical record information. For survey participants, this information was linked with survey responses and used in analyses investigating predictors of readiness to quit and quitting behaviour.

Analyses

IBM® SPSS® Statistics release version 19.0.0 [177] was used to analyse the data. Descriptive statistics were used to describe the sample with respect to demographic characteristics, smoking status, nicotine dependence (FTND), readiness to quit, reasons for quitting, and previous quit attempts. Percentages, means, standard errors and ranges are reported where appropriate. Chi-square analyses were used to explore socio-demographic and clinical differences between respondents and non-respondents, and to examine associations between socio-demographic characteristics, smoking-related variables, readiness to quit, and quit attempts among the surveyed participants.

Categorical variables associated at $p < .10$ were entered into multinomial backwards likelihood ratio (LR) logistic regressions to determine predictors of readiness to quit, and quit attempts in the last 12 months. To facilitate conduct of chi-square and subsequent multinomial logistic regression analyses, the following demographic, smoking and motivational variables were condensed into two categories: marital status, cultural identification, diagnosis, previous admission, nicotine dependence, enjoy being
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a smoker, imagine life as a non-smoker, and stage of change for quitting. The remaining variables were reduced to three categories: age, admission length, smoking duration, self-reported level of addiction and self-reported desire to quit.

Results

Participants

A total of 757 patients were admitted to the three study units during the survey period, of whom 263 (34.7%) were approached for participation and 494 were not. The majority of those not approached \( (n = 385, 77.9\%) \) were not present in a unit and/or eligible for inclusion on any day when interviewing occurred, and nearly a quarter had short admissions of three days or less \( (n = 109) \). Of those approached, a small percentage were excluded on the basis of being mentally or physically unable to complete the interview \( (n = 46, 17.5\%) \) or being under 18 years of age \( (n = 3, 1.1\%) \). Of those patients who were eligible, 199 (93.0%) consented to participate, with full interviews able to be completed for 181 patients (90.9%).

Survey participants were mostly male (56.9%), aged 31 years or over \( (70.7\%; M = 40.9, SD = 14.2) \), single (75.1%), and not of Aboriginal or Torres Strait Islander descent (96.1%). The most common diagnoses were mood disorders (42.0%), and schizophrenia and related psychosis (38.1%). The majority of participants had previously been admitted to the facility (53.6%), with 40.9% admitted for between 8-30 days, with an average length of stay of 36.2 days \( (SD = 49.8) \). Chi-square analyses indicated no
differences in socio-demographic or clinical characteristics between respondents and non-respondents (i.e., those who were not approached or who declined participation).

**Smoking status and smoking-related characteristics**

Just over one half of survey participants identified themselves to be smokers; 53.6% (n = 97). In accordance with the study’s sampling frame, approximately one-third of smokers were drawn from each of the three study units (n = 35, 32 and 30). Smoking rates however, differed significantly by unit, with a higher reported rate of smoking in the co-morbid acute mental health and substance use unit (83.3%; 35/42 survey participants) than the two acute mental health units – where the smoking rates were 44.4% (32/72) and 44.8% (30/67) ($X^2(4) = 15.7, p = .002$). The quit ratio (calculated as the proportion of ex-smokers to ever smokers [196]) for the sample was 26.0%. Chi-square analyses revealed a significantly lower quit ratio for participants of the co-morbid acute mental health and substance use unit (12.5%), than the two acute mental health units (28.9% and 34.8%; $X^2(2) = 6.6, p = .04$).

Participants began smoking regularly at a mean age of 16.8 years ($SE = 0.5$), had smoked for an average 20.4 years ($SE = 1.3$), and 40.6% smoked 11-20 cigarettes per day. The majority (54.6%) were classified as nicotine dependent (FTND ≥ 6) [166]. The single item level of addiction scale (1-10) indicated the majority of smokers (62.1%) reported addiction levels ranging from 8-10. Almost 30% of participants indicated that they did not ‘enjoy being a smoker’, and when asked to imagine life as a non-smoker, 50% of participants reported this to be hard (Table 3). Aside from smoking rate and quit
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

ratio, no other differences in smoking-related characteristics were identified between units or diagnostic groupings.

Table 3. Smoking-related characteristics

<table>
<thead>
<tr>
<th>Smoking characteristics</th>
<th>Total % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking onset (years)</strong></td>
<td></td>
</tr>
<tr>
<td>M: 16.75; SE: 0.47; Range: 8-32</td>
<td></td>
</tr>
<tr>
<td><strong>Duration of smoking (years)</strong></td>
<td></td>
</tr>
<tr>
<td>M: 20.42; SE: 1.31; Range: 0-59</td>
<td></td>
</tr>
<tr>
<td>6 or less</td>
<td>13.4 (13)</td>
</tr>
<tr>
<td>7-15</td>
<td>27.8 (27)</td>
</tr>
<tr>
<td>15 or more</td>
<td>58.8 (57)</td>
</tr>
<tr>
<td><strong>Cigarettes per day</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 10</td>
<td>11.5 (11)</td>
</tr>
<tr>
<td>11-20</td>
<td>40.6 (39)</td>
</tr>
<tr>
<td>21-30</td>
<td>27.1 (26)</td>
</tr>
<tr>
<td>31 or more</td>
<td>20.8 (20)</td>
</tr>
<tr>
<td><strong>Nicotine dependence</strong></td>
<td></td>
</tr>
<tr>
<td>M: 5.84; SE: 0.22; Range: 0-10</td>
<td></td>
</tr>
<tr>
<td>Nicotine dependent (FTND ≥ 6)</td>
<td>54.6 (53)</td>
</tr>
<tr>
<td><strong>Self-report level of addiction (1-10)</strong></td>
<td></td>
</tr>
<tr>
<td>M: 7.75; SE: 0.25; Range: 1-10</td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>4.2 (4)</td>
</tr>
<tr>
<td>4-7</td>
<td>33.7 (32)</td>
</tr>
<tr>
<td>8-10</td>
<td>62.1 (59)</td>
</tr>
<tr>
<td><strong>Find smoking enjoyable</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>89.6 (86)</td>
</tr>
<tr>
<td>No</td>
<td>10.4 (10)</td>
</tr>
<tr>
<td><strong>Enjoy being a smoker</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>70.1 (68)</td>
</tr>
<tr>
<td>No</td>
<td>29.9 (29)</td>
</tr>
<tr>
<td><strong>Imagine life as a non-smoker</strong></td>
<td></td>
</tr>
<tr>
<td>Quite hard- very hard</td>
<td>49.5 (47)</td>
</tr>
<tr>
<td>Unsure</td>
<td>9.5 (9)</td>
</tr>
<tr>
<td>Quite easy - very easy</td>
<td>41.1 (39)</td>
</tr>
</tbody>
</table>
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Readiness to quit

Readiness to quit characteristics of the sample are described in Table 4.

**Table 4. Motivation and quitting characteristics**

<table>
<thead>
<tr>
<th>Motivation to quit</th>
<th>Total</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-report desire to quit (1-10)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M: 4.4; SE: .31; Range: 1-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>43.2 (41)</td>
<td></td>
</tr>
<tr>
<td>4-7</td>
<td>37.9 (36)</td>
<td></td>
</tr>
<tr>
<td>8-10</td>
<td>18.9 (18)</td>
<td></td>
</tr>
<tr>
<td><strong>Stage of change (RMQ)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC1 (Pre-contemplation 1: Not seriously thinking of quitting smoking, not planning to quit and not seriously thinking of cutting down)</td>
<td>15.5 (15)</td>
<td></td>
</tr>
<tr>
<td>PC2 (Pre-contemplation 2: Not seriously thinking of quitting smoking, not planning to quit, but seriously thinking of cutting down)</td>
<td>15.5 (15)</td>
<td></td>
</tr>
<tr>
<td>PC3 (Pre-contemplation 3: Seriously thinking of quitting smoking or planning to quit but not within the next 6 months)</td>
<td>40.2 (39)</td>
<td></td>
</tr>
<tr>
<td>C (Contemplation: Seriously thinking of quitting smoking but not planning to quit within 6 months, but either (a) not planning to quit within one month or (b) has not intentionally quit for at least 24 hours within the past year)</td>
<td>14.4 (14)</td>
<td></td>
</tr>
<tr>
<td>PA (Preparation for action: Seriously thinking of quitting smoking and planning to quit smoking within 1 month, and having intentionally quit for at least 24 hours within the past year)</td>
<td>14.4 (14)</td>
<td></td>
</tr>
</tbody>
</table>

Factors associated with a readiness to quit (C, PA)

Chi-square analyses indicated that three variables were associated with having advanced beyond a ‘precontemplative’ stage of change, at $p < .10$: ability to imagine life as a non-smoker, enjoy being a smoker, and having made a quit attempt in the last 12 months.

The final regression model revealed that two of the three variables entered into the model independently predicted falling into the contemplative stages of change (C or PA): having made a quit attempt within the previous 12 months ($OR = 4.6$, $df = 1$, $p =$
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

.02), and responding ‘No’ to ‘Do you enjoy being a smoker?’ (OR = 7.2, df = 1, p = .01) (Table 6).

Previous quit attempts

Characteristics of previous quit attempts are detailed in Table 5. Nearly half (46.9%) of smokers had made at least one quit attempt in the last 12 months.

Table 5. Previous quit attempts

<table>
<thead>
<tr>
<th>Previous quit attempts</th>
<th>Total % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made quit attempt ever</td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>15.5 (15)</td>
</tr>
<tr>
<td>2-3 times</td>
<td>30.9 (30)</td>
</tr>
<tr>
<td>More than 3 times</td>
<td>35.1 (34)</td>
</tr>
<tr>
<td>Never tried to quit</td>
<td>18.6 (18)</td>
</tr>
<tr>
<td>Quit attempts in last 12 months</td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>28.1 (27)</td>
</tr>
<tr>
<td>2-3 times</td>
<td>14.6 (14)</td>
</tr>
<tr>
<td>More than 3 times</td>
<td>4.2 (4)</td>
</tr>
<tr>
<td>No quit attempt in last 12 months</td>
<td>53.2 (51)</td>
</tr>
<tr>
<td>Length of abstinence on last quit attempt</td>
<td></td>
</tr>
<tr>
<td>1 day or less</td>
<td>22.8 (18/79)</td>
</tr>
<tr>
<td>2-7 days</td>
<td>21.5 (17/79)</td>
</tr>
<tr>
<td>More than a week, less than a month</td>
<td>17.7 (14/79)</td>
</tr>
<tr>
<td>More than a month</td>
<td>38.0 (30/79)</td>
</tr>
<tr>
<td>Length of last quit attempt more than a month</td>
<td></td>
</tr>
<tr>
<td>M: 16.32; SE: 5.5; Range: 2-156</td>
<td></td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>40.0 (12/30)</td>
</tr>
<tr>
<td>6-24 months</td>
<td>50.0 (15/30)</td>
</tr>
<tr>
<td>Over 24 months</td>
<td>10.0 (3/30)</td>
</tr>
</tbody>
</table>
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Factors associated with making a quit attempt in the last 12 months

Chi-square analyses indicated that three variables were associated with making a quit attempt in the last 12 months at $p < .10$: enjoying being a smoker, stage of change for quitting and self-reported desire to quit. The final model revealed that only one of the three variables, a self-reported desire to quit between 8-10, significantly predicted making a quit attempt within the previous 12 months, ($OR = 11.9$, $df = 1$, $p = .03$), compared to those self-reporting a desire of 1-3 (Table 6).

Reasons for quitting

Smokers scored a total score of 2.7 ($SE = 0.1$) on the RFQ scale [194], with an intrinsic – extrinsic score of 0.4 ($SE = 0.1$). Scores were highest for intrinsic health concerns ($M = 3.1$, $SE = 0.1$), followed by immediate reinforcement ($M = 2.8$, $SE = 0.1$), self-control ($M = 2.7$, $SE = 0.1$) and social influence factors ($M = 2.2$, $SE = 0.1$).
Table 6. Logistic regression results for patient characteristics associated with a) readiness to quit (C, PA) and b) making a recent quit attempt in the final regression model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Co-efficient</th>
<th>SE</th>
<th>df</th>
<th>p-value</th>
<th>OR</th>
<th>CI (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a) Factors associated with readiness to quit (C, PA)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent (within 12 months) quit attempt</td>
<td>1.53</td>
<td>.65</td>
<td>1</td>
<td>.018</td>
<td>4.61</td>
<td>1.30 – 16.41</td>
</tr>
<tr>
<td>Do not enjoy being a smoker</td>
<td>2.00</td>
<td>.70</td>
<td>1</td>
<td>.005</td>
<td>7.18</td>
<td>1.84 – 28.10</td>
</tr>
<tr>
<td><strong>b) Factors associated with recent quit attempts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-report desire to quit (8-10)</td>
<td>2.45</td>
<td>1.2</td>
<td>1</td>
<td>.033</td>
<td>11.93</td>
<td>1.22 – 116.77</td>
</tr>
</tbody>
</table>
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Discussion

This study adds substantively to our knowledge of smoking and quitting behaviours and motivations among mental health inpatients. The results demonstrate that while a majority of smokers were classified at the time of the survey as ‘precontemplative’ with respect to readiness to quit, a desire to quit smoking was evident in that the great majority had made quit attempts in the past (82%) and 47% had done so within the last year. Consistent with previous studies, the quit ratio for the current sample was lower than general population rates [197, 198], and similar to previously reported quit ratios for persons with a mental illness [24, 199]. Despite a low quit ratio, reflecting a low likelihood of quit attempts translating into successfully maintained smoking cessation, a large proportion of those making a quit attempt in the last 12 months indicated a period of abstinence of more than a month.

Importantly, there is a need to inform clinical staff about the significant proportion of their clients who are making attempts to quit smoking, and to emphasise that the evident low success rate of such attempts should only serve to further highlight the need for clinical staff to provide appropriate nicotine dependence treatment in the inpatient setting and to facilitate post discharge smoking cessation support. Further, while the rate of smoking was higher among patients in a co-morbid mental health and substance use unit, as previously observed in this population [24, 182, 200], no differences were evident by unit or diagnostic grouping, or other demographic or clinical descriptors considered, with respect to readiness or desire to quit, or the number of previous quit attempts. Given that previous research has indicated that mental health staff provide nicotine dependence treatment selectively based on their perceptions of patient
receptivity to care, and desire to quit [50], our findings reinforce the need to provide smoking cessation care routinely and systematically rather than selectively to a particular type of patient [201, 202]. Additionally, the proportion of participants making a quit attempt in our sample was similar to rates reported in psychiatric outpatient samples [200]. This finding is encouraging and suggests pervasive attempts to quit despite the presence of acute psychiatric symptoms. Clinicians should be made aware of their patients ongoing attempts to quit, particularly given the clinical opportunity provided by the inpatient stay; where patients may be in a restricted smoking environment for an extended period, with access to clinical and pharmacological support [110, 148].

In examining factors associated with currently being in a contemplative (as opposed to precontemplative) stage of change, only two factors were identified as predictors: a quit attempt within the last 12 months, and indicating not enjoying being a smoker. In examining factors associated with a quit attempt in the last 12 months, only a high self-reported desire to quit (8-10, on a 10 point scale) was identified as a predictor. These findings are consistent with research among psychiatric outpatient samples indicating that making a recent quit attempt [132, 133], and endorsing negative aspects of smoking [123] are associated with a greater desire to quit. Further, evidence from general population smokers suggests that motivational factors predict quit attempts [188], and the number of previous quit attempts is positively correlated with intention to quit [203]. Together, these results suggest that actual quitting behaviour may be an important indicator of ‘desire to quit’ in the inpatient psychiatric setting.
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

However, among general population smokers, motivational factors also predict relapse among those attempting to quit, suggesting that motivation alone is not sufficient to ensure cessation success [188]. The majority of smokers in the current, and in other similar samples [53, 182] have made several recent, but unsuccessful attempts to quit. Limited research suggests that unsuccessful quit attempts are associated with higher levels of psychological distress [204], and that failed quitters have higher levels of psychological distress than successful quitters [205]. While this may be a result of the higher smoking rates among the mentally ill, future research among smokers with a mental illness should examine the patterns and context in which quit attempts are made, and the impact of failed quit attempts on future smoking behaviour and psychological wellbeing. Understanding previous quitting behaviour may also be useful for guiding appropriate clinical management and targeted cessation strategies for this population of smokers.

The finding that not enjoying being a smoker predicted readiness to quit is supported by similar previous research indicating that patients who endorse the ‘cons’ of smoking are more likely to be contemplating quitting, and show greater desire for abstinence [57]. In a recent systematic review examining the predictors of quitting smoking in the general adult population, studies revealed that having a negative opinion of smoking was also predictive of making a quit attempt, and that greater enjoyment of smoking was negatively associated with making a quit attempt [206]. Our findings also suggest that participants were almost equally divided in their ability to imagine their life as a non-smoker (hard vs. easy). While there has been limited research on the topic of smoking identity, some researchers suggest that developing a ‘non-smoker’ identity predicts
motivation to quit, and quit attempts [207, 208], and may prevent relapse after making a quit attempt [195, 209, 210]. Relapse prevention may be a particularly pertinent intervention strategy for this population, given that a substantial proportion of smokers in our sample indicated a recent quit attempt of more than a month; however the quit ratio of the total sample was low. Clinicians may routinely identify smokers who report high levels of enjoyment from smoking, and place an emphasis on the negative attributes of smoking (e.g. health, cost, smell, social stigma), and assist in the development of a non-smoker identity (e.g. removing smoking paraphernalia from home and car, responding ‘I am a non-smoker’ to proffered cigarettes, etc.). Future research into ‘smoker identity’ and its use as a practice approach in clinical settings may potentially improve cessation rates among this group [210].

Smokers reported slightly higher levels of intrinsic versus extrinsic motivation on the RFQ [194], however the little difference between intrinsic and extrinsic scores suggests participants were equally influenced by both types of motivation. Overall, scores on the RFQ were similar to those in outpatient psychiatric samples [133, 211], and higher than in general population samples [193, 211]. As previously found among smokers with a mental illness [133, 211], and in the general population [193, 211], participants cited health concerns as the most important reason for quitting; however scores on immediate reinforcement were almost equally as high. Having intrinsic concerns about the effect of smoking on health has been found to be associated with more advanced readiness to quit [193] and has been shown to predict making a quit attempt among general population smokers [206]. Interventions among this population could focus on enhancing intrinsic motivation types (such as self-control) and harnessing immediate
reinforcement type motivations. Contingency management for instance, has shown some promise in reducing smoking behaviours among smokers with schizophrenia and opioid-maintained patients [212, 213].

This study was conducted across three units located at one site, and as such the generalisibility of the findings may be limited. However, given that similar smoke-free policies are now compulsory in many hospitals internationally [103], these findings are likely to be of relevance in other inpatient psychiatric facilities. Further, the possibility of bias, particularly the influence of social desirability through the use of self-report data in this study, cannot be discounted. However, as the interviewers were independent of clinical care, and participants were not enrolled in a smoking cessation trial, the risk of such bias may have been reduced.

In conclusion, these results suggest that actual quitting behaviour should be considered as an important indication of ‘intent to quit’. The high proportion of respondents reporting a quit attempt, paired with the low quit ratio of this sample, suggests that targeted, comprehensive smoking cessation interventions are required. These findings will enable mental health staff to be better informed and hence assist in removing barriers to the provision of nicotine dependence care for this significant population of smokers, and facilitate the provision of nicotine dependence treatment. Integrated, combined, evidence based psychosocial and pharmacological interventions are required within mental health and addiction treatment settings to improve quit success.
CHAPTER 3: Readiness to quit and quit attempts among mental health inpatients

Acknowledgements

The authors would like to acknowledge the assistance of the research team at the University of Newcastle, particularly Lyndell Moore, Maree Adams and Samantha McCrabb, and the staff and patients of the Mental Health Centre, Calvary Mater Hospital, Newcastle.
CHAPTER 4: A RANDOMISED CONTROLLED TRIAL LINKING MENTAL HEALTH INPATIENTS TO COMMUNITY SMOKING CESSATION SUPPORTS: A STUDY PROTOCOL

Emily A. Stockings\textsuperscript{1,2}, Jenny A. Bowman\textsuperscript{1,2}, John Wiggers\textsuperscript{1,2,3}, Amanda L. Baker\textsuperscript{1,4}, Margaret Terry\textsuperscript{5}, Richard Clancy\textsuperscript{1,4}, Paula M. Wye\textsuperscript{1,2,3}, Jenny Knight\textsuperscript{3}, Lyndell H. Moore\textsuperscript{1}.

\textsuperscript{1} University of Newcastle, University Drive, Callaghan, New South Wales, (NSW) Australia, 2308
\textsuperscript{2} Hunter Medical Research Institute (HMRI), Level 3 John Hunter Hospital, Lookout Road, New Lambton Heights
\textsuperscript{3} Hunter New England Population Health (HNEPH), Longworth Ave, Wallsend, NSW, Australia, 2287.
\textsuperscript{4} Centre for Translational Neuroscience and Mental Health (CTNMH), Mater Hospital Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
\textsuperscript{5} Mental Health and Substance Use Service (MHSUS), Mater Hospital, Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298


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CHAPTER 4: Linking mental health inpatients to community cessation support: Protocol

Abstract

Background: Mental health inpatients smoke at higher rates than the general population and are disproportionately affected by tobacco dependence. Despite the advent of smoke-free policies within mental health hospitals, limited systems are in place to support a cessation attempt post hospitalisation, and international evidence suggests that most smokers return to pre-admission smoking levels following discharge. This protocol describes a randomised controlled trial that will test the feasibility, acceptability and efficacy of linking inpatient smoking care with ongoing community cessation support for smokers with a mental illness.

Methods/Design: This study will be conducted as a randomised controlled trial. 200 smokers with an acute mental illness will be recruited from a large inpatient mental health facility. Participants will complete a baseline survey and will be randomised to either a multimodal smoking cessation intervention or provided with hospital smoking care only. Randomisation will be stratified by diagnosis (psychotic, non-psychotic). Intervention participants will be provided with a brief motivational interview in the inpatient setting and options of ongoing smoking cessation support post discharge: nicotine replacement therapy (NRT); referral to ‘Quitline’; smoking cessation groups; and fortnightly telephone support. Outcome data, including cigarettes smoked per day, quit attempts, and self-reported 7-day point prevalence abstinence (validated by exhaled carbon monoxide), will be collected via blind interview at one week, two months, four months and six months post-discharge. Process information will also be collected, including the use of cessation supports and cost of the intervention.
Chapter 4: Linking mental health inpatients to community cessation support: Protocol

Discussion: This study will provide comprehensive data on the potential of an integrated, multimodal smoking cessation intervention for persons with an acute mental illness, linking inpatient with community cessation support.

Trial registration: This trial is registered on the Australian and New Zealand Clinical Trials Registry ACTRN1260900046525.
CHAPTER 4: Linking mental health inpatients to community cessation support: Protocol

Introduction

Persons with a mental illness are one of the largest remaining groups of smokers, comprising an estimated 32% of the total smokers in Australia [8]. Consistently high rates of smoking have been found among the mentally ill in Australia and internationally, ranging from 36% in community samples to above 90% among inpatients with psychosis [12-15]. Smokers with a mental illness are also more nicotine dependent [142], more likely to smoke unfiltered cigarettes [214] and less likely to quit than smokers in the general population [35, 143, 190]. Consequently, smokers with a mental illness have a significantly reduced life expectancy and are more likely to die from smoking related disease including cancers, cardiovascular disease, respiratory disease and stroke [215, 216].

Evidence for the effectiveness of multimodal smoking cessation interventions utilising combined pharmacological and psychosocial support is well established for smokers in the general population [5, 217, 218]. Recent evidence suggests that smokers with a mental illness have similar levels of motivation to quit as the general population [53, 134, 182] and smoking cessation intervention strategies can be equally effective among this group [96, 137, 219]. Multimodal smoking cessation interventions have been found to be effective among US veterans with Post-Traumatic Stress Disorder (PTSD) [220], depressed smokers [95], and in smokers with schizophrenia [97].

General hospitals can provide a base for the initiation of effective smoking cessation interventions [6, 202, 221, 222]. Abstaining from tobacco during hospitalisation has
been associated with higher abstinence rates at six months post discharge [114]. The recent introduction of smoke-free policies in Australian mental health facilities [110] provides the opportunity for smokers to temporarily abstain from cigarettes in a supportive environment, and may facilitate sustained cessation attempts upon discharge [12, 154]. Hospitalisation within a smoke-free mental health facility has been found to increase patients’ desire to quit smoking during admission [14, 154], and has been associated with a reduction in daily cigarette consumption from admission to discharge [12].

However, the limited data available indicate that smoke-free policies in mental health facilities appear to have had little effect on long term cessation [6], a finding suggested to be due in part to the lack of coordination between inpatient and community smoking cessation treatment [63, 130]. Systematic reviews show that by better integrating inpatient smoking care with post discharge cessation support, long term quit rates are increased among general hospital patients [221, 222]. However, in the context of mental health services, low levels of smoking cessation treatment have been found in both inpatient and community-based psychiatric services [52, 75, 223], and as a consequence, many smokers return to pre-admission smoking levels upon discharge from a mental health hospital [14, 154, 163]. The limited provision of smoking cessation treatment in community-based psychiatric services, to which many patients are likely to be referred upon discharge, highlights the need for integrated post-discharge smoking cessation treatment for smokers with a mental illness [63, 130].
Although an Australian randomised control trial of outpatients with psychosis reported that a multimodal smoking cessation intervention was effective in reducing smoking rates [96], at the time of writing the authors are not aware of any published studies that have examined the effectiveness of integrating inpatient smoking cessation care with community cessation support for individuals with a mental illness. This study is the first of its kind internationally to test, via randomised controlled trial, the feasibility, acceptability and efficacy of integrating inpatient smoking care with post-discharge ongoing, multimodal smoking cessation treatment for persons with an acute mental illness. This paper describes the methodology to be employed in the conduct of this trial.

**Methods/Design**

**Study aim**

The aim of this study is to test a multimodal smoking cessation intervention, linking hospital inpatient care (in a smoke-free mental health facility) with post-discharge community cessation support for smokers with a mental illness. This study aims to evaluate the feasibility, acceptability and efficacy of the integrated intervention to reduce smoking behaviour and encourage quitting post-discharge. This study will also provide a detailed evaluation of the uptake and use of the study intervention components, including the cost of the intervention.
CHAPTER 4: Linking mental health inpatients to community cessation support: Protocol

Study Design and Setting

This study will employ a single-site prospective randomised controlled study design, and will be reported in accordance with the requirements of the CONSORT statement [224]. It will be conducted at a large regional inpatient mental health facility located in the Hunter New England region of New South Wales (NSW), Australia. Inpatients will be recruited from three units within the facility (two general adult units and one dual diagnosis unit), with a total of 66 beds, with three other units excluded from this study (two emergency psychiatric care units and one geriatric unit). The majority of the study intervention will be delivered in the community setting, upon participants’ discharge from hospital, and contact between participants and project officers will occur via telephone and mail.

Figure 2 shows the study design. Mental health inpatients who report being current smokers will be approached to participate. Participants will be randomly allocated to intervention or control conditions. A permuted block randomisation approach will be used so that the distribution of participants by diagnosis (psychotic; non-psychotic) across treatment conditions will be maintained regardless of the final sample size [225, 226].

Inpatients allocated to the intervention condition will receive a brief motivational intervention from the research staff, and will be offered a range of psychosocial and/or pharmacological supports for up to 16 weeks post discharge. An initial two week supply of nicotine replacement therapy (NRT) is provided at discharge, and details of the patient’s participation in the study will be added to their electronic discharge summary,
for the information of health professionals providing post-discharge treatment. Patients allocated to the control condition will receive standard hospital smoking care only, which may include provision of up to three days free NRT and a referral to ‘Quitline’ upon discharge.

Baseline data will be collected during the initial face-to-face interview in the inpatient setting by trained project officers. Follow-up outcome data will be collected by blind interviewers independent of the study, via telephone interview at four time points following discharge: one week, two months, four months and six months.

This project has received ethics approval from the Hunter New England Human Research Ethics Committee, HREC reference no: 08/04/16/5.10, and the University of Newcastle Human Research Ethics Committee reference no: H-2008-0191. The trial is registered on the Australian New Zealand Clinical Trials Registry ACTRN1260900046525.

Participants and research eligibility

Approximately 200 smokers will be recruited to the study (100 in each condition). Written, informed consent will be obtained from each potential participant before commencement of the baseline interview.
**Figure 2. Study design**
Inclusion criteria

Participants will be required to be at least 18 years of age and to self-report being a current or occasional smoker upon admission to hospital. Participants will also be required to have a contact telephone number and address at the time of recruitment, and be judged by clinical staff to be physically and psychologically capable to complete the face-to-face baseline interview. Any person who presents severe psychological distress during the baseline interview will be referred to clinical staff and the interview will cease. Eligibility will be reassessed after these patients have stabilised.

Exclusion criteria

Patients will be excluded if they are not current smokers, are younger than 18 years of age, do not have a current contact telephone number or address, are non-English speaking, or if their current physical or mental wellbeing is judged by clinical staff to be too unstable to participate.

Recruitment and Allocation

Recruitment of participants will be ongoing over, approximately, a one year period. A systematic daily (weekdays only) review of current patients within each unit will be undertaken in conjunction with clinical staff, with advice provided to project staff regarding those patients deemed to be sufficiently stable to be approached on that day. The study will aim to approach all patients at some time during their stay, establishing
the smoking status of those patients who agree to speak with project staff. If patients report being a non- or ex-smoker, they will be thanked for their time, and the interview will cease. Eligible patients will be offered participation in the project, provided with the information statement about the research, and written informed consent will be obtained. Participants will complete a baseline interview with the project officer (up to one hour duration).

**Allocation**

Prior to commencement of recruitment, a random allocation sequence will be generated using IBM® SPSS® Statistics release version 19.0.0 [177] through consultation with an independent statistician not actively involved in the project. The randomisation will follow a permuted block design, restricted to blocks of 10, and stratified by diagnosis (psychotic; non-psychotic) to ensure an even distribution of participants within and between treatment conditions [225, 226]. The random allocation sequence will be stored with a research assistant independent of the recruitment process, and all project officers involved in recruitment and follow-up data collection will be kept blind to the sequence. According to the order of the random allocation sequence, the research assistant will place small cards indicating the treatment condition (“Intervention” or “Control”) inside sealed, security envelopes, displaying the sequentially ordered participant identification code on the exterior. Following completion of the baseline interview, the project officer will provide the participant with the subsequent envelope in sequence, and the envelope will be opened by the participant at the conclusion of the baseline interview.
CHAPTER 4: Linking mental health inpatients to community cessation support: Protocol

**Intervention condition**

In addition to hospital smoking care, the participants randomised to the intervention condition will be provided with a ‘base’ intervention component, comprising a brief motivational interview and smoking cessation self-help material in the inpatient setting. Participants will also be offered the following ‘additional’ components of the intervention, to occur post discharge: up to 12 weeks of ongoing NRT; a proactive ‘Quitline’ referral; and a referral to community smoking cessation support groups. Upon discharge, participants will receive an initial two week supply of NRT, and their participation in the study will be recorded on the hospital discharge summary and sent to relevant treating practitioners in the community. Participants will additionally receive supportive phone contact at three days, and one week post hospitalisation, and the delivery of the elected intervention components will commence. Subsequently, participants electing any of the ‘additional’ intervention components will concurrently receive up to 16 weeks of further fortnightly telephone support.

**Intervention content**

The smoking cessation intervention focuses on the adoption of multiple, evidence based cessation strategies to assist with smoking reduction and abstinence, at the participant’s discretion [5, 218]. Quitting smoking will be the focus of the intervention. However, a harm minimisation approach will also be employed, through encouraging a reduction in the number of cigarettes smoked per day [227-230]. At the completion of the baseline
interview, and following allocation to the intervention condition, participants will receive:

‘Base’ intervention component

*Smoking cessation self-help material*: Participants will be provided with a clear, plastic folder containing a pamphlet and workbook targeted at smokers with a mental illness, developed by a state government provided proactive telephone smoking cessation support service ‘Quitline’ [231, 232], a smoking and mental health factsheet developed by a national mental health charity organisation ‘SANE’ [233], and a one page document (developed by the research team) with instructions on how to effectively use NRT, and how to manage nicotine withdrawals and NRT side effects [92].

*Brief motivational interview*: The project officer will conduct a brief (5-10 minutes) motivational interview by guiding the participant through a series of topics designed to motivate the participant towards positive health behaviour change, including: positives and negatives of smoking and quitting, importance and confidence in quitting, and health and financial costs of smoking [86].

Immediately upon discharge from hospital, intervention participants will receive:

*Initial NRT supply*: To allow for continuation of inpatient and community smoking cessation treatment, an initial two week supply of NRT will be provided to the patient at discharge. Subsequent NRT supplies are delivered in the community setting (below).
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*Study participation recorded on discharge summary:* The project officer will provide brief information regarding the participants’ engagement in the trial into the area health service’s online discharge summary system. This information will be communicated to general practitioners and other relevant health professionals upon the participants’ discharge from hospital, in order for these services to support the participants’ ongoing care, and for this study, their quit attempt in the community setting [221, 222].

Additionally, participants allocated to the intervention condition will be offered the following supports to commence upon discharge:

*‘Additional’ intervention component*

*NRT:* Participants will be offered up to 12 weeks free NRT [234-236]. An NRT protocol for this trial will be developed based on a combination NRT algorithm [237], the area health services’ NRT protocol (provided in Appendix 8) [110] and the product disclosure information for the NRT provided in this trial. Patch (21, 14 and 7mg), lozenge, gum (2 and 4mg), and inhaler (10mg) will be prescribed according to the study NRT protocol, and based on a nicotine dependence assessment [176] and patient preferences. Combination therapy (patch plus adjunctive) will be recommended for all smokers. For those who smoke >20 cigarettes per day, 2mg gum or lozenge, or 10mg inhaler will be offered to manage acute craving. Tapering of NRT dose will not be explicitly advised, but dosage and frequency of use will be closely reviewed during fortnightly telephone support.
On the day of recruitment, a project officer will send an email notification of the NRT prescription to the participant’s chief and junior medical officer should there be any unknown medical concern. An initial two week supply of NRT will be provided to the patient at discharge. Subsequent supplies of NRT will be mailed fortnightly at the completion of the fortnightly telephone support call (below), in which daily cigarette consumption, nicotine withdrawal symptoms and patient preferences will be reviewed.

Community smoking cessation support groups: Referral will be offered to smoking cessation support groups developed in conjunction with allied health staff in local community mental health services, and delivered by staff in those services [238]. A project officer will complete a referral form for the participant and email it to the appropriate community mental health service (based on local government area) upon the participant’s discharge from hospital. Group facilitators will contact participants to complete an initial screening interview and provide details of the group program. Groups will run on a rotating basis of one, one hour group for four weeks, and will follow an educational, group-oriented support and skills training format, with no specific psychological or behavioural intervention [239, 240]. Content will be tailored to smoking and mental illness, with topics covered including: understanding nicotine addiction and withdrawal, smoking habits and triggers, benefits of quitting, effective use of NRT, illness management and interaction with medications, and quit strategies.

Proactive ‘Quitline’ referral: The NSW ‘Quitline’ (funded by the Cancer Institute, NSW) [231] is a confidential telephone based service designed to help smokers to
reduce or quit tobacco smoking. With the consent of participants, the project officer will complete a proactive NSW ‘Quitline’ referral form at the completion of the baseline interview, and fax the form to Quit NSW upon the participant’s discharge from hospital. The ‘Quitline’ will call the participant according to the time and day suggested by the participant on the form, within one week of referral. The telephone service typically involves six calls, and a follow-up call conducted three months following the participants’ elected quit date, with content including: nicotine dependence; quit strategies; relapse prevention; and information on cessation products and services [231].

**Fortnightly telephone support:** For all intervention participants, support calls will be conducted by a telephone counsellor at three days, and one week post discharge [241]. If participants elect any of the ‘additional’ intervention supports, these calls will continue fortnightly for as long as the participant is engaged with the intervention (up to 16 weeks total). Each call will follow a predefined script as developed by the research team. Topics covered include: uptake, usage, problems and effectiveness of intervention supports (NRT, ‘Quitline’, community smoking cessation support groups), fortnightly review of NRT dosage, assistance with NRT use, monitoring and managing nicotine withdrawal symptoms, daily cigarette consumption, techniques to improve smoking outcomes, and general psychological support and encouragement. If participants are receiving study NRT, these fortnightly telephone support calls will act as a means for project officers to monitor NRT use, dosage and side effects, and to subsequently mail an appropriate fortnightly supply of NRT.
CHAPTER 4: Linking mental health inpatients to community cessation support: Protocol

Intervention personnel, recruitment and training

Recruitment will be conducted by a registered health psychologist and several project officers with four year undergraduate psychology degrees. Prior to commencement of recruitment, all recruitment staff will complete the area health services’ mandatory two-day mental health training, concerned with ensuring occupational health and safety when working in the hospital environment. All recruitment staff will be trained by a senior member of the research team and psychologist undertaking recruitment in conducting the baseline interviews and brief motivational interviewing, including the conduct of mock interviews, and sitting in on patient interviews.

The fortnightly telephone support service will be provided by a registered nurse (and undergraduate psychology student), experienced with patient contact and managing patient issues. The interviewer will undergo project specific training and will assist in the development of the support protocols and content.

Outcome data will be collected by blind telephone interviewers, independent of the study, with several years’ experience in conducting health related telephone based surveys, but no formal qualifications in psychology or social sciences. Interviewers will undergo project specific training where they will be briefed on the aims and methodology of the study. Details regarding project specific issues (including NRT and psychiatric medication) will be provided to ensure interviewers are able to prompt participants if they have any difficulty or confusion regarding outcome questions.
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Treatment monitoring and fidelity

To ensure integrity of the intervention, members of the research team will have weekly contact with project officers, support call staff and follow-up telephone interviewers to ensure common issues or concerns are dealt with in a consistent and timely manner. The research team will also meet fortnightly with a working group comprising experienced mental health and drug and alcohol clinicians employed at the hospital site to raise and address any issues arising from working within the hospital, and to discuss and gain insight into the best management of participants throughout the trial period. The research team will also meet quarterly with a larger advisory group to discuss the aims of the trial, ensure recruitment, follow-up and intervention delivery are occurring to the best standard possible, and to keep abreast of approach, consent and follow-up rates.

Control condition

Participants allocated to the control condition will receive standard hospital nicotine dependence treatment only. This may include provision of NRT during hospitalisation and, upon discharge, up to three days provision of NRT and referral to ‘Quitline’. Nicotine dependence treatment is known to be limited and to vary in this setting [75].
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Data collection and measures

Baseline

The baseline survey will be administered as a face-to-face interview by project officers, within the inpatient setting prior to the allocation of treatment condition, and will be of up to one hour duration for both groups.

Contact information

During the baseline interview, contact details will be obtained directly from the participant, including: home address, contact phone number, living situation, and smoking status of housemates. In order to reduce attrition, participants will also be asked to elect and provide contact details of two ‘contact persons’ (friends or family members) and for their regular general or health practitioner (name, phone number and service address) for use by the research team in the event that participants can no longer be contacted and new details need to be obtained [242, 243]. Consent will also be gained from the participant for their contact details to be obtained from another Hunter New England Area Health Service providing care, in the event that their contact details change and the research team cannot contact them through other means.
Follow-up data collection

Follow-up data will be collected for both groups via blind telephone interview at one week, two months, four months and six months post discharge. To enable subsequent assessment of the effectiveness of the blinding, interviewers will be asked at the completion of the interview to indicate the treatment condition to which they believe the participant was allocated. If any participant experiences an acute phase of their psychiatric disorder during any of the follow-up phone interviews, they will be encouraged to contact their general practitioner, psychologist or community mental health team. Participation will continue as normal unless the participant expresses severe psychological distress and/or they no longer wish to participate in the trial. To minimise attrition, notices will be mailed, one week prior the due date, to remind participants of each upcoming follow-up call [244]. The protocol for follow-up calls will comprise up to four weeks of call attempts, with at least 10 attempts made within the first seven days of the due date, and regular attempts thereafter. At the completion of the six month follow-up interview, a letter will be mailed to participants, notifying them that their participation is complete and thanking them for their contribution to the study.

Demographic information

Demographic details including level of education, employment status and whether the participant receives a government support pension will be collected during the baseline interview. At the completion of the baseline interview, additional demographic information will be obtained from the participant’s medical record, by a health
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psychologist employed by the service, including participant’s full name, medical record number, age, address at time of admission, gender, pregnancy status (if NRT is to be prescribed), marital status, Aboriginal or Torres Strait Islander cultural identification, date and length of current admission, smoking status on admission, nicotine dependence treatment provided during admission, primary and secondary mental health diagnoses, medications for mental and general health conditions, and date of most recent previous admission to the facility (if applicable).

Primary outcome measures

The primary outcomes of this trial relate to changes in participants’ smoking behaviour. Smoking behaviour will be assessed at each of the four follow-up surveys (one week, two, four and six months) by: daily cigarette consumption; number and duration of quit attempts; and biochemically validated abstinence. Daily cigarette consumption and quit attempts are recognised and recommended outcome measures which are frequently used in this population [245, 246]. When abstinence is reported, it will be verified by exhaled carbon monoxide (CO) levels using a MICRO+ Smokerlyzer, with a cut-off of <10ppm [228, 246]. CO validation tests will be arranged during the follow-up surveys and will be conducted by a project officer within three days of the survey (with smoking status attained again at that time), in a public location convenient to the participant (e.g. library) or, if not viable, conducted as a home visit following the institutional safety guidelines.
Secondary outcome measures

Secondary outcome measures will include: nicotine dependence, as measured by the Fagerstrom Test of Nicotine Dependence (FTND) [176]; changes in motivation to quit smoking, as measured by the Readiness and Motivation to Quit Smoking Questionnaire [192]; alcohol and other substance use, as measured by The Alcohol Use Disorders Identification Test (AUDIT) [247]; and mental well-being, as measured by the Kessler Psychological Distress Scale (K10) [248].

Process measures

All participants: Details regarding participant uptake, use and perceived effectiveness of smoking cessation supports (provided by this trial or elsewhere) will be collected at each of the four follow-up time points (one week, two, four and six months post discharge) for participants in both conditions. In addition, the follow-up telephone interviewers will record data arising from the outcome of each follow-up telephone survey, including the time and date of all call attempts, call outcome (e.g. engaged, answering machine, call partially complete, call complete or refusal), length of call, and the interviewer who conducted the call.

Intervention participants: For participants allocated to the intervention condition, more detailed information regarding uptake, use and effectiveness of the interventions provided by this trial will be collected systematically at each fortnightly telephone support call, including: intervention options elected at baseline, three day call and initial (one week) support call; whether the participant received their previous NRT allocation
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and details of its contents; usage of NRT, including type, dosage, and amount used per day; problems with and perceived effectiveness of NRT; smoking cessation support group attendance and effectiveness; number, date and effectiveness of calls received from ‘Quitline’; and any problems experienced with the intervention options or participation in the project. Additionally, information regarding the process and outcome of these calls will be recorded, including date and time of call attempts, call outcome (e.g. engaged, answering machine, call partially complete, call complete or refusal) call duration, interviewer who conducted the call, and the total number of calls received by each participant in the intervention support phase.

Cost: This trial will provide a detailed evaluation of the costs to deliver the intervention. Cost will be determined by assessing: staff time associated with initial recruitment and follow-up support calls; NRT and other intervention materials (including self-help brochures); and phone and mail costs. Data for the use in calculation of costs will be collected through detailed records of baseline interview length, support call attempts and length, total NRT usage and associated mail costs.

Sample size and detectable difference

A total of 200 participants (approximately 100 per group) will be recruited to the study (an estimated 70 per group at 6 month follow-up, assuming a 70% follow-up rate). This number is sufficient to conduct intention to treat analyses to examine intervention effectiveness (with 80% power and .01 level significance tests) in terms of differences on the continuous outcome measures (e.g. quit attempts, daily cigarette consumption,
nicotine dependence) of the order of 0.51 standardised (effect-size) units, and 4.8 fold increases in point prevalence abstinence (e.g. treatment group, 24% abstinent, vs. comparison group, 5% abstinent). A previous, similar sized multimodal intervention study conducted among a mental health patient population demonstrated statistically significant differences (20% effect size or larger) between groups on continuous outcomes including reduction in daily cigarette consumption and nicotine dependence levels, but not for abstinence [96]. Due to the unique methodology and intensity of intervention employed in the current trial, it is uncertain whether this trial will have sufficient power to detect statistically significant differences in abstinence between the two conditions, however significant differences in other outcomes are achievable. It could be argued, based on the novel design of this trial, larger effect sizes may be achieved, but this remains speculative.

Analysis

Data will be analysed using IBM® SPSS® Statistics release version 19.0.0 [177]. For the key smoking-related outcome variables, intention-to-treat analyses will be conducted, together with subgroup analyses based on patterns of intervention uptake. For these analyses, missing data will be classified non-abstinent or as failing to achieve reduction. Odds ratios and associated confidence intervals (CI) will be reported, with the control group as the reference point (odds ratio=1.00). For the continuous outcome variables (e.g., daily cigarette consumption), planned comparisons between follow-up points, from repeated-measures analyses of variance (ANOVAs), will be used to
examine group differences in patterns of change. As a partial control for the number of statistical tests, the threshold for statistical significance will be set at $p < 0.01$. Among this population, evidence of satisfactory engagement with post-discharge support services and progressive changes in smoking behaviour are also considered highly desirable outcomes. The projected sample sizes should also be sufficient to allow an examination of correlations between selected participant characteristics and aggregate indices of engagement based on the various process measures.

Discussion

The research literature indicates no previously published randomised control trials internationally to evaluate the effectiveness of an integrated smoking cessation intervention for mental health inpatients, linking inpatient smoking care with community cessation supports. This multimodal, integrated intervention design has been developed to maximise the likelihood of positive smoking outcomes for mental health patients, and aims to demonstrate the feasibility, acceptability and potential efficacy of linking inpatient smoking care to community cessation support. The study demonstrates many strengths. Firstly, most smoking cessation interventions for persons with a mental illness to date have focused on specific diagnostic groups, particularly, samples with schizophrenia or schizoaffective disorders [130]; and have further required patients to express a willingness or desire to quit for participation [137]. The methodology employed in this trial is particularly unique. No previous studies have directly examined the effect of linking inpatient smoking care to community cessation support for mental
health patients, and only very few have been conducted in the general hospital setting [145, 249]. In the current trial, we aim to employ a ‘real life’ approach, working within existing mental health services, systematically approaching patients and determining smoking status, and offering the project regardless of diagnosis or motivation to quit. By offering participation to a heterogeneous sample of diagnostic groups and motivation levels, this trial may demonstrate the effectiveness of providing integrated smoking cessation treatment to mental health inpatients in a systematic manner that may be incorporated into existing mental health settings.

This manuscript provides a comprehensive description of the methodology to be employed as part of a randomised control trial to examine the feasibility, acceptability and potential efficacy of an integrated smoking cessation intervention for mental health inpatients, linking inpatient smoking care with community cessation support. The successful implementation of this trial will provide strong evidence on which to base judgments regarding the efficacy of this intervention approach.

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CHAPTER 5: IMPACT OF A POST-DISCHARGE SMOKING CESSATION INTERVENTION FOR SMOKERS ADMITTED TO AN INPATIENT PSYCHIATRIC FACILITY: A RANDOMISED CONTROLLED TRIAL

Emily A. Stockings\textsuperscript{1,5,6}, Jenny A. Bowman\textsuperscript{1,5,6}, Amanda L. Baker\textsuperscript{1,3,6}, Margaret Terry\textsuperscript{4}, Richard Clancy\textsuperscript{1,3,6}, Paula M. Wye\textsuperscript{1,2,6}, Jenny Knight\textsuperscript{2}, Lyndell H. Moore\textsuperscript{1}, Maree F. Adams\textsuperscript{1}, Kim Colyvas\textsuperscript{1}, John H. Wiggers\textsuperscript{1,2,5,6}

\textsuperscript{1} University of Newcastle, University Drive, Callaghan, New South Wales, (NSW) Australia, 2308
\textsuperscript{2} Hunter New England Population Health (HNEPH), Longworth Ave, Wallsend, NSW, Australia, 2287.
\textsuperscript{3} Centre for Translational Neuroscience and Mental Health (CTNMH), Mater Hospital Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
\textsuperscript{4} Mental Health and Substance Use Service (MHSUS), Mater Hospital, Cnr Edith and Platt Streets, Waratah, NSW, Australia, 2298.
\textsuperscript{5} Hunter Medical Research Institute (HMRI), Level 3 John Hunter Hospital, Lookout Road, New Lambton Heights
\textsuperscript{6} University of Newcastle Priority Research Centre for Health Behaviour (PRCHB), Room 271, Level 2, David Maddison Building, Cnr King and Watt Streets, Newcastle, NSW, Australia, 2300.


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Abstract

Introduction: Persons with a mental disorder smoke at higher rates and suffer disproportionate tobacco-related burden than the general population. The aim of this study was to determine if a smoking cessation intervention initiated during a psychiatric hospitalisation and continued post-discharge was effective in reducing smoking behaviours among persons with a mental disorder.

Methods: A randomised controlled trial was conducted at an Australian inpatient psychiatric facility. Participants were 205 patient smokers allocated to a treatment as usual control (n = 101), or a smoking cessation intervention (n = 104) incorporating psychosocial and pharmacological support for four months post-discharge. Follow-up assessments were conducted at one week, two, four and six months post-discharge and included: abstinence from cigarettes, quit attempts, daily cigarette consumption and nicotine dependence.

Results: Rates of continuous and seven-day point-prevalence abstinence did not differ between treatment conditions at the six month follow-up, however, point prevalence abstinence was significantly higher for intervention (11.5%) than control (2%) participants at four months (OR = 6.46, p = .01). Participants in the intervention condition reported significantly more quit attempts (F [1,202.5] = 15.23, p = .0001), and lower daily cigarette consumption (F [4, 586] = 6.5, p < .001) and levels of nicotine dependence (F [3, 406] = 8.5, p <.0001) than controls at all follow-up assessments.

Conclusions: Post-discharge cessation support was effective in encouraging quit attempts and reducing cigarette consumption up to six months post-discharge.
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Additional support strategies are required to facilitate longer term cessation benefits for smokers with a mental disorder.
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Introduction

Tobacco use remains one of the leading global causes of preventable illness and premature death [1]. General population smoking rates in developed nations have steadily declined over the past 50 years and range from 15-20% [7, 142, 250]. However, for persons with a mental disorder, rates of smoking have remained unchanged for the past 20 years [174], and are at least two to three times higher than general population estimates [8, 55, 72]. The association between smoking and mental illness appears to increase with illness severity, with some of the highest rates of smoking identified among persons with schizophrenia [35, 55], and those hospitalised for psychiatric treatment [11, 13], with smoking rates ranging between 45.9 - 81.8% for these groups [11, 13, 29]. Consequently, persons with a mental disorder are more likely to die from smoking-related disease [38, 39] and experience a reduced life expectancy of 12-15 years [40]. Interventions that reduce smoking rates among persons with a mental disorder are both a clinical and a public health priority [173].

The recent smoking and mental health report released by the Royal College of Physicians and the Royal College of Psychiatrists highlights the importance of health care services in delivering systematic smoking cessation treatment to smokers with a mental disorder [173]. The introduction of smoking bans [103, 105] and concurrent provision of behavioural and pharmacological smoking cessation treatment in inpatient psychiatric settings [4, 108, 110] provides an opportunity to initiate such care [130]. Several studies have suggested a smoke-free psychiatric hospitalisation may increase patients’ motivation to quit [154] and result in reductions in cigarette consumption up to two weeks post-discharge [53]. However, without continued cessation support post-
hospitalisation, most smokers return to smoking [14]. Extensive literature demonstrates the efficacy of initiating smoking cessation treatment within general hospital settings [129], with the chance of cessation success significantly enhanced by including at least a one-month supportive period post-hospitalisation [170]. Such support may also represent an effective model for smokers discharged from an inpatient psychiatric facility [170].

Only one recently published study, conducted in the United States, has examined smoke-free inpatient adult psychiatry as a setting for initiating smoking cessation treatment [98]. Abstinence rates at 18 months post-discharge were higher among patients receiving motivational smoking cessation treatment combined with nicotine replacement therapy (NRT) (20%) relative to usual care controls (7.7%). These findings support the initiation of smoking cessation treatment within inpatient psychiatry, however no such research has been conducted in the Australian context [251]. To address this evidence gap, a study was undertaken to examine the efficacy of a smoking cessation intervention initiated during a psychiatric hospitalisation and continued post-discharge in increasing smoking cessation and quit attempts, and in reducing cigarette consumption and nicotine dependence among Australian psychiatric inpatients.

**Methods**

*Design*

A single site, stratified (psychotic/non-psychotic diagnosis), blinded, individually randomised controlled (intervention versus treatment as usual control) parallel-group
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trial was conducted. As details of the trial have been reported previously [251], study design and methods are presented in summarised form here.

Participants and setting

Study participants were patients of a discrete psychiatric facility located within a large, regional public hospital in NSW, Australia over a 12-month period (May 2010-11). The psychiatric facility had up to 2000 discharges per year, and comprised six units, of which three were included in this study (comprising a total of 66-beds): one comorbid acute mental health and substance use unit, and two acute adult mental health units. The three excluded units (comprising 34-beds) were two psychiatric emergency care short stay units and one older persons unit. In accordance with state-wide policy directives, a total smoking ban was implemented in the facility in 2006, prohibiting smoking in all hospital buildings and grounds [105] and treating staff were required to provide nicotine dependence treatment to all smokers [110]. Patient inclusion criteria were, being: at least 18 years of age, a self-reported current or occasional smoker, able to provide a contact telephone number and/or address, capable of completing a face-to-face baseline survey and being fluent in English.

Ethics approval for the study was obtained from the Hunter New England Human Research Ethics Committee, HREC reference no: 08/04/16/5.10, and the University of Newcastle Human Research Ethics Committee reference no: H-2008-0191. The trial was registered on the Australian New Zealand Clinical Trials Registry ACTRN1260900046525.
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*Recruitment Procedure*

Ward lists were used to determine new patient admissions on a daily basis, and trained project officers (independent of the hospital) liaised with clinical staff to determine patient capability to complete the baseline interview, and mental health diagnosis. Each patient was approached as soon as possible following admission and stabilisation, and patients identified to be smokers were invited to participate in the trial.

*Randomisation*

A randomisation sequence was computer generated by a statistician independent of the research team using IBM® SPSS® Statistics release version 19.0.0 [177] and was stratified by mental health diagnosis (psychotic and non-psychotic) with a 1:1 allocation, prior to recruitment. Randomisation was achieved by each consenting participant drawing a sequentially numbered envelope from a series of envelopes containing an equal distribution of control and intervention. All project and clinical staff working in the hospital setting, and follow-up interviewers were blinded to the randomisation sequence.
Treatment conditions

i)  Control

Participants allocated to the ‘treatment as usual’ control condition received nicotine dependence treatment provided by the facility as standard care during admission and on discharge. In accordance with state-wide guidelines [110], such care could have involved: assessment of smoking status and nicotine dependence on admission, provision of brief advice to quit, provision of NRT during admission and for three days upon discharge, and a post-discharge smoking care plan included on the discharge summary. Previous research in this setting has suggested that the provision of such care is limited and variable [75].

ii)  Intervention

In addition to treatment as usual, all participants allocated to the intervention condition received self-help smoking cessation literature and a 10-15 minute motivational interview with the project officer, immediately following completion of the baseline interview. The focus of this motivational interview was to explore ambivalence and barriers towards smoking cessation and to encourage behaviour change via the uptake and use of the intervention support components. Information regarding a participants’ engagement in the study was entered into the online discharge summary system for the information of treating clinicians post-discharge. At the time of discharge, patients collected a two week supply of project NRT (tailored to personal preferences and severity of nicotine dependence).
Upon discharge, all participants received four months of fortnightly telephone smoking cessation support with a designated counsellor who offered: 12-weeks additional supply of tailored NRT, a referral to a free state government-operated telephone quit service ‘Quitline’, and a referral to community-run smoking cessation groups (delivered by allied health staff in local community mental health services; tailored for persons with a mental disorder). Each telephone support call followed a standardised script and covered topics including: usage of the intervention supports, review of NRT dosage, assistance with correct NRT use, monitoring and managing nicotine withdrawal symptoms, techniques to improve smoking outcomes, and general psychological support and encouragement. While quitting smoking was the focus of the intervention, a harm minimisation approach was also employed, through encouraging uptake of cessation supports and a reduction in daily cigarette consumption.

Measures

i) Sample characteristics at baseline

Socio-demographic and clinical characteristics of the sample were collected on the day of recruitment via face-to-face surveys and medical record audit, and comprised: unit of admission, length of stay (calculated from date of admission and date of discharge), age, gender, marital status, completed education, current employment, receipt of government pension, primary mental health diagnosis, psychological distress (Kessler Psychological Distress scale [K10]; [248]), and alcohol consumption (three-item Alcohol Use Disorders Identification Test [AUDIT-C]; [247]). Patient reported receipt of nicotine
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dependence treatment during admission, including receipt of brief advice to quit and NRT was obtained at the one week follow-up assessment to account for the entire admission. Smoking-related characteristics comprised: age of smoking onset, previous quit attempts (in lifetime, and in the past 12 months), stage of change for quitting (Readiness and Motivation to Quit Questionnaire [RMQ]; [192]), lifetime NRT use, cannabis use (in lifetime, and in the past 12 months) and if cannabis is usually mixed with tobacco.

ii) Primary and secondary smoking outcomes

Follow-up data were collected via computer-assisted telephone interview at one week and at two, four (aligned with completion of the intervention period), and six months post-discharge. The four month assessment was designed to occur at the completion of the intervention period, however differences in the timing of intervention onset and difficulties in contacting participants meant that this assessment may have occurred slightly before or after treatment had ceased. The primary outcomes were the differences in validated continuous (from date of discharge) and seven day point-prevalence abstinence between treatment conditions. For participants who self-reported abstinence in a follow-up assessment, an appointment was made to meet with a project officer at a convenient time and location within three days of the interview to complete an expired breath carbon monoxide (CO) assessment using a MICRO+ Smokerlyzer to verify smoke-free status. Self-reported abstinence was re-assessed immediately prior the CO assessment, and the cut-off for abstinence set at <10 parts per million [228, 246].

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Secondary outcomes were the differences in prevalence of quit attempts, daily cigarette consumption and level of nicotine dependence (Fagerstrom Test for Nicotine Dependence [FTND]; [176]) between treatment conditions. Quit attempts were defined as not smoking for a period of at least 24 hours with the intent to quit (not including hospitalisation). We also assessed changes in psychological distress between treatment conditions using the K10 at each follow-up assessment.

iii) Use of intervention supports

For participants in the intervention condition, use of each of the smoking cessation supports (NRT, ‘Quitline’ and cessation groups), and details regarding number of, and duration of support calls were recorded during each fortnightly telephone support call with the designated counsellor.

Variable transformation

Responses to the following variables were reduced to two levels: K10 (low or moderate psychological distress [10-29], high psychological distress [30-50] [252]), education level (< higher school certificate, higher school certificate or greater), employment (paid employment, no paid employment), and nicotine dependence (not dependent [FTND ≤ 5], dependent [FTND ≥ 6] [166]). Participants were classified as having hazardous levels of alcohol consumption if AUDIT-C scores were ≥ 3 for women and ≥ 4 for men [253]. Responses to the following variables were reduced to three levels: marital status
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(current partner [married or de facto], previously partnered [single, divorced/widowed/separated]), age (< 30, 31-45, 46+), and mental health diagnoses (mood disorders, schizophrenia and related psychosis, other).

Analyses

IBM® SPSS® Statistics release version 20.0 [254] and SAS 9.3 for windows [255] were used to analyse the data. Descriptive statistics were used to describe the sample’s socio-demographic, clinical and smoking-related characteristics and receipt of nicotine dependence treatment at baseline. Chi-square analyses and independent samples t-tests were used to examine differences between consenters and non-consenters, between participants in the intervention and control conditions, and between those who did and did not complete each follow-up assessment.

Outcome analyses were conducted on an intention to treat (ITT) basis with participants retained in their originally assigned groups [256]. The primary endpoint for all outcomes was defined as the six month follow-up assessment. For all smoking-related outcomes (with the exception of continuous abstinence), and for psychological distress, generalised linear mixed modelling was used to examine differences between treatment conditions over time (intervention group \[n = 104\] versus control group \[n = 101\]) [257]. To examine predictors of the primary abstinence outcomes, we entered baseline demographic variables (age, gender, education level, pension status, mental health diagnosis, and readiness to quit smoking), use of the intervention components, psychological distress (K10), alcohol consumption (AUDIT-C) and cannabis use as
covariates into the generalised linear mixed models. A significant intervention effect was determined based on a significant group-by-time interaction. For variables where no baseline assessment was applicable (i.e. point prevalence abstinence, quit attempts, and 50% reduction in cigarettes per day), a significant intervention effect was determined based on a main effect of condition at the primary endpoint. Due to the low number of counts due to zero cells for the continuous abstinence variable, chi-square Fischer’s exact tests were used in lieu of generalised linear mixed modelling to examine differences between treatment conditions at each follow-up assessment separately. For this analysis, a significant intervention effect was determined based on a significant difference between treatment conditions at the primary endpoint.

For categorical outcomes, missing data were classified as non-abstinent, as not having made a quit attempt, or as failing to achieve the 50% reduction in the number of cigarettes smoked. If participants exhaled above 10 parts per million of CO during biochemical validation of self-reported abstinence, or if they failed to provide a CO sample, they were classified non-abstinent [228, 246]. Smoking reduction was calculated based on whether participants had reduced their daily cigarette consumption by 50% or greater (including abstinence) since baseline [96, 97, 258]. Odds ratios, uncertainty estimates (95% confidence interval) and p-values were reported where appropriate, with the control group as the reference point (odds ratio = 1.00). The threshold for statistical significance was set at $p < .01$. 

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Sample size

A sample size of 100 per group was calculated to have sufficient power to detect population differences of the following magnitude (at \( p < .01 \)): 4.8 fold increases in point prevalence and continuous abstinence; 2.5 fold increases in those achieving a 50% or greater reduction in cigarettes per day; and differences on the continuous outcome measures of the order of 0.51 standardised (effect-size) units.

Results

Participants

Participant recruitment and attrition characteristics are presented in Figure 3. Of the 1,174 patients admitted to the study units during the 12-month study period, 716 (61.0%) were assessed for eligibility of which 297 (41.4%) were eligible for inclusion, and 205 provided consent (69.0%) and were randomised (101 control, 104 intervention). Follow-up rates were 75.1% of consenting participants at one week, 75.6% at two months, 72.2% at four months, and 64.4% at six months and did not differ between treatment conditions at any time point. There were no significant differences in characteristics for those who completed the follow-up assessments compared to those who did not, at any time point.
**Figure 3.** CONSORT flowchart of progress of participants throughout the trial

Admitted to facility \( (n = 1,174) \)

- Not assessed for eligibility \( (n = 458) \)
  - Admission < 3 days \( (n = 276) \)
  - Discharged before interview \( (n = 99) \)
  - Declined interview \( (n = 80) \)
  - Transfer to other unit \( (n = 3) \)

Assessed for eligibility \( (n = 716) \)

- Excluded \( (n = 419) \)
  - Ex-smoker \( (n = 118) \)
  - Never smoker \( (n = 148) \)
  - Mentally or physically unwell \( (n = 68) \)
  - Discharge before follow-up \( (n = 67) \)
  - Declined participation \( (n = 92) \)
  - No post-discharge contact \( (n = 13) \)
  - < 18 years of age \( (n = 5) \)

Randomised \( (n = 205) \)

Allocated to intervention \( (n = 104) \)
- Received allocated intervention \( (n = 94) \)
- Did not receive allocated intervention \( (n = 10) \)
  - Unable to contact during whole study period \( (n = 4) \)
  - Refused \( (n = 3) \)
  - Not discharged from facility \( (n = 2) \)
  - Discharged to rehab facility \( (n = 1) \)

Assigned to control \( (n = 101) \)

Lost to follow-up:
- 1 week \( (n = 26) \)
  - Unable to contact \( (n = 19) \)
  - Refused \( (n = 5) \)
  - Not discharged from facility \( (n = 2) \)
- 2 months \( (n = 25) \)
  - Unable to contact \( (n = 13) \)
  - Refused \( (n = 10) \)
  - Not discharged from facility \( (n = 2) \)
- 4 months \( (n = 31) \)
  - Unable to contact \( (n = 16) \)
  - Refused \( (n = 13) \)
  - Not discharged from facility \( (n = 2) \)
- 6 months \( (n = 37) \)
  - Unable to contact \( (n = 19) \)
  - Refused \( (n = 16) \)
  - Not discharged from facility \( (n = 2) \)

Analysed \( (n = 104) \) using intention to treat

Lost to follow-up:
- 1 week \( (n = 25) \)
  - Unable to contact \( (n = 17) \)
  - Refused \( (n = 6) \)
  - Not discharged from facility \( (n = 4) \)
- 2 months \( (n = 25) \)
  - Unable to contact \( (n = 15) \)
  - Refused \( (n = 6) \)
  - Not discharged from facility \( (n = 4) \)
- 4 months \( (n = 31) \)
  - Unable to contact \( (n = 5) \)
  - Refused \( (n = 17) \)
  - Not discharged from facility \( (n = 4) \)
- 6 months \( (n = 40) \)
  - Unable to contact \( (n = 13) \)
  - Refused \( (n = 20) \)
  - Not discharged from facility \( (n = 3) \)

Analysed \( (n = 101) \) using intention to treat

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Socio-demographic and clinical characteristics by treatment condition at baseline are provided in Table 7. Mean length of stay for all patients admitted during the study period was 22.6 days ($SD = 78.0$). Mean number of days from admission to consent to the trial was 11.4 days ($SD = 19.5$). Consenters had significantly longer lengths of stay than non-consenters ($M = 31.5$, $SD = 38.5$, vs. $M = 13.5$, $SD = 15.2$, $t(279) < .0001$), but did not differ from non-consenters with respect to any other characteristics. The mean age of consenting participants was 37.6 years ($SD = 10.9$), and the majority were male (53.7%), single (68.1%) and received a government pension (82.0%). The primary mental health diagnoses were schizophrenia and related psychosis (33.7%), substance-related disorders (21.5%), unipolar depressive disorders (18.5%), and bipolar disorders (14.1%). There were no significant differences in the socio-demographic or clinical characteristics between treatment groups at baseline, indicating that the randomisation was successful (Table 7).

*Receipt of nicotine dependence treatment in facility*

Most participants (84.8%) reported receiving NRT from hospital staff, however, the majority continued to smoke during admission (82.9%) and just under a third (32.5%) reported receiving advice to quit. There were no significant differences by treatment condition (Table 7).
### Table 7. Socio-demographic and clinical characteristics for both treatment conditions at baseline

| Number of participants | Control  
\( (n = 101) \) | Intervention  
\( (n = 104) \) | Total  
\( (n = 205) \) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit admitted</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health and substance use unit</td>
<td>54.5 (55)</td>
<td>54.8 (57)</td>
<td>54.6 (112)</td>
</tr>
<tr>
<td>General acute unit 1</td>
<td>25.7 (26)</td>
<td>26.9 (28)</td>
<td>26.3 (54)</td>
</tr>
<tr>
<td>General acute unit 2</td>
<td>19.8 (20)</td>
<td>18.3 (19)</td>
<td>19.0 (39)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37.2 (10.8)</td>
<td>38.1 (11.0)</td>
<td>37.6 (10.9)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53.5 (54)</td>
<td>53.8 (56)</td>
<td>53.7 (110)</td>
</tr>
<tr>
<td>Female</td>
<td>46.5 (47)</td>
<td>46.2 (48)</td>
<td>46.3 (95)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>68.3 (69)</td>
<td>67.3 (70)</td>
<td>68.1 (139)</td>
</tr>
<tr>
<td>Current partner</td>
<td>15.8 (16)</td>
<td>19.2 (20)</td>
<td>17.6 (36)</td>
</tr>
<tr>
<td>Previously partnered</td>
<td>14.9 (15)</td>
<td>13.5 (14)</td>
<td>14.1 (29)</td>
</tr>
<tr>
<td><strong>Total admission length</strong></td>
<td>31.4 (37.9)</td>
<td>31.6 (39.2)</td>
<td>31.5 (38.5)</td>
</tr>
<tr>
<td><strong>K10 total</strong></td>
<td>28.6 (10.6)</td>
<td>30.1 (10.8)</td>
<td>29.4 (10.7)</td>
</tr>
<tr>
<td><strong>K10 score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low to moderate distress (10-29)</td>
<td>54.5 (55)</td>
<td>50.0 (52)</td>
<td>52.2 (107)</td>
</tr>
<tr>
<td>Severe distress (30-50)</td>
<td>43.6 (44)</td>
<td>46.2 (48)</td>
<td>44.9 (92)</td>
</tr>
<tr>
<td><strong>Education, % (n)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than year 12</td>
<td>58.0 (58)</td>
<td>60.0 (60)</td>
<td>57.6 (118)</td>
</tr>
<tr>
<td>Year 12 or greater</td>
<td>42.0 (42)</td>
<td>40.0 (40)</td>
<td>40.0 (82)</td>
</tr>
<tr>
<td><strong>AUDIT-C categories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-hazardous alcohol use</td>
<td>66.3 (67)</td>
<td>58.7 (61)</td>
<td>62.4 (128)</td>
</tr>
<tr>
<td>Hazardous alcohol use</td>
<td>33.7 (34)</td>
<td>41.3 (43)</td>
<td>37.6 (77)</td>
</tr>
<tr>
<td><strong>Employment, % (n)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No paid employment</td>
<td>60.4 (61)</td>
<td>68.3 (71)</td>
<td>64.4 (132)</td>
</tr>
<tr>
<td>Paid employment</td>
<td>39.6 (39)</td>
<td>31.7 (39)</td>
<td>35.6 (72)</td>
</tr>
<tr>
<td><strong>Receives government pension</strong></td>
<td>18.8 (19)</td>
<td>12.5 (13)</td>
<td>15.6 (32)</td>
</tr>
<tr>
<td>No</td>
<td>78.2 (79)</td>
<td>85.6 (89)</td>
<td>82.0 (168)</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Primary mental health diagnosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia and related psychosis</td>
<td>34.7 (35)</td>
<td>32.7 (34)</td>
<td>33.7 (69)</td>
</tr>
<tr>
<td>Substance-related disorders</td>
<td>20.8 (21)</td>
<td>22.1 (23)</td>
<td>21.5 (44)</td>
</tr>
<tr>
<td>Unipolar depressive disorders</td>
<td>20.8 (21)</td>
<td>16.3 (17)</td>
<td>18.5 (38)</td>
</tr>
<tr>
<td>Bipolar disorders</td>
<td>9.9 (10)</td>
<td>18.3 (19)</td>
<td>14.1 (29)</td>
</tr>
<tr>
<td>Anxiety and stress-related disorders</td>
<td>6.9 (7)</td>
<td>2.9 (3)</td>
<td>4.9 (10)</td>
</tr>
<tr>
<td>Personality disorders</td>
<td>2.0 (2)</td>
<td>3.8 (4)</td>
<td>2.9 (6)</td>
</tr>
<tr>
<td>Other</td>
<td>5.0 (5)</td>
<td>3.8 (4)</td>
<td>4.4 (9)</td>
</tr>
<tr>
<td><strong>Abstained from smoking during admission?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>82.2 (83)</td>
<td>83.7 (87)</td>
<td>82.9 (170)</td>
</tr>
<tr>
<td>Yes</td>
<td>17.8 (18)</td>
<td>16.3 (17)</td>
<td>17.1 (35)</td>
</tr>
<tr>
<td><strong>Received NRT during admission</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>13.3 (10)</td>
<td>17.1 (13)</td>
<td>15.2 (23)</td>
</tr>
<tr>
<td>Yes</td>
<td>86.7 (65)</td>
<td>82.9 (63)</td>
<td>84.8 (128)</td>
</tr>
<tr>
<td><strong>Received advice to quit during admission</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>70.7 (53)</td>
<td>65.5 (49)</td>
<td>67.5 (102)</td>
</tr>
<tr>
<td>Yes</td>
<td>29.3 (22)</td>
<td>34.5 (27)</td>
<td>32.5 (49)</td>
</tr>
</tbody>
</table>

*Numbers vary due to missing data.

*Data are means (Standard deviation [SD]) or numbers (%).

*Data collected during the one week follow-up assessment to account for the whole admission.
CHAPTER 5: Post-discharge smoking cessation intervention for mental health inpatients

**Smoking-related characteristics of participants**

Participants began smoking at an average of 16.1 years of age, and smoked an average of 23 cigarettes per day (Table 8). The majority (53.7%) were classified as nicotine dependent (FTND ≥ 6) [166]. Over half of participants (55.1%) had made one or more quit attempt in the previous 12 months. There were no significant differences in smoking-related characteristics between treatment groups at baseline (Table 8).

**Table 8. Smoking-related characteristics at baseline**

<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Control (n = 101)</th>
<th>Intervention (n = 104)</th>
<th>Total (n = 205)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age began smoking regularly</td>
<td>15.7 (4.3)</td>
<td>16.4 (4.5)</td>
<td>16.1 (4.4)</td>
</tr>
<tr>
<td>Cigarettes per day</td>
<td>23.7 (15.0)</td>
<td>22.2 (10.8)</td>
<td>23.0 (13.0)</td>
</tr>
<tr>
<td>FTND total</td>
<td>5.6 (2.2)</td>
<td>5.7 (2.1)</td>
<td>5.7 (2.1)</td>
</tr>
<tr>
<td>Nicotine dependent (FTND ≥ 6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>49.0 (48)</td>
<td>43.7 (45)</td>
<td>46.3 (93)</td>
</tr>
<tr>
<td>No</td>
<td>51.0 (50)</td>
<td>56.3 (58)</td>
<td>53.7 (108)</td>
</tr>
<tr>
<td>Previous quit attempts (lifetime)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>16.8 (17)</td>
<td>14.6 (15)</td>
<td>15.7 (32)</td>
</tr>
<tr>
<td>Once</td>
<td>18.8 (19)</td>
<td>12.6 (13)</td>
<td>15.7 (32)</td>
</tr>
<tr>
<td>2-3</td>
<td>32.7 (33)</td>
<td>33.0 (34)</td>
<td>32.8 (67)</td>
</tr>
<tr>
<td>&gt; 3</td>
<td>31.7 (32)</td>
<td>39.8 (41)</td>
<td>35.8 (73)</td>
</tr>
<tr>
<td>Previous quit attempts (12 months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No attempt</td>
<td>47.8 (44)</td>
<td>42.1 (40)</td>
<td>44.9 (84)</td>
</tr>
<tr>
<td>One or more</td>
<td>52.2 (48)</td>
<td>57.9 (55)</td>
<td>55.1 (103)</td>
</tr>
<tr>
<td>Stage of change for quitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-contemplation</td>
<td>58.0 (58)</td>
<td>48.1 (50)</td>
<td>52.9 (108)</td>
</tr>
<tr>
<td>Contemplation</td>
<td>30.0 (30)</td>
<td>34.6 (36)</td>
<td>32.4 (66)</td>
</tr>
<tr>
<td>Preparation for action</td>
<td>12.0 (12)</td>
<td>17.3 (18)</td>
<td>14.7 (30)</td>
</tr>
<tr>
<td>Pre-hospitalisation NRT use (lifetime)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>34.7 (35)</td>
<td>30.8 (32)</td>
<td>32.7 (67)</td>
</tr>
<tr>
<td>Yes</td>
<td>65.3 (66)</td>
<td>69.2 (72)</td>
<td>67.3 (138)</td>
</tr>
<tr>
<td>Cannabis use (12 months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>42.6 (43)</td>
<td>40.4 (42)</td>
<td>41.5 (85)</td>
</tr>
<tr>
<td>Yes</td>
<td>57.4 (58)</td>
<td>59.6 (62)</td>
<td>58.5 (120)</td>
</tr>
<tr>
<td>Mix cannabis with tobacco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>13.8 (8/58)</td>
<td>12.9 (8/62)</td>
<td>13.3 (16/120)</td>
</tr>
<tr>
<td>Yes</td>
<td>86.2 (50/58)</td>
<td>87.1 (54/62)</td>
<td>86.7 (104/120)</td>
</tr>
</tbody>
</table>

*Numbers vary due to missing data.
* Data are means (SD) or numbers (%)
CHAPTER 5: Post-discharge smoking cessation intervention for mental health inpatients

Use of intervention support options

Of the 104 participants randomised to the intervention condition, 94 received at least some of the allocated intervention. Of these, 43 (45.7%) received at least seven support calls, with a mean of 5.1 ($SD = 3.1$) calls received, with a mean duration of 14.9 ($SD = 6.3$) minutes per call, resulting in an average of 76.0 ($SD = 62.6$) minutes of supportive counselling throughout the intervention phase. A total of 71 intervention participants (68.3%) used NRT, with a mean duration of 6.2 weeks ($SD = 3.7$). The most commonly used therapy was nicotine patch in combination with nicotine gum, lozenge or inhaler (77.5%, $n = 55$), followed by nicotine patch alone (16.9%, $n = 12$) and gum, lozenge or inhaler alone (5.6%, $n = 4$, details, Table 9). A total of 29 participants (27.9%) received supportive telephone counselling from the ‘Quitline’, with a mean of 1.2 calls received ($SD = 1.7$). Only two participants (1.9%) attended the community-run smoking cessation groups during the intervention phase.
CHAPTER 5: Post-discharge smoking cessation intervention for mental health inpatients

Table 9. Type of study-provided NRT used, weeks of use and daily dose among participants in the intervention condition

<table>
<thead>
<tr>
<th>Type of NRT used</th>
<th>Intervention (n = 71)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combination therapy</strong></td>
<td></td>
</tr>
<tr>
<td>Patch alone</td>
<td>16.9 (12)</td>
</tr>
<tr>
<td>Patch + adjunct (gum, lozenge, inhaler)</td>
<td>77.5 (55)</td>
</tr>
<tr>
<td>Adjunct alone</td>
<td>5.6 (4)</td>
</tr>
<tr>
<td><strong>Patch</strong></td>
<td></td>
</tr>
<tr>
<td>Used patch</td>
<td>90.1 (64)</td>
</tr>
<tr>
<td>Weeks of use</td>
<td>7.1 (4.2)</td>
</tr>
<tr>
<td>Dose per day</td>
<td>1.1 (0.9)</td>
</tr>
<tr>
<td><strong>Gum</strong></td>
<td></td>
</tr>
<tr>
<td>Used gum</td>
<td>50.7 (36)</td>
</tr>
<tr>
<td>Weeks of use</td>
<td>5.4 (3.4)</td>
</tr>
<tr>
<td>Dose per day</td>
<td>4.1 (3.4)</td>
</tr>
<tr>
<td><strong>Lozenge</strong></td>
<td></td>
</tr>
<tr>
<td>Used lozenge</td>
<td>50.7 (36)</td>
</tr>
<tr>
<td>Weeks of use</td>
<td>5.7 (3.4)</td>
</tr>
<tr>
<td>Dose per day</td>
<td>2.0 (2.8)</td>
</tr>
<tr>
<td><strong>Inhaler</strong></td>
<td></td>
</tr>
<tr>
<td>Used inhaler</td>
<td>33.8 (24)</td>
</tr>
<tr>
<td>Weeks of use</td>
<td>4.8 (3.1)</td>
</tr>
<tr>
<td>Dose per day*</td>
<td>0.6 (1.3)</td>
</tr>
</tbody>
</table>

*Data are means (Standard deviation [SD]) or numbers (%)  
*Defined as the number of 10mg cartridges used per day

**Primary outcomes**

i. **Continuous abstinence**

Biochemical validation confirmed 100% of self-reported continuous abstinence throughout the study period. Prevalence of continuous abstinence at the one week, two, four and six month follow-ups were 1.0% (1), 0% (0), 0% (0), 0% (0) for the control group and 5.8% (6), 2.9% (3), 1.9% (2), 1.9% (2) for the intervention group. Fisher’s exact tests revealed no significant differences between conditions at the one week ($p = 0.06$), two months ($p = 0.13$), four months ($p = 0.26$) or six month assessments ($p = 0.26$).
ii. Point-prevalence abstinence

Biochemical validation confirmed 96.6% of self-reported seven day point-prevalence abstinence throughout the study period. Prevalence of biochemically validated seven day point-prevalence abstinence varied between 2.0% and 5.9% for the control group, and 6.7% and 11.5% for the intervention group for each of the four follow up points, with no significant main effect of condition ($F [1, 206] = 3.78, p = .05$; Table 10). However, at the four month follow-up, seven day point-prevalence abstinence was significantly higher in the intervention (11.5%) than control (2.0%) condition ($OR = 6.46, 95\% CI = 1.50-32.77$). Demographic variables, use of the intervention components, psychological distress, alcohol and cannabis use did not predict seven-day point prevalence abstinence at any time point (all $p$’s > .37). However, at the four month follow-up, use of NRT was significantly associated with point prevalence abstinence. Of the 12 participants in the intervention condition with validated abstinence at this time point, 11 (91.7%) reported using NRT, and of the two participants in the control condition with validated abstinence none (0%) used NRT ($\chi^2 (3) = 6.8, p = .009$).

Secondary Outcomes

i. Quit attempts, cigarette consumption and nicotine dependence

A significant main effect of condition was found for quit attempts, with significantly greater proportions of participants in the intervention condition making a quit attempt at two months (48.1% vs. 27.7%), four months (46.2% vs. 24.8%) and six months (31.7% vs. 13.9%) relative to controls ($F [1, 202.5] = 15.23, p = .0001$). A significant main effect of condition was found for 50% reduction in cigarettes per day, with greater
proportions of participants in the intervention condition having reduced their cigarette consumption by 50% or more at one week (26.0% vs. 9.9%), two months (29.8% vs. 12.9%), four months (33.7% vs. 8.9%) and six months (36.5% vs. 8.9%) relative to controls ($F [1,204.6] = 25.28, p < .0001$; Table 10).

Time-by-condition interactions were significant for daily cigarette consumption ($F [4, 586] = 6.5, p = .001$) and nicotine dependence ($F [3, 406] = 8.5, p < .0001$), with greater reductions in each outcome for participants in the intervention condition relative to controls (Table 11). For psychological distress, we found no significant condition-by-time interaction ($F [3, 621] = 1.48, p = .22$) and no significant main effect of condition ($F [1, 621] = .04, p = .85$). The main effect of time was significant ($F [3, 621] = 63.2, p < .0001$), with K10 scores decreasing from baseline to the two month assessment, and remaining constant from two months to six months for both conditions (Table 11).
Table 10. Results of generalised linear mixed models for categorical outcomes point prevalence abstinence, quit attempts and 50% reduction in cigarette consumption for the intervention and control groups at the 1 week, 2, 4, and 6 month follow-up assessmentsa

<table>
<thead>
<tr>
<th>Measure/ groups</th>
<th>1 week</th>
<th>2 months</th>
<th>4 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (n)</td>
<td>OR</td>
<td>95% CI</td>
<td>% (n)</td>
</tr>
<tr>
<td>Point prevalence abstinenceb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (n=101)</td>
<td>5.0 (5)</td>
<td>1</td>
<td></td>
<td>2.0 (2)</td>
</tr>
<tr>
<td>Intervention (n=104)</td>
<td>6.7 (7)</td>
<td>1.37</td>
<td>0.45-4.98</td>
<td>10.6 (11)</td>
</tr>
<tr>
<td>Quit attempts*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (n=101)</td>
<td>12.9 (13)</td>
<td>n/a</td>
<td>n/a</td>
<td>24.8 (25)</td>
</tr>
<tr>
<td>Intervention (n=104)</td>
<td>23.1 (24)</td>
<td>n/a</td>
<td>n/a</td>
<td>48.1 (50)</td>
</tr>
<tr>
<td>50% Reduction in cigarettes per dayd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (n=101)</td>
<td>9.9 (10)</td>
<td>1</td>
<td></td>
<td>8.9 (9)</td>
</tr>
<tr>
<td>Intervention (n=104)</td>
<td>26.0 (27)</td>
<td>3.19</td>
<td>1.57-8.18</td>
<td>29.8 (31)</td>
</tr>
</tbody>
</table>

OR = Unadjusted odds ratio

*aMissing data were classified as non-abstinent, as not having made a quit attempt or as failing to achieve the specified rate of reduction.

*bValidated with CO test <10ppm. No significant condition-by-time interaction ($F_{[3,641.7]} = 1.63, p = .18$). No significant main effect of condition ($F_{[1, 206]} = 3.78, p = .05$) or time ($F_{[3, 641.7]} = 0.49, p = .69$).

cQuit attempts defined as not smoking for a period of 24 hours with the intent to quit (not including hospitalisation).

*dNo significant condition-by-time interaction ($F_{[2, 412.6]} = 0.12, p = .89$). Significant main effect of condition, ($F_{[1, 202.5]} = 15.23, p = .0001$), with more participants in the intervention condition having made a quit attempt at 2, 4, and 6 months, relative to controls. Significant main effect of time ($F_{[2, 412.7]}= 9.66, p = <.0001$), with more participants having made a quit attempt at 2 and 4 months relative to 6 months for both treatment conditions.

*eNo significant condition-by-time interaction ($F_{[3, 610.2]}= 1.22, p = .31$). Significant main effect of condition ($F_{[1,204.6]} = 25.28, p < .0001$), with more participants in the intervention condition having reduced their cigarette consumption by 50% since baseline at 1 week, 2, 4, and 6 months relative to controls. No significant main effect of time ($F_{[3, 613.2]} = 0.43, p = .73$).

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Table 11. Results of generalised linear mixed models examining differences in continuous outcomes cigarettes smoked per day, nicotine dependence and psychological distress (K10) between the treatment conditions at the 1 week, 2, 4, and 6 month follow-up assessments

<table>
<thead>
<tr>
<th>Variable/time point</th>
<th>Control (n = 101)</th>
<th>Intervention (n = 104)</th>
<th>Mean Difference (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cigarettes per day</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>23.7 (1.4)</td>
<td>22.2 (1.4)</td>
<td>-1.5 (-5.4 to 2.4)</td>
<td>0.404</td>
</tr>
<tr>
<td>1 week</td>
<td>18.8 (1.4)</td>
<td>14.0 (1.2)</td>
<td>-4.8 (-8.3 to -1.2)</td>
<td>0.006</td>
</tr>
<tr>
<td>2 months</td>
<td>18.2 (1.4)</td>
<td>12.1 (1.2)</td>
<td>-6.0 (-9.4 to -2.6)</td>
<td>0.002</td>
</tr>
<tr>
<td>4 months</td>
<td>19.2 (1.4)</td>
<td>11.3 (1.1)</td>
<td>-7.9 (-11.4 to -4.4)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>6 months</td>
<td>19.0 (1.5)</td>
<td>11.9 (1.1)</td>
<td>-7.1 (-10.7 to -3.5)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td><strong>Nicotine dependence (FTND)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>5.6 (0.2)</td>
<td>5.7 (0.2)</td>
<td>0.1 (-0.6 to 0.8)</td>
<td>0.779</td>
</tr>
<tr>
<td>1 week</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
</tr>
<tr>
<td>2 months</td>
<td>5.2 (0.3)</td>
<td>4.4 (0.3)</td>
<td>-0.8 (-1.5 to -0.1)</td>
<td>0.036</td>
</tr>
<tr>
<td>4 months</td>
<td>5.5 (0.3)</td>
<td>4.1 (0.3)</td>
<td>-1.3 (-2.1 to -0.6)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>6 months</td>
<td>5.7 (0.3)</td>
<td>4.2 (0.3)</td>
<td>-1.6 (-2.3 to -0.8)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td><strong>Psychological distress (K10)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>28.6 (1.1)</td>
<td>30.1 (1.1)</td>
<td>1.5 (-1.6 to 4.6)</td>
<td>0.337</td>
</tr>
<tr>
<td>1 week</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
</tr>
<tr>
<td>2 months</td>
<td>21.0 (1.0)</td>
<td>21.0 (1.0)</td>
<td>0.1 (-2.8 to 2.9)</td>
<td>0.960</td>
</tr>
<tr>
<td>4 months</td>
<td>22.6 (1.1)</td>
<td>21.2 (1.0)</td>
<td>-1.4 (-4.3 to 1.6)</td>
<td>0.355</td>
</tr>
<tr>
<td>6 months</td>
<td>22.0 (1.1)</td>
<td>21.3 (1.1)</td>
<td>-0.7 (-3.7 to 2.3)</td>
<td>0.642</td>
</tr>
</tbody>
</table>

*Data are mean score (standard error [SE]) or mean change score.
~Data not collected at this time point.
Significant condition-by-time interaction ($F_{[4, 586]} = 6.5, p = .001$), for baseline versus 1 week, 2, 4, and 6 months. Significant main effect of time for baseline versus 1 week, 2, 4, and 6 months ($F_{[4, 586]} = 31.1, p < .0001$). Significant main effect of condition for intervention versus control ($F_{[1, 205]} = 16.6, p < .0001$).
Significant condition-by-time interaction ($F_{[3, 406]} = 8.5, p < .0001$) for baseline versus 1 week, 2, 4, and 6 months. Significant main effect of time ($F_{[3, 406]} = 10.9, p < .0001$) for baseline versus 1 week, 2, 4, and 6 months. Significant main effect of condition ($F_{[1, 215]} = 9.8, p = .002$ for intervention versus control.
FTND not administered if participant reported abstinence.
Significant condition-by-time interaction ($F_{[3, 621]} = 1.48, p = .22$). No significant main effect of condition ($F_{[1, 621]} = .04, p = .85$). Significant main effect of time ($F_{[3, 621]} = 63.2, p < .0001$) with K10 scores decreasing from baseline to 2 months, and remaining constant from 2 to 6 months for both conditions.

Discussion

To the authors’ knowledge, this is one of only two studies undertaken internationally to examine the efficacy of a smoking cessation intervention initiated in the inpatient psychiatric setting and continued post-discharge for smokers with a mental disorder,
CHAPTER 5: *Post-discharge smoking cessation intervention for mental health patients*

and the first such study undertaken in Australia. Moreover, this study is unique in examining the effect of providing integrated smoking cessation support immediately upon discharge; facilitating a continuation of NRT use from the inpatient setting and proactively encouraging all smokers to accept the offer of cessation support, irrespective of any stated desire to quit at that time, or request for assistance. While we found no significant difference between the intervention and control conditions on rates of continuous or seven-day point prevalence abstinence at the six month follow-up, numeric group differences were in the expected direction, indicating this study may have been underpowered to detect the effect of the intervention. Point prevalence abstinence was higher among intervention participants than controls at four months (end of treatment), but not at six months post-discharge (two months post treatment), suggesting that the intervention was effective for some, but relapse was high when treatment ended. Participants in the intervention condition were also more likely to have made a quit attempt, to have reduced their daily cigarette consumption by 50% or more since baseline, and had lower levels of nicotine dependence than controls at six months post-discharge. Psychological distress did not differ between treatment conditions over time. We did not identify any significant predictors of successful abstinence at any time point; however, use of NRT was significantly associated validated point prevalence at the four month assessment. The results demonstrate the potential for an integrated approach to smoking cessation intervention to address the currently unmet needs for smoking cessation care among people with an acute mental disorder. Further research is required to extend the benefits of such care.
Despite the significant proportion of smokers with a mental disorder, they are often excluded from studies examining the efficacy of smoking cessation interventions. Consequently, there remains little rigorous evidence regarding effective smoking cessation treatments among this group, and only one systematic review - containing eight trials - has been published to date [137]. Such studies have primarily focused on clinically stable community-residing patients with schizophrenia or schizoaffective disorders, who were required to report a willingness to quit at study intake [137]. At six to eight month follow-up, seven-day point prevalence abstinence in such studies has ranged from 0% to 17.6% for control groups and between 4.0% and 18.8% for intervention groups [94, 96, 138, 139, 259], with just one producing significant differences between treatment conditions [138]. It is important to note that with the exception of one study [96] sample sizes for studies in the review ranged from 32 to 58 and few described reasons for dropout [137]. Aside from the current study, the recently published study of Prochaska and colleagues is the only other randomised controlled trial conducted among a diagnostically heterogeneous sample of inpatient psychiatric patients who were not required to express a willingness to quit for study entry [98]. In their study, rates of seven-day point prevalence abstinence at six month follow-up were 6.5% and 14.4% for the control and intervention groups respectively, however many instances of reported abstinence were not directly validated with CO, but often consisted of collateral contact reports of participants’ non-smoking status. Results of secondary outcomes in the present study including significantly higher rates of 50% reduction in cigarette consumption, and significant declines in nicotine dependence levels are also comparable to those found previously [96, 97]. These findings suggest
that additional strategies which enhance cessation effects may be required for smokers with an acute mental disorder who have been recently discharged from an inpatient psychiatric facility.

More intensive intervention involving more frequent contacts has previously been suggested to be efficacious in reducing smoking-related behaviours, with a strong dose-response relation between counselling intensity (minutes of contact) and efficacy [4, 96, 220]. In this study, the interventions did not involve intensive intervention modalities, particularly as participants received on average just under one hour and a half of individual cessation counselling, and only two participants attended the smoking cessation groups throughout the duration of the trial. Future studies may focus on further enhancing individual-based telephone, computer or face-to-face counselling with evidence-based behavioural therapies such as motivational interviewing and cognitive behavioural therapy (CBT), which have demonstrated efficacy among smokers with a serious mental disorder [96, 97]. Prochaska and colleagues [98] demonstrated that, paired with NRT, computerised motivational feedback based on the transtheoretical stage of change model [113] delivered for up to six months doubled cessation rates at 18 month follow-up. CBT has also been found to double cessation rates among smokers with depression [260], and the addition of psychological counselling and computerised motivational feedback has also been shown to increase cessation rates among this group [261]. These findings are further supported by a recent systematic review and meta-analysis identifying a modest, but positive effect of behavioural mood management in increasing cessation rates among smokers with depression [262]. Further, while we found no evidence that alcohol and cannabis use were associated with cessation.
outcomes, the high rate of comorbid substance use identified in this sample suggests that interventions concurrently targeting tobacco and other drug use may also assist in improving long-term abstinence in this population [263].

While the efficacy of all forms of NRT in increasing the likelihood of cessation has been established among general population smokers [264], the efficacy of NRT among persons with a mental disorder has not been subject to large scale reviews or meta-analyses. Given that smokers with a mental disorder are more nicotine dependent [142] and extract greater levels of nicotine from each cigarette [265], more intensive NRT therapies may be required to aid cessation among this group. Use of combination therapy whereby a transdermal patch is supplemented with fast acting forms of NRT such as sublingual lozenges, nicotine inhaler and gum should likely continue beyond the typically recommended 8-12 weeks [173, 237, 266], however further studies are needed to confirm the potential for extended use of higher dose NRT in increasing cessation rates among smokers with a mental disorder.

No smoking cessation intervention effect was observed in this study at one week post-discharge. Such a finding is consistent with previous studies showing no effect on post-discharge smoking cessation of admission to a smoke-free hospital [14, 163]. Such a pattern of results has been suggested to be a result, in part, of inadequate implementation of smoke-free policies and associated provision of smoking cessation care to patients in the inpatient psychiatric setting [111, 267]. This explanation is likely to have been relevant to the findings in this study, given that 82.9% of participants continued to smoke during admission, and provision of nicotine dependence treatment was inconsistent. Evidence from general medical settings suggests that smokers who
abstain from smoking during hospitalisation have four times greater odds of remaining abstinent up to six months post-hospitalisation compared to those who do not abstain [114]. Further, adding NRT to counselling during hospitalisation significantly increases cessation rates [129]. Strategies to improve smoke-free policy implementation in inpatient psychiatric settings, including consistent enforcement of smoking bans, cohesive leadership among staff, and systematic provision of nicotine dependence treatment are greatly needed [151].

While this study was limited to a single Australian psychiatric facility, inpatient psychiatric facilities in most developed nations have some form of smoking ban in place [103], and treat a diagnostically heterogeneous group of predominantly dependent smokers [98, 125, 159], and as such there is no compelling reason to suggest our study findings are not generalisable to smoke-free psychiatric settings in other developed nations. However, the study was likely underpowered to detect the effect of the intervention and to identify factors predicting successful abstinence. Secondly, while the use of biochemical validation of abstinence is a strength of the study, bias associated with the self-report of the secondary smoking-related outcomes cannot be ruled out.

For smokers with a mental disorder, cessation support provided post-hospitalisation was effective in increasing cessation at four months post discharge, and in reducing cigarette consumption and nicotine dependence, and encouraging quit attempts at six months. Additional support strategies are required to facilitate longer term cessation benefits. This study represents a significant step forwards in the systematic treatment of smokers with a mental disorder through the platform of health care services. The unique methodology employed, whereby cessation treatment was initiated during
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Hospitalisation and provided to all smokers regardless of intent to quit, or psychiatric diagnosis, adds to its strength, and supports the feasibility and efficacy of initiating smoking cessation treatment in inpatient psychiatry.

**Acknowledgements**

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CHAPTER 6: SUMMARY OF FINDINGS AND FUTURE DIRECTIONS FOR PRACTICE AND RESEARCH
CHAPTER 6: Summary of findings and future directions for practice and research

Introduction

The key health issue which underpins this thesis is the disproportionate rate of smoking among persons with a mental disorder, and the consequent high tobacco-related morbidity and mortality experienced by this population. The introduction of smoke-free policies in inpatient psychiatric settings provides an opportunity to deliver smoking cessation intervention to this underserved group. This thesis explored the potential of a smoke-free psychiatric hospitalisation as a platform to initiate smoking cessation treatment among smokers with a mental disorder, and to deliver extended smoking cessation support post-discharge, in an attempt to reduce the disproportionate tobacco-related burden experienced by this group.

Based on the findings of the literature review in the introductory chapter of this thesis, the research presented in this thesis was undertaken to address several key knowledge gaps, including: 1) the potential impact of a smoke-free psychiatric hospitalisation on patients’ smoking behaviour, 2) how the quality of implementation of a smoke-free policy in an inpatient psychiatric facility may impact patient acceptability of such a policy, 3) understanding the smoking and quitting characteristics of smokers hospitalised for acute psychiatric treatment and 4) how hospital-based nicotine dependence treatment can be effectively linked to continued smoking cessation supports post-discharge for smokers with a mental disorder.

The aim of Chapter 1 was to explore the impact of a smoke-free psychiatric hospitalisation on patients’ smoking-related behaviours, and to explore these findings based on the level of smoking restrictions imposed, patient adherence to the smoking restrictions, and the provision of nicotine dependence treatment. Building on this
CHAPTER 6: Summary of findings and future directions for practice and research

review, the aim of Chapter 2 was to explore key factors pertaining to the quality of implementation of a smoke-free policy in an inpatient psychiatric facility, and the association between these factors and patient acceptability of the smoke-free policy. Exploring patient acceptability of a smoke-free policy may help to identify strategies to improve smoke-free policy implementation in these settings, and thus increase the likelihood that the intended benefits of such policies are realised. Chapter 3 explored the current and previous smoking behaviours and readiness to quit characteristics among inpatients of a smoke-free psychiatric facility, in order to better understand the smoking characteristics and future quitting intentions among this population, and to highlight the pressing need to provide smoking cessation treatment to these smokers, both during hospitalisation and post-discharge. Chapter 4 described the methodology of a randomised controlled trial with the aim of assessing the efficacy of linking hospital-based nicotine dependence treatment to ongoing community-based smoking cessation support for smokers discharged from a smoke-free inpatient psychiatric hospital. Chapter 5 described the outcomes of this trial.

This concluding chapter provides a brief summation of the five preceding chapters, focusing on the key findings and their significance. This chapter also outlines a number of recommendations for future research and practice.
SUMMARY OF KEY FINDINGS AND THEIR SIGNIFICANCE

The systematic literature review described in Chapter 1 provided a synthesis of the literature examining the impact of a smoke-free psychiatric hospitalisation on patients’ smoking-related behaviours, motivations and beliefs, both during admission and post-discharge. First and foremost, Chapter 1 identified the paucity, and limited methodological quality of research conducted in this area to date. However, the limited evidence indicated that positive changes in smoking-related outcomes, including increased motivation to quit [14], increased rates of quit attempts [159], and reductions in daily cigarette consumption [14, 53] can occur among smokers admitted to a psychiatric facility with a smoke-free policy. Such changes were identified to occur both during hospitalisation and for up to three months post-discharge.

In the four reviewed studies that examined changes in smoking behaviour post-discharge, most smokers returned to pre-admission smoking levels soon after being discharged from hospital [14, 53, 156, 163], reflecting similar findings among general medical patients [129]. These results suggest that while a smoke-free psychiatric hospitalisation may increase motivation to quit and result in small, but significant reductions in cigarette consumption for up to three months post-discharge, a smoke-free psychiatric hospitalisation itself is not sufficient to produce long term changes to smoker’s behaviour. As such, continued support into the community setting may be required to increase the likelihood of sustained abstinence following hospitalisation among this group.
Chapter 1 also identified that total smoking bans, with concurrent provision of nicotine dependence treatment, may result in more positive changes to smoking behaviour than partial bans where smoking is continued to be permitted in some areas of the hospital. However, limitations in the data available precluded any quantitative assessment of this effect. Importantly, the studies included in the review largely failed to consider other contextual factors which may accompany the introduction of a smoking ban, such as patients’ views towards the ban, their perception of staff views, their adherence to the ban, and the uptake and use of hospital-based nicotine dependence treatment, and how these factors may impact on their smoking behaviours. Given that the introduction of smoking bans in inpatient psychiatric settings has often been reported to be difficult [117, 126], understanding these contextual factors may assist both researchers and clinicians in identifying strategies to improve smoke-free policy adherence and provision of adequate nicotine dependence treatment during hospitalisation, and thus increase the likelihood that patients experience the intended benefits of such policies.

The paper comprising Chapter 2 reported the findings of a survey of patients admitted to an inpatient psychiatric facility with a total smoke-free policy in NSW, Australia. The aim of the study was to explore, as identified in Chapter 1, the ‘contextual factors’ associated with the introduction of a smoking ban, and their association with patients’ acceptability of a smoke-free policy.

The results of the survey indicated that the smoke-free policy introduced in the facility three years previously appeared to have limited effectiveness in stopping smoking among patients during admission, and in ensuring smokers were provided adequate nicotine dependence treatment. More than 80% of the smokers surveyed indicated they
had smoked at some point during their admission. While three-quarters of smokers reported having received NRT, less than 20% received optimal treatment as recommended in clinical practice guidelines, and over half indicated that the treatment they did receive had little to no effect in reducing their cravings to smoke.

Despite the low levels of adherence to the smoking ban and sub-optimal provision of nicotine dependence treatment, both smokers and non-smokers reported positive aspects of the smoke-free policy. Overall however, the smoke-free policy in the study unit was acceptable to less than half of patients (45.9%), and least so to smokers. Only half of the patients perceived staff to be supportive of the policy. Importantly, smokers were more likely to be accepting of the smoke-free policy in their unit of admission if they perceived staff to be supportive of the policy, and if they themselves did not smoke on the unit during admission.

The findings of Chapter 2 further highlighted the difficulty of implementing smoke-free policies in inpatient psychiatric settings, as reported previously [117, 126, 149], but also identified the significant potential for improving patient acceptability of smoke-free policy, and thus increasing the likelihood that patients will gain the intended benefits of smoke-free policies. Firstly, the views and attitudes of treating staff can have a significant influence on the success of smoke-free policy implementation [151], and as such, it is considered important that staff actively endorse the smoking ban and display cohesive, consistent leadership and teamwork [149, 151]. Secondly, consistent monitoring and enforcement of the smoke-free policy may be required to increase patient adherence to the smoking ban during admission [268]. Finally, to ensure that patients’ nicotine withdrawal is adequately managed, dose-appropriate nicotine
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dependence treatment needs to be systematically provided to all smokers upon and
during admission to hospital [4]. Further research is required to identify effective
strategies to address these key implementation quality issues in inpatient psychiatric
facilities.

The paper described in Chapter 3 reported findings from the survey of psychiatric
inpatients discussed in Chapter 2, with an aim of exploring the smoking-related
characteristics of such patients, and to examine the factors predicting a recent quit
attempt, and readiness to quit smoking.

The findings in Chapter 3 confirmed the high rate of smoking among persons
hospitalised for psychiatric treatment found in previous studies [11, 14, 53], with more
than 50% of the patients surveyed reporting current or occasional smoking at the time of
admission. For patients hospitalised for co-morbid psychiatric and substance use
treatment, rates of smoking exceeded 80%. Further, the quit ratio of the sample was just
26%, supporting previous findings of lower cessation rates among persons with a
mental disorder than the general population [197, 198].

Importantly, almost all smokers had made at least one attempt to quit in their lifetime,
and almost half had attempted to quit within the preceding 12 months; a large
proportion of whom were able to remain abstinent for longer than a month. These
findings indicate that smokers hospitalised for psychiatric treatment wanted to quit, and
had made repeated, unsuccessful attempts to do so, supporting the findings of previous
research [55, 56]. Smokers who had made a quit attempt in the previous 12 months, and
reported that they did not enjoy smoking were more likely to be in the ‘contemplative’
rather than ‘precontemplative’ stages of change for quitting on the transtheoretical stages of change model [113]. Additionally, smokers who reported a high desire to quit were significantly more likely to have made a quit attempt in the previous 12 months than those reporting a low desire to quit (1-3).

The perception of smokers’ readiness to quit or otherwise has been found to predict the provision of nicotine dependence treatment in inpatient psychiatric settings, with staff more likely to provide care to those patients whom they perceive as being motivated to quit [50]. The finding that almost all smokers had made at least one quit attempt in their lifetime (half of whom had done so within the preceding 12 months) despite only 14.4% of the sample being categorised in the ‘contemplation’ stage of change indicates that ongoing attempts to quit may be an indication of ‘wanting to quit’. Stage-based categorisations of motivation have been suggested to be of little use to treating clinicians in healthcare settings, given that smokers’ intentions may transition rapidly whilst in this setting [187], up to half of quit attempts occur spontaneously [269], and prior planning does not appear to be associated with cessation outcome [270]. In this light, the findings in Chapter 3 highlighted the importance of providing training to treating clinicians about the significant proportion of their patients who have made multiple, unsuccessful attempts to quit throughout their lifetime, rather than the proportion of whom appear to be actively ‘motivated’ to quit. It has also been suggested that brief opportunistic interventions should be provided to smokers in lieu of determining stage-based classifications of their readiness to quit [271]. For example, provision of brief advice to quit and offering assistance to quit have been shown to significantly increase the frequency of quit attempts among smokers who were not
CHAPTER 6: Summary of findings and future directions for practice and research

classified as being ‘motivated’ to quit [271]. These findings also reinforce the need for treating staff to provide nicotine dependence treatment routinely and systematically to all smokers rather than selectively to a particular type of patient [201, 202].

Chapters 4 and 5 described a randomised controlled trial that assessed the efficacy of initiating smoking cessation treatment during a psychiatric hospitalisation and continuing treatment for up to four months post-discharge. Chapter 4 described the methodology employed in this trial, and Chapter 5 described the primary outcomes. This is the second only such trial conducted internationally and the first in an Australian context to examine the efficacy of using the inpatient psychiatric setting as a platform for initiating smoking cessation treatment and linking it to ongoing cessation support post discharge. The methodology employed a number of novel design elements. Firstly, a ‘real world’ approach was taken, whereby patients were approached in a systematic manner, regardless of diagnosis or readiness to quit, and were proactively offered involvement in the trial. Secondly, part of the intervention component in the current trial was delivered during the patients’ admission, and existing systems, including the electronic discharge summary system, were utilised in an effort to demonstrate the feasibility of initiating smoking cessation treatment in this setting. Further, for smokers randomised to the intervention condition, smoking cessation supports, including a two-week supply of NRT, written self-help material, and a proactive referral to the ‘Quitline’ telephone service were provided immediately on discharge, to provide continuation of care from the inpatient to the community setting. Once discharged, supportive counselling commenced within three days, and was delivered for up to 12 weeks, with concurrent provision of NRT, tailored to personal preferences and nicotine
CHAPTER 6: Summary of findings and future directions for practice and research

dependence. The purpose of this treatment model was to build on the potential provided by a smoke-free psychiatric hospitalisation in enhancing readiness to quit, as evidenced in general medical [114, 147], and inpatient psychiatric settings [14, 53].

The results of the intervention described in Chapters 4 and 5 demonstrated that smokers randomised to receive combined behavioural and pharmacological smoking cessation support had significantly higher rates of point prevalence abstinence than controls at four months (end of treatment), but not at six months post-discharge (two months post treatment). Participants in the intervention condition were also more likely to have made a quit attempt, to have reduced their daily cigarette consumption by 50% or more since baseline, and had lower levels of nicotine dependence than controls at six months post-discharge. These findings suggest that an integrated model of care, whereby smoking cessation treatment is initiated during a smoke-free psychiatric hospitalisation, and provided for up to four months post-discharge, was effective in increasing cessation at four months post-discharge, in encouraging quit attempts and in reducing cigarette consumption up to six months post-discharge. However, we found limited effectiveness in increasing rates of cessation, particularly continuous abstinence, and as such, additional support strategies may be required to increase the likelihood of sustained cessation in this group. Importantly, given that the numeric group differences on all primary and secondary smoking outcomes were in the expected direction, it is likely that this study was underpowered to detect the effect of the intervention, and as such, larger scale studies of such an intervention model may be needed to determine its’ efficacy. It is also possible that the inclusion of smokers who were willing to reduce their cigarette consumption, but not quit, may also have influenced the low cessation
rates in this trial. Further, some intervention components, particularly the smoking cessation support groups, were underutilised in this study. One possible reason for the low attendance at the cessation support groups may have been logistical barriers – many participants did not have private transport, and attending an appointment at a community mental health centre in addition to regular treatment may have been a low priority. Further, some participants resided in areas where they did not have access to the group program, and many community mental health clinicians were reluctant to develop new group programs, primarily due to lack of time and resources. These logistical barriers lend further support to the need for integrated smoking cessation treatment within existing mental health treatment [220].

Importantly, and consistent with the survey results reported in Chapter 2, and with other research [117, 149], few smokers remained abstinent during their hospitalisation, and despite most smokers having received NRT, almost half reported that it did not reduce their cravings to smoke, and less than a third received brief advice to quit from treating staff, as recommended in clinical practice guidelines [110]. These findings suggest that the potential benefit of a ‘smoke-free’ psychiatric hospitalisation may not have been gained by most smokers in this study, which may be reflected in the low rate of cessation in both groups at all follow-up points. Together, these results suggest that improvements in smoke-free policy implementation are required to further enhance the ‘teachable moment’ that an admission to a smoke-free hospital facility presents [115, 147]. The following final sections of this thesis outline a potential approach to addressing these issues, and provide a basis for future research in this area.
SMOKE-FREE PSYCHIATRIC HOSPITALS: RECOMMENDATIONS FOR ENHANCING A ‘TEACHABLE MOMENT’

The studies described in this thesis indicate that implementation of smoke-free policies in inpatient psychiatric settings remains suboptimal. Strategies to increase effective implementation of such policies in these settings are needed to ensure that staff, patients and visitors receive the full intended benefits of smoking bans. The findings of this thesis identified particular areas of need, including increasing staff support for smoke-free policies, improving patient adherence to smoking bans, and increasing staff provision of nicotine dependence treatment to patients. It is likely that a multi-strategic approach is needed at the systems level to improve the implementation of smoke-free policies in inpatient psychiatric settings.

A multi-strategic systems change approach

A multi-strategic systems change approach been recommended as a means to improve the provision of timely and effective nicotine dependence treatment to patients attending healthcare services [272, 273]. The components of such an approach are designed to address key barriers to the provision of such care in these settings, including lack of staff time, skills and experience, and organisational support [274]. The key systems change strategies comprising this approach are summarised in Table 12, and include the systematic assessment of smoking status of patients on admission, staff education, the promotion of policies that support the provision of nicotine dependence treatment,
subsidies for patients accessing such care, and reimbursement to staff for care provision [272].

Table 12. Systems level strategies to facilitate the delivery of nicotine dependence treatment in healthcare settings*

<table>
<thead>
<tr>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Implement systems to identify and record patients’ smoking status and nicotine dependence upon admission.</td>
</tr>
<tr>
<td>2  Provide staff education, resources and develop communication channels to enable feedback and evaluation.</td>
</tr>
<tr>
<td>3  Dedicate staff to provide nicotine dependence treatment and evaluate its delivery.</td>
</tr>
<tr>
<td>4  Promote policies that support the provision of nicotine dependence treatment.</td>
</tr>
<tr>
<td>5  Offer nicotine dependence treatments free of charge or subsidised.</td>
</tr>
<tr>
<td>6  Reimburse clinicians for delivery of effective nicotine dependence treatment and include this treatment among the defined duties of clinicians</td>
</tr>
</tbody>
</table>

*Adapted from Fiore et al [272].

A systematic review and meta-analysis conducted by Freund et al [275] examined the effectiveness of such system change strategies, including educational meetings with staff, medical record audit and feedback, use of reminder systems and staff leadership in increasing tobacco dependence treatment in hospital settings. The review identified 25 trials conducted between 1989 and 2004, and concluded that such strategies can increase the provision of nicotine dependence treatment [275]. Specifically, results of the meta-analysis revealed a 17% increase in the number of patients who were counselled or assisted to quit, relative to control conditions. A subsequent multi-site quasi-experimental trial conducted by the review authors examined the efficacy of multiple systems level strategies on improving smoking cessation treatment in hospitals [202]. The intervention included the development of advisory boards comprised of
senior hospital staff, staff consensus and adaptation, development of a smoking care guideline, staff training and education, prompts and reminders, monitoring of feedback and compliance, and management support. At follow-up, both patient report and medical record audit indicated that hospitals allocated to the intervention condition demonstrated an increase in the offer and provision of NRT to patients, and increased discussion of smoking management between staff and patients. Medical record audit suggested an increase of 13% for discussing smoking management, 24% for the offer of NRT and 21% for the provision of NRT, compared to increases of 3%, 3% and 5% respectively for comparison hospitals [202]. These findings demonstrate that such systems-wide strategies can improve the delivery of nicotine dependence treatment to patients in hospital settings.

To the author’s knowledge, no reviews or individual studies have examined the efficacy of systems level strategies in increasing nicotine dependence treatment in inpatient psychiatric settings, and future research in this area is needed. However, staff surveys from this setting have identified that of the recommended systems strategies, some key strategies are crucial to the successful implementation of smoke-free policies in inpatient psychiatric settings [151, 276]. Such strategies include: increasing staff agreement with, and support for smoke-free policies, consistent monitoring and enforcement of smoking bans, and the provision of effective nicotine dependence treatment.
CHAPTER 6: Summary of findings and future directions for practice and research

Increasing staff support for smoke-free policies

Clinical practice guidelines highlight the importance of staff agreement with, and commitment to the smoke-free policy for effective implementation to occur in hospital settings [106, 277]. An important step for increasing staff commitment to the policy is through developing local consensus via the inclusion of all staff in the policy planning and implementation process, and developing systems for ongoing staff feedback and information exchange [276, 277]. Specifically, identifying a ‘change champion’ for the implementation of smoke-free policies has been suggested as a potential key factor in developing clear and consistent leadership and for developing staff support [106, 277]. Clear leadership and cohesive teamwork have also been cited as important factors associated with smoke-free policy success in inpatient psychiatric settings [151]. In-depth surveys with 60 senior administrators and clinical staff across 99 inpatient psychiatric settings with a smoke-free policy in Australia identified that clear leadership and planning were involved in 97% of sites where policy implementation was successful, and cohesive teamwork was present in 95% of successful smoke-free sites [151]. Ongoing collaboration between such change champion/s and clinical staff is suggested to be needed to ensure cohesive teamwork, and to avoid splits in organisational management [151]. This may be achieved through various means of communication and dissemination, including scheduled meetings to discuss policy implementation, and via email, newsletters or local intranet [276]. An example of the type of information and education that may be disseminated this way is the benefit of implementing total smoking bans on patients’ behaviour. A common barrier to implementing total smoke-free policies in inpatient psychiatric facilities is the
perception among treating staff that such bans will have a negative impact on patients’
behaviour, including heightened levels of distress, aggression, and acting out [126].
However, reviews have identified 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 [126, 150, 151]. Case-study evidence from other
facilities where such bans have been implemented successfully, and the strategies used,
may also be disseminated regularly to staff.

Consistent monitoring and enforcement of smoke-free policies

It has been suggested that consistent monitoring and enforcement of the smoking ban
component of smoke-free policies is a potentially efficacious method of improving
smoke-free policy adherence among patients in hospital settings [268]. However, a
number of studies have suggested that staff report a lack of skill and confidence in
enforcing smoking bans, and hence may choose to not approach patients who are
smoking as a result [127, 278]. Shipley and colleagues explored the factors associated
with staff members approaching patients who were found to be in violation of the
smoking ban at an acute general medical facility [278]. Half the respondents reported
that they would not challenge a patient smoking, and only a quarter reported having
previously done so. A major barrier to enforcing the smoking ban was found to be the
fear of aggression from patients, which has also been identified as a potential barrier to
smoking ban enforcement in inpatient psychiatric settings [127]. Many respondents also
CHAPTER 6: Summary of findings and future directions for practice and research

reported that enforcing the smoking ban was outside their responsibilities, and that patients had the right to smoke [278].

One recommended strategy to increase staff confidence in approaching smoking patients is to formalise staff roles in regards to policy enforcement [4]. A survey of staff working in mental health trusts in the UK identified that revising the smoke-free policy to include concrete instructions and guidance for staff when dealing with patients smoking in a non-smoking area was identified as important strategy to improve staff confidence in enforcing the smoking ban [276]. Staff empowerment and encouragement from senior clinical staff were also identified as important factors for increasing smoke-free policy enforcement [276]. However, future research is needed to determine if such strategies are successful in increasing patient adherence to smoking bans in inpatient psychiatric settings.

The provision of effective nicotine dependence treatment

The systematic provision of tailored nicotine dependence treatment to patients, including pharmacological and behavioural support is recommended in clinical practice guidelines, and is essential for managing patients’ nicotine withdrawal during a smoke-free hospitalisation [4, 5, 272]. Effective management of patients’ nicotine withdrawal during admission may consequently increase the likelihood of patients adhering to the smoking ban, and have the added benefit of encouraging abstinence post-discharge [114, 146]. A survey of 650 adult patients admitted to a general hospital facility with a smoke-free policy in the US identified that those patients who reported suffering
nicotine withdrawal during admission were almost four times more likely to violate the ban and smoke while hospitalised, and were more likely to resume smoking upon discharge [146]. Despite the presence of clinical practice guidelines mandating the provision of pharmacological and behavioural nicotine dependence treatment to all smokers during admission, medical record audit has indicated that staff provision of such care is negligible (0-0.5%) in inpatient psychiatric settings [75, 123]. One suggested strategy to increase staff adherence to clinical care guidelines is the development of a clinical audit and feedback process that includes the collection of clearly defined performance indicators [179, 272, 279]. Such an approach is based on the principle that treating staff will adapt their work practices when performance feedback indicates it is inconsistent with a desirable target [279]. A review of 140 studies examining the efficacy of such processes demonstrated a 17% median increase in increasing staff compliance with clinical care guidelines [279]. Further, auditing and feedback processes were found to be more effective when provided more than once, in both verbal and written forms, and when targets were explicitly communicated and accompanied with an action plan [279]. There are no such studies that have examined the efficacy of such systems change strategies in increasing staff adherence to nicotine dependence treatment guidelines in inpatient psychiatric settings, and implementation research is needed.
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EXTENDED AND INCREASED INTENSITY SMOKING CESSATION APPROACHES FOR PERSONS WITH A MENTAL DISORDER

The findings of the randomised controlled trial examining the efficacy of linking hospital-based to community-based smoking cessation support for smokers with a mental disorder described in Chapters 4 and 5 of this thesis indicated that such a model of care was effective in increasing smoking cessation immediately post intervention and in reducing cigarette consumption, and increasing the likelihood of a quit attempt at the six month assessment. However, such benefits were not sustained for cessation. These limited findings may have been due, in part, to the limited intensity of the intervention component. For example, Baker and colleagues [96] found that outpatient smokers with schizophrenia and schizoaffective disorders who completed all eight smoking cessation treatment sessions were more significantly likely to achieve continuous abstinence at three months post-treatment, compared to participants who attended fewer than five sessions. In our trial, fewer than 2% of participants allocated to the intervention condition utilised all three proffered smoking cessation supports in combination (i.e. NRT, ‘Quitline’ and community-based smoking cessation support groups), use of NRT averaged approximately six weeks, and the participants received on average five out of a possible eight telephone support calls (averaging 76 minutes total) throughout the four month intervention phase. Further, the relatively high percentage of participants in the intervention condition making a quit attempt of 24 hours or longer compared to those with validated seven-day point prevalence abstinence at the six month assessment (31.7% vs. 7.7%) suggests that participants were actively attempting to quit, but may have had difficulties in sustaining their quit attempt and avoiding a smoking lapse.
CHAPTER 6: Summary of findings and future directions for practice and research

These findings are supported by those identified in Chapter 3, where smokers hospitalised for psychiatric treatment were found to have made recent repeated unsuccessful attempts to quit. While some studies suggest that interventions targeting smokers with a mental disorder can achieve rates of seven-day point prevalence abstinence of approximately 20% [98, 137], rates of relapse to smoking among this group have been reported to be as high as 50-70% once these therapies have ceased [132, 139, 259]. These findings suggest that extended, more intensive smoking cessation approaches that incorporate relapse prevention may be required to reduce the smoking prevalence among persons with a mental disorder [173, 237, 266].

Efficacy of extended provision of high-dose pharmacological treatment

Cigarette craving and nicotine withdrawal symptoms have been identified to be important predictors of ongoing smoking and relapse during quit attempts [280, 281]. Smokers with a mental disorder are known to have higher levels of nicotine dependence [13, 28, 34, 35], and inhale more deeply and absorb greater levels of nicotine per cigarette than smokers in the general population [31-33]. When required to abstain from cigarettes for a short period, smokers with schizophrenia report more severe cigarette craving and nicotine withdrawal, and lapse back to smoking significantly sooner than smokers without schizophrenia [282]. Consequently, pharmacological interventions targeting such smokers may need to be of a higher dose, faster acting, and administered beyond the typically recommended 8-12 weeks in order to increase the likelihood of smoking cessation [173, 237, 266]. However, few studies have examined the efficacy of
extended provision of high-dose pharmacological cessation supports in increasing the likelihood of smoking cessation among persons with a mental disorder.

Horst et al [235] examined the efficacy of extended NRT provision for maintaining smoking cessation among psychologically stable smokers with schizophrenia or schizoaffective disorder. Participants who had quit smoking for at least three months were randomly assigned to receive either placebo patches or constant-dose nicotine patches (14, 21, 42 or 63mg, depending on baseline nicotine dependence level) for six months. Participants who received nicotine patches were significantly less likely to relapse within the six month intervention period than the placebo controls. This finding supports the provision of extended NRT to smokers with schizophrenia in reducing the rate of lapse back to smoking. However, confirmation using larger sample sizes among a diagnostically heterogeneous group of smokers, in addition to monitoring of potential changes in psychiatric symptoms is needed to determine if extended use of NRT is safe and efficacious in reducing rates of relapse among smokers with a mental disorder.

Recent evidence suggests that faster-acting forms of NRT, such as nicotine nasal spray, may be more effective in reducing cravings to smoke among smokers with mental disorders than other forms of NRT [283]. Nicotine patches alone may have limited efficacy in increasing cessation rates among smokers with a mental disorder, given that the delivered dose is passive and continuous, and they do not allow for dose adjustment based on changes in craving severity [284]. Nicotine nasal spray is delivered via the nasal mucosa, has a rapid onset of action, and more closely mimics the physiological effects of smoking than other forms of NRT [284], producing peak plasma levels of nicotine within five minutes of administration [285]. Further, nicotine nasal spray has
demonstrated efficacy in increasing cessation rates among highly dependent smokers [285, 286]. Despite these benefits, nicotine nasal spray tends to be underutilised, potentially due to reports of unpleasant side effects such as nasal irritation, however these effects tend to dissipate within the first week of use [287]. Few studies have examined the efficacy of nicotine nasal spray relative to other forms of NRT in reducing cravings to smoke, and increasing cessation rates among highly dependent smokers with a mental disorder. Williams et al [288] examined the efficacy of nicotine nasal spray versus nicotine patch in reducing craving to smoke in a randomised open-label controlled trial among smokers with schizophrenia or schizoaffective disorder. Patients attending outpatient mental health services and who had abstained from smoking for three days were randomised to receive either three bottles of 10mL nicotine nasal spray (containing 100mg of nicotine each), or three 24-hour 21mg nicotine patches. Following baseline assessment of craving, participants allocated to receive the nicotine patches were instructed to wear one 21mg nicotine patch per day, and those randomised to receive nicotine nasal spray were instructed to administer one dose per hour, up to 40 doses per day for three days. Participants randomised to the nasal spray condition reported significantly less craving to smoke in response to environmental cues to smoke than participants allocated to receive nicotine patch. Ease of use was reported to be similar between the two forms of NRT, suggesting that regular use of fast-acting, high dose nasal sprays may have good utility in controlling nicotine cravings and preventing relapse after a quit attempt among smokers with schizophrenia. Further trials are needed in real-world contexts to determine if such regular dosing of fast acting forms of NRT is
efficacious and feasible, particularly in regards to treatment adherence and cost effectiveness among smokers with a mental disorder.

Despite post-marketing reports of serious side effects, including depressed mood, agitation and suicidality [82, 85]; recent evidence suggests that varenicline (or ‘Champix’) may be a safe and effective pharmacological treatment for preventing relapse to smoking after abstinence among smokers with a mental disorder. Evins et al [289] tested the efficacy of an extended intervention incorporating 40 weeks of combined varenicline and CBT in preventing smoking relapse among 87 outpatient smokers with schizophrenia, schizoaffective disorders and bipolar disorders. Participants were randomly allocated to receive either 1mg of varenicline twice daily or a placebo, in conjunction with CBT targeting relapse prevention techniques, for 40 weeks. At end of treatment, seven-day point prevalence abstinence rates were 60% in the varenicline group versus 19% in the placebo group, and these differences were sustained up to six months post-treatment [289]. Importantly, despite previous reports of serious adverse events related to the use of varenicline among persons with a mental disorder [82, 85], there were no significant treatment effects on psychiatric symptoms or adverse events. However, this study was conducted among a relatively small sample of psychiatrically stable outpatients, and persons with suicidal or homicidal ideation, other active substance use disorder/s, those who had been hospitalised for suicidality in the prior 12 months or who had experienced a major depressive episode in the prior six months were excluded from the trial. Thus, further research is needed to support the
efficacy and safety of long-term use of varenicline for preventing smoking relapse among diagnostically heterogeneous groups of smokers with acute mental disorders.

Cognitive behavioural mood management as an adjunct to smoking cessation treatment

In addition to higher levels of nicotine dependence, smoking cessation among persons with a mental disorder is likely to be more difficult due to the ongoing mental health issues experienced by this group. It was previously thought that cessation of smoking increased the recurrence of negative mental health events among persons with a mental disorder, such as relapse of a depressive episode [290]. However, recent studies suggest that smoking cessation may not negatively impact mental health [137], and recent review evidence suggests that quitting is associated with improve psychological functioning [98, 291, 292]. However, for those smokers who try, but fail to quit, psychological distress may increase [293]. A recent cohort study of smokers with anxiety disorders identified that those who achieved abstinence reported a reduction in anxiety symptoms, however, those who failed to quit or lapsed after a quit attempt experienced a modest increase in anxiety in the long term [294]. Other research has indicated that smokers with depression may have fewer cognitive coping skills than smokers without a depressive history [295], which may contribute to their higher rates of relapse and lower rates of successful smoking cessation among smokers with depression. These findings suggest that the integration of behavioural interventions, including mood management and coping skills training such as CBT may be an
important augmentation to smoking cessation treatments for smokers with a mental disorder [56].

Hass et al [260] examined the efficacy of behavioural mood management in increasing cessation rates among smokers with and without past episodes of major depressive disorder. Participants were randomly allocated to receive either eight weeks of group-based CBT or health education. The CBT component was designed to assist smokers manage negative affect and psychological distress following a quit attempt, and to develop skills to cope with situations associated with low mood and smoking. The health education component comprised the delivery of health-related information and required participants to develop a plan to quit smoking, monitor the plan weekly, and participate in didactic educational presentations and complete homework tasks. At end-of-treatment, smokers with recurrent past episodes of major depression receiving CBT had significantly higher rates of cessation than their peers receiving the health education component, suggesting that interventions that incorporate mood management and coping strategies may be more effective than physical health-based education alone in increasing cessation rates among smokers with depression.

The findings in the study by Hass et al [260] were supported by a recent systematic review and meta-analysis examining the efficacy of smoking cessation treatments for smokers with a previous or current depressive disorder [262]. The review identified 16 randomised controlled trials, of which only three were conducted among smokers with a current depressive disorder. Despite the paucity of research, a small but positive effect was found for the addition of behavioural mood management, including group, individual and telephone-based CBT and behavioural activation therapy in increasing
cessation success in smokers with current or past depression (RR: 1.41, 95% CI: 1.01-1.96), with this effect being stronger than that for the addition of antidepressants (RR: 1.31, 95% CI 0.73-2.34) [262]. These findings support the addition of behavioural mood management to smoking cessation treatments for smokers with a mental disorder, however further studies are needed among smokers with acute psychiatric conditions to determine if such an approach is effective in reducing rates of smoking among this group.
RECOMMENDATIONS FOR LINKING HOSPITAL-BASED TO COMMUNITY-BASED SMOKING CESSATION TREATMENT

In addition to improving the implementation of smoke-free policies in inpatient psychiatric settings, and augmenting smoking cessation treatments with higher dose pharmacological supports and behavioural mood management, based on the results of these chapters, enhanced strategies are needed to provide effective continuation of smoking care post-discharge for smokers hospitalised for psychiatric treatment. Smoking cessation treatments delivered only in the inpatient setting do not significantly increase cessation rates, primarily because they fail to provide the ongoing support necessary to address the high rate of relapse to smoking post-discharge [147]. The findings of this thesis suggest that linking hospital-based to community-based smoking cessation treatment may be an efficacious model for reducing smoking behaviour among persons with a mental disorder. However, the post-discharge intervention component was delivered solely by an external research group, independent of the participants’ mental and physical healthcare team. For such an intervention to be adopted more broadly, integration of smoking cessation treatment within the patients’ ongoing clinical management needs to occur [296]. Within mental healthcare services, patients are recommended to receive treatment through a coordinated team of professionals (including general practitioners, nurses, psychologists, psychiatrists, social workers and case managers), rather than a single healthcare provider [297]. Given that persons with a mental disorder tend to ‘cycle’ through different treatment stages depending on the acuteness of their illness, the continuity of smoking care between such healthcare providers post discharge, via the development of a discharge smoking care
CHAPTER 6: Summary of findings and future directions for practice and research

plan, is vital [297]. Integrating smoking cessation treatment within existing community-based mental healthcare has been widely advocated [220], but its effectiveness as a service delivery approach has only been only preliminarily studied [298].

**Integrating smoking cessation treatment within mental healthcare services**

Several attempts have been made to examine the potential for integrating smoking cessation treatment into inpatient and community mental health services. In Australia, Ashton et al [299] examined the potential of a smoking cessation program embedded within outpatient mental health services in reducing smoking behaviour among smokers with a mental disorder. The study engaged a multidisciplinary group of clinicians and services, including general practitioners, private psychiatrists, community mental health services and the ‘Quitline’ telephone service. One hundred and twenty-nine smoking cessation programs were delivered to 844 smokers with a mental disorder attending 11 government and non-governmental community mental health services. The two hour group programs were delivered by a mental health professional and a peer worker, and were based on an active group participatory model specifically tailored to smokers with a mental illness, with techniques including problem solving, skills training, motivational interviewing, managing mental health, coping strategies, and dealing with stress, boredom and sadness. Details of the participants’ involvement in the programs were sent to their doctor and healthcare worker, requesting assistance with their patients’ quit attempt, and to monitor their medication dosage and mental health. Up to six weeks of subsidised NRT was provided to those smokers who were planning to quit and attended
CHAPTER 6: Summary of findings and future directions for practice and research

at least three sessions. Attendance at the program was good (57% attended 1 to 9 sessions), and cessation rates were higher among those attending 10 or more sessions (30%) compared to those who attended at least once (19.3%). At the 12 month assessment, 11.5% of smokers had quit. Although the study was of naturalistic design and lacked a control group, it provides promising results for the feasibility, acceptability and efficacy of integrating smoking cessation treatment within routine care delivered by outpatient mental health services in Australia.

Parker and colleagues developed and tested an innovative model of smoking cessation treatment spanning inpatient, community and rehabilitation mental health services in the UK [300]. Four inpatient and two outpatient rehabilitation mental health units were involved in an uncontrolled pilot trial. Two mental health professionals trained in smoking cessation treatment worked within each study site and provided a smoking reduction and cessation support service (based on UK National Health Service guidelines) to patients and staff who expressed a willingness to address their smoking. The flexible service was adapted to support individual needs and motivation, and comprised motivational interviewing, CBT, combination NRT and tailored written materials. Referral and communication pathways were developed by providing staff with smoking assessment materials, and developing an online referral system. Additionally, letters were sent to each member of the patients’ multidisciplinary psychiatric treatment team to provide an update of their patients’ progress with addressing their smoking. All members of staff in the participating settings were offered smoking cessation training, including support in adhering to the units’ nicotine dependence treatment guidelines, and how to manage changes in their patients’
psychiatric medication dosage. Uptake of the cessation support service among patients was modest (23% of smokers) in inpatient units, however of those engaged in the service, 47% utilised NRT, and 7% ($n = 4$) quit successfully. In the community mental health units, 75 referrals to the program were received, of which 70% were successfully contacted and received at least one contact with a smoking cessation advisor.

Importantly, barriers to the successful implementation of the smoking cessation program were identified. Firstly, staff identified a lack of resources and support to adequately implement the smoke-free policy and provide smoking care to patients according to the nicotine dependence treatment guidelines. Such a finding further highlights the need for ongoing support via the provision of educational and training resources for staff to improve the implementation of smoke-free policies and the delivery of nicotine dependence treatment to patients in inpatient psychiatric settings [121, 179]. Secondly, shortfalls in staff knowledge and negative attitudes towards addressing smoking among persons with a mental disorder were identified, including concerns that cessation would lead to social isolation, that smoking was an important coping strategy for patients, and that psychiatric inpatient settings were not the right place to address their smoking. These findings support previous assertions that staff agreement with smoke-free policies, and clear and consistent leadership is required to improve the delivery of smoking care in inpatient psychiatric settings [106, 277]. Finally, patient illness-related barriers, including cognitive, attentional and motivational factors were found to affect patient engagement with, and retention in the smoking cessation service, highlighting the importance of a tailored, flexible smoking cessation
CHAPTER 6: *Summary of findings and future directions for practice and research*

approach, delivered concurrently with mental health treatment and clearly communicated to all members of the patient’s multidisciplinary healthcare team [297].
This thesis sought to explore the potential of smoke-free psychiatric inpatient settings as a platform to initiate smoking cessation treatment in order to reduce the tobacco-related burden experienced by smokers with a mental disorder. The findings of this thesis indicate that admission to a smoke-free psychiatric facility may be an opportune moment to deliver smoking cessation treatment. However, issues relating to smoke-free policy implementation, including staff support for such policies, patient adherence to smoking bans, and provision of adequate nicotine dependence treatment need to be addressed to enhance this opportunity. Despite commonly held misperceptions among treating staff, smokers with a mental disorder are motivated to quit, and have made many unsuccessful attempts to do so, highlighting the pressing need for smoking cessation interventions targeted at this group. The results of this thesis indicated that a multimodal smoking cessation intervention initiated during a smoke-free psychiatric hospitalisation and continued post-discharge showed promising results in reducing tobacco consumption among smokers with a mental disorder. In order for the true benefit of smoke-free policies in inpatient psychiatric settings to be realised, and for large scale changes in smoking consumption among persons with a mental disorder to occur, future research needs to address three key areas: 1) testing the efficacy of multi-strategic systems level strategies to improve smoke-free policy implementation in inpatient psychiatric settings, 2) testing the efficacy of tailored, intensive smoking cessation interventions among smokers with an acute mental disorder, and 3) identifying means of providing continued smoking cessation support across the transition from inpatient to community mental health settings.


BIBLIOGRAPHY


43. NSW Government: Hospital costs and outcomes study: Independent Pricing and Regulatory Tribunal (IPART); 2010 [ipart.nsw.gov.au].

BIBLIOGRAPHY


73. Williams JM, Steinberg ML, Griffiths KG, Cooperman N: Smokers with behavioral health comorbidity should be designated a tobacco use disparity group. American Journal of Public Health 2013, 103(9):1549-1555.


84. Tsoi DT, Porwal M, Webster AC: Interventions for smoking cessation and reduction in individuals with schizophrenia. *The Cochrane Database of Systematic Reviews* 2013, 2:CD007253.


90. West R, Evans A, Michie S: Behavior change techniques used in group-based behavioral support by the English stop-smoking services and preliminary


BIBLIOGRAPHY

120. Willemsen MC, Görts CA, Soelen PV, Jonkers R, Hilberink SR: Exposure to environmental tobacco smoke (ETS) and determinants of support for


141. US Department of Health and Human Services: The health consequences of smoking: a report of the surgeon general. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 2004


BIBLIOGRAPHY


BIBLIOGRAPHY


BIBLIOGRAPHY


233. SANE Australia: Smoking and Mental Illness [http://www.sane.org/information/factsheets-podcasts/210-smoking-and-mental-illness]


268. Royal College of Physicians: Smoking or health, third report. Tunbridge Wells, Kent: Pitman Medical; 1977


APPENDICES
APPENDIX 1

APPENDIX 1. THE UNIVERSITY OF NEWCASTLE
THESIS BY PUBLICATION GUIDELINES

Office of Graduate Studies
Information Sheet
Thesis by Publication

The Rules Governing Research Higher Degrees (Rule 000830) allow for a thesis to be submitted in the form of a series of published papers. Rule 50 states:

A thesis submitted in the form of a series of published papers shall conform to the following:

a) a full explanatory overview shall be included to link the separate papers and to place them in the context of an established body of knowledge;

b) a literature review shall be included;

c) if detailed data and descriptions of methods are not otherwise given, they shall be included as appendices;

d) the papers must be published, in press or submitted to scholarly media only, i.e. refereed publications classified by national journal rankings and refereed conference papers, however at least 50% of the papers must have been published. Papers published up to three years prior to enrolment may be included provided they were published in scholarly media and do not represent more than 50% of the total papers;

e) publications submitted for another degree may only be referred to in the literature review;

f) the number of papers submitted should be sufficient for the body of work to constitute a significant and original contribution to knowledge;

g) the candidate must be the lead author in at least 50% of the papers written in the time of their formal Research Higher Degree candidature. Any published paper of which the candidate is a joint author may only be included in the thesis provided the work done by the candidate is clearly identified. The candidate must include in the thesis a written statement from each co-author attesting to the candidate’s contribution
APPENDIX 1

to a joint publication included as part of the thesis. These statements must be endorsed by the Pro Vice-Chancellor (or nominee).

h) the Head of School or Pro Vice-Chancellor may seek the approval of the Deputy Vice-Chancellor (Research) to include a paper that is outside the scope of these rules.

Issues to consider

- Each discipline area will have different issues to consider in the decision to submit a thesis in the form of a series of published papers.

- It is essential that you discuss your options carefully with your supervisor(s). The thesis must reflect a sustained and cohesive theme, an integrated whole that sits logically in the context of the available literature. Overall the material presented for examination needs to equate to that which would otherwise be presented in the traditional thesis format.

- Some journals take a long time to finalise the review process and waiting for papers to be accepted can delay thesis submission. Time management and selection of journals/publishers is critical. Focusing on publication rather than research may lead to candidates being tempted to publish sections of their work prematurely and missing opportunities to fully capitalize on the significance of the work.

- You need to consider the thesis from the examiners' viewpoint - if the publications do not have a clear cohesion and the contribution to knowledge is not clearly demonstrated, then the thesis may attract criticism and be rejected by examiners. The content of the thesis remains a matter of professional judgment for the supervisor(s) and candidate.

- As per rule 50 g) any published paper of which the candidate is a joint author may only be included in the thesis provided the work done by the candidate is clearly identified. The candidate must include in the thesis a written statement from each co-author attesting to the candidate's contribution to a joint publication included as part of the thesis.

- We strongly advise you to arrange for the signatures from co-authors to be collected as soon as the paper is prepared or submitted for publication rather than trying to collect them at the time of thesis submission. A sample statement is provided at the end of this document.

- There is no minimum or maximum requirement on the number of papers. Of equal, or perhaps more importance than quantity, is the quality of the journals.
APPENDIX 1

Other options

As discussed above, you need to consider if your publications will form a sufficient body of work to meet the requirements of thesis by publication. You may wish to consider the other option of including publications within a standard thesis format, either in the body or as an appendix, as per rule 48 c) below.

48. A thesis:

   c) may include publications arising as a consequence of the research undertaken for a thesis. When the candidate includes a co-authored published paper or co-authored scholarly work, or a substantive component of a co-authored published paper or co-authored scholarly work in the body of the thesis, the candidate must include in the thesis a written statement attesting to their contribution to the joint publication. This statement must be endorsed by the supervisor. A statement is not required when publications are included as an appendix.
APPENDIX 2

APPENDIX 2. EVIDENCE TO SUPPORT MANUSCRIPT SUBMISSION AND PUBLICATION

Appendix 2.1 Acknowledgement of acceptance of Paper 1 for publication

08-Apr-2014

Dear Ms. Stockings,

Your manuscript “The impact of a smoke-free psychiatric hospitalisation on patient smoking outcomes: a systematic review” has been accepted for publication in Australian and New Zealand Journal of Psychiatry.

In order for our publisher SAGE to proceed with publication of your article, you must complete a Contributor Form.

You should review and complete the form online at the journal’s SAGE Track site. The following link will take you there directly.

http://mc.manuscriptcentral.com/anzjp?URL_MASK=e12f6d0138e948dfa0ac15917f609914

Please note that without a completed agreement, we are unable to proceed with publication of your article.

If you have any questions please contact us at the ANZJP Editorial Office.

Yours sincerely,
ANZJP  Editorial Office
APPENDIX 2

Appendix 2.2 Acknowledgement of revision and re-submission of Paper 2

MS ID#: BJP/2014/148841
MS TITLE: Quality of implementation of a smoke-free policy in an inpatient psychiatric facility: association with patient acceptability

Dear Ms Stockings

Thank you for submitting your revised article to the British Journal of Psychiatry.

Please note, it is considered on the understanding that it has not been submitted for publication to another journal and will not be submitted elsewhere unless it is rejected.

To follow the progress of your paper please go to http://submit-bjp.rcpsych.org and log into the 'Author Area'.

If you have not registered with the system please click go to http://submit-bjp.rcpsych.org and click on 'Create a new account'.

If you have any problems please contact the Editorial Assistant at bjp@rcpsych.ac.uk

Yours sincerely,

Editorial Office

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Fax:+44 (0) 20 3701 2761
bjp@rcpsych.ac.uk
APPENDIX 2

Appendix 2.3 Acknowledgement of acceptance of Paper 5 for publication

11-May-2014

Dear Ms Stockings

The editors of Nicotine & Tobacco Research are pleased to accept your manuscript entitled "Impact of a post-discharge smoking cessation intervention for smokers admitted to an inpatient psychiatric facility: a randomised controlled trial" in its current form for publication.

In order to publish your article, Oxford University Press requires that you complete a license agreement online. A link to the online licensing system, and instructions on how to select and complete a license, will be provided to you by the Production Editor at Oxford University Press in due course.

Thank you for your contribution. On behalf of the Editors of Nicotine & Tobacco Research, we look forward to your continued contributions to the Journal.

Yours sincerely,

Dr Brian Hitsman
Deputy Editor, Nicotine & Tobacco Research
Email: b-hitsman@northwestern.edu
## APPENDIX 3. SUPPLEMENTARY MATERIAL FOR CHAPTER 1

### Table 13. PRISMA checklist

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<td>Title</td>
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<td>Identify the report as a systematic review, meta-analysis, or both.</td>
<td>28</td>
</tr>
<tr>
<td><strong>ABSTRACT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured summary</td>
<td>2</td>
<td>Provide a structured summary including, as applicable: background; objectives;</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>data sources; study eligibility criteria, participants, and interventions;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>study appraisal and synthesis methods; results; limitations; conclusions and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>implications of key findings; systematic review registration number.</td>
<td></td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rationale</td>
<td>3</td>
<td>Describe the rationale for the review in the context of what is already known.</td>
<td>30-31</td>
</tr>
<tr>
<td>Objectives</td>
<td>4</td>
<td>Provide an explicit statement of questions being addressed with reference to</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>participants, interventions, comparisons, outcomes, and study design (PICOS).</td>
<td></td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocol and</td>
<td>5</td>
<td>Indicate if a review protocol exists, if and where it can be accessed (e.g.,</td>
<td>32</td>
</tr>
<tr>
<td>registration</td>
<td></td>
<td>Web address), and, if available, provide registration information including</td>
<td></td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>6</td>
<td>registration number.</td>
<td>32-33</td>
</tr>
<tr>
<td>Information sources</td>
<td>7</td>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report</td>
<td>31-32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>characteristics (e.g., years considered, language, publication status) used as</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>criteria for eligibility, giving rationale.</td>
<td></td>
</tr>
</tbody>
</table>
additional studies) in the search and date last searched.

<table>
<thead>
<tr>
<th>Search</th>
<th>Study selection</th>
<th>Data collection process</th>
<th>Data items</th>
<th>Risk of bias in individual studies</th>
<th>Summary measures</th>
<th>Synthesis of results</th>
<th>Risk of bias across studies</th>
<th>Additional analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
<td>9 State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).</td>
<td>10 Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.</td>
<td>11 List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.</td>
<td>12 Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.</td>
<td>13 State the principal summary measures (e.g., risk ratio, difference in means).</td>
<td>14 Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I² for each meta-analysis).</td>
<td>15 Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).</td>
<td>16 Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.</td>
</tr>
</tbody>
</table>

RESULTS

<table>
<thead>
<tr>
<th>Study selection</th>
<th>Study characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.</td>
<td>18 For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.</td>
</tr>
</tbody>
</table>

APPENDIX 3
<table>
<thead>
<tr>
<th>Section</th>
<th>Item</th>
<th>Description</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of bias within studies</td>
<td>19</td>
<td>Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).</td>
<td>50, Fig 5 (216), Table 16 (217-225)</td>
</tr>
<tr>
<td>Results of individual studies</td>
<td>20</td>
<td>For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.</td>
<td>Table 1 (37-47)</td>
</tr>
<tr>
<td>Synthesis of results</td>
<td>21</td>
<td>Present results of each meta-analysis done, including confidence intervals and measures of consistency.</td>
<td>n/a</td>
</tr>
<tr>
<td>Risk of bias across studies</td>
<td>22</td>
<td>Present results of any assessment of risk of bias across studies (see Item 15).</td>
<td>50, Fig 5 (216), Table 16 (217-225)</td>
</tr>
<tr>
<td>Additional analyses</td>
<td>23</td>
<td>Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).</td>
<td>n/a</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td></td>
<td>Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).</td>
<td>56</td>
</tr>
<tr>
<td>Limitations</td>
<td>25</td>
<td>Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).</td>
<td>56</td>
</tr>
<tr>
<td>Conclusions</td>
<td>26</td>
<td>Provide a general interpretation of the results in the context of other evidence, and implications for future research.</td>
<td>56-59</td>
</tr>
<tr>
<td>FUNDING</td>
<td></td>
<td>Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.</td>
<td>60</td>
</tr>
</tbody>
</table>

APPENDIX 3 209
**Figure 4.** Risk of bias summary: review authors' judgements about each risk of bias item for each included study using the Cochrane Collaboration’s tool for assessing risk of bias.
Table 14. Risk of bias and support for bias judgement for studies included in the review using the Cochrane Collaboration's tool for assessing risk of bias

<table>
<thead>
<tr>
<th>Study</th>
<th>Selection bias</th>
<th>Risk of bias domains</th>
<th>Attrition bias</th>
<th>Reporting bias</th>
<th>Other bias</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comparability of groups</td>
<td>Detection bias</td>
<td>Incomplete outcome data</td>
<td>Selective reporting</td>
<td>Other sources of bias</td>
</tr>
<tr>
<td>I. Resnick and Bosworth (1989)</td>
<td>The authors’ stated that, between groups “No discernible changes in antipsychotic drug doses, PRN psychotropic medications dispensed, episodes of seclusion or restraint and discharges against medical advice.”. No statistical tests were conducted on differences between groups. Inadequate detail on differences in relevant prognostic factors to determine comparability of groups.</td>
<td>Did not describe derivation of the sample. Did not compare characteristics of sample to total patient population.</td>
<td>Did not describe methods of how outcome data were collected, or by whom.</td>
<td>Not repeated measures design.</td>
<td>Selective use of statistical tests to support reported changes in patient smoking outcomes.</td>
</tr>
</tbody>
</table>

Risk judgement  Unable  Unable  Unable  n/a  Unable  High
<table>
<thead>
<tr>
<th>Study (Year)</th>
<th>Design</th>
<th>Sample Description</th>
<th>Data Collection</th>
<th>Data Analysis</th>
<th>Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Smith and Grant (1989)</td>
<td>Single group</td>
<td>Did not describe derivation of the sample. Did not compare characteristics of sample to total patient population.</td>
<td>Study authors conducted the surveys with patients.</td>
<td>Not repeated measures design.</td>
<td>Select quotes presented from individual medical staff members.</td>
</tr>
<tr>
<td>3. Jonas and Eagle (1991)</td>
<td>Single group</td>
<td>Did not describe derivation of the sample. Did not compare characteristics of sample to total patient population.</td>
<td>Outcome data collectors were blind to purpose of study and patient information.</td>
<td>Only presented data for first 39 smokers for whom data were obtained. Did not describe subject attrition.</td>
<td>Outcomes reported as stated in methods.</td>
</tr>
<tr>
<td>Study</td>
<td>Design Details</td>
<td>outcomes</td>
<td>Follow-up</td>
<td>Risk judgement</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>Patten et al (1995)</td>
<td>Pre and post-ban groups did not differ on relevant prognostic factors at baseline (age, gender, treatment duration, psychiatric diagnosis or number of years smoking). Included all patients admitted to the facility during the study period. Study authors conducted the follow-up interview.</td>
<td>Did not report differences between those surveyed and those lost to follow-up. Long follow-up and small sample size ($n = 19$) likely to have increased risk of bias in follow-up sample.</td>
<td>Outcomes reported as stated in methods.</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Downey et al (1998)</td>
<td>Groups did not differ on relevant prognostic factors at baseline (race, gender, age, education level, age of smoking onset, years of smoking, number of cigarettes smoked per day, nicotine dependence, or psychopathology). Authors stated “All smokers agreed to participate, but only 20 of 30 restricted smokers and 22 of 30 ad lib smokers provided complete data”. Did not compare characteristics of sample to total patient population. Participants were approached by a “research assistant”. Unclear if research assistant was blind to study purpose or outcomes.</td>
<td>Not repeated measures design.</td>
<td>Outcomes reported as stated in methods.</td>
<td>Low</td>
<td></td>
</tr>
</tbody>
</table>

**Risk judgement**

| Low | Unable | n/a | Low | High |

**APPENDIX 3**
<table>
<thead>
<tr>
<th>Risk judgement</th>
<th>n/a</th>
<th>Unable</th>
<th>High</th>
<th>n/a</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6. Keizer and Eytan (2005)</strong> Single group design. Surveyed sample did not differ from total patient population on age or gender, but authors did not assess differences in relevant prognostic factors such as length of admission or level of smoking. The authors’ stated “Patients were directly contacted by one of the authors in order to increase participation rates….”. Not repeated measures design. Outcomes reported as stated in methods. No other sources of bias identified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7. Prochaska et al (2006)</strong> (includes Shmueli et al., 2008) Single group design. The authors’ stated “Compared to the sample, study refusers were more likely to be female [67% vs. 39%, odds ratio (OR) = 10.8, p = 0.43] but did not differ by age, marital status, ethnicity, employment, insurance status, admission status, or level of smoking as recorded in the medical record.” The authors stated “Patients were contacted by research staff” and “follow-up assessments were conducted by phone”. Unclear whether outcome assessors were blind to study purpose or outcomes. The authors’ stated “Patients lost to follow-up were more likely to be male (90% vs. 57%, OR = 4.2, p = 0.45) and receive Medicare/medical (70% vs. 24%, OR = 7.2 p = .003) as compared to the full sample.”. Outcomes reported as stated in methods. No other sources of bias identified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

APPENDIX 3
<table>
<thead>
<tr>
<th>Study</th>
<th>Characteristics of the surveyed sample compared to the total patient population</th>
<th>Methodology and outcomes</th>
<th>Risk judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etter et al (2008)</td>
<td>Groups not differ on age or gender, but authors did not assess differences in relevant prognostic factors such as length of admission or level of smoking.</td>
<td>The authors' stated “A physician, a nurse or a psychologist distributed the questionnaires to patients and staff after explaining the study and obtaining written informed consent….the physician a nurse or a psychologist completed the questionnaires with patients who were unable to answer by themselves.”. Unclear if outcome assessors were blind to study purpose or outcomes.</td>
<td>Low</td>
</tr>
<tr>
<td>Smith &amp; O’Callaghan (2008)</td>
<td>No details provided regarding differences in characteristics of the surveyed sample compared to the total patient population</td>
<td>No details provided on who conducted the interviews, and whether outcome assessors were blind to study purpose and outcomes.</td>
<td>High</td>
</tr>
</tbody>
</table>

**APPENDIX 3**

<table>
<thead>
<tr>
<th>Study</th>
<th>Risk judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith &amp; O’Callaghan (2008)</td>
<td>Unable</td>
</tr>
</tbody>
</table>

Statistical tests not conducted to support statements of changes in patient smoking outcomes.
<table>
<thead>
<tr>
<th>Risk judgement</th>
<th>High</th>
<th>Unable</th>
<th>High</th>
<th>n/a</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Keizer et al (2009)</td>
<td>No significant differences between groups in gender or education level, however in the ‘post’ group, patients were older ((p = .007)), more likely to have a diagnosed affective disorder (44% vs. 33%) and less likely to have a psychotic disorder (27% vs. 34%).</td>
<td>The authors’ stated “The two non-participating units did not differ from the others but patients were unavailable because of another ongoing research programme.”, but did not examine or report differences between characteristics of the surveyed sample compared to the total patient population.</td>
<td>The authors’ stated “The same person as in 2001 (one of the authors: IK) interviewed the patients, with the help of a second psychologist (one of the authors: VD).”</td>
<td>Not repeated measures design.</td>
<td>Outcomes reported as stated in methods.</td>
<td>No other sources of bias identified.</td>
</tr>
<tr>
<td>11. Ratschen et al (2010)</td>
<td>Single group design.</td>
<td>No details provided regarding differences in characteristics of the surveyed sample compared to the total patient population.</td>
<td>The authors’ stated “The researcher was well acquainted with the ward environment and with several interview participants…”.</td>
<td>Not repeated measures design.</td>
<td>Examination of views towards the policy heavily focused on negative attributes only.</td>
<td>Statistical tests not conducted to support statements of changes in patient smoking outcomes.</td>
</tr>
</tbody>
</table>
| 12. Siru et al (2010) | The authors’ stated “The MHD [mental health disorder] and non-MHD samples were not significantly different in terms of age, gender or level of education. The non-MHD samples had a significantly shorter length of stay and smoked less cigarettes per day while they were inpatients”.

Did not describe derivation of the sample. | The authors’ stated “As soon as possible after admission, patients were approached by the researcher and their smoking status determined….Post discharge surveys were conducted at five and fourteen days, and six months after the patients’ date of discharge.”. No details provided on who conducted the follow-up surveys or if they were blinded to study purpose and outcomes. | The authors’ stated “Individuals lost to follow-up were not significantly different in terms of age ($t_{105} = 1.32, p = 0.187$) length of stay ($t_{105} = 1.32, p = .087$), usual number of cigarettes smoked at baseline ($U = 1273.5, p = 0.370$)…”

Outcomes reported as stated in methods. | The authors reported that some participants in the non-mental health comparison sample had diagnosed mental health disorders. |

| Risk judgement | High | Unable | Unable | Low | Low | High |

APPENDIX 3 217
<table>
<thead>
<tr>
<th>Risk judgement</th>
<th>n/a</th>
<th>Unable</th>
<th>Unable</th>
<th>Unable</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
</table>

13. Hehir et al (2012) | Single group design | For the 106 patients in the hospital, 84 were eligible and 45 completed the survey. No details provided regarding differences in characteristics of the surveyed sample compared to the total patient population. | The authors’ stated “Groups were facilitated by two of the authors…” and “…surveys were administered by local staff at two of the facilities and by the research team at the third facility.” Authors did not state whether outcome assessors were blind to study purpose and outcomes. | Of the 23 patients selected for the post-discharge survey, 15 were completed (65.2%). Did not report differences between those surveyed and those lost to follow-up. | Outcomes reported as stated in methods. | No other sources of bias identified. |
| Risk judgement | n/a | Unable | Unable | n/a | Low | Low |

4. Smith et al (2012) | Single group design | Convenience sample. The authors’ stated “These 100 inpatients represented approximately 50% of the 202 total patients residing at the facility.”. No details provided regarding differences in characteristics of the surveyed sample compared to the total patient population. | The authors stated that “…data were primarily collected by Peer Advocates at the facility…”, however did not state if they were blind to study purpose and outcomes. | Not repeated measures design. | Outcomes stated as reported in methods. | No other sources of bias identified. |
APPENDIX 4

APPENDIX 4. SUPPLEMENTARY MATERIAL FOR CHAPTER 2

4.1 Variable transformations for the conduct of the multi-variable binary logistic regression model

Responses to the following variables were collapsed into two categories: cultural identification (Aboriginal or Torres Strait Islander [yes, no]), diagnosis (mood disorders, other) previous admission (yes, no), nicotine dependence (FTND total ≤ 5, ≥ 6; [166]), and NRT effectiveness in reducing cravings (not at all – a little, a fair bit – a lot). The remaining variables were reduced to three categories: age (< 30, 31-45, 46+), and admission length (< 7 days, 8-30, 31+).

Four variables describing adherence to the smoke-free policy in the unit were created from patient responses to items regarding the observed adherence of other patients/staff in the unit and/or grounds (yes, no), and the smokers’ own adherence in the unit and/or grounds (yes, no). Responses to the survey item assessing perceived staff support of the policy were collapsed into two categories (most-all staff positive, most-all staff negative/unsure). Items assessing the receipt of brief advice to quit, receipt of NRT and types of NRT used were collapsed into a single variable termed ‘optimal nicotine dependence treatment’ (patch + adjunctive NRT + brief advice to quit vs. other) in accordance with the NSW Health treatment guidelines for the management of nicotine dependent inpatients [110]. Patient acceptability of the smoke-free policy was derived from the item assessing patients’ view of the smoke-free policy within the current unit of
APPENDIX 4

admission, with responses collapsed into two categories (somewhat-very positive, somewhat-very negative/neutral).

---

**Figure 5.** Flow diagram of participant recruitment
### Table 15. Smokers' receipt of nicotine dependence treatment

<table>
<thead>
<tr>
<th>Received brief advice to quit</th>
<th>Smokers (n = 97)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>63.9 (62)</td>
</tr>
<tr>
<td>Yes</td>
<td>36.1 (35)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Received NRT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>24.7 (24)</td>
</tr>
<tr>
<td>Yes</td>
<td>75.3 (73)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nicotine dependence treatment received</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>20.6 (20)</td>
</tr>
<tr>
<td>Brief advice to quit</td>
<td>7.2 (7)</td>
</tr>
<tr>
<td>Adjunct NRT</td>
<td>22.7 (22)</td>
</tr>
<tr>
<td>Adjunct NRT + patch</td>
<td>20.6 (20)</td>
</tr>
<tr>
<td>Adjunct NRT + brief advice to quit</td>
<td>8.2 (8)</td>
</tr>
<tr>
<td>Patch + brief advice to quit</td>
<td>1.0 (1)</td>
</tr>
<tr>
<td>‘Optimal’: adjunct NRT + patch + brief advice to quit</td>
<td>19.6 (19)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NRT effectiveness in reducing cravings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all - a little</td>
<td>56.1 (41/73)</td>
</tr>
<tr>
<td>A fair bit - a lot</td>
<td>43.8 (32/73)</td>
</tr>
</tbody>
</table>

^ Data are numbers (%).
Appendix 5.1 Ethics approval for Chapters 2 and 3

HUMAN RESEARCH ETHICS COMMITTEE

Quality Assurance Proposal
To Project Supervisor: Associate Professor Jenny Bowman
Cc Project Team Members: Associate Professor John Wiggers
  Ms Jenny Knight
  Ms Margaret Terry
  Mr Richard Clancy
  Ms Emily Stockings
Re: Project: Patient views of smoke free policy: secondary data analysis
Date: 4 November 2011
Reference Number: QA39

Thank you for your Quality Assurance Activity Proposal submission to the Human Research Ethics Committee (HREC).

Based on the information you have provided, the proposed activity meets the committee's guidelines1 for the identification of a quality assurance activity that does not require review by the Human Research Ethics Committee.

You may now proceed with the activity. Best wishes for a successful project.

Professor Alison Ferguson
Chair, Human Research Ethics Committee

For communications and enquiries:
Human Research Ethics Administration

Research Services
Research Office
The University of Newcastle
Callaghan NSW 2308
T +61 2 492 18999
F +61 2 492 17164
Human-Ethics@newcastle.edu.au

1 Human Research Ethics Committee, University of Newcastle – Quality Assurance Guidelines – 15 October, 2008: based on National Health & Medical Research Council (NHMRC). When does quality assurance in health care require independent ethical review? Advice to institutions, human research ethics committees and health care professionals
APPENDIX 5

Appendix 5.2 Ethics approval for Chapters 4 and 5

2 May 2008

Associate Professor J Bowman
School of Psychology
University of Newcastle

Dear Professor Bowman,

Re: Integrated smoking care linking mental health inpatients (08/04/16/5.10)

HNEHREC Reference No: 08/04/16/5.10
NSW HREC Reference No: 08/HNE/96

Thank you for submitting the above protocol which was first considered by the Hunter New England Human Research Ethics Committee at its meeting held on 16 April 2008. This Human Research Ethics Committee is constituted and operates in accordance with the National Health and Medical Research Council’s National Statement on Ethical Conduct in Human Research (2007) (National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

As part of the procedure for ethical approval of research involving humans in Hunter New England Health the above protocol has reviewed by the Clinical Trials Subcommittee, an advisory group of the Hunter New England Human Research Ethics Committee.

I am pleased to advise that following receipt of the requested clarifications and revised Information Statement by the Professional Officer, the Hunter New England Human Research Ethics Committee has granted ethical approval of the above project.

The following documentation has been reviewed and approved by the Hunter New England Human Research Ethics Committee:

- The Information Statement (Version 2 dated 29 April 2008);
- The Consent Form (Version 1 dated 31 March 2008); and
- The Questionnaire.

For the protocol: Is management of post operative pain in laparoscopic cholecystectomy patients adequate? A questionnaire

Approval from the Hunter New England Human Research Ethics Committee for the above protocol is given for a maximum of 5 years from the date of this letter, after which a renewal application will be required if the protocol has not been completed.

The National Statement on Ethical Conduct in Human Research (2007), which the Committee is obliged to adhere to, include the requirement that the committee monitors the research protocols it has approved. In order for the Committee to fulfil this function, it requires:

- a report of the progress of the above protocol be submitted at 12 monthly intervals. Your review date is May 2009. A proforma for the annual report will be sent two weeks prior to the due date.

Hunter New England Human Research Ethics Committee

(Locked Bag No 1)
(New Lambton NSW 2305)
Telephone (02) 49214 960 Facsimile (02) 49214 918
Email hnehrec@hneh.rosw.gov.au
Nicole.gemmell@hneh.rosw.gov.au
Michelle.lane@hneh.rosw.gov.au
Dear Professor Bowman,

Re: Integrated smoking care linking mental health inpatients to community services

HNEHREC Reference No: 08/04/16/5.10
HREC Reference No: 08/HNE/96
SSA reference number: 08/HNE/87

Thank you for submitting an application for authorisation of this project. I am pleased to inform you that authorisation has been granted for this study to take place at the following sites:

- James Fletcher Hospital

The following conditions apply to this research project. These are additional to those conditions imposed by the Human Research Ethics Committee that granted ethical approval:

1. Proposed amendments to the research protocol or conduct of the research which may affect the ethical acceptability of the project, and which are submitted to the lead HREC for review, are copied to the research governance officer;

2. Proposed amendments to the research protocol or conduct of the research which may affect the ongoing site acceptability of the project, are to be submitted to the research governance officer.

Yours faithfully,

[Signature]
Nicole Gerrand
Research Governance Officer
Hunter New England Health
APPENDIX 5

HUMAN RESEARCH ETHICS COMMITTEE
Certificate of Approval

| Applicant: (first named in application) | Associate Professor Jennifer Bowman |
| Co-Investigators / Research Students:   | Professor Vaughan Carr               |
|                                         | Associate Professor John Wiggers     |
|                                         | Associate Professor Amanda Baker     |
|                                         | Ms Paula Wye                         |
|                                         | Mr R Clancy                          |
|                                         | Ms Margaret Terry                    |
|                                         | Ms Jenny Knight                      |
| Protocol:                               | Integrated smoking care linking mental health inpatients to community services |

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Note: Approval is granted subject to the requirements set out in the accompanying document Approval to Conduct Human Research, and any additional comments or conditions noted below.

Details of Approval

<table>
<thead>
<tr>
<th>HREC Approval No: H-2008-0191</th>
<th>Approved to: 10-Jun-2011</th>
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</thead>
</table>

Approval is granted to this date or until the project is completed, whichever occurs first. If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.

Progress reports due: Annually.

If the approval of an External HREC has been "noted", the reporting period is as determined by that HREC.

Initial Approval

11-Jun-2008
External HREC Approval Noted
HNE-HREC Reference No.: 08/04/16/5.10

Renewal of Approval

Variations to Approved Protocol

Authorised Certificate held in Research Services

Professor Val Robertson
Chair, Human Research Ethics Committee
APPENDIX 6

APPENDIX 6. FUNDING

Appendix 6.1 Funding sources for Chapters 4 and 5

<table>
<thead>
<tr>
<th>Funding body</th>
<th>Funding project title</th>
<th>First/last name, investigator</th>
<th>Grant Ref.</th>
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<tbody>
<tr>
<td>Human New England Area Health Service/Project Grant**</td>
<td>Provision of integrated smoking care to mental health patients</td>
<td>Bowman Jennifer, Ann</td>
<td>00190260</td>
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<tr>
<td>Australian Rotary Health/Mental Health Research Grant**</td>
<td>Integrated smoking care linking mental health inpatients to community services; a randomised controlled trial</td>
<td>Bowman Jennifer, Ann</td>
<td>00188134</td>
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<tr>
<td>Hunter Medical Research Institute/Project Grant**</td>
<td>Integrated Smoking Care Linking Mental Health Inpatients to Community Services: a Pilot Study</td>
<td>Bowman Jennifer, Ann</td>
<td>00189473</td>
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<tr>
<td>Department of Health and Ageing/Project Grant**</td>
<td>Integrated smoking care linking mental health inpatients to community services - a randomised control trial</td>
<td>Bowman Jennifer, Ann</td>
<td>01000335</td>
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Chair, Human Research Ethics Committee

For communications and enquiries:
Human Research Ethics Administration

HUMAN RESEARCH ETHICS COMMITTEE

Acknowledgement of Grant Linkage

To Chief Investigator or Project Supervisor:
Associate Professor Jennifer Bowman
Professor Vaughan Carr
Associate Professor John Wiggers
Associate Professor Amanda Baker
Ms Paula Wye
Mr R Ciancy
Ms Margaret Terry
Ms Jenny Knight

Cc Co-investigators / Research Students:
Integrated smoking care linking mental health inpatients to community services

Re Protocol:
Date: 21-Jul-2008
Reference No: H-2008-0191

Dear Associate Professor Jennifer Bowman,

This letter serves to confirm that the above Human Ethics project has been linked to your HMRI 08-18 grant - GO188473.

Professor Val Robertson
Chair, Human Research Ethics Committee

For communications and enquiries:
Ms Genevieve Farrell
Human Research Ethics Officer

Research Services
Research Office
The University of Newcastle
Callaghan NSW 2308
T +61 2 492 16333
F +61 2 492 17164
Genevieve.Farrell@newcastle.edu.au

Funding Details

<table>
<thead>
<tr>
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<th>Funding project title</th>
<th>First named investigator</th>
<th>Administering institution</th>
<th>Uni of Newc GS Reference</th>
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<td>HMRI 08-18</td>
<td>Integrated Smoking Care Linking Mental Health Inpatients to Community Services: a Pilot Study</td>
<td>A/Prof Jenny Bowman</td>
<td>University of Newcastle</td>
<td>GO188473</td>
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APPENDIX 7. AREA HEALTH SERVICE
FLOWCHART FOR NICOTINE DEPENDENCE
TREATMENT PROVISION

Guide for the management of nicotine dependent inpatients – Flowchart

1 Identify every tobacco user on admission
   • Use Substance Use History form or include smoking status on existing admission forms
     – Ex-smokers – Encourage continued abstinence
     – Daily/occasional smokers – Follow steps 2-5

2 Manage inpatient nicotine dependence
   • Inform patient of the ‘NSW Health Smoke Free Workplace Policy’ and specify contraindications to their treatment regime if they leave the ward/facility to smoke
   • Discuss options for management of nicotine dependence while in hospital such as:
     – abstinence
     – abstinence supported by nicotine replacement therapy (NRT), unless contraindicated
     – smoking office/indoor designated areas if available
   • If a patient has a history of mental health problems consult with treating clinician

3 Prescribe nicotine therapy
   • Arrange prescription for NRT (with patient consent)
   • Record
     – type (patch/inhaler/gum) and dose on medication chart
     – ‘nicotine dependent’ in patient notes

4 Monitor patient’s withdrawal symptoms
   If patient is still experiencing withdrawal symptoms:
   • review NRT dose/product (patient may benefit from combination therapy)

5 Discharge
   Ask all smokers – “Do you plan to smoke when you go home?”
   • “Yes”
     – Encourage future quit attempt: “The best thing you can do for your health is to stop smoking. When you’re ready, phone the Quitline or talk to your doctor.
   • “No”
     – Arrange three days post discharge NRT
     – Include treatment summary in discharge plan
     – Advise patient to seek cessation support from GP/pharmacist/Quitline 131 334

**NSW Health Smoke Free Workplace Policy (1996)** – This policy prohibits smoking in all buildings, vehicles and grounds controlled by NSW Health with the exception of approved designated outdoor areas. The rationale of the policy is to reduce the harms of smoking, to prevent exposure to environmental tobacco smoke and to promote the message that smoking is a serious chronic condition that is lethal for one in two regular users. This flowchart is a companion to the Guide for the management of nicotine dependent inpatients: summary of evidence.
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**Nicotine**

Nicotine is the drug in tobacco that causes dependence. This dependence is reinforced by:
- the rapid delivery of nicotine to the brain which inhaled cigarette smoke provides (10-19 seconds)
- positive reinforcement linked to dopamine release in the brain
- relief of withdrawal symptoms by continued smoking

Nicotine dependence can be assessed using these two questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How soon after you wake do you smoke your first cigarette?</td>
<td>Within 15 minutes</td>
<td>2</td>
</tr>
<tr>
<td>2. How many cigarettes per day do you smoke?</td>
<td>0 or less</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1-5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6-20</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>21-50</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>51-100</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>More than 100</td>
<td>5</td>
</tr>
</tbody>
</table>

Nicotine withdrawal symptoms

Symptoms include cravings plus four (or more) of the following within 24 hours of cessation – depressed mood, insomnia, irritability, frustration or anger, anxiety, difficulty in concentrating, restlessness, decreased heart rate, increased appetite or weight gain. These symptoms cause clinically significant distress and are not due to a general medical condition and are not better accounted for by another mental disorder (DSM-IV).

Nicotine Replacement Therapy (NRT)

NRT provides lower nicotine levels than those achieved by smoking and relief from physiological withdrawal symptoms. This helps resist the urge to smoke cigarettes. Delivery of nicotine via the oral mucosa (gum/inhaler) and transdermally (patch) is slower than delivery by smoking. NRT medications do not contain other toxic substances found in cigarettes such as carbon monoxide and tar; they do not produce dramatic surges in blood nicotine levels and they do not produce strong dependence.

The 'Cochrane Review' (Slagle et al. 2001) found that:
- odds ratio for abstinence with NRT compared to control was 1.73 (patch 1.76, gum 1.66 and inhaler 2.08)
- these odds were largely independent of the intensity of additional support provided to the smoker
- in highly dependent smokers there is significant benefit of 4-mg gum over 2-mg gum (odds ratio 2.67)
- NRT increases quit rates approximately 1.5 to 2 fold regardless of setting

"All of the evidence indicates that nicotine administered as a medication is always safer than that obtained by cigarette smoking." (Proctor 1990)

In Australia, NRT is currently contra-indicated for some patient groups and use by these patients requires special consideration.

**Contraindications to use of NRT (MIMS April/May 2001)**

**Gum (S2)**
- Non-tobacco users, pregnancy, lactation, children (<12 yrs).

**Patch (S2)**
- Non tobacco users, acute MI, unstable angina pectoris, severe arrhythmias, recent CVA, skin disease, children (<12 yrs), pregnancy and lactation.

**Inhaler(S3)**
- Non tobacco users, hypersensitivity to menthol, pregnancy, children (<12 yrs).

**Dose (MIMS April/May 2001)**

**Gum (S2)**
- Maximum 40mg daily

**Patch (S2)**
- Healthy people, >100kg/day, >45 kgs one patch daily 21mg/24hr or 15mg/16hr
- Cardiovascular disease, <100kg/day, <45 kgs one patch daily 14mg/24hr or 10mg/16hr

**Inhaler (S3)**
- 6-12 cartridges/day

**How to use NRT**

**Gum**
- The gum is effectively a mouth patch and nicotine is absorbed through the oral mucosa. Chew till a proper tingling feeling forms and ‘park’ between the gum and the cheek. Chew and ‘park’ several times per piece. (Avoid coffee/soft drinks 15 minutes before and while using gum.)

**Patch**
- Place on clean, non-hairy site on chest or upper arm upon waking. Rotate site each day.

**Inhaler**
- Inhale air through cartridge for 30 minutes. Self-instrate dose according to withdrawal symptoms.

**Bupropion**
- Not an appropriate medication for management of short-term nicotine withdrawal.

**Resources available on www.health.nsw.gov.au**

For patients  Prodicts to help you quit smoking
For staff  Guide for the management of nicotine dependent impatient: summary of evidence.
Appendix 8.1 Information statement

Assoc Prof Jenny Bowman  
School of Psychology  
Faculty of Science and IT  
University of Newcastle  
ph 49215958 fax 49216980  
Email jenny.bowman@newcastle.edu.au

Information Statement for the Research Project:  

Smoker’s Assistance Program  

Document version no. 6 Date 02/05/10

You are invited to participate in the research project identified above which is being conducted by Associate Professor Jenny Bowman and a number of other researchers at the University of Newcastle: Professor Amanda Baker, Associate Professor John Wiggers, Professor Vaughan Carr, and Ms Emily Stockings. Ms Stockings is a PhD student, under the supervision of Associate Professor Bowman at the University of Newcastle.

Why is the research being done?

The purpose of the research is to identify strategies which are effective in assisting people to reduce or cease their tobacco smoking. We believe that an approach that links mental health services with supports in the community, such as the Quitline or support groups, is likely to help. This research will help test whether this is the case.

Who can participate in the research?  

We are seeking to recruit people who are inpatients of the Mater Hospital, who are aged 18 years and over, who identify themselves as smokers at the time of admission.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. The doctors and treating clinicians here at the hospital will not be informed as to whether you have decided to take part or not.
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If you do decide to participate but later to decide to withdraw, you can do so at any time without giving a reason. In that event, any information collected from you or about you would be destroyed.

What would you be asked to do?
If you agree to participate, you will be asked to do five things:

1. Take part in a brief interview and questionnaire survey here today, about your smoking and your mental well-being. This will take about 20 minutes.

2. Agree to us accessing some limited information about you which has already been collected by the Mater Hospital: smoking status, psychiatric diagnoses, medication use, and use of Nicotine Replacement Therapy (NRT) and any nicotine withdrawal symptoms experienced as an inpatient.

3. Agree to being assigned, by chance, to either an Intervention group (where as part of the research we will offer a number of options to assist you in addressing your smoking after discharge from hospital), or a Control group (where this does not happen). The options which will be offered to you if assigned to the Smoking Intervention group include: referral to the Quitline, referral to your GP, participation in a smoking cessation support group, and extended provision of NRT.

4. Agree to us contacting you again – by telephone - in 1 week, 2 months, 4 months and 6 months following your discharge to ask some similar questions about your smoking and any strategies you may have tried to help you reduce or cease smoking. We will ask you for some contact details for a family member or friend, health care service or other agency who we could check with for your own up-to-date contact details if we have difficulty locating you for the follow-up phone calls. We also ask that you give permission for your contact details only (current phone number and address) to be obtained from these bodies, or from any other health care service or agency which you may be attending. These other people or services will only be used should our attempts to contact you not be successful, and only for the purpose of checking whether they have updated contact information for you.

5. Agree to providing a breath sample if selected to do so at the time of a follow-up phone call to allow us to measure the amount of tobacco you have smoked in the past 24 hours. To collect this breath sample, members of the research team will arrange to meet you at a healthcare
service, or other public facility convenient to you. If this is not possible, it may be arranged to visit you at home. Not all participants will be selected to provide a breath sample, and you will be informed at the time of each follow-up call if you have been selected to do so on that occasion.

**What are the risks and benefits of participating?**

There are no known risks to you in taking part in this research. While there may be no direct benefits for you personally in taking part, your participation in this research may ultimately help to improve the assistance available to people with mental health conditions for addressing their tobacco smoking. If you are assigned at random to the Smoking Intervention group for this research project, you will be offered a number of options for support in reducing your smoking or making a quit attempt, which may include the provision of NRT for an extended period following discharge.

**How will your privacy be protected?**

The information you provide will be treated with strictest confidence. The research requires that we collect some personal information, including your name and contact details. This is so that we can obtain some information already collected by the hospital (mentioned above), and also so that we can contact you for follow-up telephone surveys. Your personal information will not be used for any other purpose. Your personal information and all other study information (including questionnaires) will be kept in a locked cabinet in the project research office at the University. Interview and questionnaire information, and data entered from them onto computer, will be retained for a period of 5 years at the University following the completion of the study. After this time the information will be destroyed.

**How will the information collected be used?**

Individual participants will not be identified in any reports arising from this project. The results may reported in a paper submitted for publication in a scientific journal, and also possibly at an appropriate scientific conference. They may also form part of a student’s research thesis.

**What do you need to do to participate?**

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the researcher.
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If you would like to participate, please read and sign the consent form attached.

Further information
If you would like further information please contact Associate Professor Jenny Bowman at the University of Newcastle (ph 49215958, email jenny.bowman@newcastle.edu.au).

Thank you for considering this invitation.

Principal Investigators

Assoc Prof Jenny Bowman        Assoc Prof Amanda Baker
Chief Investigator

Assoc Prof John Wiggers        Prof Vaughan Carr

Ms Emily Stockings

Complaints about this research
This project has been approved by the Hunter New England Human Research Ethics Committee of Hunter New England Health, Ref no: 08/04/16/5.10.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Professional Officer (Research Governance and Ethics), Hunter New England Human Research Ethics Committee, Hunter New England Health, Locked bag 1, New Lambton NSW 2305, telephone 02 49214950, email hnehrec@hnehealth.nsw.gov.au
Appendix 8.2 Consent form

Assoc Prof Jenny Bowman  
School of Psychology  
Faculty of Science and IT  
University of Newcastle  
ph 49215958 fax 49216980  
Email jenny.bowman@newcastle.edu.au

Consent Form for the Research Project:

Smoker's Assistance Program

Document version no.3 Date 02/05/10

This research project is being conducted by Associate Professor Jenny Bowman and a number of other researchers at the University of Newcastle.

Please read the statements below, and add your name, signature and date at the bottom if you are willing to take part.

I agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statements, a copy of which I have retained.

I understand I can withdraw from the project at any time and do not have to give any reason for withdrawing.

I consent to:

1. Take part in an interview/survey here today, about smoking and my psychological well-being
2. Allow the researchers access to information already collected about me by the Mater Hospital (being smoking status, psychiatric diagnoses, medication use, and use of NRT and nicotine withdrawal symptoms experienced while I have been an inpatient)
3. Be assigned, by chance, to either an Intervention group (where I would be provided with encouragement and support to address smoking following discharge) or a Control group (where this did not occur), and
4. Be contacted, by telephone – in 1 week, 2 months, 4 months, and 6 months time - for the collection of follow-up information about smoking and any strategies I may have used to reduce or cease smoking.
5. Provide contact details for a family member, friend, health care service or other agency, and give permission for these bodies to release my contact information only (current phone number and address) to members of the research team, for the purpose of follow-up phone calls. I also
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consent for the research team to request my contact information from any health care service or provider, and give permission for the release of such information only.

7. Provide a breath sample, if I am selected to do so at the time of a follow-up call, to measure the amount of tobacco I have smoked in the last 24 hours,

I understand that my personal information will remain confidential to the researchers.

I have had the opportunity to have questions answered to my satisfaction.

Print Name:………………………………………………

Signature:………………………………………………

Date:……………………..