

Assessing motivation to quit smoking in people with mental illness: a review

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ABSTRACT

Background People with mental health (MH) disorders smoke at higher rates, are more nicotine-dependent and suffer greater morbidity and mortality from smoking-related illnesses than the general population. Helping these people to quit smoking is a public health priority; however, many MH professionals assume that those with mental illness are not motivated to quit. **Objectives** To use predetermined criteria to identify, review critically and evaluate empirically all English language, peer-reviewed data on motivation to quit smoking in MH populations. **Methods** A systematic search was conducted and key data on subject characteristics, measures of motivation and other variables abstracted. χ^2 analyses were used to compare motivation between MH and general populations, between in-patients and out-patients and between people with depression and people with psychotic disorders. **Results** Evidence suggests that people with MH disorders are as motivated to quit smoking as the general population, although those with psychotic disorders may be less motivated than individuals with depression. Although readiness to cease smoking was assessed in 14 studies, only two evaluated motivation to quit smoking in in-patient populations. **Conclusions** People with MH disorders are motivated to quit smoking, although more research is needed looking at in-patient populations. The commonly held false belief that people with MH disorders are not motivated to cease smoking means that opportunities to encourage smoking cessation among this disenfranchised group are being missed.

Keywords Hospital, mental health, review, smoking, stages of change, tobacco.

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INTRODUCTION

People with mental health disorders smoke at greater rates [1] and are more nicotine-dependent [2] than people in the general population. It is estimated that 50–90% of individuals with a mental illness are tobacco-dependent [3] versus 25–27% of the general population [4,5]. Two US population studies found that while people with past-month mental illness made up 28–30% of the smoking population, they smoked nearly half of all cigarettes consumed [1,6]. Thirty-four per cent of all cigarettes consumed were smoked by a mere 7% who had comorbid nicotine dependence and psychiatric illness [6].

Secondary to this high rate and level of smoking, people with mental health disorders are at elevated risk for smoking-related diseases such as cardiovascular

disease, cancer and stroke [7–9]. In the United States 40% of smoking-related deaths occur among mentally ill patients and substance abusers, which equates to approximately 160 000–200 000 deaths per year [3,10]. Furthermore, quality of life decreases with increased medical morbidity [3]. Thus, in terms of lives saved, quality of life and cost-efficacy, it has been suggested that treating smoking is one of the most important activities a clinician can undertake [11].

The development of relatively effective behavioural and pharmacological smoking cessation interventions, together with increased knowledge about the health consequences of smoking and anti-smoking public health campaigns, has seen a dramatic decline in smoking rates in the general population [12], yet no such trend has been observed in psychiatric populations [13]. One

explanation is that people with mental illness belong to a group of so-called 'hardcore' smokers [14,15]. Hardcore smokers are defined as daily, long-term smokers who, despite extensive knowledge of the health hazards of smoking and substantial social pressure to quit, are unable or unmotivated to do so [15].

There is a moderate amount of evidence to support the theory that people with mental illness have difficulty with quitting. Smoking cessation rates among people with mental illness are much lower than cessation rates among the general population [16–20]. Smoking abstinence rates in trials of nicotine replacement therapy (NRT) and bupropion are lower in people with schizophrenia than people without [21]. On the other hand, a meta-analysis of 15 studies comparing smoking cessation treatment outcome between individuals with and without a history of major depressive disorder (MDD) found no differences in either short- or long-term abstinence rates [22,23].

Even less is known about the level of motivation to cease smoking in psychiatric populations [24]. It has been assumed traditionally by mental health (MH) professionals that people with mental illness are not motivated to quit smoking, or that smoking cessation should not be a priority in this population [10,25,26]. Perhaps as a result of these assumptions, as smoke-free policies become increasingly common in general hospital settings, psychiatric facilities remain resistant to the implementation of such bans [27]. Despite the potential of hospitalization in a non-smoking environment to be a 'teachable moment' for smoking cessation [28,29], requiring smokers who are unmotivated to quit to be abstinent while in hospital is seen as an infringement of patients' rights [30], particularly among those who are acutely unwell [31].

However, whether smokers with mental health disorder (MHD) are truly unmotivated to quit is questionable; few studies have analysed empirically the level of motivation to quit smoking among people with mental illness [32,33] and no study has attempted to review critically and evaluate empirically all available data. Given the potential physical health detriment to smokers with MHD, as well as the adverse effects of environmental tobacco smoke on non-smokers, the finding that people with MHD are motivated to quit smoking combined with the failure to implement non-smoking policies responsibly in MH settings would present its own ethical quandary.

Therefore the primary aims of this review were (i) to determine whether or not people with mental illness are motivated to quit smoking, (ii) to use available data to compare motivation to cease smoking between psychiatric and general populations and (iii) to determine whether the level of motivation differs between in-patients and out-patients, or across different psychiatric diagnoses.

METHODS

Computer database search

Medline, CINAHL, EMBASE, PsychInfo, ScienceDirect, Australasian Medical Index and Web of Science were searched using the following search strategy: (mental disorders or mentally ill persons) and (smoking or smoking cessation or 'tobacco use disorder') or (psychological models or psychological theory or intention or motivation or attitude to health or health behaviour or health knowledge, attitudes, practice). Articles which appeared suitable from their title and abstract were read in their entirety to ensure their relevance before being included in the review.

To be included, an article had to be published in the English language in a peer-reviewed journal. Editorials, commentaries, theses/dissertations, unpublished studies, technical reports and books were not included. All articles which assessed and reported results for motivation to quit in psychiatric populations were included, regardless of their method of measuring motivation, and regardless of whether assessing motivation was a primary aim of the article.

Although other psychological factors, such as self-efficacy, can influence smoking cessation, articles which assessed only these psychological factors, without measuring motivation in any way, were excluded from this study.

For each paper included in the review the cited references were inspected for any additional, relevant articles. If a database provided a list of related articles, that list was also examined and the relevant papers added to the review.

Data extraction

Each article was summarized in a table that includes first author and year, aims of the study, subject characteristics, measure of motivation, other variables measured, findings of the study and implications of the study.

Among the articles recovered, the main motivational measures used were variations of the stage of change algorithm [34] and the contemplation ladder [35].

Stage of change

The Transtheoretical Model (TTM) [34] was developed in the 1980s to be an overarching model of health behaviour change [36]. The TTM is able to characterize both motivation to change and the means by which change is achieved using four distinct constructs: stage of change, processes of change, decisional balance and situational temptation/self-efficacy [36]. Whereas processes of change, decisional balance and situational temptation/self-efficacy are concerned chiefly with the mechanisms

by which change occurs, the stage of change construct merely describes an individuals' progression towards new health behaviours over time [37].

In its current form, five stages of change for smoking cessation are defined [38]. Pre-contemplation (PC) describes smokers who are not intending to quit in the next 6 months. Smokers in the contemplation (C) stage of change are considering quitting in the next 6 months. Smokers in the preparation (PA) stage are planning to quit within the next 30 days and have made at least one 24-hour quit attempt in the past year. Ex-smokers who have quit within the last 6 months are said to be in the action (A) stage of change. Finally, individuals are classified in the maintenance (M) stage if they have been abstinent for more than 6 months. Progression through the stages is thought to follow a spiral rather than linear pattern, in which people attempting behaviour change relapse and recycle through the stages before finally attaining maintenance [37].

The stage of change construct has undergone several modifications over the years. Previous versions of this construct have incorporated a sixth stage—termination (T)—in which an ex-smoker has been abstinent for 5 or more years [34], or omitted the preparation stage altogether [39]. Moreover, the questionnaire itself may be worded differently by different authors [40]. Currently, there is no standard for comparing different motivational measures [41,42]. A few studies have, however, assessed motivation to quit in a single sample of smokers using different stage of change questionnaires or both the stage of change algorithm and an alternative measure. Three different versions of the stages of change algorithm classified 83–93% of participants in the same stage, providing evidence of a high level of agreement between questionnaires [40].

For each study in the review which assessed motivation using a stage of change questionnaire, the source of that questionnaire is referenced in the 'measure of motivation' subheading.

The contemplation ladder

The contemplation ladder was created as an alternative to the categorical stage of change algorithm [35]. The contemplation ladder is an 11-point scale with verbal anchors at rungs 0, 2, 5, 8 and 10. Possible responses range from 'no thought of quitting' to 'taking action to quit (e.g. cutting down, enrolling in a programme)'. Respondents indicate their level of readiness to change by circling the appropriate rung number. The stage of change algorithm has been found to underestimate motivation to quit relative to the contemplation ladder [43].

In this review, two studies used the contemplation ladder to assess motivation. One article which used the

contemplation ladder [33] found that subjects' responses clustered around the five rungs with verbal anchors, and collapsed their outcome categories accordingly.

Comparison of populations of interest

From 14 papers, 11 articles were found which used stage of change algorithms to assess motivation to quit smoking. Of these, only nine gave complete stage of change distributions for a psychiatric population. From each of the nine studies the following numerical data were extracted: total number of smokers, number of smokers in PC, number of smokers in C and number of smokers in PA. These figures were tabulated, with total number of smokers, smokers in PC, smokers in C and smokers in PA in separate columns. Each column was then summed and the totals expressed as percentages to provide a combined sample ($n = 1247$) and its stage of change distribution. For simplicity, the numbers of smokers in each stage are expressed as only percentages with confidence intervals in Table 2.

To provide a comparative sample, Medline was searched for articles assessing stage of change distributions in general populations internationally; this search excluded samples collected in health facilities. A further six articles were found, one which reviewed the results from seven different studies [44] and two which examined multiple populations [45,46], giving a total of 20 non-psychiatric populations for comparison. By virtue of the high prevalence of smoking in people with MHD, it was expected that the number of individuals in the A and M stages of change would differ significantly between MHD and general populations. Also, some studies did not report data on individuals in A or M, thus a decision was made to include only individuals in the first three stages of change in the analysis.

Statistical analysis

χ^2 analyses were used to elucidate differences in stage of change distributions between psychiatric and non-psychiatric populations, in-patients and out-patients and across diagnoses.

RESULTS

Fourteen articles were identified which assessed motivation to quit smoking in people with mental health disorders. The stage of change algorithm [24–26,32,47–50], or one of its variations [51–53], was the most frequently used measure of readiness to quit. Other measures used were the contemplation ladder [33,54] and an original, single-item measure of motivation not based on the stages of change [55]. Only two studies [25,55] compared directly people with mental illness to people

without, and found no significant differences in motivation between groups. The results and implications of each study are summarized in Table 1.

Of the 14 studies in Table 1, nine provided stage distributions for mental health groups. The combined stage of change data from these nine MH samples found that 43% of smokers with MH disorders were in the pre-contemplation stage of change, 38% were in contemplation and 19% were in preparation (Table 2). Stage of change distributions among current smokers were also assessed in 20 general population samples, where 57% were in pre-contemplation, 33% were in contemplation and 10% were in preparation (Table 3). χ^2 analysis showed that significantly fewer people with mental health disorders were in the pre-contemplation stage of change than people without ($\chi^2 = 154.85$, 2 df, $P < 0.0001$).

Of the nine studies which assessed stage of change in psychiatric populations, two focused solely upon patients with depression or symptoms of depression. Between 21% [32] and 29% [47] of this population were in the pre-contemplation stage. Among people with psychotic disorders, including schizophrenia and schizoaffective disorder, four studies found the percentage of pre-contemplators to be 13% [51], 58% [48], 75% [52] and 79% [25]. Stage of change distributions were significantly different between those with psychotic disorders and those with depressive disorders ($\chi^2 = 20.34$, 2 df, $P < 0.0001$), with more depressed individuals in the contemplation stage and more individuals with psychotic disorders in the pre-contemplation stage. One study, which had recruited only subjects expressing an interest in quitting smoking, reported a very low rate of pre-contemplators (13%) [51]. After excluding this study from the analysis, the difference in stage of change distribution between diagnoses was still significant ($\chi^2 = 142.37$, 2 df, $P < 0.0001$).

Although two studies were found which evaluated motivation in in-patients, only one used stage of change [24], with the other using the contemplation ladder [33]. Due to the small number of studies available for comparison with out-patient samples, statistical analysis was not conducted. In the former study, however, a majority (60%) of smokers were in pre-contemplation [24], whereas in the latter study only one-third had 'not thought of quitting or cutting down' (an approximation to the pre-contemplation stage of change) [33].

The other study employing the contemplation ladder to measure motivation was conducted in an adolescent sample with MHD [54]. In this group, 33% of smokers were not thinking about quitting or cutting down, while 13% were planning to quit within the next 30 days. A subgroup of smokers (47%) was identified who had thought about quitting, but were not planning to quit.

Haukkala *et al.* [55] assessed motivation using the question: 'Would you like to stop smoking?', and simultaneously assessed severity of depression using the Beck Depression Inventory (BDI). An association between motivation and depression score was reported among females, with motivation actually increasing as depression score increased.

DISCUSSION

This review found that people with mental illness are motivated to cease smoking. Combined data from nine studies suggests that more than half of all smokers with MH disorders may be contemplating quitting within 6 months or preparing to quit within 30 days. This level of motivation is not dissimilar from that seen in the general population. Two studies which compared motivation directly among those with MH disorders and motivation in the general population found no significant differences in the stage distributions of participants with and without mental illness [25,55]. Lerman *et al.* [53] reported only on the proportion of smokers in the preparation stage of change; however, this proportion was the same for depressed and non-depressed individuals. In a slightly different analysis, Tsoh *et al.* [50] found that the prevalence of depression history among smokers was statistically similar across all stages of change, suggesting that a history of depression was not related to stage of change.

In purely psychiatric samples, excluding the one study that recruited only smokers interested in quitting and which predictably had a very low prevalence of pre-contemplators [51], the proportion of smokers in the pre-contemplation stage of change ranged from 21 to 79%. These rates were similar to the 37–74% rates found in the general population (see Table 2). χ^2 analyses directly comparing of stage of change distributions between MH and non-MH samples showed that motivation to quit in MH populations appeared greater than in general population samples. This finding may be due, in part, to the slightly larger proportion of studies in MH populations which occurred in the United States. It has been recognized that stage distributions in European countries are often less favourable than stage distributions in the United States [44]. In addition, the sensitivity of χ^2 with large samples may mean that this statistically significant difference does not translate to a clinically important difference in favour of the MH group.

There may also be differences in motivation between different psychiatric morbidities. This review found that significantly more individuals with psychotic disorders were in the pre-contemplation stage of change than people with depression. While amotivation is itself a negative symptom of schizophrenia, and may impede

Table 1 Intention to quit smoking among people with mental illness.

<i>First author and year</i>	<i>Aims of the study</i>	<i>Subject characteristics</i>	<i>Measure of motivation</i>	<i>Findings</i>	<i>Summary of study conclusions</i>
Hall 1995 [49]	To test the association between level of psychosocial functioning and intention to quit smoking in psychiatric out-patients	300 current and former smokers drawn from a pool of 390 chronic psychiatric out-patients with schizophrenia, schizoaffective disorder, bipolar affective disorder and major depression	4- or 5-item stages of change algorithm [86]	63% PC, 15% C, 2% PA, 4% A, 7% M, 9% T; 1.1% never smoked Statistically significant difference in total BPRS scores between former and current smokers	Less disabled, higher functioning psychiatric patients without negative symptoms are more successful at quitting
Lerman 1996 [53]	To test the 'self-medication' and 'learned helplessness' hypotheses explaining the association between depression and nicotine dependence	97 depressed and 105 non-depressed smokers from the community, who responded to advertisements for a free smoking cessation trial involving a minimal contact intervention	Single, forced-choice item assessing stages of change [38]	50% depressed smokers and 50% non-depressed smokers in preparation stage of change Depressed and non-depressed smokers reported similar levels of self-efficacy and outcome efficacy	Learned helplessness processes did not appear to underlie the relationship between depression and nicotine dependence Some evidence for self-medication hypothesis
Addington 1997 [48]	To assess the motivation and readiness to change of individuals with schizophrenia prior to developing a smoking cessation programme	60 smokers with schizophrenia recruited from an out-patient schizophrenia disorders clinic in a general teaching hospital	Stages of change [37]	58% PC, 30% C, 12% PA. Mean scores on RFQ were 10.01 (health concerns), 8.62 (self-control), 9.05 (immediate reinforcement), 3.93 (social influence) out of 20	Individuals with schizophrenia are as interested in smoking cessation and as motivated to quit as the general population Cessation programmes should be modified to account for the cognitive, social and affective deficits of schizophrenia
Carosella 1999 [24]	To assess: 1. Barriers and motives for quitting 2. Health risk knowledge 3. Readiness to change in psychiatric in-patients	127 in-patients of 4 psychiatric units: admissions (length of stay <45 days), (LTC-M), long term care—severely disturbed long term care—moderately disturbed (LTC-S) and mentally impaired/chemically addicted (MICA)	4-item stages of change algorithm [39]	53% PC, 21% C, 13% PA, 4% A, 9% M; 8% never smoked 33% never intended to quit Mean response to self-efficacy was 2.6 out of 5 68% of smokers thought that smoking 'hurt their health in any way'	General smoking education and intervention programmes are recommended to enhance motivation to quit smoking Assessment of readiness to change would allow targeted, action-orientated strategies for those smokers interested in quitting
Haukkala 2000 [55]	To examine how depressive symptoms are associated with smoking cessation motivation and self-efficacy in the general population	3403 participants of a cardiovascular risk factor survey, aged 25–64 years and drawn from the community of four areas of Finland	Single-item measure of motivation 'Would you like to stop smoking?' with responses no, yes, not sure	Proportion of smokers who reported that they wanted to quit increased significantly with depression score among female but not male respondents Higher depression scores were related to lower quitting self-efficacy in males	Smokers with higher depressive symptoms had lower self-efficacy but greater motivation to quit than non-depressed smokers Smokers with higher depressive symptoms were equally likely to try cessation as non-depressed smokers

Table 1 Cont.

First author and year	Aims of the study	Subject characteristics	Measure of motivation	Findings	Summary of study conclusions
Acton 2001 [47]	To: 1. Determine the validity of the TTM in clinical populations 2. Test the hypothesis that patients in earlier stages of change show higher rates of MDD and higher levels of depressive symptoms 3. Provide a current description of cognitive and motivational aspects of smoking in psychiatric out-patients	205 Californian psychiatric out-patients with MDD	5-item stages of change algorithm [38]	12% PC, 17% C, 12% PA, 12% A, 48% M; 31% never smoked Prevalence of MDD showed little variability across stages. Use of behavioural processes increased across stages, while use of experiential processes was high across all stages	Patterns of associations among the TTM constructs in this clinical sample were similar to those observed in studies of the general population Maintainers in this sample had the highest scores for both experiential and behavioural processes of change, suggesting that psychiatric patients may have to put more effort into quitting than members of the general population
Reichler 2001 [33]	To examine associations between level of smoking, diagnosis, socio-demographic variables and readiness to quit smoking in psychiatric in-patients	160 psychiatric in-patients with co-existing alcohol or other drug problems	10-rung contemplation ladder collapsed into five categories for analysis	29% of participants had no thought of quitting/cutting down, 22% thought they needed to consider quitting someday, 24% thought they should quit but were not quite ready, 13% were starting to think about how to change their smoking patterns and 12% taking action to quit or cut down	There are many psychiatric patients for whom an intervention may encourage the move from their current stage of contemplation to action Assessment of smoking stage of change and motivational interviewing to enhance contemplation of change may be suitable strategies for the majority of smokers
Etter 2004 [25]	To compare smoking behaviour and motivation to quit smoking in out-patients with schizophrenia or schizoaffective disorder and in a representative sample of the general population	742 smokers in the general population (GP) of Geneva, Switzerland and 151 out-patients with schizophrenia or schizoaffective disorder (SP) who attended a Geneva ambulatory psychiatric clinic in 2000	5-item stages of change algorithm [38]	Among current smokers in GP: 74% PC, 22% C, 4% PA Among current smokers in SP: 79% PC, 18% C, 2% PA Among current smokers in GP: 20% were absolutely sure they could quit, 24% fairly sure, 33% not sure, 23% not sure at all Among current smokers in SP: 13% were absolutely sure they could quit, 20% fairly sure, 26% not sure, 41% not at all sure	SP smokers were less confident in their ability to quit than GP smokers, but were just as motivated to quit as GP smokers This should encourage psychiatrists to treat tobacco dependence more systematically in these patients

<p>Lucksted 2004 [26]</p>	<p>To describe: 1. Smoking and quitting histories 2. Current smoking behaviours 3. Motivations of smokers with serious mental illness</p>	<p>120 out-patient smokers with serious mental illness including schizophrenia, other psychotic disorders, bipolar affective disorder, MDD and personality disorder</p>	<p>4- or 5-item stages of change algorithm [38] plus an undefined measure of desire to quit or reduce smoking</p>	<p>66% PC, 24% C, 10% PA On the other measure used, 82% reported a desire to quit or reduce smoking, 37% intended to quit within 6 months and 46% had already cut down on the amount they smoked in the past month Few participants had the assistance of professional or self-help interventions during their past quit attempts</p>	<p>High percentages of pre-contemplation and contemplation stage scores may reflect a lack of help in transforming a desire to quit into action, rather than a lack of primary desire Discrepancies between the stages of change and other measures of readiness to quit need to be resolved in future work</p>
<p>Prochaska 2004 [32]</p>	<p>To examine: 1. Depressed smokers' readiness to quit 2. The applicability of the stages of change framework to a psychiatric sample</p>	<p>322 currently depressed smokers recruited from four out-patient psychiatric clinics</p>	<p>5-item stages of change algorithm [38]</p>	<p>21% PC, 55% C, 24% PA Depressive symptom severity and history of recurrent depressive episodes were unrelated to readiness to quit Preparers reported more prior quit attempts, a greater commitment to abstinence, increased recognition of the cons of smoking and greater use of the processes of change Pre-contemplators were least likely to identify a goal related to smoking behaviour</p>	<p>The consistency of hypothesized patterns among theoretical constructs of the stages of change model supports the transfer of stage-tailored interventions to this clinical population</p>
<p>Tsoh 2004 [50]</p>	<p>To examine the association between depression history, current depressive symptoms and the TIM constructs in a non-treatment-seeking sample of smokers</p>	<p>239 current smokers in the US general population</p>	<p>Stages of change [87]</p>	<p>42% PC, 40% C, 18% PA CES-D score and prevalence of history of depression across each stage of change were statistically similar. CES-D score was positively correlated with the pros of smoking, temptation subscales for habitual and negative affect, self-re-evaluation process of change and FTND score</p>	<p>MDD history and depressive symptoms appear to be unrelated to individuals' stages of change The cognitive effects of depression may contribute most to the difficulty of smoking cessation among smokers who experience depressive symptoms</p>

Table 1 Cont.

First author and year	Aims of the study	Subject characteristics	Measure of motivation	Findings	Summary of study conclusions
Esterberg 2005 [52]	To use qualitative methodology to assess the TTM in the context of smoking behaviour in a sample of participants with schizophrenia-spectrum disorders	12 out-patients with either first-episode or chronic schizophrenia-spectrum disorders, recruited from a clinical trials programme and a community mental health centre in the United States	Stage of change assessed by the question 'Are you thinking of quitting smoking in the next 6 months?'	75% PC, 25% C Participants were most likely to describe the calming effects of nicotine as a pro of smoking There was high awareness of the negative health consequences of smoking	There was a low readiness to change among the sample. The consistency found between low readiness to change in this sample and the importance assigned to the pros of smoking is evidence for the applicability of the TTM in this population Information from decisional balance assessments can be combined with targeted motivation-based treatment techniques that may be particularly effective with people suffering from mental illnesses
Apodaca 2007 [54]	To identify characteristics associated with readiness to quit smoking in order to guide future efforts to tailor motivational interviewing for use with this population	191 adolescent smokers admitted to a psychiatric hospital	Contemplation ladder [35]	36% had no plans to quit or were intending to continue smoking 17% had made changes in their smoking or had quit Confidence was related significantly to readiness to change	The current results converge with the findings of previous studies that confidence is one of the most important predictors of smoking intention
Baker 2007 [51]	To investigate the characteristics of smokers with psychotic disorders	298 Australian smokers with an ICD-10 psychotic disorder residing in the community	Stages of change with pre-contemplation stage divided into subgroups [88]	13% PC, 50% C, 37% PA	The distribution of stages of change among people with psychotic disorders is very similar to the distribution of stages of change among the general population. Smoking cessation interventions offered by mental health services would probably attract sufficient numbers of people as many are interested in giving up

BPRS; Brief Psychiatric Rating Scale; PC: pre-contemplation; C: contemplation; PA: preparation; A: action; M: maintenance; T: termination; FTND: Fagerstrom Test of Nicotine Dependence; CES-D: Centre for Epidemiologic Studies Depression Scale, scores ≥ 16 indicate moderate to severe depression; RFQ: reasons for Quitting; BDI: Beck Depression Inventory, scores 10–18 indicate mild depression, scores >18 indicate moderate to severe depression; MDD: major depressive disorder; ICD: International Classification of Diseases; TTM: transtheoretical model.

Table 2 Stage of change distribution among psychiatric population samples.

First author and year	Measure of motivation	Country and subpopulation	n smokers in sample	Year data collected	Distribution of smokers by stage, % (95% CI)		
					PC	C	PA
Mental health disorders: Mixed diagnoses							
Hall 1995 [49]	Prochaska 1994 [86]	USA, out-patients	213	Not mentioned	79 (74, 84)	19 (14, 24)	2 (0, 4)
Carosella 1999 [24]	Prochaska 1983 [39]	USA, in-patients	70	1993	60 (49, 72)	24 (14, 34)	16 (7, 25)
Lucksted 2004 [26]	DiClemente 1991 [38]	USA, out-patients	108	Not mentioned	66 (57, 75)	24 (16, 32)	10 (4, 16)
Subtotal			391		72	21	7
Mental health disorders: Depression							
Acton 2001 [47]	DiClemente 1991 [38]	USA, out-patients	58	1998–1999	29 (17, 41)	43 (30, 56)	28 (16, 40)
Prochaska 2004 [32]	DiClemente 1991 [38]	USA, out-patients	322	Not mentioned	21 (17, 25)	55 (50, 60)	24 (19, 29)
Subtotal			380		22	53	25
Mental health disorders: Psychotic disorders							
Addington 1997 [48]	Prochaska 1992 [37]	Canada, out-patients with schizophrenia	60	Not mentioned	58 (46, 71)	30 (18, 42)	12 (4, 20)
Etter 2004 [25]	DiClemente 1991 [38]	Switzerland, out-patients with psychotic disorders	106	2000	79 (71, 87)	18 (11, 25)	3 (0, 6)
Esterberg 2005 [52]	'Are you thinking of quitting smoking in the next 6 months?' yes = C, no = PC	USA, out-patients with schizophrenia-spectrum disorders	12	Not mentioned	75 (51, 100)	25 (1, 50)	0 (–, –)
Baker 2007 [51]	Crittenden 1994 [88]	Australia, out-patients with schizophrenia or schizoaffective disorder	298	2001–2002	13 (9, 17)	50 (44, 56)	37 (32, 43)
Subtotal			476		35	40	25
Total			1247		43 (40, 46)	38 (35, 41)	19 (18, 20)

PC: pre-contemplation; C: contemplation; PA: preparation; CI: confidence interval.

Table 3 Stage of change distribution among general population samples.

First author and year	Measure of motivation	Country and subpopulation	n smokers in sample	Year data collected	Distribution of smokers by stage, %		
					PC	C	PA
General population							
Etter 1997 [44]	Prochaska 1992 [37]	Switzerland, population sample Switzerland, university sample Netherlands ^a Spain ^a Finland ^a USA, Virginia ^a USA, Rhode Island ^a USA, workites ^a USA, California ^a USA 1 USA 2 Australia 1 Australia 2 Australia 3	148 616 918 342 490 556 4 144 4 663 9 534 4 748 100 169 192 661	1996 1995 1990 1994 1984 1995 1990-1991 1990 1990 1991 1994 1994 1995 1993	74 (67, 81) 72 (69, 76) 70 (67, 73) 68 (63, 73) 58 (54, 62) 53 (49, 57) 42 (41, 44) 41 (40, 42) 37 (36, 38) 42 (40, 43) 53 (43, 63) 52 (45, 60) 43 (36, 50) 55 (51, 59)	22 (15, 29) 20 (17, 23) 24 (21, 27) 25 (20, 30) 29 (25, 33) 29 (25, 33) 40 (39, 42) 39 (38, 40) 47 (46, 48) 38 (37, 39) 29 (20, 38) 35 (28, 42) 42 (35, 49) 37 (33, 41)	4 (1, 7) 8 (6, 10) 6 (5, 8) 7 (4, 10) 13 (10, 16) 18 (15, 21) 18 (17, 19) 20 (19, 2) 16 (15, 17) 20 (19, 21) 18 (11, 26) 13 (8, 18) 15 (10, 20) 8 (6, 10)
John 2003 [89]	DiClemente 1991 [38]	Germany	1 075	1996-1997	76 (73, 79)	17 (15, 19)	7 (6, 9)
Wewers 2003 [46]	PC = not seriously considering quitting in the next 6 months; C = planning to quit in the next 6 months; PA = planning to quit in the next 30 days and at least one 24 hours quit attempt in the last year Littell 2002 [91]	United States USA	39 706 34 865	1992-1993 1995-1996	59 (59, 60) 63 (63, 64)	33 (33, 34) 29 (29, 30)	8 (8, 8) 8 (8, 8)
Macnee 2004 [90]	Littell 2002 [91]	USA	30 153	1998-1999	59 (58, 60)	32 (32, 33)	9 (9, 9)
Yalçinkaya-Alkar 2007 [92]	DiClemente 1991 [38]	USA Turkey	192 370	Not mentioned Not mentioned	56 (49, 63) 60 (55, 65)	30 (24, 37) 18 (14, 22)	14 (9, 19) 22 (18, 26)
Total			133 644		57 (57, 57)	33 (33, 33)	10 (10, 10)

PC: pre-contemplation; C: contemplation; PA: preparation. ^aData taken from review study.

commitment to quitting [48], other factors such as a low perceived vulnerability to harm, a lack of stress management skills, coping resources and education, poverty and inadequate support systems may all contribute to low uptake of smoking cessation advice and treatment [24,52]. People with schizophrenia may also have compelling reasons to continue smoking: evidence suggests that nicotine can relieve negative symptoms and reduce medication side effects such as Parkinsonism [56].

It is also possible that people with depressive disorders are more motivated to quit than the average smoker. A disproportionately high number of smokers entering smoking cessation treatment programmes have a history of major depressive disorder (MDD) [57], perhaps suggesting that these smokers want to quit, but require extra help to achieve success. In this review, the two studies which assessed stage of change in depressed smokers found that only 12% [47] to 21% [32] were in the pre-contemplation stage—considerably fewer than the 50–60% rates in the general population. Another study even found a direct relationship between wanting to quit smoking and depressive symptom score among female smokers [55].

Although the findings of this review are generally promising, it must be noted that the included studies are heterogeneous with respect to their sample characteristics and methods of assessing motivation. Of the 14 articles reviewed, 11 used some variation of the stages of change algorithm, two used the contemplation ladder and one used an original, single-item measure. Currently, there is no standard for comparing different motivational measures [41,42]. A few studies have, however, assessed motivation to quit in a single sample of smokers using different stage of change questionnaires. Three different versions of the stages of change algorithm classified 83–93% of participants in the same stage, providing evidence of a high level of agreement between questionnaires [40].

Furthermore, despite the popularity of the TTM, both the model itself and the stage of change construct in particular have been the object of some criticism. It has been suggested that the theoretical precepts underpinning this model are unsound [58], that the temporal cut-offs for each stage are chosen arbitrarily [59] and that the stages are artificially categorical, with motivation to change being represented more effectively as a continuum [60]. For instance, one study found that more than 10% of smokers who had expressed an interest in quitting smoking were classified in the pre-contemplation stage of change; that is, as not thinking about giving up smoking within the next 6 months [51].

Additionally, the validity and reliability of the stage of change algorithm in people with MHD have yet to be tested thoroughly, although initial findings seem to indi-

cate that the interactions between constructs are the same for those with MHD as for those without [32,47]. Theoretically, movement through the stages requires individuals to engage in relatively complex cognitive processes, such as goal-setting, planning and decision-making, which may be impaired in those with active MHD [61]. It is also possible that as states of illness change, or as patients regain some clarity of thought, motivation might also change. Thus it is advisable that caution should be taken when applying the TTM and the stage of change construct to individuals with MHD.

In spite of these criticisms, only three articles could be found which assessed motivation without using the stage of change construct. Both articles assessing motivation using the contemplation ladder found that only one-third of smokers were not thinking about quitting or cutting down, although a previous study has found that the contemplation ladder tends to overestimate motivation to quit smoking relative to the stage of change algorithm [43]. It has also been suggested by West *et al.* [58] that it may be more appropriate when measuring complex psychological entities such as motivation to use a simple, single question, such as: 'would you like to stop smoking?'. One study which used such an original, single-item measure still found a direct, positive relationship between wanting to quit smoking and depressive symptom score among female smokers [55].

Thus the findings of this review are generally promising, yet despite the fact that people with MHD may be as motivated to quit as the general population, rates of smoking in this population remain high. Many factors may play a role in reducing quit rates. People with MHD may have more difficulty quitting due to higher levels of nicotine dependence [62] and low self-efficacy for quitting [63,64], and may use nicotine to self-medicate [14] or to reduce the side-effects of neuroleptic medications [65–67]. People with MHD may also depend upon cigarettes as a tool for social engagement and acceptance [68,69]. Treatment of cigarette smoking in this population will have to make allowances for these additional barriers to quitting. For instance, high-dose or extended-duration nicotine replacement therapy may prove beneficial [70,71], as may additional coping skills or mood management training [72–74] and the use of newer atypical antipsychotic medications [75].

There is also evidence that patients do not receive the help that they desire. Typically, clinical practice guidelines on treating tobacco use and dependence are not followed by clinicians treating patients with co-occurring mental health problems [60]. In one study, psychiatrists offered smoking cessation counselling to only 12% of their patients [76]. Another study found that mental health care providers on an in-patient unit rarely encouraged clients to quit smoking [77]. Psychiatrists may feel

that they do not have the training to address adequately the issue of smoking cessation with their patients [78]. More pertinently, mental health care providers may not view smoking cessation as a priority or their responsibility [79], and may believe that smokers with mental illness are not willing to quit smoking [10,25,26]. If smoking is not included as a target for treatment, mental health providers will miss the opportunity to support cessation efforts in this group [32].

In this review, a preponderance of articles assessed motivation in out-patients, as opposed to in-patients. Only two of 14 articles assessed motivation to quit smoking in in-patients. Although hospitalization has been identified as a potential teachable moment for smoking cessation in general populations [28,29,80,81], few data are available about the efficacy of hospitalization to enhance motivation to quit in the most severely affected individuals with MH disorders. Concerns exist that hospitalization may not be an appropriate time for implementing cessation interventions. Only a small percentage of the most severely affected patients are hospitalized, and typically only for short periods of time, so using hospitalization as a teachable moment might only deliver interventions to a small proportion of those with MHD, and may not provide sufficient time to initiate effective treatment. Furthermore, an ethical dilemma exists whereby implementing a smoking ban is seen as forcing acutely unwell patients to abstain against their will, thus exacerbating stress levels, causing increases in aggression and violence on the ward and interfering with psychiatric treatment [30,31,79,82].

In fact, multiple studies have shown a negligible or positive effect of smoking bans in psychiatric facilities [83]. Contrary to popular belief, smoking cessation interventions for the acutely unwell patient may not be harmful or unwanted. Hospitalization brings patients who may never have thought about quitting into contact with professionals who can offer interventions aimed at enhancing motivation [84]. Stabilization of patients' symptoms with psychiatric medications while in hospital may actually improve their motivation to accept smoking cessation treatment [85]. Finally, smoking cessation interventions begun in hospital can be followed-up in the out-patient setting, consistent with the approach recommended for general hospital patients, where at least 1 month of follow-up intervention is needed for successful cessation [84].

However, traditional, negative assumptions among those responsible for the delivery of such interventions prevent them from reaching their intended targets. Before hospital-based smoking cessation interventions can be implemented properly it is imperative that MH staff receive the education and training necessary to change the 'culture of smoking' in psychiatric facilities, and to

make MH staff aware that individuals with MHD are receptive and responsive to such interventions. Further studies to assess the motivation of in-patients to quit smoking, and their receptivity to in-patient cessation programmes, would also be needed.

CONCLUSION

Individuals with mental health disorders smoke at greater rates and are more nicotine-dependent than individuals in the general population. It is believed traditionally that these individuals are unmotivated to quit smoking. Despite the heterogeneity of the measures of motivation and sample characteristics, the studies in this review consistently found that motivation to quit smoking among people with mental illness matched that of the general population. This finding is important, as false assumptions concerning the willingness of patients to quit smoking may mean that opportunities for encouraging smoking cessation are being missed.

Conflicts of interest

None.

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