Reasons for substance use among people with mental disorders.

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REASONS FOR SUBSTANCE USE AMONG PEOPLE WITH MENTAL DISORDERS

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Abstract

Background: Comorbidity of mental disorders and substance use continues to be a major problem. To inform the development of more effective interventions for these co-existing disorders, this paper aimed to determine if there are clear variations in the reasons for tobacco, alcohol or cannabis use across people with different mental disorders. **Methods:** Data from five randomized controlled trials on co-existing disorders that measured reasons for tobacco, alcohol or cannabis use using the Drug Use Motives Questionnaire, Reasons for Smoking Questionnaire or via free response are reported and combined. Two studies involved participants with depression, two involved participants with a psychotic disorder and one involved participants with a range of mental disorders. A series of logistic regressions were conducted to examine differences in reasons for tobacco, alcohol or cannabis use and to compare these reasons between people with psychotic disorders or depression. **Results:** Participants had a mean age of 38 and just over half (60%) were male. Forty-six percent of participants had a psychotic disorder and 54% experienced depression. Data from 976 participants across the five studies were included in the analyses. Tobacco and alcohol were primarily used to cope, while cannabis was primarily used for pleasure. People with psychotic disorders were more likely than people with depression to use tobacco for coping, pleasure and illness motives. People with depression, in contrast, were more likely to use alcohol for these reasons and social reasons. **Conclusions:** It may be important to tailor interventions for co-existing mental disorders and substance use by substance type and type of mental disorder. For example, interventions might be improved by including alternative coping strategies to tobacco and/or alcohol use, by addressing the social role of alcohol and by helping people with mental disorders using cannabis to gain pleasure from their lives in other ways.

REASONS FOR SUBSTANCE USE AMONG PEOPLE WITH MENTAL

DISORDERS

1. Introduction

Substance use is a major health problem among people with mental disorders (Baker, Kavanagh, Kay-Lambkin, Hunt, Lewin, Carr & Connolly, 2010; Degenhardt & Hall, 2001; Healey, Peters, Kinderman, McCracken & Morriss, 2008; Ziedonis & Nickou, 2001). Approximately 50% of people with a mental disorder meet criteria for a lifetime substance use disorder. This is a concern as substance use has been consistently associated with adverse outcomes for this population. Tobacco, alcohol and cannabis use have each been linked to reduced medication effectiveness and exacerbation of psychiatric symptoms, especially positive psychotic symptoms (Ziedonis & Nickou, 2001). Substance use is also associated with increased rates of suicide, suicide attempts and poor medication compliance among people with mental disorders (Carey, Carey, & Meisler, 1991; Healey et al., 2008; Ziedonis & Nickou, 2001). These negative consequences extend to the wider community, as people with co-existing mental and substance use disorders tend to have greater use of costly services such as psychiatric hospitalization and emergency medical care (Dickey & Azeni, 1996; Mangrum, Spence, & Lopez, 2006; Ziedonis & Nickou, 2001).

Given the high prevalence, adverse consequences and high treatment costs associated with co-existing mental disorders and substance use, it is important that effective evidence based intervention and preventative strategies are employed. Integrated treatment approaches, which combine mental health and substance use interventions into one clinical program, have been found to be more effective than interventions addressing substance use and mental health separately (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998; Drake, Mueser, Brunnette, & McHugo,

2004; Drake, O'Neal, & Wallach, 2008; Mangrum et al., 2006). However, there is still considerable room for improvement. Reviews of integrated treatments have found few consistent results supporting the efficacy of these approaches on mental health and substance use outcomes (Cleary, Hunt, Matheson, Siegfried, & Walter, 2008; Drake et al., 2008).

Research also suggests that different treatment approaches may work better for different substances. Baker, Turner, Kay-Lambkin and Lewin (2009) found that while brief integrated interventions worked well for alcohol misuse among people with severe mental disorders, they were only somewhat effective for cannabis use. To improve the effectiveness of these interventions it has been suggested that it may be important to understand better why people with mental disorders use substances (Chabrol, Duconge, Casas, Roura, & Carey, 2005; Giddings, Christo, & Davy, 2003; Kuntsche, Knibbe, Gmel, & Engels, 2006; Spencer, Castle, & Michie, 2002).

A number of studies have investigated reasons for substance use among people with mental disorders, especially people with psychotic disorders (e.g. Gregg, Barrowclough, & Haddock, 2007; Gregg, Barrowclough, & Haddock, 2009; Pencer & Addington, 2008). Among people with psychotic disorders, relaxation, pleasure and dysphoria relief are some of the most frequently endorsed reasons for tobacco, alcohol and cannabis use. People also commonly describe using tobacco because of addiction, alcohol for social reasons and cannabis for intoxication effects (Addington & Duchak, 1997; Baker, Richmond, Haile, Lewin, Carr, Taylor, Constable, Jansons, Wilhelm & Moeller-Saxone, 2007; Forchuk, Norman, Malla, Martin, McLean, Cheng et al., 2002; Fowler, Carr, Carter & Lewin, 1998; Schaub, Fanghaenel & Stohler, 2008; Thornton, Baker, Johnson, Kay-Lambkin & Lewin, 2011). While relief of psychotic symptoms and medication side-effects are often the least frequently endorsed reasons for using

substances (e.g. Forchuk et al., 2002; Fowler et al., 1998; Gregg et al., 2007; Thornton et al., in press), tobacco is frequently used by people with psychotic disorders to self-medicate psychotic symptoms and medication side effects (Forchuk et al., 2002; Kumari & Postma, 2005; Leonard & Adams, 2006; Thornton et al., in press). There is considerable evidence that tobacco use by people with psychotic disorders also has other beneficial effects, including transient improvements in sustained attention and spatial working memory (Kumari & Postma, 2005; McChargue, Gulliver, & Hitsman, 2002; Smith, Singh, Infante, Khandat, & Kloos, 2002).

Much less research has been conducted among people with depression. Among people with depression, alcohol is reported to be primarily used for social motives (Nishith, Mueser, Srsic & Beck, 1997), followed by coping motives. Coping motives, including alleviation of boredom, and negative affect have been found to be central to tobacco, alcohol and cannabis use among people with depression (Bizzarri et al., 2009; Currie, Hodgin, el-Guebaly, & Campbell, 2001; Gonzalez, Zvolensky, Vujanovic, Leyro, & Marshall, 2009; Grant, Stewart, & Mohr, 2009). The main weaknesses of this previous research are that few studies have compared reasons for use between different substances, nor have they very often compared reasons for use between people with different types of mental disorders.

For the development of effective and appropriately targeted interventions, a clearer understanding is needed regarding the reasons people with different mental disorders use specific substances and whether these reasons for use differ according to type of substance or mental disorder. The authors had access to data from five randomized controlled trials conducted by Dr Baker, Dr Kay-Lambkin and colleagues at the University of Newcastle, Australia, that measured reasons for substance use among people with mental disorders. As reasons for substance use were not the core

focus of these trials, there has been limited analysis and reporting of these data. However, these data present a valuable opportunity to examine reasons for substance use among people with different mental disorders. This paper aimed to report reasons for substance use data from these five studies and to identify the most appropriate way to pool and analyse these data so that it might add to our understanding of how reasons for tobacco, alcohol and cannabis use may differ among people with different mental disorders. The paper also seeks to provide recommendations as to how interventions might be improved, and specifically considers whether such interventions need to be targeted by type of substance or type of mental disorder to be optimally effective.

Based on previous literature, it was hypothesized that reasons for use reported across the five studies would differ between tobacco, alcohol and cannabis. While it was hypothesized that coping motives would be highly endorsed across all three substances, it was anticipated that social motives for use would be endorsed more frequently for alcohol, pleasure or intoxication effects would be endorsed more frequently for cannabis, and relief of psychotic symptoms or illness motives would be endorsed more frequently for tobacco than for the other two substances. It was also hypothesized that reasons for substance use would differ between people with different mental disorders, specifically between people with a diagnosis of a psychotic disorder and with a diagnosis of depression.

2. **Method**

This paper combined data from five randomized controlled trials conducted at the Centre for Brain and Mental Health Research, at the University of Newcastle, New South Wales, Australia. Study 1 recruited 274 treatment-seeking participants

with comorbid depression and drug and alcohol problems (Kay-Lambkin, Baker, Kelly, & Lewin, 2011). Study 2 (Baker et al., 2010) had 285 treatment-seeking participants with comorbid depression and alcohol problems. Study 3 (Baker et al., 2006a) included 130 treatment-seeking participants with a comorbid psychotic disorder (including bipolar disorder, schizophrenia, schizoaffective disorder and other psychosis) and drug and alcohol problems. Study 4 (Baker et al., 2006b) involved 298 treatment-seeking smokers with a non-acute psychotic disorder. Study 5 (Baker et al., 2002a; Baker et al., 2002b) recruited 160 inpatients with comorbid depression, schizophrenia or personality disorder and drug and alcohol problems. Table 1 displays the details of each study. All trials received regional ethics approval and used informed consent. Additionally, access to the de-identified data across the five studies was approved by the University of Newcastle Human Research Ethics Committee (H-2009-0141).

(Table 1 about here)

2.1. *Participants*

Data from 1032 participants across the five studies were available. Over half (59.9%) were male and ages ranged from 15 to 73 years (M=38.03, SD=12.13). Most participants had a diagnosis of a psychotic disorder (45.6%) or depression (54%). A small percentage of participants (0.4%) had a diagnosis of an anxiety, personality or other mental disorder, and were excluded from all future analyses. Therefore, the final sample consisted of 976 participants with a diagnosis of a psychotic disorder or depression.

2.2 *Measures*

The full set of assessments employed across studies 1-5 have been reported elsewhere (Baker et al., 2010;Baker et al., 2006a; Baker et al., 2006b; Baker 2002a; Baker et al., 2002b; Kay-Lambkin et al., 2011). Of particular relevance to the current analysis are basic socio-demographic characteristics (age and gender), a clinical assessment to determine participants' diagnosis, and drug use motive instruments.

2.2.1. *Drug Use Motives Questionnaire (DUMQ: Cooper, Russell, Skinner, & Windle, 1992).* Studies 1, 2, and 3 investigated reasons for alcohol and cannabis use using the DUMQ (Cooper et al., 1992). This is a modified form of the Drinking Motives Questionnaire (DMQ: Cooper et al., 1992), which presents participants with 15 potential reasons for drinking alcohol and asks them to rate how often (1= Never/Almost Never, 2= Sometimes, 3= Often, 4=Almost Always) they drink for each reason. These reasons are grouped into three motivational domains: social (e.g. to celebrate); coping (e.g. to forget worries); and pleasure enhancement (e.g. like the feeling; Cooper et al., 1992). Participants receive a score in each domain. For the DUMQ two items are added ('reduction in mental health symptoms' and 'reduction in medication side effects') to increase the questionnaire's relevance to people with mental disorders. The DUMQ also allows the assessment of drug use motives for substances other than alcohol.

Confirmatory factor analysis of the DUMQ for alcohol, cannabis and amphetamines has supported a four factor model, comprising of social, pleasure and coping motives and an 'illness' motive made up of the two extra items, to be adequate and marginally superior to a 3 factor model in which the two extra items formed part of the coping motives domain. The four factor model has been found to be a particularly good fit among people with psychotic disorders compared to people with

depression. Additionally, these four motive domains (social, pleasure, coping, illness) have been found to have satisfactory internal consistency (Thornton et al., in press).

2.2.2. *Reasons for Smoking Questionnaire (RSQ: Pederson, Bull, Ashley, & MacDonald, 1996).* Study 4 assessed participants' reasons for smoking using the RSQ that was developed by Pederson et al, (1996) to measure reasons for smoking among a general population sample. Participants are required to answer 'yes' or 'no' to a list of 12 possible reasons for smoking. As in the DUMQ (Cooper et al., 1992), two additional items relating specifically to mental illness were added to this questionnaire. Factor analysis of this scale among people with mental disorders has derived 5 subscales from these 14 items: addiction; stress reduction; arousal; mental illness and partner smoking (Baker et al., 2007). Participants were also able to list any other reasons they smoked and the most important reason they smoked.

2.2.3. *Free response.* In study 5, participants were asked to give the three main reasons they used tobacco, alcohol and/or cannabis.

2.3. Procedure

Results from the individual scales used in the five studies were initially examined. The following procedure was then implemented to pool the data. To control for differences in age and gender distributions across studies (see Table 1), age and gender were included as covariates in all analyses. A decision was also made to include participants who did not meet criteria for a diagnosis of depression but had scored over 17 on the Beck Depression Inventory (BDI-II: Beck, Steer & Brown, 1996) indicating moderate to severe depression. Several steps were also taken to

enhance the comparability of the reasons for substance use data collected across the studies. The RSQ items (Pederson et al., 1996) and the free response answers given in study 5 were re-categorized into the four motive domains (social, pleasure, coping and illness) used in the DUMQ (Cooper et al., 1992), as the majority of data across the five studies was collected via this measure. Five independent researchers were provided with descriptions of each of the motive domains and categorized the items independently. A consensus as to which motive domain items should be categorized into was reached by at least 4 of the 5 researchers for 72% of the RSQ and free response items. Consensus between 3 of the 5 researchers was reached for a further 22% of items. For a final 6% the researchers did not initially reach a consensus. For these items, the first author, after discussion with the researchers, assigned the items to a motive domain.

In studies 4 and 5, only information regarding whether or not a participant endorsed a particular reason for use was available. To facilitate analysis of results across studies, the more detailed responses collected in the DUMQ regarding frequency of use for each reason were collapsed into 'yes' vs. 'no'. Participants from studies 1, 2 and 3 who reported using a substance 'never' or 'almost never' for a particular reason on the DUMQ received a 'no' endorsement rating for that reason. Participants who reported using a substance 'sometimes', 'often' or 'almost always' for a particular reason received a 'yes' endorsement rating for that reason. In calculating the numbers of participants endorsing each of the 4 motive domains, participants endorsing at least one of the individual reasons categorized into each domain were counted.

2.4 Data Analysis

To test the hypothesis that people with mental disorders would report using tobacco, alcohol and cannabis for different reasons a series of aggregate hierarchical logistic regressions were performed (i.e., ignoring diagnostic status) with motive endorsement status as the dependent variable. Separate hierarchical logistic regressions were conducted for each of the four motive domains, in which the predictor variables of age and gender were entered in the first step and substance type in the second. The reference categories of under 30, female, and alternatively cannabis and tobacco were used.

To test the hypothesis that reasons for substance use would differ between people with a diagnosis of a psychotic disorder and depression an additional series of hierarchical logistic regressions was conducted, involving separate analyses for each of the four motive domains by each substance type (tobacco, alcohol and cannabis). These used the predictor variables of age and gender in the first step and diagnosis in the second, with the reference categories of under 30, female, and depression. As participants differed in their patterns of substance use (e.g., some were using only one substance, others two or three) the data were transposed so that the N for each analysis was equal to the number of times participants completed the DUMQ, RSQ or provided free response data.

3. **Results**

3.1 Reasons for Substance Use by Scale

3.1.1. *Drug Use Motives Questionnaire (Cooper et al., 1992)*

Participants' DUMQ results from studies 1, 2 and 3 were combined and are presented in Figure 1. Participants reported using alcohol and cannabis for different reasons. Alcohol was primarily used for coping motives (M=2.80, SD=0.80), closely

followed by social motives (M=2.71, SD=0.77), while cannabis was primarily used for pleasure enhancement motives (M=2.59, SD=0.80), followed by coping motives (M=2.55, SD=0.80). For both substances, illness motives were the least frequently endorsed.

(Figure 1 about here)

3.1.2. *Reasons for Smoking Questionnaire (Pederson et al., 1996)*

As can be seen in Table 2 smoking to satisfy cravings and habit were the two most frequently endorsed reasons for smoking by people in study 4, with over 90% of participants endorsing these reasons. Smoking to cope with stress, and 'to relax', were also endorsed by over 85% of participants. Over a quarter (27%) of participants reported smoking because it helped the symptoms of their mental illness, while only 9% of people smoked to help with side effects of their medication. In addition, 36% of participants listed smoking to satisfy cravings and addiction as the most important reason they smoked. Smoking because it is a habit was identified as the most important reason for smoking by 19% of participants, smoking to relax by 15% and smoking for enjoyment by 12%.

(Table 2 about here)

3.1.3. *Free Response*

As in study 4, 'cravings', 'addiction' and 'habit' were the most commonly reported reasons for smoking tobacco, with 63% of participants with a psychotic disorder and 49% of participants with depression volunteering these as some of the main reasons they smoked (see Table 3). 'To relieve tension', 'stress' and 'to calm

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me' were reported as main reasons for smoking by 27% and 28% of participants with psychotic disorders and depression respectively; followed by 'relief of boredom' (21%). For alcohol, the most commonly reported reasons for use were 'to take away sad feelings, to cheer me up and loneliness' (Psychotic disorder: 28.3%, Depression: 16.2%) 'to be social/gives me a social life' (Psychotic disorder: 22%, Depression: 30%), ,'to block everything out and escape reality' (Psychotic disorder: 19.6%, Depression: 13.5%), and 'to relieve tension and stress' (Psychotic disorder: 15.2%, Depression: 18.9%). Cannabis was most frequently used 'to relax and to give me a mellow mood' (Psychotic disorder: 32%, Depression: 33%), and 'to get high, because they liked the effect and to have fun' (Psychotic disorder: 30%, Depression: 27%). Among people with psychotic disorders this was followed by 'to feel good and to make me feel happy' (21%) and by 'to relieve tension and stress and to calm me' (23%) among people with depression. A small group of participants reported using alcohol (Psychotic disorder: 7%, Depression: 11%) and cannabis (Psychotic disorder: 2%, Depression: 3%) to cope with negative affect. Four percent of participants with psychotic disorders reported using alcohol and cannabis to get away from hallucinations and paranoia, and 2% of participants with depression reported using tobacco to help with the side effects of their medication while 4% of participants with psychotic disorders reported using alcohol for this reason.

(Table 3 about here)

3.2. *Overall Reasons for Substance Use*

The combined reasons for substance use data (i.e., across all five studies) are displayed in Tables 4 and 5. These show the percentages of participants who

endorsed at least one reason for substance use belonging to a particular motive domain (.e.g. 8.1% of men endorsed at least one social reason for smoking tobacco).

3.2.1. Influence of Substance Type on Reasons for Use

The series of hierarchical logistic regressions performed on the combined data found that patterns of reasons for substance use differed significantly according to gender, substance type and age. As can be seen in Table 4, tobacco was primarily used to cope, with 94% of participants endorsing this motive. Alcohol was also primarily used to cope (79%), closely followed by use for social motives (75%). Cannabis, on the other hand, was primarily used for pleasure (77%). Participants were significantly more likely to use alcohol for social motives than tobacco and cannabis and significantly more likely to use cannabis for social motives than tobacco. Tobacco was significantly more likely to be used to cope than alcohol and cannabis, and alcohol was significantly more likely to be used to cope than cannabis.

(Table 4 about here)

Additionally, for both males and females coping motives were the most frequently endorsed motive for substance use. However, females were significantly more likely to endorse this motive. Females were also significantly more likely than males to endorse using substances for illness motives. Participants aged under 30 were significantly less likely to endorse using substances for social, coping and illness motives than participants aged 30-44 and 45 and over.

3.2.2. Influence of Illness Type on Reasons for Use.

The series of hierarchical logistic regressions conducted separately for each substance found that there were significant differences between diagnostic groups in

the reasons given for using tobacco and alcohol. Patterns of reasons for use were also found to differ significantly according to age for tobacco and according to gender for alcohol and cannabis (see Table 5).

(Table 5 about here)

People with psychotic disorders were significantly more likely to report using tobacco for pleasure, coping and illness motives than people with depression. On the other hand people with depression were found to be significantly more likely to use alcohol for social, pleasure, coping and illness motives than people with psychotic disorders. As can be seen in Table 5, cannabis was primarily used by participants for pleasure.

Additionally, relative to men, women were significantly more likely to report using tobacco for social motives, using alcohol for coping and illness motives, and using cannabis for coping motives. People under 30 years of age were also significantly less likely to use tobacco for pleasure and coping motives and alcohol for social, coping and illness motives than participants aged 30-44 and 45 and over.

4. **Discussion**

This study reported reasons for substance use data from five RCTs in detail, for the first time, and is one of the first investigations of reasons for tobacco, alcohol and cannabis use among people with different mental disorders. Supporting the authors' hypotheses, people with mental disorders were found to use tobacco, alcohol and cannabis for different reasons, and people with depression and psychotic disorders differed in the reasons for which they used each of these substances.

As hypothesized, this study found that for people with mental disorders substance use was an important coping strategy, which was perceived by them to help

cope with cravings, stress, boredom, loneliness and negative affect. Tobacco and alcohol were found to be primarily used for coping motives, while cannabis was primarily used for pleasure, followed by coping motives. Coping motives were found to be particularly important for tobacco, which was chiefly used to cope with cravings and because of addiction, followed by relief of stress and boredom.

Drinking alcohol to cope with negative affect, boredom, loneliness and to escape was closely followed by alcohol use for social motives. As in the Australian general population (Ministerial Council on Drug Strategy, 2006), alcohol was reported to play an important social role in participants' lives in the current study and in line with our hypothesis, was significantly more likely to be used for social motives than the other two substances.

Consistent with our hypothesis, cannabis was used by people with mental disorders primarily to enhance pleasure. For many participants, cannabis use was a way in which they could gain some pleasure from their lives, a way to relax, to make themselves feel happy, and to experience a pleasurable high. Cannabis was also more likely to be used for pleasure than either alcohol or tobacco, and was the substance least likely to be used to help participants to cope.

Reasons for substance use were found to differ between people with psychotic disorders and depression, in line with this paper's hypothesis. For participants with psychotic disorders, tobacco was found to play an important role in their lives, helping them to cope, giving them a source of pleasure and, for some, helping them with the symptoms of their mental illness and medication side effects. In contrast, among participants with depression, alcohol appeared to fill this role, as alcohol was frequently used to help people with depression cope, to give them pleasure, for social reasons and to help with symptoms of their mental illness.

These results may help guide some of the ways in which interventions for co-existing mental disorders and substance use might be improved. The perceived ability of tobacco to assist people with mental disorders to cope may itself be a significant barrier to smoking cessation among this population. It may be imperative to the success of smoking cessation interventions, especially among people with psychotic disorders, to address alternative coping strategies and to adequately address the person's nicotine addiction. Craving for and addiction to cigarettes were the most frequently endorsed, and important, individual reason for tobacco use reported in the current study. Consequently, and given the low abuse potential, ready over-the-counter and often subsidised availability of nicotine replacement therapy, flexible dose and longer-term delivery of nicotine replacement therapy should be the minimum level of intervention for tobacco use among people with mental disorders. Additionally, many participants with psychotic disorders used tobacco to reduce the symptoms of their mental illness and medication side effects, highlighting the continued need for research to investigate how the same symptom and side effect relief received from tobacco might be achieved in a safer way.

These results also suggest that alcohol use interventions for people with mental disorders, especially depression, might benefit by addressing the social importance of alcohol, such as how to interact in social situations without drinking. Similarly, this study suggests the perceived capacity of alcohol to help people cope, to escape reality, or block everything out, may be a strong deterrent to stopping drinking, especially among women and people with depression. Alternative coping mechanisms and strategies for reducing negative affect may be important parts in an effective intervention for these disorders when they co-occur.

Additionally, it may be important for interventions addressing cannabis use to investigate alternative ways in which people with mental disorders might gain pleasure from their lives. However, the key demographic variables (diagnosis, age and gender) that were associated with use of tobacco and alcohol, for the most part did not significantly predict reasons for cannabis use. Together with previous research that has indicated, when compared to alcohol, cannabis use responds less well to treatment (Baker et al., 2009), the current results suggest that factors influencing cannabis use among people with mental disorders, including reasons for its use, need to be examined more closely.

To reduce the prevalence and impact of co-existing mental disorders and substance use, it is also important to address prevention. As tobacco, alcohol and cannabis were frequently used to cope and for pleasure, it is suggested that offering information and guidance about alternative coping strategies and alternative sources of pleasure, especially to people at risk of developing a psychotic disorder or depression, may help to prevent the onset of substance use problems among this population.

This study is the first known to compare reasons for substance use between multiple substances and between people with different mental disorders. It improves upon previous research that has reported only reasons for use of one substance, or substance use in general among people with only one type of mental disorder, or that has reported on only mental disorders in general (e.g. Bizzarri et al., 2009; Currie et al., 2001; Forchuk et al., 2002; Fowler et al., 1998; Gregg et al., 2007; Healey et al., 2008).

Some of the limitations of the current study are self-evident. Unfortunately, only one of the studies included in this paper (Study 5: Baker et al., 2002a,b) collected

free response information regarding reasons for tobacco, alcohol and cannabis use, and only this study contained participants with both depression and psychotic disorders. Additionally, only three of the five studies used the same instrument to measure reasons for substance use. As a result, it was necessary to reduce the combined reasons for use data to 'yes' or 'no' endorsements of just four motive domains. The combined analysis, therefore, lacked the detail contained in the original measures, such as frequency of use for each motive as collected in the DUMQ. As these measures also possessed different numbers of items within each motive domain, the combined data were reported in terms of the percentage of participants who endorsed at least one of the reasons belonging to a particular motive domain. It did not take into consideration how many individual reasons belonging to each motive domain were endorsed by participants and therefore may underestimate the differences between the endorsements of these motives. Consensus between at least 4 of the 5 independent researchers regarding the classification of individual reasons to motive categories was reached for only 72% of items, meaning that the combined reasons for use data may need to be interpreted with a degree of caution. Most participants also reported polydrug use, meaning that they were represented multiple times in the analyses. This may have confounded the results of this paper.

Despite these weaknesses, the current study is an important first step towards understanding why people with various mental disorders use substances, as it revealed that tobacco, alcohol and cannabis are often used for different reasons and that these patterns differ according to type of mental disorder. It is recommended that future research directly test these differences by examining reasons for tobacco, alcohol and cannabis use simultaneously among a sufficiently large sample of people with a variety of mental disorders.

Previous research has found targeted integrated interventions to be the most effective approach for co-existing mental disorders and substance use, however, there is still considerable room for improvement. These results suggest that to be optimally effective, integrated interventions may need to be more specifically tailored according to the substances being used by patients and the type of mental disorder they experience. As such, it is hoped the current results will be used to inform the development of more effective interventions for co-existing mental disorders and substance use in the future.

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