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Perceived risk associated with tobacco, alcohol and cannabis use among people with and without psychotic disorders

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Abstract

Background: Perceived harmfulness of substances is a key concept of behavioural theories that have been used to explain substance use behaviours. However, perceptions of risk associated with substance use have rarely been examined among people with psychotic disorders. This study examined the relationship between perceived harm and patterns of substance use among people with and without psychotic disorders. It also aimed to identify the factors that may be associated with perceived harmfulness of tobacco, alcohol and cannabis use among these populations.

Methods: Participants were recruited via first year psychology courses, research databases and the social networking service 'Facebook'. Participants completed a self-report questionnaire either online or on paper which assessed substance use, perceived harmfulness of substance use, history of mental illness, current psychological distress, and exposure to and acceptance of anti-substance use campaigns. A series of linear regressions were conducted to examine key predictors of the perceived harmfulness of tobacco, alcohol and cannabis use.

Results: 1046 participants were recruited. Participants were aged 18 to 86 years and 53.2% were female. For tobacco and cannabis, substance use was found to be inversely and significantly related to perceived harm of these substances. In addition, higher risk perceptions for tobacco and cannabis were associated with: being female, perceived effectiveness of anti-substance use campaigns, and less hazardous substance use. Increased age and negative psychosis status were also associated with higher risk perceptions for tobacco, while positive psychosis status was associated with higher risk perceptions for

cannabis. Only perceived effectiveness of anti-drinking campaigns was found to be significantly related to perceived harmfulness of alcohol.

Conclusions: These results suggest that demographic, substance use, mental health and public health campaign variables are associated with perceptions of the harmfulness of tobacco, cannabis, and to a lesser extent alcohol, among people with and without mental disorders. While messages regarding the negative consequences associated with cannabis use among people with psychotic disorders may be accepted, there is a continued need to highlight the negative consequences of smoking among people with psychotic disorders.

Keywords:

Tobacco, Alcohol, Cannabis, Perceived harm, Psychotic disorder

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I. Introduction

Tobacco, alcohol and cannabis are the three most widely used psychoactive substances (other than caffeine) among people with and without mental disorders (Degenhardt & Hall, 2001; Degenhardt, Hall, & Lynskey, 2001). Use of these three substances represents a significant global health issue. Tobacco smoking remains the leading cause of preventable death and illness globally (United Nations Office on Drugs and Crime, 2012). The harmful use of alcohol is estimated to be responsible for 4% of deaths globally, including 6.2% of male deaths and 1.1% of female deaths (United Nations Office on Drugs and Crime, 2012). The global annual prevalence of cannabis use is estimated to be 2.6-5.0%, with the highest prevalence of use reported in Australia and New Zealand (9.1-14.6%) (United Nations Office on Drugs and Crime, 2012). No deaths were attributable to cannabis abuse in 2003 in Australia, however cannabis abuse was found to be responsible for .02% of the total burden of disease (Australian Institute of Health and Welfare, 2010, 2011).

Among people with mental disorders, tobacco, alcohol and cannabis use are associated with a range of adverse consequences, in addition to the physical and social problems typically associated with their use by the general population. These include: reduced medication effectiveness, exacerbation of psychiatric symptoms, increased rates of suicide and suicide attempts, relapse and hospitalization, homelessness, poor social functioning and increased risk of victimization (Carey, Carey, & Meisler, 1991; Degenhardt & Hall, 2001; Healey, Peters, Kinderman, McCracken, & Morris, 2008; Maniglio, 2009; Ziedonis & Nickou, 2001). Use of these three substances are also much more common among people with mental disorders than among the general population (Degenhardt & Hall, 2001; Grant et al., 2004; Regier et al., 1990; Teesson, Slade, & Mills, 2009).

Perceived risk, or perceived harmfulness, of substances is a key concept in a range of behavioural theories that have been used to explain substance use behaviours (Azjen, 1985; Bandura, 1986; Lopez-Quintero & Neumark, 2010). Several studies have shown that perception of risk is inversely and significantly associated with substance use, particularly for cannabis use (Duistman & Colbry, 1995; Johnston, O'Malley, Bachman, & Schulberg, 2005; O'Callaghan, Reid, & Copeland, 2006). The Monitoring the Future study (Johnston et al., 2005), for example, is a large longitudinal study of adolescents in the US, conducted over 30 years. This study found a consistent inverse relationship between the level of perceived risk of using a drug and the level of reported use of that drug. Similarly, among students from Columbia, Lopez-Quintero and Neumark (2010) found that positive intentions to use cannabis, and lifetime and monthly cannabis use, were more prevalent among people with a low risk perception of cannabis than among those with a high risk perception. Additionally, analyses conducted by Romer and Jamieson (2001) indicate that risk perceptions may play a stronger role in the decisions of young people, and adults, to stop using substances, than in their decisions to initiate substance use.

While substance use among people with mental disorders has been widely studied, perceptions of risk have been rarely considered among this population (Thornton, Baker, Johnson, & Lewin, 2012a). Additionally, studies that have examined the perceived harmfulness of substances among people with mental disorders have only addressed the perceived harmfulness of substances in general or of tobacco only. Alvidrez, Kaiser and Havassy (2004), for example, conducted a series of 24 qualitative interviews among people with severe mental disorders. In these interviews participants described numerous risks

associated with substance use, including the exacerbation of psychiatric symptoms.

Participants also described many positive effects of substance use, including the reduction of symptoms of depression and anxiety. In the only study identified that compared perceptions of harmfulness between people with and without mental disorders, Pattanayak, Sagar and Jain (2012) found that smokers with bipolar disorder in India perceived their risk of getting cancer to be significantly lower than smokers without a mental disorder of the same age. This very small body of research suggests that people with mental disorders may have lower risk perceptions of substances than people without mental disorders.

This paper aimed to examine the relationship between perceived harm and patterns of substance use among people with and without mental disorders. Specifically, it aimed to identify factors that may be associated with perceived harmfulness of substances (e.g. level of substance use, demographic factors, perceptions of anti-substance use public health campaigns, psychological distress) and to determine if people with and without mental disorders differ in their perceptions of the harmfulness of tobacco, alcohol or cannabis.

2. Methods

2.1 Participants and procedure

Ethics approval for this study was obtained from the University of Newcastle Human

Research Ethics Committee. Participants were recruited from several sources, including: the Australian Schizophrenia Research Bank (ASRB); two randomized controlled trials (RCTs) of treatments for co-occurring substance use and depression; the Hunter Medical Research

Institute's research register; first year psychology courses at the University of Newcastle Australia; and the social networking service 'Facebook'. The ASRB is a register which contains data on people with a clinical diagnosis of schizophrenia and related disorders (Loughland et al., 2010), while the HMRI research register is a database of people from the Hunter region in New South Wales, Australia, who are interested in contributing to medical research. An assessment pack including a self-report questionnaire was posted to 325 registrants on the ASRB, to 307 past participants of the RCTs, and to 200 registrants on the HMRI research register. Additionally, an advertisement was placed on the University of Newcastle, School of Psychology's online experimental management system, which enables psychology students to participate in research projects for which they earn course credit, and on 'Facebook'. The advertisement on 'Facebook' appeared on the profiles of 'Facebook' users who listed their location as Australia and invited people to 'Go into the draw to win an iPod by telling us what you think about drugs and alcohol'. If 'Facebook' users or Psychology students clicked on the advertisement they were taken to an online version of the self-report questionnaire, hosted by Zoomerang.com.

2.2 Measures

2.2.1 Perceived harmfulness

In order to assess the perceived harmfulness of tobacco, alcohol and cannabis use, questions were adapted from the Monitoring the Future study (Johnston et al., 2005). Participants rated the degree to which they believed people risked harming themselves (1= no risk to 4= great

risk) if they used tobacco, alcohol and cannabis at various frequencies (occasionally, regularly, everyday).

2.2.2 Substance use

To assess levels of current substance use and substance use disorder, the Fagerstrom Test for Nicotine Dependence (FTND: Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), Alcohol Use Disorder Identification Test (AUDIT: Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) and Cannabis Use Disorder Identification Test (CUDIT: Adamson & Sellman, 2003) were used. A score of 7 or over on the FTND is recommended as an indicator of probable nicotine dependence (Etter, Duc, & Perneger, 1999; Heatherton et al., 1991), while a score of 8 or over on the AUDIT or CUDIT is recommended as an indicator of hazardous or harmful alcohol or cannabis use and probable alcohol or cannabis dependence (Adamson & Sellman, 2003; Conigrave, Saunders, & Reznik, 1995; Dawe, Loxton, Kavanagh, & Mattick, 2002). The FTND, AUDIT and CUDIT have been shown to be valid and reliable measures (see: Adamson & Sellman, 2003; Conigrave et al., 1995; Dawe et al., 2002; Etter et al., 1999; Heatherton et al., 1991).

2.2.3 Mental Health

All participants recruited via the ASRB had a diagnosed psychotic disorder. Additionally, all participants were asked to indicate on the self-report questionnaire if they had ever been diagnosed with a mental disorder (depression, anxiety, eating disorder, psychotic disorder or other). Current psychological distress was measured using the Depression, Anxiety and Stress Scale (DASS-21: Lovibond & Lovibond, 1995). This measure consists of three subscales that

assess current symptoms of depression, anxiety and stress. These subscales have also been shown to assess a more general dimension of psychological distress or negative affect. The reliability and validity of the DASS-21 and its subscales is well established (Henry & Crawford, 2005; Lovibond & Lovibond, 1995).

2.2.4 Public Health campaigns

To investigate participants' exposure to and the perceived effectiveness of anti-substance use public health campaigns and advertisements, participants were asked if they could remember seeing, reading or hearing any public health campaigns regarding tobacco, alcohol or cannabis. Participants were also asked to indicate if they felt these campaigns had helped them to reduce or stop using these substances.

2.2.5 Demographic information

Participants were asked to indicate their employment status, age, gender and if they were of Aboriginal or Torres Strait Islander (ATSI) descent.

2.3 Analysis

An aim of the current study was to investigate whether psychotic disorder status was associated with participants' perceptions of the harmfulness of tobacco, alcohol or cannabis. For this reason, the sample was split into two groups; a psychotic disorder group and a no psychotic disorder group. All participants recruited via the ASRB had a diagnosed psychotic disorder. As it was possible that people with psychotic disorders may also have been recruited via the other recruitment sources, participants were asked to indicate if they had ever been diagnosed with a psychotic disorder. Participants indicating on the self-report questionnaire that they had a psychotic disorder were grouped with participants from the

ASRB to form the psychotic disorder group. Participant characteristics were compared between the psychotic disorder and no psychotic disorder groups using a series of independent t-tests (Age, FTND, AUDIT, CUDIT, DASS21) and chi-square tests (Sex, Unemployment status, ATSI status, Campaign recall, Perceived campaign effectiveness).

To examine participants' perceptions of the harmfulness of tobacco, alcohol and cannabis, a total score for perceived harmfulness was calculated for each substance by summing participants' responses to the three harmfulness items. A series of one-way between subjects analyses of covariance were conducted comparing perceived harmfulness scores across recruitment sources while controlling for age and sex differences. Separate ANCOVAs were performed for tobacco, alcohol and cannabis. A series of hierarchical linear regressions was then conducted with perceived harmfulness total score as the dependent variable. Separate regressions were performed for tobacco, alcohol and cannabis. The predictor variables for step one included demographic variables and long-term mental health problems (age, gender, unemployment status, psychosis status). Recall of anti-substance use public health campaigns and perceived effectiveness of anti-substance use public health campaigns were entered in the second step of the analyses. Step three included measures of current psychological distress and substance use (DASS-21 and standardised FTND, AUDIT and CUDIT total scores). As the DASS-21 subscale scores for depression, anxiety and stress were found to be highly correlated, participants' DASS-21 total score was entered in step 3 of the analysis. Interaction terms of psychosis status by FTND, AUDIT and CUDIT scores were entered into the 4th step of the analysis to determine if the relationship between current substance use and perceived harm differed between people with and without a psychotic disorder. As a partial control for the number of statistical tests, the threshold for significance was set at $p < 0.01$.

3. Results

A total of 1,254 participants returned the self-report questionnaire or completed it online. 57 questionnaires were returned to sender and 14 were returned blank. 137 participants who did not complete the perceived harmfulness items for at least one substance, or did not provide age and gender information were also excluded, leaving a total of 1046 participants. This included 117 participants recruited from the ASRB, 65 past RCT participants, 106 from the HMRI research register, 300 psychology students and 458 participants recruited from 'Facebook'. Participants were aged between 18 and 86 years (Mean = 33.9, SD =15.1) and 53.2% were female. Participant characteristics are described in detail in Table 1.

As can be seen in Table 1, the psychotic disorder group was found to be significantly older than the no psychotic disorder group and to have a significantly lower percentage of female participants. For this reason, subsequent analyses were conducted controlling for age and sex. Additionally, significant differences between the groups were found for employment status, recall of anti-alcohol campaigns, FTND, AUDIT, CUDIT and DASS21 total scores. No significant differences between the groups were found in the proportions of participants who could recall seeing campaigns for tobacco and cannabis. However, a significantly greater proportion of people with psychotic disorders perceived campaigns regarding tobacco, alcohol and cannabis use to be effective. ANCOVAs conducted separately for tobacco, alcohol and cannabis and controlling for age and sex, found there were no significant differences between the perceived harmfulness total scores of participants recruited from the five recruitment sources.

[Table 1 about here]

As shown in Figure 1, for all three substances the degree to which people risked harming themselves was perceived to increase as frequency of a persons' use increased (i.e., occasional to regular to everyday use). Overall, tobacco was perceived to place people at a greater risk of harm than alcohol and cannabis. Occasional use of tobacco was perceived to pose a slight to moderate risk to people, while regular and everyday use of tobacco was perceived to pose a moderate to great risk to people. Alcohol was perceived to be the least harmful substance of the three when used occasionally or regularly, where it was perceived to pose only a slight risk, and slight to moderate risk to people. When used everyday, however, alcohol was perceived to be slightly more harmful than cannabis, and both substances were perceived to pose moderate to great risk to people using these substances everyday.

[Figure 1 about here]

The results of three hierarchical linear regressions are presented in Table 2. For tobacco a significant model emerged ($F(13, 597)=5.823, p<.001$) which accounted for 11.5% of the variance of perceived harmfulness of tobacco ($R^2=.115$). Increased age and being female were significant predictors of increased perceived harmfulness of tobacco in the first step of the regression. Although positive psychosis status was also inversely related to perceived harmfulness of tobacco, this relationship failed to reach significance ($p=.048$). In the second step of the analysis, perceived effectiveness of anti-smoking campaigns was significantly associated with perceived harm. In the third step, total FTND score was found to be significantly and inversely related to perceived harmfulness of tobacco. In step four,

interaction terms between psychosis status and FTND, AUDIT and CUDIT scores were not significantly related to perceived harmfulness of tobacco.

While a statistically significant model also emerged for alcohol ($F(13, 619)=11.140, p<.001$), the final model only accounted for 7% of the variance of perceived harmfulness of alcohol. Perceived effectiveness of anti-drinking campaigns, which was found to be inversely related to perceived harm, was the only predictor variable to be significantly related to perceived harmfulness of alcohol.

Finally, a significant model for cannabis emerged ($F(13,308)=36.811, p<.001$) which accounted for 31.1% of the variance of perceived harmfulness of cannabis ($R^2=.311$). Positive psychosis status and being female were significant predictors of increased perceived harmfulness of cannabis in the first step of the analysis. In the second step, perceived effectiveness of anti-cannabis campaigns was significantly and inversely related to perceived harmfulness of cannabis. In step three of the analysis, total CUDIT score was significantly and inversely related to perceived harmfulness of cannabis. Interactions between psychosis status and FTND, AUDIT and CUDIT scores were not significantly related to perceived harmfulness of cannabis.

4. Discussion

This paper adds to our current understanding of the relationship between perceived harmfulness and patterns of substance use, as it is the first known to investigate perceptions of harmfulness regarding tobacco, alcohol and cannabis simultaneously among people with

and without psychotic disorders. Tobacco was perceived as the most harmful of the three substances across all substance use frequency profiles. However, when used everyday all three substances were perceived to pose a moderate to great risk to someone's health and wellbeing. In this sense, participants' perceptions of the harmfulness of tobacco, alcohol and cannabis was in line with current evidence that also suggests, at least in terms of disease burden, that tobacco is the more harmful of the three substances (Australian Institute of Health and Welfare, 2011). Disability-adjusted life years (DALYS) is a measure of disease burden expressed as the number of 'healthy' years lost due to ill-health, disability and premature death (Australian Institute of Health and Welfare, 2010, 2011). In Australia in 2003, it is estimated that 204,788 (7.8%) DALYs were attributable to tobacco use, as well as 11.7% of deaths. 61,091 (2.3%) DALYs were attributable to alcohol use, as well as 0.8% of deaths, while 5,062 (.02%) DALYs and no deaths were attributable to cannabis use (Australian Institute of Health and Welfare, 2011).

As has been found in previous research (Duistman & Colbry, 1995; Johnston et al., 2005; O'Callaghan et al., 2006), an inverse relationship between level of substance use and perceived harmfulness of substance use was found for tobacco and cannabis. People who reported more hazardous or harmful use of tobacco and cannabis, as demonstrated by higher FTND and CUDIT scores, were found to have lower risk perceptions of these substances. However, this relationship was not evident for alcohol. Interactions between psychosis status and FTND, AUDIT and CUDIT scores were not found to be significantly related to perceived harmfulness of tobacco and cannabis, indicating that the relationships between current tobacco, alcohol and cannabis use and perceived harm did not differ between people with and without psychotic disorders.

This study revealed that the factors associated with how harmful tobacco, alcohol and cannabis use are perceived may differ. For cannabis the final model of accounted for 31.1% of the variance in perceived harmfulness. For tobacco and alcohol, however, the final models accounted for only 11.5% of the variance in perceived harmfulness of tobacco and only 7% of the variance in perceived harmfulness of alcohol. Increased age was found to be a significant predictor of high risk perceptions of tobacco use, but was not a significant predictor of high risk perceptions of alcohol and cannabis. That is, older participants were more likely to perceive tobacco as harmful. Although female gender was associated with significantly higher risk perceptions for tobacco and cannabis, this relationship was not significant for alcohol. Additionally, participants with a psychotic disorder were found to have significantly higher risk perceptions of cannabis than people without psychotic disorders. On the other hand, there was a trend for people with psychotic disorders to have lower risk perceptions of tobacco than people without psychotic disorders.

This is the first study known to have investigated how harmful cannabis is perceived to be, in its own right and not combined with other substances as ‘illicit substances’ or ‘substances’ in general, among people with mental disorders. The finding that people with psychotic disorders perceived cannabis to be more harmful than people without psychotic disorders may reflect evidence suggesting that cannabis use is linked to the development of and exacerbation of psychotic symptoms (Carey, Purnin, Maisto, Carey, & Barnes, 1999; Thornton, Baker, Johnson, & Lewin, 2012b; Thornton, Baker, Lewin, et al., 2012c). For example, in a qualitative study involving a subsample of participants from the current sample (Thornton, Baker, Johnson, & Kay-Lambkin, in submission), participants linked cannabis use

to the development of mental disorders, particularly psychosis, and the exacerbation of psychotic symptoms.

Evidence suggests that smokers with psychotic disorders (and mental health problems in general) are heavier and more dependent smokers than those in the general population (ONS, 2002), and are therefore more likely to experience ill effects as a result of their smoking. In the 2001 British General Household Survey, for example, while only 8% of the general population smoked more than 20 cigarettes per day, 51% of people with a diagnosis of schizophrenia reported smoking more than 20 cigarettes per day (ONS, 2002). However, participants with psychotic disorders in the current study perceived tobacco to be less harmful than participants without mental disorders. This finding may be linked to evidence that suggests tobacco use is associated with a range of cognitive improvements for people with psychotic disorders, such as improved sustained attention, working memory and reductions in negative psychotic symptoms (Kumari & Postma, 2005; Patkar et al., 2002). Additionally, in the qualitative study using participants from the current sample, tobacco was frequently described to be used for positive effects such as to relax and to cope with stress (Thornton et al., in submission).

These results indicate that the public health messages about the negative consequences associated with cannabis use among people with psychotic disorders appear to be getting across. They also suggest there is a continued need to highlight the negative consequences of smoking among people with mental disorders and an urgent need to identify safer ways in which they might achieve the benefits they perceived themselves to receive from tobacco. Perhaps the immediate and salient nature of the consequences associated with cannabis use

e.g. exacerbation of psychotic symptoms, means public health messages regarding cannabis are more likely to be headed in this population. This is in contrast to the long-term and delayed health consequences associated with tobacco use.

Across all three substances, people who perceived anti-substance use campaigns to have been effective had significantly higher risk perceptions of tobacco, alcohol and cannabis.

However, being able to recall anti-substance use campaigns was not found to be a significant predictor of increased perceived harm. These results indicate that while campaigns may be effective at increasing perceived harm of substances for some people, simply being exposed to a campaign, and even remembering the campaign and its content, is not enough to increase a person's risk perceptions of a substance. As such, these results show that recall may not be an appropriate or effective measure of success in changing people's perceptions of the harmfulness of substances. However, many evaluations of anti-substance use campaigns use recall of a campaign as a measure of success (e.g. Shanahan & Elliott, 2009).

Together, these results suggest that demographic, substance use, mental health and public health campaign variables may substantially influence the perceived harmfulness of tobacco, and particularly cannabis among people with and without mental disorders. They suggest that additional variables, that were not included in the current analyses, may play an important role in determining people's perceptions of the harmfulness of tobacco and especially alcohol. Relatively little of the variance in perceived harmfulness of these substances was accounted for in the analyses. The results also suggest that perceived harmfulness of alcohol may not be strongly related to levels of alcohol use. In previous research conducted among people with and without mental disorders, social factors have been found to play an important

role in people's alcohol use (Fowler, Carr, Carter, & Lewin, 1998; Kuntsche, Knibbe, Gmel, & Engels, 2005, 2006; Thornton et al., 2012a).

The results of the current study should be interpreted with some caution. Participants recruited from the ASRB are likely to be relatively high functioning, limiting the generalizability of these findings to the wider population of people with psychotic disorders (Loughland et al., 2010). Participants with psychotic disorders were found to have significantly lower AUDIT and CUDIT scores compared to participants without psychotic disorders, indicating lower rates of current harmful use and substance use disorders. Since large population studies consistently find higher rates of use and substance use disorder among people with mental disorders, especially psychotic disorders (Degenhardt & Hall, 2001; Grant et al., 2004; Regier et al., 1990; Teesson et al., 2009), participants of the current study may not be representative.

Additionally, participants who self-reported a diagnosis of a psychotic disorder were grouped with participants recruited via the ASRB to form the psychotic disorder group. There is a risk that participants may have misreported their mental health history and were therefore incorrectly grouped as having a psychotic disorder or no psychotic disorder. In future research this limitation could be addressed by employing a diagnostic interview to classify all participants. Unfortunately this was outside the scope and budget of the current study.

Previous research and behavioural theories indicate perceived harmfulness may play an important role in people's decisions to use, and particularly to stop using substances (Romer & Jamieson, 2001). If this relationship is to be used by clinicians and health promotion

practitioners to effect people's substance use, it is important that this relationship and the relationships between perceived harmfulness and other factors is well understood. The current study adds significantly to our understanding of the perceived harmfulness of tobacco, alcohol and cannabis among people with mental disorders. While these results suggest the relationship between patterns of substance use and perceived harmfulness does not differ between people with and without psychotic disorders, they also suggest that additional education regarding the consequences of smoking among people with psychotic disorders may be needed. Results from the second Australian national survey of psychosis found that rates of alcohol use disorders among people with psychosis have increased from 29% to 50% in the last decade (Morgan, Waterreus, Jablensky, Mackinnon, McGrath, Carr, Bush, Castle, Cohen, Harvey, Galletly, Stain, Neil, McGorry, Hocking, Shah and Saw, 2012). For this reason it is particularly important that future research investigates other factors (e.g. social factors) which may influence people's perceptions of the harmfulness of alcohol. It may also be important to note that when evaluating public health campaigns simple recall of campaigns may not be a good measure of success.

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