The utility of the MMPI-2-RF to predict the outcome of a smoking-cessation treatment

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A B S T R A C T

People with psychopathology experience high rates of smoking and have more trouble quitting. The Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF; Tellegen & Ben-Porath, 2008, 2009) is a valid and reliable instrument for the assessment of psychopathology. In this study, we examined the ability of the MMPI-2-RF to assess psychopathology and to predict smoking cessation outcomes in a sample of 281 smokers seeking psychological treatment to stop smoking at the end of treatment and at 6- and 12-month follow-ups. Results showed that T-scores ≥ 65 on Disaffiliativeness (DSF) scale were associated with a higher likelihood of smoking at the end of treatment, and T-scores ≥ 65 on Neurological Complaints (NC) scale were associated with a higher likelihood of smoking at the 12-month follow-up, after controlling for the effect of age and initial levels of nicotine dependence. The results highlight the usefulness of the MMPI-2-RF in the field of smoking cessation treatment.

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1. Introduction

Tobacco use is the leading preventable cause of morbidity and mortality in high income countries. Nearly six million people worldwide die each year because of tobacco due to its direct relation with different diseases (e.g., lung cancer, cardiovascular disorders, emphysema, etc.) (United States Department of Health and Human Services U.S.D.H.H.S., 2014).

Evidence indicates that smoking is also related to mental health (Aubin, Rolloma, Svensson, & Winterer, 2012; Hall & Prochaska, 2009; Rüther et al., 2014). In a study conducted by Lasser et al. (2000) adults with and without mental disorders were compared regarding their smoking rates and cessation. The results indicated a dose-response pattern with smoking rates increasing from individuals with no mental disorders to those with past month mental disorders. The same pattern was found when assessing smoking cessation outcomes: abstinence rates were higher in those participants with no mental disorders and they decreased progressively in those with history of mental disorders and those with past month mental disorders.

People with mental disorders smoke more cigarettes per day and are more nicotine dependent (Aubin et al., 2012) with rates of smoking prevalence from two to four times higher than in the general population (Rüther et al., 2014). The reasons for this high consumption are still unknown. It has been indicated that they might smoke for stress relief and enjoyment, to ameliorate the effects of mental health problems and medication side effects, to relief boredom or as a tool to facilitate social interactions (Campion, Checinski, Nurse, & McNeill, 2008). As a result of this high consumption, people with mental disorders have serious physical health problems. Moreover, studies suggest that people with mental disorders have more problems quitting smoking, showing lower abstinence rates in comparison with the general population (Hall & Prochaska, 2009). Despite the need for people with mental disorders to stop smoking, few studies have evaluated the efficacy of smoking cessation treatments in patients with mental disorders (Aubin et al., 2012). Among them, the majority has focused in the population of smokers with severe mental disorders (e.g., schizophrenia, bipolar disorders). This indicates that more studies are needed for those smokers without a diagnosis of mental disorder but who suffer an important level of distress to influence their smoking and their smoking cessation.

One of the difficulties in the study of psychopathology in smokers is the diversity of assessment tools used. Historically, the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943) has been the most commonly used measure to assess psychopathology. In studies with the MMPI or the MMPI-2, a relationship has been found between tobacco and high scores on the Hypomania (Ma) (Basile et al., 2004; Evans, Borgatta, & Bohrnstedt, 1967; Lipkus, Bareffot, Williams, & Siegler, 1994), Psychopathic deviate (Pd) (Andrucci, Archer, Pancost, & Gordon, 1989; Evans et al., 1967; Jaffe & Archer, 1987; Leon, Kolotkin, & Korgeski, 1979; Lipkus et al., 1994), Hypochondriasis (Hs) (Tappan & Weybrew, 1982), and Depression (D) (Leon et al., 1979) scales. Ames et al. (2005) used various MMPI scales to assess
neuroticism, anxiety, depression and pessimism traits to predict tobacco abstinence in 1877 smokers undergoing treatment to quit smoking. The results showed that high scores on these scales were associated with a lower likelihood of being abstinent six months after treatment completion. In general, these studies employed some items or scales of the questionnaire, but not the entire scale, and they mainly used samples of students, making it difficult to generalize these results to other populations.

The MMPI-2-RF (Tellegen & Ben-Porath, 2008, 2009) is the latest version of the MMPI. It is a self-report questionnaire composed of 338 items grouped into scales that are organized hierarchically. Studies have indicated that the scales within the MMPI-2-RF had good convergent and discriminant validity (Ayeart, Sellbom, Trobst, & Bagby, 2013; Tellegen & Ben-Porath, 2008, 2009) and it has been found to be useful for the assessment of psychopathology (Simms, Casillas, Clark, Watson, & Doebbeling, 2005; van der Heijden, Egger, & Derksen, 2008). However, to our knowledge, no research is available on the assessment of smokers seeking treatment to quit. Taking into account the high comorbidity of psychopathology and personality problems with smoking and its influence on the process of quitting smoking, using the MMPI-2-RF in the context of smoking cessation interventions would be useful to identify, in a relatively simple way, those smokers with a higher risk for psychopathological problems and treatment failure that may need more attention.

Thus, the aim of this study was to analyze the utility of the MMPI-2-RF scales, as indicators of psychopathology, in the prediction of the outcome of a smoking cessation treatment, both at the end of treatment and at the 6 and 12 month follow-ups.

2. Method

2.1. Participants

Sociodemographic characteristics of participants are presented in Table 1. All participants requested treatment to quit smoking between April 2010 and December 2012. Of the 594 people who requested information, 134 just wanted information about the program, 10 were abstinent and 19 were not located. Finally, 99 were not interested in the smoking cessation intervention by mail and at the 6 and 12 month follow-ups.

diagnosis of a severe mental disorder (bipolar disorder and/or psychotic disorder) (n = 14); concurrent dependence on other substances (alcohol, cannabis, cocaine, heroin, etc.) (n = 6); smoking rolling tobacco, cigars, or cigarillos (n = 3); having participated in the same program or other efficacious psychological or pharmacological treatments to quit smoking in the past year (n = 7); suffering from some pathology that implies a high life risk for the person (n = 3); and not attending the first group session (n = 5). Of the remaining 285, 4 were eliminated from the study because they presented an invalid MMPI-2-RF protocol according to the recommended criteria (CNS ≥ 18, TRIN ≥ 80, VRIN ≥ 80, Fp ≥ 100) (Tellegen & Ben-Porath, 2008, 2009). The final sample comprised 281 smokers (60.5% women; M = 41.80 years, SD = 10.78), with an average pretreatment consumption of 21.36 cigarettes per day (SD = 7.92).

2.2. Measures

2.2.1. Questionnaire about the smoking behavior (Becoña, 1994).

Composed of 59 items analyzing sociodemographic variables and various aspects of the smoking history and behavior.

2.2.2. Fagerström test for nicotine dependence (FTND) (Heatherton, Kozlowski, Frecker, & Fagerström, 1991; adaptation to Spanish of Becoña & Vázquez, 1998).

Composed of six items in which scores ≥ 6 are considered to be indicative of nicotine dependence (Fagerström & Furbeger, 2008). In the current study, the reliability obtained with Cronbach’s alpha coefficient was 0.59, indicating that it has moderate internal consistency, in accordance with previous studies (e.g., John, Meyer, Rumpf, & Hapke, 2004).

2.2.3. MMPI-2-RF (Tellegen & Ben-Porath, 2008, 2009).

A 338-item self-report questionnaire that provides scores on 51 scales. First, there is a group of 9 scales for the assessment of validity. On the other hand a group of five scales, the Personality Psychopathology Five (PSY-5), assess personality, aggressiveness, psychoticism, disconstraint, negative emotionality, and introversion. In addition, two scales measure aesthetic-literary or mechanical-physical interests. Finally, measures of psychopathology are organized hierarchically. The Higher-Order (H-O) scales, which define the highest level, provide an organizational structure, the Restructured Clinical (RC) scales, which are in an intermediate level and analyze clinical features, and at the bottom of the hierarchy, the Specific Problems (SP) scales that provide a more fully developed and detailed assessment. The H-O scales are three scales for the assessment of emotional or internalization dysfunction, thought dysfunction and behavioral or externalizing dysfunction. The RC scales, are a group of 9 scales that assess demoralization, somatic complaints, low positive emotions, cynicism, antisocial behavior, ideas of persecution, dysfunctional negative emotions, aberrant experiences, and hypomanic activation. The SP scales are 23 and they are divided in four groups for the assessment of somatic/cognitive problems, internalizing problems, externalizing problems, and interpersonal problems. Reliability and validity of this instrument are good, and extensive data can be consulted in the MMPI-2-RF Technical Manual (Tellegen & Ben-Porath, 2008, 2009). T scores of ≥ 65 are considered to be indicative of psychopathology (Tellegen & Ben-Porath, 2008, 2009).

2.3. Procedure

All the participants were assessed with all the above-mentioned questionnaires in a face-to-face interview. All the smokers gave their informed consent for participation, and the study was authorized by the Bioethics Committee.

After the assessment, participants started the Smoking Cessation Program (Becoña, 2007). It is a cognitive-behavioral intervention consisting of six sessions (one per week) administered in groups made-up of 4–10 participants assigned according to their availability.
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