



Pain depression and sleep disorders among methadone maintenance treatment patients

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ABSTRACT

Background: The success of rehabilitation is not influenced solely by drug abstinence, but also by the state of general health and well-being, which for patients in methadone maintenance treatment (MMT) frequently is compromised by experiencing pain, depression and sleep disorders. Accordingly, this study sought to (1) characterize clusters of MMT patients who experienced different levels of these symptoms and (2) examine the association between these clusters and quality of life (QOL) measures.

Methods: A convenience sample of MMT patients ($n = 73$) completed surveys containing four scales (Numeric Rating Scale on Pain, Center for Epidemiological Studies–Depression Scale, General Sleep Disturbance Scale, and Short Form-36 QOL). Homogenous clusters based on the symptom severity of pain, depression and sleep disturbances were created using a two-stage process of: hierarchical clustering and K-means cluster analysis.

Results: Based on the levels of symptoms, MMT patients were grouped as High ($n = 29$), Moderate ($n = 26$) or Low ($n = 18$) symptom cluster members. The High symptom cluster group reported the highest severity levels of pain, depression and sleep disorders. Also, this group had the lowest scores on all QOL indices ($p < 0.05$). Although pain, depression and sleep disorders effectively distinguish symptom clusters of MMT patients, pain was the single most important symptom differentiating MMT patients.

Conclusions: Successful rehabilitation will necessitate interventions that target MMT patients with high levels of pain, depression and sleep disorders. To the best of our knowledge this study was innovative in its approach to identify the presence of this high risk group by using cluster methodology in the MMT population.

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1. Introduction

Drug rehabilitation is the beginning of several important life processes: halting the addiction process, detoxification and living life anew in recovery (Moos, 2003). However, the success of rehabilitation is not influenced solely by drug abstinence, but also by the state of general health and well-being, often measured by quality of life indicators. In fact, among individuals in treatment and recovery, the ability to function is associated with health and the sense of well-being (Grella & Lovinger, 2012; Ouimette, Goodwin, & Brown, 2006).

Patients in methadone maintenance treatment (MMT) experience a collection of different symptoms that influence general health and well-being. Among them, pain is one of the most common. In a survey of 14 European countries (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006), approximately 19% of the general population report chronic pain; however, in patients with drug abuse problems or more

specifically MMT patients, the prevalence of chronic pain ranges between 37–61% (Barry et al., 2009; Jamison, Kauffman, & Katz, 2000; Peles, Schreiber, Gordon, & Adelson, 2005; Rosenblum et al., 2003). In addition, the co-existence of pain and addiction is associated with high rates of psychiatric disorders (Barry et al., 2009). As a result, the National Institute on Drug Abuse (NIDA) published treatment recommendations for substance abuse treatment programs stating that since mental illness (e.g., Depression) is a common co-morbidity with drug addiction, patients entering substance abuse treatment should routinely be assessed for mental illness (National Institute on Drug Abuse, 2009). For MMT patients, studies reported rates between 19%–74% for life time and between 10%–30% for current depression (Brienza et al., 2000; Darke & Ross, 1997; Hasin & Nunes, 1988; Havard, Teesson, Darke, & Ross, 2006; Peles, Schreiber, Naumovsky, & Adelson, 2007; Rounsaville, Weissman, Crits-Christoph, Wilber, & Kleber, 1982; Teesson et al., 2005). MMT patients also commonly report sleep disorders. Stein et al. (2004) and Peles, Schreiber, and Adelson (2006) found that between 75–84% of MMT patients had sleep disturbances.

Quality of life (QOL) measures are among the most common indicators assessing the levels of general health and well-being. The three

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aforementioned symptoms, pain, depression, and sleep disorders are common and debilitating symptoms in MMT patients (Peles et al., 2006) that are among the most influential symptoms affecting the QOL. As a result, current studies are finding that chronic disease and QOL indices are an increasingly important part of substance abuse treatment, and therefore, must be assessed and included as part of rehabilitation services (Karow et al., 2011; Laudet, 2011).

Clearly, a clinical approach for MMT populations is needed for better symptom control and optimal treatment among patients who experience this constellation of symptoms. One way of overcoming this challenge is by identifying common symptoms and creating subgroups of patients according to symptom severity. Cluster analysis is one of these methods; it creates groups based on similarities and dissimilarities in a number of characteristics within each subgroup. If these common debilitating symptoms have an impact on overall health and well-being, it will be crucial to identify and provide treatment to promote function and stability in rehabilitation. The use of cluster analysis has been used as a method of identifying groups of debilitating symptoms in a variety of medical fields.

The goal of this study is to identify clusters of MMT patients experiencing different levels of pain, depression and sleep disorders; and examine the impact of these clusters on the quality of life. To the best of our knowledge, this is the first attempt to classify this unique population (of MMT patients) by assessing multi-symptom severity with the vision of promoting more effective and individualized patient care.

2. Methods

2.1. Sample and study design

This cross-sectional study protocol and its consent form were approved by the Ethics Committee at the University of Haifa (#201/10). The data were collected at the Haifa Drug Abuse Treatment Center (HDATC). The HDATC is a multi-service substance abuse treatment center operating since 1977. Its first program was the MMT program, a long-term program serving about 500 patients on a daily bases (about 700 annually). The MMT program offers a comprehensive psychosocial and medical treatment plan to each patient. Only patients who were able to read and understand Hebrew were invited to participate in the study. A staff member at the HDATC MMT described the study aims and protocol to these patients. Patients willing to participate signed an informed consent form. As a result, a convenience sample consisting of 78 MMT patients was recruited for this study.

2.2. Instruments

Patients were given a paper-and-pencil survey with questions on demographic characteristics, drug history, and several well-established, valid and reliable scales to measure level of pain, sleep, depression and quality of life. Pain was measured using the Numeric Rating Scale on Pain (NRS) and has scores ranging from 0 (no pain) to 10 (worst pain) (Jensen, 2003). Depression was measured with the Center of Epidemiological Studies–Depression Scale (CESD), a well-established 20-item scale with a Likert scale ranging from 0 indicating rarely to 3 (most or all the time) (Sheehan, Fifield, Reisine, & Tennen, 1995). CESD scores range from 0 to 60. A score of 16 indicates the need for further assessment for depression (Radloff, 1977). This well-established scale has been used with outpatient substance abuse treatment programs in other studies (Chelminski et al., 2005). Sleep disturbances were measured using the General Sleep Disturbance Scale (GSDS), a 21-item questionnaire that has been used to measure different aspects of sleep (Dorsey, Lee, & Scharf, 2004; Humphreys, Lee, Neylan, & Marmar, 1999; Lee, 1992). The GSDS contains a Likert scale ranging from 0 to 7, and yields summed scores ranging from 0 to 147; higher scores demonstrate greater sleep

disorder. A score of ≥ 43 indicates sleeping difficulties (Carney et al., 2011; Gay, Lee, & Lee, 2004; Lee, 1992). Lastly, the Short Form-36 (SF36) is a reliable and valid, 36-question survey designed to assess the perception of well-being. Respondents use a five-level Likert scale to assess eight domains of well-being, four focusing on physical health (i.e., Physical Functioning, Role Physical, Bodily Pain, and General Health) and four focusing on mental health (i.e., Vitality, Social Function, Role Emotional, and Mental Health) (Ware & Sherbourne, 1992). Scores indicate the level of well-being and range from 0 (lowest) to 100 (highest). This established survey was validated in Hebrew using a sample of 2030 adults 45–75 years of age (Lewin-Epstein, Sagiv-Schifter, Shabtai, & Shmueli, 1998). The SF36 also has been used previously with patients in drug treatment (Richter, Eikelmann, & Berger, 2004).

2.3. Statistical methods

All data were analyzed using SPSS® Version 17. Descriptive statistics (means and standard deviation) for the sample were tabulated for continuous variables and frequencies were tabulated for categorical variables. When possible, sample means (and standard deviations) of standardized scales were compared to normative samples found in published studies to better understand the nature of respondents in this sample. Cluster analyses were conducted to identify relatively homogeneous MMT patients based on scores from the NRS for pain, CESD for depression and GSDS for sleep. Prior to cluster analysis, scores were standardized using Z-scores to adjust for the value ranges of the three different scales (Milligan & Cooper, 1985). Determination of the “stopping rule” for the number of clusters was conducted using a two-stage process: hierarchical clustering to identify large inconsistent increases of coefficients in the agglomeration schedule and dendrogram; and K-means cluster analysis to confirm and optimize results (Clatworthy, Buick, Hankins, Weinman, & Horne, 2005; McQuitty, 1966; Milligan & Cooper, 1985). Since cluster analysis is a somewhat subjective method of categorization, we assessed the stability of the clusters by randomly assigning each observation into two equally sized groups, and repeated the above cluster analysis (Clatworthy et al., 2005). That is, we examined both the two-cluster and three-cluster approach; and based on findings, selected the three-cluster solution, which illustrates the best fit and differentiates MMT patient subgroups by symptoms.

One-way analysis of variance (ANOVA) with the cluster variable as a covariate was conducted to show differences between clusters, first using the three scales that were used to form the clusters, and second, using the eight SF36 scales indicating well-being. To enable comparisons with other studies, means and confidence intervals are provided using original scores rather than the standardized Z-scores. Post-hoc contrasts were conducted using the Bonferonni procedure to adjust for the number of pairwise contrasts. Means and 95% confidence intervals (CI) are provided. Significance is declared at $p < 0.05$.

3. Results

A total of 78 patients were enrolled into the study; however, only 73 patients (93.6%) had complete data for the three interval level scales used in the cluster analysis. More than three-quarters of patients were male (see Table 1). The mean age of the sample was 43.0 (SD = 8.7). Almost a third of patients were under 40 years, half were between 41 to 50 years old, and the remainder was over 51 years old. Family status of patients was divided into approximately equal thirds: married/partner, widowed/divorced/separated or never married. Most patients started drug use by 20 years old (mean age of first drug use = 21.3, SD = 6.6); and more than a third reported at least two decades of drug use (mean duration of drug use = 2.6, SD = 0.9). More than half listed having taken amphetamines,

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