Physical Pain in Alcohol-Dependent Patients Entering Treatment in Poland—Prevalence and Correlates

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ABSTRACT. Objective: Chronic pain and problematic alcohol use commonly co-exist, as the use of alcohol is commonly considered a useful pain self-management strategy. The purpose of this study was to characterize pain and pain-related problems in a group of primary alcohol-dependent individuals entering treatment facilities. **Method:** A sample of 366 (73.5% men and 26.5% women) alcohol-dependent (according to *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, criteria) subjects was recruited in alcohol treatment centers in Warsaw, Poland. Information was obtained about demographics, social functioning, sexual and physical abuse during childhood, and severity of alcohol and sleep problems as well as level of impulsivity and general psychopathology. The study group was divided into a “mild or no pain” group and a “moderate or greater pain” group. **Results:** Among the study group, 34.4% of individuals reported moderate or greater

physical pain during the last 4 weeks. The statistical analysis revealed that the experience of physical pain was significantly associated with lower level of education, unemployment, experience of sexual abuse before 18 years of age, and severity of alcohol dependence as well as other potential predictors of relapse (impulsivity, sleep problems, general psychopathology). When entered into logistic regression analysis with other dependent variables, the level of general psychopathology, severity of sleep problems, age, and education were all significantly associated with pain severity. **Conclusions:** Physical pain is a prevalent and potentially impairing experience in adults seeking treatment for alcohol dependence. Therapeutic interventions aimed at reducing pain in alcohol-dependent individuals should be studied to evaluate their impact on improving overall treatment outcomes. (*J. Stud. Alcohol Drugs*, 76, 607–614, 2015)

BOTH CHRONIC PAIN AND problematic alcohol use are common in Poland (Domżał, 2008; Państwowa Agencja Rozwiązywania Problemów Alkoholowych [PARPA], 2008). The prevalence of the experience of physical pain in the general population varies depending on the population and pain conditions examined. The 12-month prevalence of chronic pain conditions in Europe is estimated to be between 17% and 29% (Breivik et al., 2006; Demyttenaere et al., 2006). Problematic alcohol use and/or alcohol use disorders are also common in European countries, with rates of drinking heavily reaching 25% of the 15- to 64-year-old population and between 3% and 4% of the European general population meeting criteria for alcohol dependence (Popova et al., 2007; Rehm et al., 2015; Wittchen et al., 2011). According to the most recent data, about 3% of the Polish general population suffers from alcohol dependence, whereas another 5%–7% of the population drinks alcohol in a harmful way (PARPA, 2008). Therefore, problem drinking affects about 10% of the Polish population. This study addresses the issue of prevalence

and potential correlates of physical pain in alcohol-dependent patients.

Population studies from North America and Asia as well as data from a number of clinical settings indicate that pain and alcohol dependence commonly co-occur (Subramaniam et al., 2013; Von Korff et al., 2005). For example, national surveys in both the United States and Singapore found that those with a chronic pain condition were approximately twice as likely to meet criteria for alcohol dependence as those without (Subramaniam et al., 2013; Von Korff et al., 2005). Beyond diagnosable alcohol problems, the use of alcohol is commonly considered a useful pain self-management strategy, with more than 25% of individuals with various pain symptoms reporting the use of ethanol for the purposes of analgesia (Riley & King, 2009).

In clinical settings, the comorbidity between pain and alcohol problems is even more apparent. For example, Katon et al. (1985) found that more than 40% of patients treated for chronic pain also met the criteria of either alcohol abuse or dependence. Several studies of patients

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recruited from mixed drug and alcohol treatment programs have found elevated rates of pain. Specifically, Potter and colleagues used data from a large survey of substance use disorder treatment programs in the United States and found that between 18% and 38% of patients reported at least moderately severe pain during the prior 12 months (Potter et al., 2008). In addition, chronic and persistent pain is associated with worse pain-related and substance-related outcomes among adults treated for substance use disorders (Caldeiro et al., 2008; Larson et al., 2007). Thus, chronic pain is a highly prevalent and potentially problematic condition in general substance use disorder treatment settings.

Emerging data indicate that prolonged alcohol use and/or withdrawal may lead to hyperalgesia or an increased sensitivity to pain (Gatch, 2009; Jochum et al., 2010). In addition, alcohol-dependent individuals who report that they use alcohol to cope with pain tend to have worse alcohol-related outcomes over time (Brennan et al., 2005). The general prevalence of pain has not been explicitly examined in the specific group of treated alcohol-dependent adults. Also, the relationship between pain and other predictors of alcohol relapse (sleep problems, general psychopathology, severity of alcohol dependence, impulsivity) (Boschloo et al., 2012; Bottlender & Soyka, 2005; Brower, 2003; Loree et al., 2015) has not been well studied in alcohol-dependent individuals. However, other research findings (Barry et al., 2012; Moore et al., 2009; Park et al., 2012; Subramaniam et al., 2013) confirm associations between these variables and pain. Given the specific importance of sleep problems, impulsivity, and general psychopathology in alcohol dependence, it is important to investigate their associations with pain in alcohol-dependent subjects.

The present study was designed to characterize pain and pain-related problems in a group of primary alcohol-dependent individuals (subjects with alcohol dependence diagnosed according to *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* [DSM-IV; American Psychiatric Association, 1994], criteria, but not dependent on any other substance, either prescribed or not prescribed) entering alcohol treatment, inpatient facilities. Specifically, this study was designed to determine the prevalence of physical pain and the associations between pain and demographic variables (e.g., age, gender, education, employment, and marital status) as well as other variables that have been previously shown to affect the course of alcohol dependence. In addition, taking into consideration data indicating that prolonged alcohol use and withdrawal symptoms may lead to hyperalgesia, we assessed the associations between severity of alcohol dependence and physical pain. We hypothesized that pain would be prevalent in alcohol-dependent patients and significantly associated with poor social functioning, severity of alcohol dependence, sleep problems, impulsivity, and level of general psychopathology.

Method

Participants

The study was performed in accordance with the ethical principles described in the Declaration of Helsinki in 1964 and received approval from the Bioethics Committee at the Medical University of Warsaw and the Medical School Institutional Review Board at the University of Michigan.

A group of 366 alcohol-dependent (according to the DSM-IV criteria) individuals entering abstinence-based, inpatient treatment programs in Warsaw, Poland, was recruited. The substance-related treatment programs, in two inpatient facilities where the study was conducted, did not offer pharmacotherapy for alcohol dependence and were designed for individuals in stable somatic condition. Moreover, the treatment facilities from which data were collected were designed to primarily focus on the treatment of alcohol dependence. Patients with severe medical illnesses and those receiving or requiring opioid analgesic therapy were not admitted to the inpatient facilities where the study took place and, consequently, were not included in the study group. Similarly, individuals with co-occurring psychiatric disorders requiring current medication were not admitted to the treatment centers and therefore were not present in the study group. Taking into consideration commonly co-occurring alcohol and nicotine use (Bien & Burge, 1990), alcohol treatment programs (where the study took place) did allow nicotine use during the treatment. Therefore, nicotine dependence was not considered an exclusion criterion, and smoking was assessed in order to evaluate its association with pain.

The inclusion criteria were age older than 18 and a current diagnosis of alcohol dependence according to the DSM-IV criteria (American Psychiatric Association, 1994). The diagnosis of alcohol dependence was established clinically by a psychiatrist during admission and confirmed with the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) by a trained member of the research team. In addition, the MINI questionnaire was used to rule out abuse or dependence on psychoactive substances other than alcohol and nicotine. The exclusion criteria were a history of psychosis and the presence of acute alcohol withdrawal symptoms. In addition, all individuals with clinically significant cognitive deficits, as evidenced by a score of less than 25 on the Mini-Mental State Examination (Folstein et al., 1975), were not eligible to participate.

Procedures

Within a week from admission, all participants completed a questionnaire to assess psychosocial as well as demographic variables. Questions concerning the experience of physical pain applied to 4 weeks preceding the time of the study (see the following).

Measures

The experience of physical pain during the last 4 weeks was evaluated with a question from the Polish version of the Short Form Health Survey (SF-36; Zolnierczyk-Zreda, 2010). The first question asked, "During the last 4 weeks, how much physical pain did you experience?" The response options were labeled as follows: 1 (*no pain*), 2 (*very mild pain*), 3 (*mild pain*), 4 (*moderate*), 5 (*strong*), and 6 (*very strong physical pain*) during the last 4 weeks. Consistent with prior work (Potter et al., 2008; Rosenblum et al., 2003; Trafton et al., 2004), in the main analysis responses were re-coded into a "mild or no pain" group (responses 1–3) and a "moderate or greater pain" group (responses 4–6). In supplementary analysis, the pain variable was re-analyzed after being dichotomized into "no pain" (response 1) and "any pain" (responses 2–6) categories.

Questions regarding basic sociodemographic characteristics (education, marital status, employment, economic status) as well as experiences of sexual and physical abuse before or after age of 18 were obtained using a modified version of the University of Arkansas Substance Abuse Outcomes Module, a self-administered questionnaire (Smith et al., 1996). Questions concerning sexual and physical abuse were, "Did you have sexual contacts that were against your wishes before 18 years of age?" and "Were you ever hit, beaten, or physically abused, before 18 years of age, so much that you feared for your safety or had marks?"

The severity of alcohol dependence was evaluated using the Michigan Alcoholism Screening Test (MAST; Selzer et al., 1975), which is self-administered and contains 25 yes/no items. A Polish version was used in this study (Falicki et al., 1986; Habrat, 1988). The level of social support was evaluated using the Medical Outcomes Study Social Support Survey (MOSSSS; Sherbourne & Stewart, 1991). The MOSSSS is a 20-item, self-administered questionnaire with 1 question that measures the number of close friends and relatives who are available for support and 19 items that assess perceived level of social support. The 19 items are each scored on a 5-point Likert scale, with higher scores indicating more perceived support. The MOSSSS was translated for this study into Polish and then back-translated into English. The comparison of both English versions confirmed the accuracy of the Polish version of the questionnaire.

The severity of sleep problems was assessed with the validated, Polish version of the Athens Insomnia Scale (Fornal-Pawłowska et al., 2011). The level of impulsivity was measured by the Barratt Impulsiveness Scale (BIS-11) (Patton et al., 1995), which is a subjective measure of impulsivity. A Polish version of BIS-11 was used, translated from the original version according to methodology described by Wojnar et al. (2008). In this study, the BIS-11 total score was analyzed.

The level of general psychopathology was assessed with the General Severity Index of the Brief Symptom Inven-

tory, a self-administered, 53-item questionnaire (Derogatis & Melisaratos, 1983). Nicotine use was evaluated by the Fagerström Test for Nicotine Dependence (Heatherton et al., 1991).

Statistical analysis

All continuous data were checked for normal distribution with the Kolmogorov–Smirnov test. Data in the tables and the Results section are presented as arithmetic means and standard deviations (*SD*) for parametric variables. For nonparametric variables, data are presented as medians.

Analyses were conducted in two steps. First, participants from the "mild or no pain" group were compared with individuals from the "moderate or greater pain" group in terms of basic social and demographic characteristics as well as severity of alcohol dependence, depressive symptoms, sleep problems, level of impulsivity, general psychopathology, and nicotine use. For continuous variables, independent *t* tests and Mann–Whitney tests were used to analyze significant differences for normally and nonnormally distributed variables, respectively. Dichotomous variables were analyzed with chi-square tests. Comparisons between groups were deemed significantly different if a two-tailed test was $p < .05$.

In the second step, all variables that were significantly associated in bivariate analyses with moderate or greater pain, and regardless of bivariate analyses age and gender, as control variables, were entered simultaneously and were forced to remain in a logistic regression analysis in order to determine the strongest and independent correlates of physical pain in alcohol-dependent patients.

Results

Demographic characteristics

The study group comprised 269 men (73.5%) and 97 women (26.5%). All patients were White. The mean age of recruited alcohol-dependent subjects was 43.7 years (*SD* = 9.9); 43.4% of participants were married, 27.3% were separated or divorced, and 60.9% of individuals were unemployed. The median level of education was 12 years (the last level of secondary school in Poland). The mean, self-reported duration of the symptoms of alcohol dependence was 19.3 years (*SD* = 10.2); 8.5% of participants endorsed an experience of sexual abuse, and 32.2% experienced physical abuse before age 18.

Prevalence of physical pain in the study group of alcohol-dependent patients

Among the study group, 34.4% of individuals reported moderate or greater physical pain during the last 4 weeks,

TABLE 1. Comparison of alcohol-dependent patients with and without experience of physical pain

Variable	No/mild physical pain (<i>n</i> = 240)	Moderate/severe physical pain (<i>n</i> = 126)	<i>p</i>
Age, in years, <i>M</i> (<i>SD</i>)	43.1 (10.3)	45.0 (9.3)	.08
Female gender, %	23.8	31.0	.14
Years of education, <i>Mdn</i>	12	11	.001
Employment, %			
Unemployed, %	58.4	69.6	.04
Marital status, %			
married, %	45.1	40.5	.33
History of physical abuse before age 18 years, %	25.5	33.6	.11
History of sexual abuse before age 18 years, %	5.6	14.3	.005
Social support, MOSSSS, <i>M</i> (<i>SD</i>)	62.5 (18.0)	59.1 (18.8)	.10
Nicotine use, FTND, <i>Mdn</i>	6	6	.99
Severity of alcohol dependence, MAST, <i>Mdn</i>	34	37	<.05
Sleep problems, AIS, <i>Mdn</i>	6	10	<.0005
Impulsivity, BIS total score, <i>M</i> (<i>SD</i>)	69.8 (10.5)	74.5 (9.8)	<.0005
General psychopathology, GSI, <i>Mdn</i>	0.6	1.5	<.0005

Notes: The categorical values are presented as percentages. Parametric variables are presented as *M* (*SD*). For nonparametric variables, medians are presented. MOSSSS = Medical Outcomes Study Social Support Survey (higher values indicates higher social support); FTND = Fagerström Test for Nicotine Dependence (higher scores indicate more severe nicotine dependence); MAST = Michigan Alcoholism Screening Test (higher scores indicate more severe symptoms of alcohol dependence); AIS = Athens Insomnia Scale (higher values indicate more severe sleep problems); BIS = Barratt Impulsiveness Scale (higher scores indicate higher levels of impulsivity); GSI = General Severity Index (higher values indicate higher general psychopathology). *p* < .05 are **bold**.

and 65.6% reported mild or no physical pain. Specifically, the frequency of responses was as follows: no pain: 25.4%, very mild pain: 25.1%, mild pain: 15.1%, moderate: 24.6%, strong: 8.7%, and very strong physical pain: 1.1% during the last 4 weeks.

Significance of physical pain in the study group

Bivariable analyses revealed that physical pain was significantly associated with several demographic and social demographic variables, among them: lower level of education, $F(1) = 12.44$, $p < .0005$; unemployment, $\chi^2(1) = 4.37$, $p = .037$; and experience of sexual abuse before 18 years of age, $\chi^2(1) = 7.93$, $p = .005$. Gender, marital status, experience of physical abuse before age 18, social support, and nicotine use were not significantly associated with pain in bivariate analysis (see details in Table 1). We observed a statistical trend for older patients to experience more severe physical pain, $F(1) = 3.13$, $p = .078$. The experience of physical pain during the last 4 weeks was also significantly associated with severity of alcohol dependence, $F(1) = 3.94$, $p = .048$; sleep problems, $F(1) = 66.55$, $p < .0005$; impulsivity, $F(1) = 17.04$, $p < .0005$; and general psychopathology, $F(1) = 98.59$, $p < .0005$.

Multivariate analysis

When all variables that were significant in bivariate analyses were entered into a logistic regression analysis, the level of general psychopathology, severity of sleep problems, age, and education were all significantly associated with pain severity (Table 2). The overall model was significant, with R^2 Nagelkerke value greater than 3.5.

Supplementary analysis

The supplementary statistical analysis revealed no significant association between a single question from MAST concerning the presence of acute withdrawal symptoms and the pain variable—for main pain variable, $\chi^2(1) = 3.14$, $p = .076$; and for additional pain variable, $\chi^2(1) = 2.81$, $p = .094$. When the bivariate and logistic regression analyses were run for the pain variable dichotomized as “no pain” versus “any pain,” it appeared that the same variables from the primary analysis—except for employment, $\chi^2(1) = 0.3$, $p = .86$ —were significantly associated with pain in bivariate analyses. When significant variables were put into the logistic regression model, sleep problems ($p = .001$, OR = 1.14, 95% CI [1.06, 1.23]), general psychopathology ($p = .005$, OR = 2.1, 95%

TABLE 2. Multivariate model of logistic regression analysis for the prediction of moderate/severe physical pain in alcohol-dependent patients

Variable	OR	[95% CI]	<i>p</i>
General psychopathology (GSI)	2.96	[1.96, 4.47]	<.0005
Sleep problems (AIS)	1.11	[1.04, 1.18]	.001
Age	1.04	[1.01, 1.07]	.003
Education	0.87	[0.78, 0.98]	.02
Severity of alcohol dependence (MAST)	1.02	[0.99, 1.06]	.15
Gender	1.58	[0.82, 3.05]	.17
History of sexual abuse before age 18 years	1.55	[0.59, 4.07]	.38
Employment	0.87	[0.49, 1.56]	.65
Impulsivity (BIS)	0.99	[0.96, 1.02]	.74

Notes: Model: R^2 (Nagelkerke) = 0.372; $\chi^2(9) = 104.066$, $p < .0005$. OR = odds ratio; CI = confidence interval; GSI = General Severity Index; AIS = Athens Insomnia Scale; MAST = Michigan Alcoholism Screening Test; BIS = Barratt Impulsiveness Scale. $p < .05$ are **bold**.

CI [1.24, 3.53]), and total MAST score ($p = .014$, OR = 1.044, 95% CI [1.01, 1.08]) remained significantly associated with physical pain in the multivariate model.

Discussion

The results of the present study indicate that physical pain is prevalent in alcohol-dependent patients from Poland. In our study sample, more than one third of all patients reported a moderate or greater severity of physical pain during the last 4 weeks, which is almost twice the prevalence reported in the general population in Europe (Breivik et al., 2006). As anticipated, and similar to other studies, more severe physical pain was associated with a lower level of education, worse economic situation, and more frequent unemployment (Castillo et al., 2006; Demyttenaere et al., 2006; Tsang et al., 2008). All these variables reflect significantly worse social functioning in alcohol-dependent patients experiencing physical pain in comparison to other individuals with alcohol dependence but mild or no pain. These findings highlight the potential importance of pain as a prevalent problem in alcohol treatment and a correlate of predictors of poor treatment outcomes in alcohol-dependent individuals.

In contrast to population-based studies describing female gender as a predictor of more severe physical pain (Bartley & Fillingim, 2013; Paller et al., 2009), we did not observe a significant association between gender and reported intensity of pain. In the large epidemiologic study of Barry et al. (2012), the association between alcohol misuse and pain was observed to be stronger for male individuals. It is therefore plausible that the group of male alcohol-dependent individuals (who are overrepresented in our study) comprises a selected subgroup of more pain-sensitive male individuals who have a greater likelihood of self-medicating pain with alcohol than females, which diminishes the differences observed in the general population. Older age was a consistent predictor of pain severity in our sample of alcohol-dependent

patients, which may be explained by the rising prevalence of somatic comorbidity with age, and is consistent with prior research (Breivik et al., 2006).

Our study confirmed that the experience of sexual abuse before age 18 is associated with more severe physical pain during adulthood, although these results did not remain significant in multivariate analyses. This observation has been reported in numerous studies on different groups of patients (Eslick et al., 2011; Hart-Johnson & Green, 2012; Sansone et al., 2010), but (to the best of our knowledge) to date, not in alcohol-dependent individuals. Surprisingly, a history of physical abuse before 18 years of age was not associated with intensity of pain in any bivariate analysis. This observation underlines the significance of sexual trauma, which may outweigh the consequences of childhood physical trauma.

In contrast to other studies conducted in opioid-using individuals (Fishbain et al., 2012), we did not find a significant association between tobacco smoking and severity of physical pain. Considering the well-established analgesic effect of smoking (Girdler et al., 2005), this observation may be considered surprising. However, the relationship between smoking, pain, and other substance use is once again complex and multifactorial. Apart from its analgesic effect, nicotine has been shown to be a "gateway drug" to other substance use disorders (Henningfield et al., 1990), including alcohol dependence. It has been shown that up to 90% of alcohol-dependent inpatients are smokers and that severity of alcohol dependence correlates with intensity of smoking (Bien & Burge, 1990). It is possible that the general severity of nicotine dependence in the sample limited variability on this measure and made it difficult to detect associations with pain.

The findings that higher rates of physical pain in our study group were associated with more severe sleep problems and general psychopathology are not surprising and are consistent with other research findings (Barry et al., 2012; Park et al., 2012; Subramaniam et al., 2013). However, the

significance and novelty of our finding once again apply to the characteristics of our study group. Of note, above-mentioned variables are considered important risk factors of relapse (Boschloo et al., 2012; Bottlender & Soyka, 2005; Brower, 2003; Loree et al., 2015). Although the intensity of physical pain by itself has been shown to be a significant predictor of relapse (Caldeiro et al., 2008), its complex relationships with other recognized predictors to date have not been investigated. Interestingly, the multivariate analysis revealed that severity of sleep problems remained significant in the multivariate model of predictors of pain severity. It is plausible that physical pain disrupts sleep quality; however, sleep problems may also exacerbate pain (Morphy et al., 2007; Smith et al., 2009).

In accordance with other research studies pointing toward a significant influence of pain on attention (Moore et al., 2009), we observed a significant bivariate association between pain and impulsivity. Of note, recent studies confirmed an important role of impulsivity in the development and severe course of alcohol dependence (Lejuez et al., 2010; Rubio et al., 2008). However, the impulsivity variable did not remain significant after putting it into the multivariate model.

Consistent with other findings of this study, the experience of moderate or greater physical pain was associated with severity and consequences of alcohol dependence. This result is not surprising in the context of physical pain being a possible cause of drinking by itself, but also being associated with depressive symptoms, sleep problems, and impulsivity. Although the total MAST score was not significant in the main multivariate analysis, supplementary analyses found a significant association between a revised categorization of pain into "no pain" versus "any pain" and greater severity of alcohol dependence as measured by the MAST. These additional analyses highlight the potential that, even among the select group of adults being treated for alcohol dependence, those with more severe alcohol dependence are more likely to experience at least some level of pain compared to those with less severe alcohol dependence. As noted previously in the literature, prolonged alcohol use and/or withdrawal may lead to hyperalgesia or an increased sensitivity to pain (Gatch, 2009; Jochum et al., 2010). It is possible that even mild pain could place someone at greater risk for continued alcohol use and perpetuate the cycle of drinking and alcohol dependence in the period preceding entry into alcohol treatment. Therefore, a measure of "any pain" might be useful as a measure in clinical settings and within the research. Additional work is needed to understand how different levels of pain severity relate prospectively to drinking and alcohol treatment outcomes.

The study has several limitations. The study protocol used a retrospective design and was based on self-reported measures. In addition, the study group comprised only subjects who entered inpatient treatment for alcohol dependence—

individuals who were likely to have more severe course and consequences of alcohol use. Therefore, this group of patients should not be considered fully representative of the population of alcohol-dependent individuals. Moreover, the methodology of the study does not allow causal inference for any of the analyzed relationships. Notably, we did not evaluate somatic comorbidity in detail, such as location and duration of pain symptoms, and whether alcohol was used to self-medicate pain. We only excluded (during the admission to the treatment center) all subjects with severe somatic illnesses (among them requiring opioids as an analgesic therapy).

Conclusions

Our results show that physical pain is a prevalent and potentially impairing experience in adults seeking treatment for alcohol dependence. Moderate and severe pain were associated with significantly worse social functioning, more severe psychopathology, sleep problems, and higher levels of impulsivity (all recognized as important risk factors of relapse in alcohol dependence). To the best of our knowledge, this is the first study to examine the prevalence and associated features of physical pain in primary alcohol-dependent individuals seeking treatment. These results may encourage further research on the effectiveness of therapeutic interventions aimed at reducing pain in alcohol-dependent individuals in order to improve overall treatment outcomes. Existing data support the possible effectiveness of cognitive-behavioral therapy (CBT) in managing pain in nonpsychiatric samples (Ehde et al., 2014; Morley et al., 1999), and preliminary data support the feasibility of delivering CBT for pain to individuals with opioid dependence (Barry et al., 2014) or mixed substance use disorders (Currie et al., 2003). However, the extent to which CBT for pain is effective in adults with alcohol dependence has yet to be determined. It is also unknown to what extent CBT interventions aimed at pain relief may affect sleep problems, mood, and impulsivity (which may be treated as a state-related condition) as well as alcohol-related outcomes in alcohol-dependent patients. The present study highlights the potential importance of this future work.

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