Published in final edited form as:

Drug Alcohol Depend. 2016 January 1; 158: 167–171. doi:10.1016/j.drugalcdep.2015.11.020.

Reductions in physical pain predict lower risk of relapse following alcohol treatment

A Jakubczyk¹, MA Ilgen^{2,3}, M Kopera¹, A Krasowska¹, A Klimkiewicz¹, A Bohnert^{2,3}, FC Blow^{2,3}, KJ Brower², and M Wojnar^{1,2}

A Jakubczyk: ajakubczyk@wum.edu.pl; MA Ilgen: marki@med.umich.edu; M Kopera: maciej.kopera@wum.edu.pl; A Krasowska: aleksandra.krasowska@gmail.com; A Klimkiewicz: anna.klimkiewicz@mlodylekarz.pl; A Bohnert: amybohne@med.umich.edu; FC Blow: fredblow@med.umich.edu; KJ Brower: kbrower@med.umich.edu; M Wojnar: marcin.wojnar@wum.edu.pl

¹Department of Psychiatry, Medical University of Warsaw, Warsaw, Poland ²Department of Psychiatry, University of Michigan, Ann Arbor, MI, USA ³VA Center for Clinical Management Research (CCMR), VA Ann Arbor Healthcare System

Abstract

Objective—Physical pain is considered a potential predictor of relapse in alcohol dependent individuals after treatment. The aim of this study was to evaluate whether reductions in pain level during the follow-up period after treatment were associated with lower relapse risk.

Method—A sample of 366 participants were recruited from alcohol treatment centers in Warsaw, Poland. At baseline information was obtained about pain level, demographics, childhood abuse, impulsivity, depressive symptoms, severity of alcohol and sleep problems. After finishing the alcohol treatment program patients were followed for 12 months and alcohol drinking (relapse) as well as pain severity were evaluated.

Results—In the followed group, 29.5% of patients confirmed that they drank any alcohol during last four weeks. Comparing follow-up to baseline pain 48.6% of subjects reported an increased severity of pain, 28.8% - the same level of pain, 22.6% - decreased level of pain. There was a significant association between the decrease in level of pain and the lower risk of relapse. Other factors associated with relapse during four weeks prior to the follow up were: baseline severity of depressive symptoms, low baseline social support and number of drinking days during 4 weeks

Correspondence: Maciej Kopera, Department of Psychiatry, Medical University of Warsaw, 27 Nowowiejska St., 00-665 Warsaw, Poland, Phone: +48 22 825 1236, Fax: +48 22 825 1315, maciej.kopera@wum.edu.pl.

Contributors

All authors contributed to the conceptualization and design of the analyses. MW, KB, MI and FB designed the study and wrote the protocol. AJ, MK, Anna K, Aleksandra K contributed to the data collection. AJ, KB, AB, MI took responsibility for conducting analyses. AJ, Aleksandra K, Anna K and MK managed the literature search. AJ and MI wrote the first draft of the manuscript. FB, MW and KB provided substantive and conceptual feedback on all drafts. All authors contributed to and have approved the final manuscript.

Conflict of interest

No conflict declared.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

prior to entering treatment. In multivariate analysis a decrease in pain level was associated with a lower likelihood of relapse (OR=0.159; 95% CI:0.04–0.62; p=0.008) even when controlled for other factors associated with relapse.

Conclusions—Decreases in pain level following treatment for alcohol dependence are associated with, and may contribute to, a lower risk of alcohol relapse.

Keywords

alcohol dependence; physical pain; relapse

1. INTRODUCTION

Heavy alcohol use is a major contributor to social and economic harm. In Poland, about 3% of the Polish general population meets criteria for alcohol dependence and another 5 to 7% of the population drinks alcohol in a harmful way (PARPA, 2008). Alcohol use disorder (AUD) treatment (Connors et al., 1996) is generally associated with improved longer-term outcomes relative to no treatment, but post-treatment relapse remains a significant problem (MATCH, 1997; Moos and Moos, 2006).

One potential factor that could relate to alcohol relapse is physical pain. Population studies, as well as data from clinical settings, indicate that pain and alcohol dependence commonly co-occur (Jakubczyk et al., 2015; Subramaniam et al., 2013; Von Korff et al., 2005). In addition, in adults entering inpatient AUD treatment, physical pain is associated with sleep problems, general psychopathology and severity of alcohol dependence (Jakubczyk et al., 2015), all of which are considered important risk factors for relapse (Boschloo et al., 2012; Bottlender and Soyka, 2005; Brower, 2003; Loree et al., 2014). Therefore, it is possible that physical pain could be associated with the risk of alcohol relapse. Prior studies of adults treated for a mixture of drug and alcohol problems found that higher pain predicts greater use of substances following treatment (Caldeiro et al., 2008). However, it is unclear if these results would generalize to AUD samples. In addition, Witkiewitz and colleagues (2015) utilized data from two large clinical trials and found that greater physical pain at baseline was associated with increases in heavy drinking, as well as drinking lapses, during and following alcohol use disorder treatment.

The present study extends Witkiewitz's work by studying the association between pain and AUD outcomes under real-world (non-experimental) treatment conditions. Specifically, we evaluated whether reductions in pain level during the follow-up period were associated with lower relapse risk after controlling for other potential predictors of relapse (Boschloo et al., 2012; Bottlender and Soyka, 2005; Brower, 2003; Loree et al., 2014).

2. MATERIAL AND METHODS

2.1 Participants

The study received approval from the Bioethics Committee at the Medical University of Warsaw and the Medical School Institutional Review Board at the University of Michigan.

For this study, a group of 366 alcohol-dependent individuals entering abstinence-based, inpatient treatment programmes in Warsaw, Poland was recruited. The inclusion criteria were: age over 18 and a current diagnosis of alcohol dependence according to the DSM-IV criteria (APA, 2000). The exclusion criteria were: a history of psychosis, co-occurring psychiatric disorder requiring current medication and the presence of acute alcohol withdrawal symptoms. Individuals with dependence on other psychoactive substances (with the exception of tobacco) were not admitted to the study sites and, therefore, not included in the present sample.

2.2 Procedures

The study employed a prospective design and the protocol was divided into two parts: baseline assessment (within a week from admission to the study site) and follow-up. The detailed results and procedures of the baseline assessment can be found in Jakubczyk et al. (2015). After finishing the alcohol treatment program the patients were followed for approximately 12 months and alcohol drinking (relapse) as well as pain severity were evaluated. Specifically, the follow-up assessment meeting was arranged by phone; if phone contact was not available, a member of the research team was sent to the patient's declared place of living. If the phone or personal contact was successful, relapse and pain severity at follow-up were assessed using the measures described below.

2.3 Measures

2.3.1 Relapse—In this study, the main outcome was *alcohol relapse*, defined as “any drinking during the last 4 weeks” based on participant self-report on the University of Arkansas Substance Abuse Outcomes Module (SAOM; Smith et al., 1996) during the follow-up assessment. In addition, the data from Time-Line Follow Back (TLFB) interview at follow up (Sobell et al., 1979, 1988) was analysed. If any drinking day was reported in TLFB during last 28 days, the patient was also considered to have relapsed. The present analyses use 28 day relapse in order to match the period of time assessed in the question concerning the level of physical pain (see below). The categorical designation of any alcohol use as relapse is consistent with other studies (Bauer, 2001; Bowden-Jones et al., 2005; Cardenas et al., 2011) and was also associated with the aim of the therapy (total abstinence) provided in the treatment setting where the study was conducted.

2.3.2 Physical pain—The level of physical pain during the last 4 weeks was evaluated with a question from the Polish version of Short Form Health Survey (SF-36; Zolnierczyk-Zreda, 2010). This question asked “During the last 4 weeks, how much of 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, 6 - very strong physical pain during last 4 weeks. For the present analysis and consistent with the methodology of other studies (Potter et al., 2008; Rosenblum et al., 2003; Trafton et al., 2004) the group was divided into a “mild or no pain” group (responses 1–3) and “moderate or greater pain” group (responses 4–6). Pain intensity during the last four weeks was assessed both at the baseline and follow-up assessments.

In addition, in order to evaluate the changes of pain intensity during the follow-up period we compared specific responses (on a 1–6 scale) at baseline and follow-up for each patient, and re-categorized all responses into:

An increase or no change in pain level compared to those who reported a decrease in pain level. This variable, *decrease in pain*, was our primary variable of interest in the study protocol and in our analyses of relapse. The decision to categorise pain into “decreasing vs not” was made to facilitate interpretation and to enhance the potential clinical implications of the findings.

2.3.3 Control variables—The severity of depressive symptoms was evaluated with the Beck Depression Inventory (BDI; Beck et al., 1996). For the purpose of this study, the validated Polish version of the questionnaire was used ($\alpha=0.92$; Zawadzki et al., 2009).

The severity of sleep problems was assessed with the validated, Polish version of Athens Insomnia Scale (AIS; Fornal-Pawlowska et al., 2011.) (Cronbach’s Alpha for this study 0.93). The level of impulsivity was measured by the Polish version of Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995) which is a subjective measure of impulsivity. In this study the BIS-11 global score was analyzed ($\alpha=0.83$).

Severity of nicotine use was evaluated by the Fagerstrom Test for Nicotine Dependence (FTND; Heatherton et al., 1991) and the level of social support using the Medical Outcomes Study Social Support Survey (MOSSSS; Sherbourne and Stewart, 1991) ($\alpha=0.89$).

Questions regarding experiences of sexual and physical abuse before the age of 18 are detailed elsewhere (Zhabenko et al., 2012). The severity of baseline alcohol dependence was evaluated using the Polish version of Michigan Alcoholism Screening Test (MAST; Selzer et al., 1975; Falicki et al., 1986; Habrat, 1988).

2.4 Statistical analysis

The first set of analyses compared those who relapsed to those who did not on measures of pain, as well as basic demographic characteristics, severity of alcohol dependence, depressive symptoms, sleep problems, and nicotine dependence at baseline. Comparisons between groups were deemed significantly different if a two-tailed test was $p<.05$.

All variables that were significant in the primary analyses were entered into a logistic regression analysis in order to ascertain the independent significance of decrease in pain as a correlate of relapse in alcohol-dependent patients. In addition, gender, age and education (which was the single variable that differentiated the followed and not-followed group) were entered into the multivariate model as control variables.

3. RESULTS

3.1 Relapse

Follow-up data was available for 50% of individuals ($n=183$) who completed the baseline assessment. In the followed group, 29.5% of patients confirmed that they drank any alcohol during last four weeks; 94.2% of patients reported heavy drinking during the relapse.

3.1.1 Comparison between patients who were followed and not-followed—No

significant differences were found in comparisons between those patients who were followed and not followed in terms of: baseline pain severity, severity of alcohol dependence (MAST), baseline depressive symptoms (BDI) and sleep problems (AIS), gender, impulsivity (BIS total), social support, childhood history of sexual or physical abuse, employment or economic situation. The only variable that differentiated these two groups was education (patients available for follow-up were significantly better educated; $F=4.42$, $df=1$, $p=0.04$).

3.2 Physical pain

At baseline 34.4% of individuals reported moderate or greater physical pain during the last 4 weeks and 65.6% reported mild or no physical pain. Specifically, the frequency of responses were as follows: no pain – 25.4%, very mild pain – 25.1%, mild pain – 15.1%, moderate – 24.6%, strong – 8.7% and 1.1% - very strong physical pain during the last 4 weeks.

At follow-up 50.6% of individuals reported moderate or greater physical pain during last 4 weeks and 49.4% reported mild or no physical pain. Specifically, the frequency of responses were as follows: no pain – 8.9%, very mild pain – 25.6%, mild pain – 15.0%, moderate – 23.9%, strong – 12.8% and 13.9% - very strong physical pain during the last 4 weeks.

Comparing follow-up to baseline pain (comparison of the specific responses 1–6): 48.6% of subjects reported an increased severity of pain, 28.8% - the same level, 22.6% - decreased level of pain. The data on changes in pain were re-categorized into those who experienced a decrease in pain versus those who did not (including those with an increase and those with no change).

3.3 Association between pain and relapse

The statistical analysis revealed that there was no association between baseline level of physical pain and any drinking during four weeks prior to the follow up assessment (see Table 1). However, we observed a significant association between the decrease in level of pain and the relapse variable (relapse significantly less frequent in the group with decrease in pain; $\chi^2=7.09$, $df=1$, $p=0.008$). In addition, there was a significant association between more severe follow-up pain and relapse ($\chi^2=5.55$, $df=1$, $p=0.018$).

3.4 Association between relapse and baseline characteristics of patients

The analyses showed that others factors associated with any drinking during four weeks prior to the follow up were: baseline severity of depressive symptoms (BDI; $F=10.33$, $df=1$, $p=0.002$), low baseline social support (MOSSSS; $F=5.43$, $df=1$, $p=0.021$) and number of drinking days during 4 weeks prior to entering treatment ($F=16.28$, $df=1$, $p<0.0005$). Other analyzed variables were not associated with relapse (see Table 1).

3.5 Logistic regression analysis

When all variables that were significant in bivariable analyses were entered into a logistic regression analysis predicting relapse after alcohol use disorder treatment, the overall model was significant, with R square Nagelkerke value at the level of 0.334 (see Table 2). A

decrease in pain level was associated with a lower likelihood of relapse (OR=0.151; 95%CI: 0.04–0.62; $p=0.009$).

3.6 Secondary analysis

In secondary analysis, we ran separate logistic regression analysis for the predictors of relapse, with follow-up pain level put into the model instead of decrease in pain level (other factors in the model were not changed). In these analyses, the association between the follow-up pain level and relapse was also significant (OR=0.341; 95%CI:0.14–0.85; $p=0.022$).

4. DISCUSSION

In this study, decreases in physical pain from baseline (at the start of treatment) to follow-up 1 year later were significantly correlated with lower likelihood of relapse even after controlling for other, well recognized predictors of drinking. To the best of our knowledge this is the second study, after the work of Witkiewitz and colleagues (2015), to report the association between pain and relapse in a group of alcohol-dependent patients and the first study to report this association using observational data collected during standard treatment, as opposed to randomized trial data. Specifically, a decrease in pain intensity turned out to be a significant protective marker, with individuals reporting a decrease in pain level during the follow-up period having more than 6 times a lower risk of relapse than those who had an increase or no change in pain intensity.

These observations have clinical significance, because they suggest that therapeutic interventions aimed at reducing pain level may be potentially effective in improving treatment outcomes in treatment for alcohol use disorders. Preliminary data support the possible effectiveness of cognitive-behavioral therapy (CBT) in managing pain in non-psychiatric samples (Ehde et al., 2014; Morley et al., 1999), 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 reduces pain levels or alcohol use among adults with primary alcohol dependence has yet to be determined.

We observed that the report of pain increased over time from 34% to 51%. Conversely, at baseline 25% of patients reported no pain at all and at the follow-up assessment this decreased to about 9%. Although the reasons for this increase in pain are unclear, these numbers confirm that physical pain is a prevalent and persistent condition in individuals with alcohol dependence. Moreover, they highlight the need to identify not only those individuals with elevated pain at treatment entry but also those for whom pain emerges or fails to resolve during treatment.

Given the well-recognized acute analgesic effects of alcohol (James et al., 1978; Woodrow and Eltherington, 1988), it is plausible that people in our study drank alcohol *because of* pain conditions. Alternatively, a return to drinking may have led to illnesses or injuries that are associated with pain. As noted in the literature, prolonged alcohol use and/or withdrawal may lead to an increased sensitivity to pain (Gatch, 2009; Jochum et al., 2010). Therefore,

individuals who did not remain abstinent might have experienced more severe pain conditions.

4.1 Limitations

The follow-up rate for the study was 50% and we do not have systematic data on the reasons for loss to follow-up. Even though analyses indicated that few baseline characteristics were associated with whether or not follow-up data was available, this lower rate of follow-up could have biased the results. Also, the study group comprised only subjects who entered inpatient treatment for alcohol dependence – individuals who were likely to have a more severe course of alcohol use. Notably, we did not evaluate whether alcohol was used to self-medicate pain. We also did not assess the etiology of pain or the course of pain between baseline and follow-up. Importantly, while we found an association between relapse and a decrease in pain, our study cannot attribute a causal relationship between them.

There is a possibility that follow-up pain level is more important than is the change of pain level. To test for this possibility, we ran additional separate logistic regression analysis for the predictors of relapse, with follow-up pain level as a dependent variable instead of decrease in pain level. In these analyses, the association between the follow-up pain level and relapse were significant but still less strongly associated with a lower odds of relapse than was our primary predictor of change in pain. In addition, because measurement of follow-up pain occurred during the same follow-up assessment as the measurement of relapse, it is possible that our measure of change in pain reflects the consequences of a relapse, as opposed to a predictor of relapse. This limitation highlights the need for more research before concluding that improved pain management could improve post-treatment alcohol outcomes.

On the other hand, although a change in pain does not give specific information about baseline values, it does provide an internal control value for each of the patients. Therefore, change in pain may be in some aspects a better variable than pain at one moment of time to compare between different individuals, given the subjective and personal nature the feeling of pain.

A potential advantage of our study is the fact that it was conducted in a group of primary alcohol-dependent patients (individuals not dependent on any other substances, with the exception of tobacco). The specificity of the country where the study took place (Poland) provides relatively few opioids as a treatment for chronic pain. Thus, the results reflect alcohol treatment outcomes within a context where opioids are unlikely to be used among those with alcohol dependence.

4.2 Conclusions

In conclusion, the results of this study indicate that decreases in pain level following treatment for alcohol dependence are associated with, and may contribute to, a lower risk of alcohol relapse. However, further research is needed to directly test the impact of pain-related interventions on subsequent alcohol outcomes.

Acknowledgments

Role of funding source

This study was supported by the Polish Ministry of Science and Higher Education grants [2012/07/B/HS6/02370, 2P05D 004 29; PI: Wojnar], the Fogarty International Center/NIDA International Substance Abuse Research Program grant [D43-TW05818; PI: Zucker], the Fogarty International Center/NIAAA International Collaborative Alcohol & Injury Research Training Program grant [D43-TW007569; PI: Blow], National Institute on Alcohol Abuse and Alcoholism grant [R21 AA016104; PI: Brower]. The funding agencies had no additional role in study design, data collection, analysis and interpretation of the data, nor in the preparation and submission of the report, including the decision to submit.

We thank all members of the research team in Poland (especially Anna Wnorowska, MD; Katarzyna Kositorna, MS; Julia Pupek, MD; Piotr Serafin, MD; Izabela Nowosad, MD) as well as the medical staff and patients at Kolska Addiction Treatment Center in Warsaw for their support of this research.

References

- A.P.A. Diagnostic And Statistical Manual Of Mental Disorders, 4th Ed, Text Revision. American Psychiatric Association; Washington, D.C: 2000.
- Barry DT, Savant JD, Beitel M, Cutter CJ, Schottenfeld RS, Kerns RD, Moore BA, Oberleitner L, Joy MT, Keneally N, Liong C, Carroll KM. The feasibility and acceptability of groups for pain management in methadone maintenance treatment. *J Addict Med.* 2014; 8:338–344. [PubMed: 25100310]
- Bauer LO. Predicting relapse to alcohol and drug abuse via quantitative electroencephalography. *Neuropsychopharmacol.* 2001; 25:332–340.
- Beck, AT.; Steer, RA.; Brown, G. Brown Manual For The Beck Depression Inventory II. Psychological Corporation; San Antonio, TX: 1996.
- Boschloo L, Vogelzangs N, van den Brink W, Smit JH, Beekman AT, Penninx BW. Predictors of the 2-year recurrence and persistence of alcohol dependence. *Addiction.* 2012; 107:1639–1640. [PubMed: 22372473]
- Bottlender M, Soyka M. Outpatient alcoholism treatment: predictors of outcome after 3 years. *Drug Alcohol Depend.* 2005; 80:83–89. [PubMed: 15878808]
- Bowden-Jones H, McPhillips M, Rogers R, Hutton S, Joyce E. Risk-taking on tests sensitive to ventromedial prefrontal cortex dysfunction predicts early relapse in alcohol dependency: a pilot study. *J Neuropsychiatr Clin Neurosci.* 2005; 17:417–420.
- Brower KJ. Insomnia, alcoholism and relapse. *Sleep Med Rev.* 2003; 7:523–539. [PubMed: 15018094]
- Caldeiro RM, Malte CA, Calsyn DA, Baer JS, Nichol P, Kivlahan DR, Saxon AJ. The association of persistent pain with out-patient addiction treatment outcomes and service utilization. *Addiction.* 2008; 103:1996–2005. [PubMed: 18855809]
- Cardenas VA, Durazzo TC, Gazdzinski S, Mon A, Studholme C, Meyerhoff DJ. Brain morphology at entry into treatment for alcohol dependence is related to relapse propensity. *Biol Psychiatry.* 2011; 70:561–567. [PubMed: 21601177]
- Connors GJ, Maisto SA, Donovan DM. Conceptualizations of relapse: a summary of psychological and psychobiological models. *Addiction.* 1996; 91(Suppl):S5–13. [PubMed: 8997777]
- Currie SR, Hodgins DC, Crabtree A, Jacobi J, Armstrong S. Outcome from integrated pain management treatment for recovering substance abusers. *J Pain.* 2003; 4:91–100. [PubMed: 14622720]
- Ehde DM, Dillworth TM, Turner JA. Cognitive-behavioral therapy for individuals with chronic pain: efficacy, innovations, and directions for research. *Am Psychol.* 2014; 69:153–166. [PubMed: 24547801]
- Falicki Z, Karczewski J, Wandzel L, Chrzanowski W. Usefulness of the Michigan Alcoholism Screening Test (MAST) in Poland. *Psychiatr Pol.* 1986; 20:38–42. [PubMed: 3725987]
- Fornal-Pawlowska M, Wolynczyk-Gmaj D, Szelenberger W. Validation of the Polish version of the Athens Insomnia Scale. *Psychiatr Pol.* 2011; 45:211–221. [PubMed: 21714210]

- Gatch MB. Ethanol withdrawal and hyperalgesia. *Curr Drug Abuse Rev.* 2009; 2:41–50. [PubMed: 19630736]
- Habrat B. Questionnaire methods in the diagnosis and evaluation of alcohol dependence. *Psychiatr Pol.* 1988; 22:149–155. [PubMed: 3065805]
- Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict.* 1991; 86:1119–1127. [PubMed: 1932883]
- Jakubczyk A, Ilgen MA, Bohnert AS, Kopera M, Krasowska A, Klimkiewicz A, Blow FC, Brower KJ, Wojnar M. Physical pain in alcohol-dependent patients entering treatment in Poland-prevalence and correlates. *J Stud Alcohol Drugs.* 2015; 76:607–614. [PubMed: 26098037]
- James MF, Duthie AM, Duffy BL, McKeag A, Rice MCP. Analgesic effect of ethyl alcohol. *Br J Anaesth.* 1978; 50:139–141. [PubMed: 341934]
- Jochum T, Boettger MK, Burkhardt C, Juckel G, Bar KJ. Increased pain sensitivity in alcohol withdrawal syndrome. *Eur J Pain.* 2010; 14:713–718. [PubMed: 20018536]
- Loree AM, Lundahl LH, Ledgerwood DM. Impulsivity as a predictor of treatment outcome in substance use disorders: review and synthesis. *Drug Alcohol Rev.* 2014; 34:119–134. [PubMed: 24684591]
- Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH posttreatment drinking outcomes. *J Stud Alcohol.* 1997; 58:7–29. [PubMed: 8979210]
- Moos RH, Moos BS. Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction.* 2006; 101:212–222. [PubMed: 16445550]
- Morley S, Eccleston C, Williams A. Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. *Pain.* 1999; 80:1–13. [PubMed: 10204712]
- PARPA. Statystyki: populacje osób, u których występują różne kategorie problemów alkoholowych (dane szacunkowe). 2008.
- Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt impulsiveness scale. *J Clin Psychol.* 1995; 51:768–774. [PubMed: 8778124]
- Potter JS, Prather K, Weiss RD. Physical pain and associated clinical characteristics in treatment-seeking patients in four substance use disorder treatment modalities. *Am J Addict.* 2008; 17:121–125. [PubMed: 18393055]
- Rosenblum A, Joseph H, Fong C, Kipnis S, Cleland C, Portenoy RK. Prevalence and characteristics of chronic pain among chemically dependent patients in methadone maintenance and residential treatment facilities. *JAMA.* 2003; 289:2370–2378. [PubMed: 12746360]
- Selzer ML, Vinokur A, van Rooijen L. A self-administered Short Michigan Alcoholism Screening Test (SMAST). *J Stud Alcohol.* 1975; 36:117–126. [PubMed: 238068]
- Sherbourne CD, Stewart AL. The MOS social support survey. *Soc Sci Med.* 1991; 32:705–714. [PubMed: 2035047]
- Smith, GE.; Ross, RL.; Rost, KM. Psychiatric outcomes module: substance abuse outcomes module (SAOM). In: Sederer, LI.; Dickey, B., editors. *Outcome Assessment In Clinical Practice*. Williams and Wilkins; Baltimore, MD: 1996. p. 85-88.
- Sobell LC, Maisto SA, Sobell MB, Cooper AM. Reliability of alcohol abusers' self-reports of drinking behavior. *Behav Res Ther.* 1979; 17:157–160. [PubMed: 426744]
- Sobell LC, Sobell MB, Leo GI, Cancilla A. Reliability of a timeline method: assessing normal drinkers' reports of recent drinking and a comparative evaluation across several populations. *Br J Addict.* 1988; 83:393–402. [PubMed: 3395719]
- Subramaniam M, Vaingankar JA, Abidin E, Chong SA. Psychiatric morbidity in pain conditions: results from the Singapore Mental Health Study. *Pain Res Manag.* 2013; 18:185–190. [PubMed: 23936892]
- Trafton JA, Oliva EM, Horst DA, Minkel JD, Humphreys K. Treatment needs associated with pain in substance use disorder patients: implications for concurrent treatment. *Drug Alcohol Depend.* 2004; 73:23–31. [PubMed: 14687956]

- Von Korff M, Crane P, Lane M, Miglioretti DL, Simon G, Saunders K, Stang P, Brandenburg N, Kessler R. Chronic spinal pain and physical-mental comorbidity in the United States: results from the national comorbidity survey replication. *Pain*. 2005; 113:331–339. [PubMed: 15661441]
- Witkiewitz K, Vowles KE, McCallion E, Frohe T, Kirouac M, Maisto SA. Pain as a predictor of heavy drinking and any drinking lapses in the COMBINE study and the UK Alcohol Treatment Trial. *Addiction*. 2015; 110:1262–1271. [PubMed: 25919978]
- Woodrow KM, Eltherington LG. Feeling no pain: alcohol as an analgesic. *Pain*. 1988; 32:159–163. [PubMed: 3362554]
- Zawadzki B, Popiel A, Pragłowska E. Charakterystyka psychometryczna polskiej adaptacji Kwestionariusza Depresji BDI-II Aarona Becka. *Psychologia-Etologia-Genetyka*. 2009; 19:71–95.
- Zhabenko N, Wojnar M, Brower KJ. Prevalence and correlates of insomnia in a polish sample of alcohol-dependent patients. *Alcohol Clin Exp Res*. 2012; 36:1600–1607. [PubMed: 22471339]
- Zolnierczyk-Zreda D. The Polish version of the SF-36v2 questionnaire for the quality of life assessment. *Przegl Lek*. 2010; 67:1302–1307. [PubMed: 21591357]

Highlights (for review)

- Relationship between pain and relapse in alcohol-dependent patients was explored.
- Decrease in pain level after treatment was associated with lower risk of relapse.
- Managing pain may be useful in improving treatment outcomes of alcohol dependence.

Table 1

Comparison of patients who relapsed or not after alcohol treatment

	Relapse	No relapse	p value
Moderate or stronger pain at baseline (%)	37.7	33.9	0.619
Moderate or stronger pain at follow up (%)	64.2	44.9	0.018
Decrease in pain level (yes; %)	9.6	28.0	0.008
Gender (%; women)	22.2	27.3	0.47
Childhood sexual abuse (%)	11.1	7.1	0.37
Childhood physical abuse (%)	27.8	31.3	0.64
AA participation (%)	78.0	86.4	0.26
Global impulsivity (BIS total baseline)	72.6 (± 10.2)	70.5 (± 10.1)	0.202
Depressive symptoms (BDI baseline score)	22 (12.5;30)	15 (8;23)	0.002
Sleep problems (AIS baseline score)	8 (4;13)	7 (4;10)	0.112
Education (number of classes)	11.9 $\pm$ 2.3	12.8 $\pm$ 3.1	0.071
Severity of alcohol dependence (MAST)	35.6 $\pm$ 11.0	34.5 $\pm$ 9.0	0.472
Duration of alcohol dependence (years)	19.8 $\pm$ 9.4	19.1 $\pm$ 10.3	0.660
Number of drinking days (last 4 weeks)	10 (0;28)	0 (0;8)	<0.0005
Age	43.2 $\pm$ 10.1	43.8 $\pm$ 9.7	0.724
Nicotine Dependence (FTND baseline)	6.2 $\pm$ 1.9	6.2 $\pm$ 2.2	0.996
Social support (MOSSSS baseline)	57.9 $\pm$ 19.6	64.9 $\pm$ 17.8	0.021
Follow-up period (months)	12 (9;14)	11 (9.5;14)	0.781

Normally distributed values are presented as means and standard deviations (mean $\pm$ SD) and analyzed by analyses of variance.

Non-normal variables are presented as median and quartiles (25;75) and analyzed by independent samples Mann-Whitney U tests.

P values < 0.05 are bolded.

AIS – Athens Insomnia Scale, BDI – Beck Depression Inventory, MAST – Michigan Alcohol Screening Test, FTND – Fagerstrom Test for Nicotine Dependence, MOSSSS – Medical Outcomes Study Social Support Scale

Table 2

Logistic regression analysis for the predictors of relapse after treatment in alcohol dependent patients.

	OR	95%CI	p
Decrease in physical pain during follow up period	0.151	0.04–0.62	0.009
Baseline depressive symptoms (BDI)	1.064	1.02–1.11	0.003
Number of drinking days (4 weeks prior to treatment)	1.065	1.01–1.11	0.007
Baseline social support (MOSSSS)	0.983	0.96–1.01	0.218
Gender	1.405	0.51–3.85	0.509
Age	0.975	0.93–1.02	0.310
Education (number of classes)	0.961	0.81–1.14	0.642

Model:

R square (Nagelkerke) = 0.334

chi square = 34.753; df=7; p<0.0005

MOSSSS — Medical Outcomes Study Social Support Survey, BDI – Beck Depression Inventory 95%CI – 95% confidence interval

p values < 0.05 are bolded