

## Effects Of Cognitive Behaviour Therapy On Anxiety And Alexithymia In Heroin Users

Ashutosh Tiwari<sup>1</sup>, and Sunita Gupta<sup>2</sup>

1. Ashutosh Tiwari, PhD Student, Department of Psychology Guru Nanak Dev University, Amritsar, Punjab – India
2. Prof (Dr.) Sunita Gupta, Professor of Psychology, Department of Psychology Guru Nanak Dev University, Amritsar, Punjab – India  
[ashutoshpsy.rsh@gndu.ac.in](mailto:ashutoshpsy.rsh@gndu.ac.in), [sunita.gupta@gndu.ac.in](mailto:sunita.gupta@gndu.ac.in)

### ABSTRACT

The present research was carried out to find out impact of Cognitive-Behavioral Therapy or CBT on “alexithymia and anxiety” scores in heroin (opioids) addicts. Heroin is a lab-produced, higher-level substance that is made from raw opium, a dried, tar-like black substance that is a dried form of a milky chemical of poppy fruit. The chemical bond between opioids and dopamine receptors in the brain and throughout the central nervous system (CNS) has an immediate effect. A sample of 60 male heroin addicts (mean age: 27.2) was taken from two Substance Dependency Counseling Centres in the Punjab, India. After the subjects took a pre-test and signed a consent form, they were randomly put into one of two groups: I, a control group with 30 people, or II, an experimental group with 30 people. The subjects in the control group were on medications only and did not receive CBT or other interventions. Subjects in Group II, who were also on medication, were given 3 sessions of CBT per week for 30 days (total sessions = 12). Both groups were tested for alexithymia and anxiety symptoms before and after a 30-day period. The results were calculated using a t-test. The findings revealed that heroin addicts in the experimental group experienced a significant ( $p$  value,  $< 0.01$ ) reduction in anxiety and alexithymia mean scores when compared to the control group.

**Keywords:** Cognitive Behaviour Therapy, Anxiety, Heroin Addiction, Alexithymia, Substance Abuse Disorder, Drug Abuse

This research work is focused on testing the effectiveness of CBT to lower the anxiety and alexithymia in heroin users. The term "Alexithymia" came into use during the 1960s, and it has been reported that alexithymia can be a predisposing sign for future mental health issues in person, such as drug dependency, behavioral addiction, and somatic and eating disorders (Taylor, Bagby, and Parker, 1997). Alexithymia refers to the difficulty in detecting and articulating emotions, the inability to differentiate between emotions and physiological sensations, a limiting imagination, and the tendency to think in an externally focused manner (Sifneos, 1973). Drug abuse, which is also called "substance abuse disorder (SUD)," is an acute social and legal issue for governments across the world. "Drug abuse has become one

of the most difficult public health problems in the history of humanity" (Lo, Yeung, and Tam, 2020). Substances have been put into different classes based on their chemical class and the effects of drug abuse. Smith, Hayes, Yolton, Rutledge, and Citek (2002) wrote that "The Drug Recognition Expert" (DRE) has divided drugs into "seven types" based on their long-term effects and medical uses: "central nervous system (CNS) depressants, CNS stimulants, psychedelics (hallucinogens), dissociative anesthetics, inhalants, narcotic analgesics, and cannabis." The opioid category of substances includes raw opium, heroin, methadone, and buprenorphine medicines. In India, heroin has many local names such as "chitta" (white), "maal" (stuff), and "saaman." Heroin can be sniffed or injected, and it has a strong effect on the brain's reward pathways and the whole central nervous system. When heroin is used for a long time, it turns people into addicts and makes them less sensitive to the effects of the drug. Drug abuse-related accidents are the third leading cause of death in Europe and the USA, followed by heart attacks and cancer (Gtzsche, 2014). According to Kulsudjarit (2004), drugs and heroin are a major problem in Southeast Asia. Heroin abuse stands at 20.8% among all kinds of drugs abused in India (Sharma et al. 2017). 78% of people get their first drugs through their friends. According to Beck, Rush, Shaw, and Emery (1979), and King (2002), "The Cognitive Mode state that cognition, behaviour, and feelings are three separate but interrelated components of human behaviour, and these components respond in a reciprocal way; a sudden or planned change in one of these components leads to the initiation of changes in other components of this model. Beck is best known for coming up with "Cognitive Behavior Therapy" (CBT) in the 1960s. This therapy is supported by a lot of research and has been shown to be effective for treating a wide range of problems in both clinical and non-clinical populations. CBT implies that dysfunctional or illogical thoughts can help predict the likelihood of maladaptive behavior and mental health distress (Beck, 2011). Everyone, according to Beck (2011), has a belief system that governs their thoughts and actions, and a person may learn to analyze their thoughts more critically than to just keep behaving as per their intrusive thoughts and make decisions based on their reasonable ideas. Preda and Duneyevich (2012) reported that due to acuteness and complexity of heroin dependency, CBT works better when it is combined with other treatments. CBT has been shown to be effective when used with therapy that is supervised by a doctor, as well as for preventing relapse and helping people get better. Amato (2009) reported that cognitive-behavioral group therapy is a very successful method for addressing the social and psychological aspects of drug addiction. Amato (2009) examined 11 studies involving 1,592 patients and found that when psychosocial treatment was used in combination with medical treatment, irrespective of the type of psychological approach, significantly fewer "drug users" dropped out of treatment programmes, at least for the duration of treatment, and the chance of ongoing drug use and treatment programme abstention declined as well. Anxiety, low mood with "depression," and the use of addictive drugs were strongly & independently linked with cognitive performance in aged males (Paterniti & Alperovitch et al. 1999). Witlox et al. (2022) found that older people (N = 314) with anxiety who received four "face-to-face" CBT sessions (N = 164) significantly improved in anxiety and quality of life on a follow-up after 12 months, and there was no significant difference between CBT and

Acceptance Commitment Therapy (ACT) (N = 150) outcomes, the findings were similar to those of Witlox et al. (2021). A meta-analysis of 12 studies (Gould et al. 2012) found that CBT was more significant at the 6-month follow-up than the 3- or 12-month follow-up studies results when compared with the control group patients' anxiety results, with a small size effect, and that CBT was more significant than "treatment as usual" or "comparing it with the waiting group" in lowering the anxiety score with a follow-up in less than a month (Gould et al. 2012).

Gainsbury and Blaszczynski (2011) stated that online CBT can treat symptoms of anxiety disorders. CBT intervention to people with "spider phobia" (N = 28) resulted in a change in the "anterior cingulate cortex (ACC);" the changes were compared by a pre- and post-3-Tesla-MRI; the ACC is linked with cognitive and emotional functioning. The CBT-based activities excited ACC and helped in the reduction of anxiety associated with spider phobia. A meta-analysis comprising 22 trials using CBT paired with medication, including antidepressants, for anxiety-related disorders such as PTSD and OCD revealed mixed evidence for the persistence of CBT's benefits at follow-up; this study covered a total of 1047 patients, 516 of whom were female (Mataix-Cols & Fernández et al., (2017). Buckner, Morris, and Zvolensky's (2021) study found that induced cannabis and anxiety reduction therapy, or ICART (N = 27), and CBT (N = 28), performed better than the other "gold-standard" psycho-social interventions for cannabis abuse, like MET and CBT (Buckner et al., 2019). McEvoy and Hyett et al. (2022) observed significant within-treatment effect sizes on "social interaction anxiety" in a sample taken from a community health center studied in two treatment groups: "imagery-enhanced CBT" (N = 53) or "verbally-based CBT" (N = 54). Conrod et al. (2008) found that CBT techniques are effective in lowering anxiety sensitivity as a preventative measure for alcohol use disorder (Schmidt et al., 2004; Watt et al., 2006). Buckner et al. (2007) discovered that anxiety sensitivity is positively associated with emotional disorders and SUDs, while distress insensitivity and various aspects of emotion dysregulation moderate their associations (Wolitzky-Taylor et al., 2015, 2022) and may increase the risk of substance use to avoid or alleviate frustration. In fact, a number of these components are linked to drug use as a coping mechanism (Howell et al., 2010; Zvolensky et al., 2012). Therapies targeting emotional aspects in clients, such as 3rd-wave CBT (Kahl et al., 2012), which combines techniques of mindfulness, relaxation, and emotional level psychoeducation therapies (Dialectical Behavior Therapy, DBT; Linehan, 2014), offer hope to reduce alexithymia (Cameron et al., 2015).

Thorberg et al. (2011) identified anxious attachment as a potentially significant cause behind the link between alexithymia and alcohol abuse. Thorberg et al. (2019) discovered that alexithymia enhanced alcohol addiction severity by way of negative mood and alcoholic craving, demonstrating that seeking had an indirect influence on the link between alexithymia and alcohol addiction severity. Morie, Nich, Hunkele, Potenza, & Carroll (2015) concluded, based on a result from a sample of N=121 cocaine-dependent methadone-maintained persons, that those with greater alexithymia values tended to react better to "CBT for CBT" than to therapy as usual. Despite the fact that TAS-20 scores were high in this population, they did not seem to be substantially related to more severe drug use. Alexithymia stayed constant

throughout the course of therapy. Salles, Maturana, Santos, & Mograbi (2022) concocted an empirical and intensive study regarding the efficacy of DBT therapies in treating alexithymia and found DBT to be effective in treating alexithymia. A total of 75 people with major depressive disorder (MDD) were randomly assigned to attend weekly manualized CBT sessions. (Quilty, Taylor, McBride, and Bagby, 2017) The results show that pre-treatment alexithymia is linked to the treatment process and outcome. Patients of alcohol abuse, and high alexithymia benefit equivalently from residential CBT-like therapy as do those with low alexithymia (Haan, Schellekens, Palen, Verkes, Buitelaar, and Jong, 2012).

The main objective of the present study was to examine the effects of CBT on the reduction of Anxiety and Alexithymia symptoms in heroin addicts.

#### Hypotheses

It was hypothesised that CBT will significantly improve the symptoms of anxiety and alexithymia in experimental group

#### METHODOLOGY

**Participants:** For the present study, a sample of 60 male heroin users (age  $\bar{X}$  = 26.9 years, age range = 19 to 38) was taken from two government-approved non-profit "Drug counselling and Rehabilitation Centres" in Amritsar, Punjab, India. The subjects were then randomly divided into two equally groups (N = 30 in each group), namely, a control group and an experimental group. The participants in the first group did not receive any intervention. The participants of the second group were given three weekly sessions (for a month) sessions of CBT which were completed in 30 days. Both groups were assessed on the symptom checklist of "substance abuse disorders (SUD)," Four System Anxiety Questionnaire (FSAQ) by Koksals and Power (1990), and Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994), before and after completion of a 12 sessions CBT for 30 days.

*Inclusion criteria* were literacy; a willingness to participate in CBT treatment.

*Exclusion criteria* were illiteracy; severe mental health problems; and transmissible diseases.

#### Instruments

**Four System Anxiety Questionnaire or FSAQ (Koksals & Power, 1990):** FSAQ is a multimodal 60-item questionnaire that assesses four dimensions of anxiety: such as cognitive anxiety, behavioural anxiety, somatic anxiety, and feeling anxiety. Each dimension contains 15 questions designed to assess one dimension of anxiety. The responses are recorded as "YES" or "NO." The questionnaire is scored by combining the weighted score of every item that is responded as a yes. Each sub-maximum scale's total weightage score is 82.4. The "split-half reliability" coefficients for the full FSAQ test and each anxiety component separately as reported by authors were as for full FSAQ = 0.81 cognitive component ( $r$  coefficient) = 0.81, the feeling component ( $r$  coefficient) = 0.82, the behavioural component ( $r$  coefficient) = 0.68, and the emotional component  $r$  = 0.68.

**Toronto Alexithymia Scale 20 or TAS20 (Bagby, Parker, & Taylor, 1994):** TAS20 is a 20-item scale that measures three dimensions of alexithymia including "difficulty identifying feelings (DIF)," "difficulty in describing feelings (DDF)" and "externally oriented thinking (EOT)." The total score of TAS-20 is called TAS. This test is scored on a "Likert-type-5point

scale.” The scale has an internal consistency reliability coefficient 0.81, and a test-retest reliability coefficient 0.77 as reported by the authors.

**Procedure:** All 60 heroin users, who participated in this study, were already diagnosed with "Opioid Abuse" by the District Hospitals or private hospitals of Punjab, before their admission to the drug counselling rehabilitation centres. Furthermore, these 60 heroin addicts were split into the two groups. Where *Group – 1* is the control group for this research, included 30 heroin addicts who were solely completing their medication prescription, at the rehabilitation centre and were not given any counselling intervention. The *Group – 2* had another 30 heroin addicts, who were given three weekly CBT sessions (for 30 days) along with medication. The psychological case histories and mental health status examinations of all drug users in both the groups were recorded. After taking a detailed psychological workup, all heroin users were assessed on two psychological tools. After the completing of 12-CBT counselling sitting for 30 days for experimental group, a post-assessment was done on both groups. The data were scored as per the instructions given in the manual.

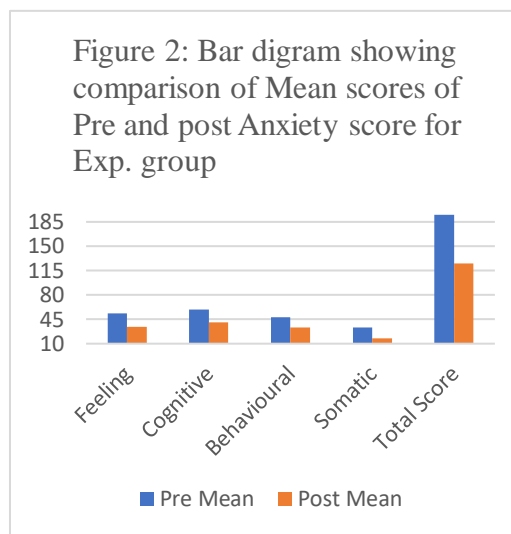
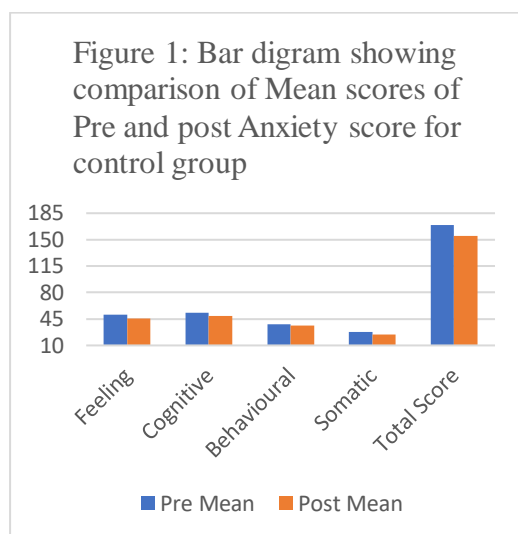
## RESULTS

In present research, the t-test was used to compare pre- and post-mean scores of both groups, in order to determine if the experimental group's (CBT) improved significantly in anxiety and alexithymia scores than control group.

**Table 1:** Means, SDs & t-scores of Anxiety, and its components for both groups

Group	Variable	Mean - (SD) Pre-Test	Mean - (SD) Post Test	t-Score	P Value
Control Group	Feeling	50.400 - (19.714)	45.447 - (19.191)	2.258	.032*
	Cognitive	52.927 - (20.500)	48.837 - (22.409)	2.481	.019*
	Behavioural	38.140 - (17.636)	36.660 - (14.924)	.704	.487
	Somatic	27.557 - (11.714)	24.313 - (12.636)	1.802	.082
	Total Score	169.023 - (54.068)	155.258 - (57.412)	3.098	.004**
Experimental Group	Feeling	53.847 - (14.175)	33.870 - (14.629)	8.219	.001**
	Cognitive	59.137 - (14.135)	40.603 - (14.985)	6.607	.001**
	Behavioural	48.440 - (14.880)	33.000 - (14.237)	5.172	.001**
	Somatic	33.507 - (13.790)	17.463 - (10.143)	7.133	.001**
	Total Score	194.930 - (39.662)	124.937 - (36.060)	9.797	.001**

Here, \* = *p* value is significant at the 0.05 level, and \*\* = *p* value is significant at the 0.01 level.

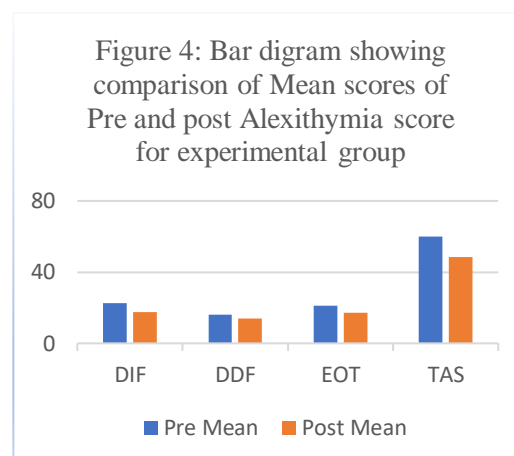
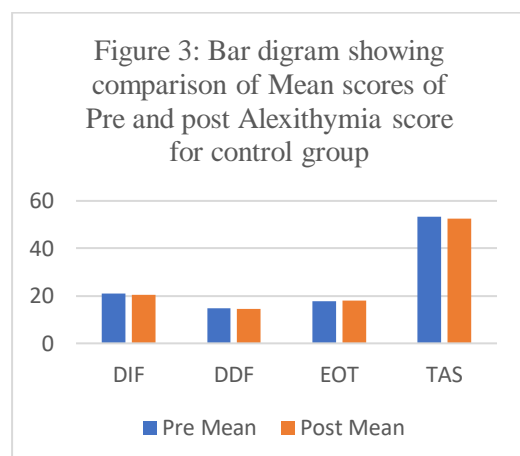


The results mentioned in Table 1, show denote that there is a significant reduction in the scores of total anxiety scores and its components, including feeling, behavioural, cognitive, and somatic, for the subjects in the experimental group who received 12 group sessions of CBT. The table also indicates that there is only a reduction in the cognitive and total anxiety scores for the subjects in the control group, who were not given CBT sessions but were on medical therapy for their drug abuse issue.

**Table 2:** Means, SDs & t-scores of Alexithymia and its components for both group

Group	Variable	Mean - (SD) Pre-Test	Mean - (SD) Post-Test	t-Score	p – Value
Control Group	DIF	20.900 - (4.937)	20.433 - (4.918)	.593	.558
	DDF	14.700 - (3.905)	14.467 - (4.455)	.314	.756
	EOT	17.867 - (4.622)	17.967 - (5.242)	.123	.903
	TAS	53.433 - (9.957)	52.600 - (10.047)	.916	.367
Experimental Group	DIF	22.667 - (4.221)	17.600 - (3.578)	8.462	.001**
	DDF	16.233 - (3.729)	13.833 - (2.817)	3.378	.002**
	EOT	21.067 - (4.025)	17.200 - (3.818)	6.658	.001**
	TAS	59.967 - (8.724)	48.533 - (7.272)	9.626	.001**

Here, \* = p value is significant at the 0.05 level, and \*\* = p value is significant at the 0.01 level



The results mentioned in Table 2, show denote that there is a significant reduction in in the score of alexithymia and its dimensions, “difficulty identifying feeling (DIF)”, “difficulty describing feeling (DDF),” “External Oriented thinking (EOT)” and total alexithymia score (TAS) for the subjects in the “experimental group” who received 12 group sessions of CBT. The table 2, mean score for control group and the graph-3 also indicates that the mean differences of pre-post score of “control group” for all the dimension of alexithymia are insignificant.

## DISCUSSION

This study aimed to see if there was any change in anxiety symptoms and level of alexithymia in male heroin users who received 12 sessions of group CBT as compared to control group participants who were not given any psychological treatment but they had completed their detoxification treatment. For the purpose of the research, a sample of 60 male heroin users was taken from two private (non-profit) drug counselling and rehabilitation centres in Amritsar, Punjab, India. The findings clearly suggest that there is a significant reduction in the symptoms of cognitive, somatic, behavioural, and feeling components of anxiety, and the total score on anxiety among the heroin users in the experimental group who received 12 sessions in CBT. Rector, Katz, Quilty, Laposa, Collimore, & Kay (2019) found that CBT sessions reduced anxiety and other symptoms in people with general anxiety disorder (GAD), agoraphobia, obsessive-compulsive disorder (OCD), and social anxiety disorder (SAD) in a clinical sample (N = 738). The pre and post mean score differences for the total anxiety score, and cognitive dimension of anxiety, of control group participants is also significant, as medicine works by blocking the reward pathway for the drug-cravings and ease withdrawal symptoms, so clients had sufficient time to reason about their drug abuse-related choices. Huang, Li, Cheng, He, Liu, & Ma also (2018) found that when pharmacological therapy was given to cocaine addicted people that targeted the beta mechanism in the brain, it led to the extinction of drug-reward related learning, which is a positive sign of medical therapy for addiction (control group). Kampman (2001) reported that cocaine addicts who were on medication propranolol, shown a significant reduction in the

withdrawal symptoms and anxiety. The results reported in table no. 2 reported that significant reduction was observed on three components (DIF, DDE, and EOT) of alexithymia and total alexithymia score in in the experimental group who received the CBT intervention than the control group who just completed their medical treatment and were not seeking any type of counseling at rehabilitation facility. The pre and post mean score change findings are consistent with those of Maturana, Santos, & Mograbi (2022), and Morie, Nich, Hunkele, Potenza & Carroll (2015) who also found that CBT has been effective in reduction of alexithymia, and Haan et. al. (2012) who reported that patients of alcohol abuse, with high alexithymia benefit similarly to the patients of residential CBT-like therapy, and with low alexithymia, and alexithymia is not a stable trait in drug addicts.

## REFERENCES

- Allen N. B. (2002). Cognitive therapy of depression. Aaron T Beck, A John Rush, Brian F Shaw, Gary Emery. New York: Guilford Press, 1979. The Australian and New Zealand journal of psychiatry. 36(2), 275–278. <https://doi.org/10.1046/j.1440-1614.2002.t01-5-01015.x>
- Amato, L., Minozzi, S., Davoli, M., Vecchi, S., Ferri, M., & Mayet, S. (2009). Psychosocial combined with agonist maintenance treatments versus agonist maintenance treatments alone for treatment of opiate dependence. Cochrane Database of Systematic Reviews, Issue 4(3). <https://doi.org/10.1002/14651858.CD004147>
- Beck, J. S. (2011). Cognitive Behaviour Therapy: Basics and Beyond. (2nd ed.). New York: Guilford Press
- Buckner, J. D., Keough, M. E., & Schmidt, N. B. (2007). Problematic alcohol and cannabis use among young adults: The roles of depression and discomfort and distress tolerance. *Addictive Behaviors*, 32(9), 1957-1963. <https://doi.org/10.1016/j.addbeh.2006.12.019>
- Buckner, J. D., Morris, P. E., & Zvolensky, M. J. (2021). Integrated cognitive-behavioral therapy for comorbid cannabis use and anxiety disorders: The impact of severity of cannabis use. *Experimental and clinical psychopharmacology*, 29(3), 272–278. <https://doi.org/10.1037/pha0000456>
- Buckner, J. D., Zvolensky, M. J., Ecker, A. H., Schmidt, N. B., Lewis, E. M., Paulus, D. J., Lopez-Gamundi, P., Crapanzano, K. A., & Bakhshaie, J. (2019). Integrated cognitive behavioral therapy for comorbid cannabis use and anxiety disorders: A pilot randomized controlled trial. *Behaviour research and therapy*, 115, 38–45. <https://doi.org/10.1016/j.brat.2018.10.014>



Bujarski, S. J., Norberg, M. M., & Copeland, J. (2012). The association between distress tolerance and cannabis use-related problems: The mediating and moderating roles of coping motives and gender. *Addictive behaviors*, 37(10), 1181-1184.

Cameron, K., Ogrodniczuk, J., & Hadjipavlou, G. (2014). Changes in alexithymia following psychological intervention: A review. *Harvard Review of Psychiatry*, 22(3), 162–178. <https://doi.org/10.1097/HRP.0000000000000036>

Cassin, S., Leung, S., Hawa, R., Wnuk, S., Jackson, T., & Sockalingam, S. (2020). Food Addiction Is Associated with Binge Eating and Psychiatric Distress among Post-Operative Bariatric Surgery Patients and May Improve in Response to Cognitive Behavioural Therapy. *Nutrients*, 12(10), 2905. <https://doi.org/10.3390/nu12102905>

de Haan, H. A., Schellekens, A. F., van der Palen, J., Verkes, R. J., Buitelaar, J. K., & De Jong, C. A. (2012). The level of alexithymia in alcohol-dependent patients does not influence outcomes after inpatient treatment. *The American journal of drug and alcohol abuse*, 38(4), 299–304. <https://doi.org/10.3109/00952990.2012.668597>

Gainsbury S, Blaszczynski A. (2011). A systematic review of Internet-based therapy for the treatment of addictions. *Journal of Clinical Psychology Review*. 31: 490–498.

Götzsche P. C. (2014). Our prescription drugs kill us in large numbers. *Polskie Archiwum Medycyny Wewnętrznej*. 124(11), 628–634. <https://doi.org/10.20452/pamw.2503>

Gould, R. L., Coulson, M. C., & Howard, R. J. (2012). Efficacy of cognitive behavioral therapy for anxiety disorders in older people: a meta-analysis and meta-regression of randomized controlled trials. *Journal of the American Geriatrics Society*, 60(2), 218–229. <https://doi.org/10.1111/j.1532-5415.2011.03824.x>

Howell, A. N., Leyro, T. M., Hogan, J., Buckner, J. D., & Zvolensky, M. J. (2010). Anxiety sensitivity, distress tolerance, and discomfort intolerance in relation to coping and conformity motives for alcohol use and alcohol use problems among young adult drinkers. *Addictive behaviors*, 35(12), 1144-1147.

Huang, B., Li, Y., Cheng, D., He, G., Liu, X., & Ma, L. (2018).  $\beta$ -Arrestin-biased  $\beta$ -adrenergic signaling promotes extinction learning of cocaine reward memory. *Science signaling*, 11(512), eaam5402. <https://doi.org/10.1126/scisignal.aam5402>

Kahl, K. G., Winter, L., & Schweiger, U. (2012). The third wave of cognitive behavioural therapies: What is new and what is effective? *Current Opinion in Psychiatry*, 25(6), 522–528. <https://doi.org/10.1097/YCO.0b013e328358e531>

Kampman, K. M., Volpicelli, J. R., Mulvaney, F., Alterman, A. I., Cornish, J., Gariti, P., Cnaan, A., Poole, S., Muller, E., Acosta, T., Luce, D., & O'Brien, C. (2001). Effectiveness of propranolol for cocaine dependence treatment may depend on cocaine withdrawal symptom severity. *Drug and alcohol dependence*, 63(1), 69–78. [https://doi.org/10.1016/s0376-8716\(00\)00193-9](https://doi.org/10.1016/s0376-8716(00)00193-9)

King R. (2002). Cognitive therapy of depression. Aaron Beck, John Rush, Brian Shaw, Gary Emery. New York: Guilford, 1979. *The Australian and New Zealand journal of psychiatry*. 36(2), 272–275. <https://doi.org/10.1046/j.1440-1614.2002.t014-01015.x>

Koksal, F., & Power, K. G. (1990). Four Systems Anxiety Questionnaire (FSAQ): a self-report measure of somatic, cognitive, behavioral, and feeling components. *Journal of personality assessment*, 54(3-4), 534–545. <https://doi.org/10.1080/00223891.1990.9674018>

Kulsudjarit K. (2004). Drug problem in southeast and southwest Asia. *Annals of the New York Academy of Sciences*, 1025, 446–457. <https://doi.org/10.1196/annals.1316.055>

Linehan, M. M. (2014). *DBT skills training manual*. Guilford Publications

Lipka, J., Hoffmann, M., Miltner, W. H., & Straube, T. (2014). Effects of cognitive-behavioral therapy on brain responses to subliminal and supraliminal threat and their functional significance in specific phobia. *Biological psychiatry*, 76(11), 869–877. <https://doi.org/10.1016/j.biopsych.2013.11.008>

Lo, T. W., Yeung, J. W. K., & Tam, C. H. L. (2020). Substance Abuse and Public Health: A Multilevel Perspective and Multiple Responses. *International journal of environmental research and public health*. 17(7), 2610. <https://doi.org/10.3390/ijerph17072610>

Mataix-Cols, D., Fernández de la Cruz, L., Monzani, B., Rosenfield, D., Andersson, E., Pérez-Vigil, A., Frumento, P., de Kleine, R. A., Difede, J., Dunlop, B. W., Farrell, L. J., Geller, D., Gerardi, M., Guastella, A. J., Hofmann, S. G., Hendriks, G. J., Kushner, M. G., Lee, F. S., Lenze, E. J., Levinson, C. A., ... Thuras, P. (2017). D-Cycloserine Augmentation of Exposure-Based Cognitive Behavior Therapy for Anxiety, Obsessive-Compulsive, and Posttraumatic Stress Disorders: A Systematic Review and Meta-analysis of Individual Participant Data. *JAMA psychiatry*, 74(5), 501–510. <https://doi.org/10.1001/jamapsychiatry.2016.3955>

McDuffie, Angie K. (2012). Treatment For Persons with Heroin Addiction. Research Papers. Southern Illinois University Carbondale. Paper 224. [http://opensiuc.lib.siu.edu/g\\_s\\_rp/224](http://opensiuc.lib.siu.edu/g_s_rp/224)

McEvoy, P. M., Hyett, M. P., Bank, S. R., Erceg-Hurn, D. M., Johnson, A. R., Kyron, M. J., Saulsman, L. M., Moulds, M. L., Grisham, J. R., Holmes, E. A., Moscovitch, D. A., Lipp, O. V., Campbell, B. N. C., & Rapee, R. M. (2022). Imagery-enhanced v. verbally-based group cognitive behavior therapy for social anxiety disorder: a randomized clinical trial. *Psychological medicine*, 52(7), 1277–1286. <https://doi.org/10.1017/S0033291720003001>

Morie KP, Nich C, Hunkele K, Potenza MN, Carroll KM. Alexithymia level and response to computer-based training in cognitive behavioral therapy among cocaine-dependent methadone maintained individuals. *Drug Alcohol Depend.* 2015 Jul 1;152:157-63. doi: 10.1016/j.drugalcdep.2015.04.004. Epub 2015 Apr 27. PMID: 25982006; PMCID: PMC4458169

Norman, H., Marzano, L., Coulson, M., & Oskis, A. (2019). Effects of mindfulness-based interventions on alexithymia: A systematic review. *Evidence-Based Mental Health*, 22(1), 36–53. <https://doi.org/10.1136/ebmental-2018-300029>

Paterniti, S., Dufouil, C., Bisserbe, J. C., & Alperovitch, A. (1999). Anxiety, depression, psychotropic drug use and cognitive impairment. *Journal of Psychological Medicine*. 29(2), 421-428.

Preda, A., & Dunayevich, E. (2012, January). Opioid abuse treatment and management. Retrieved from: <http://emedicine.medscape.com/article/287790-treatment>

Quilty, L. C., Taylor, G. J., McBride, C., & Bagby, R. M. (2017). Relationships among alexithymia, therapeutic alliance, and psychotherapy outcome in major depressive disorder. *Psychiatry research*, 254, 75–79. <https://doi.org/10.1016/j.psychres.2017.04.047>

Rector, N. A., Katz, D. E., Quilty, L. C., Laposa, J. M., Collimore, K., & Kay, T. (2019). Reassurance seeking in the anxiety disorders and OCD: Construct validation, clinical correlates and CBT treatment response. *Journal of anxiety disorders*, 67, 102109. <https://doi.org/10.1016/j.janxdis.2019.102109>

Salles, B. M., Maturana de Souza, W., Dos Santos, V. A., & Mograbi, D. C. (2022). Effects of DBT-based interventions on alexithymia: a systematic review. *Cognitive*

behaviour therapy, 1–22. Advance online publication.  
<https://doi.org/10.1080/16506073.2022.2117734>

Schmidt, N. B., & Trakowski, J. (2004). Interoceptive assessment and exposure in panic disorder: A descriptive study. *Cognitive and Behavioral Practice*, 11(1), 81-92.  
[https://doi.org/10.1016/S1077-7229\(04\)80010-5](https://doi.org/10.1016/S1077-7229(04)80010-5)

Sharma, B., Arora, A., Singh, K., Singh, H., Kaur, P. Drug abuse: Uncovering the burden in rural Punjab. *Journal of Family Medicine and Primary Care*. 2017 Jul-Sep;6(3):558-562. <https://doi.org/10.4103/2249-4863.222037> PMID: 29417008; PMCID: PMC5787955.

Sifneos, P. E. (1973). The prevalence of 'alexithymic' characteristics in psychosomatic patients. *Psychotherapy and psychosomatics*, 22(2-6), 255-262.

Smith, J. A., Hayes, C. E., Yolton, R. L., Rutledge, D. A., & Citek, K. (2002). Drug recognition expert evaluations are made using limited data. *Forensic science international*. 130(2-3), 167–173. [https://doi.org/10.1016/s0379-0738\(02\)00384-5](https://doi.org/10.1016/s0379-0738(02)00384-5)

Stewart, S.H., Conrod, P.J. (2008). Anxiety Disorder and Substance Use Disorder Co-Morbidity: Common Themes and Future Directions. In: Stewart, S.H., Conrod, P.J. (eds) *Anxiety and Substance Use Disorders*. Series in Anxiety and Related Disorders. Springer, Boston, MA. [https://doi.org/10.1007/978-0-387-74290-8\\_13](https://doi.org/10.1007/978-0-387-74290-8_13)

Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (1997). Disorders of affect regulation: Alexithymia in medical and psychiatric illness. Cambridge University Press.  
<https://doi.org/10.1017/CBO9780511526831>

Thorberg, F. A., Young, R. M., Hasking, P., Lyvers, M., Connor, J. P., London, E. D., Huang, Y. L., & Feeney, G. F. X. (2019). Alexithymia and Alcohol Dependence: The Roles of Negative Mood and Alcohol Craving. *Substance use & misuse*, 54(14), 2380–2386. <https://doi.org/10.1080/10826084.2019.1650773>

Thorberg, Fred & Young, Ross & Sullivan, Karen & Lyvers, Michael & Connor, Jason & Feeney, Gerald. (2011). Alexithymia, craving and attachment in a heavy drinking population. *Addictive behaviors*. 36. 427-30. [10.1016/j.addbeh.2010.12.016](https://doi.org/10.1016/j.addbeh.2010.12.016).

Watt, M., Stewart, S., Birch, C., & Bernier, D. (2006). Brief CBT for high anxiety sensitivity decreases drinking problems, relief alcohol outcome expectancies, and conformity drinking motives: Evidence from a randomized controlled trial. *Journal of Mental Health*. 15(6), 683-695.

Witlox M, Garnefski N, Kraaij V, de Waal MWM, Smit F, Bohlmeijer E, Spinhoven P. Blended Acceptance and Commitment Therapy Versus Face-to-face Cognitive Behavioral Therapy for Older Adults With Anxiety Symptoms in Primary Care: Pragmatic Single-blind Cluster Randomized Trial. *J Med Internet Res*. 2021 Mar 26;23(3):e24366. <https://doi.org/10.2196/24366> PMID: 33769293; PMCID: PMC8088844.

Witlox, M., Kraaij, V., Garnefski, N., Bohlmeijer, E., Smit, F., & Spinhoven, P. (2022). Cost-effectiveness and cost-utility of an Acceptance and Commitment Therapy intervention vs. a Cognitive Behavioral Therapy intervention for older adults with anxiety symptoms: A randomized controlled trial. *PloS one*, 17(1), e0262220. <https://doi.org/10.1371/journal.pone.0262220>

Wolitzky-Taylor, K., Glasner, S., Tanner, A., Ghahremani, D. G., & London, E. D. (2022). Targeting maladaptive reactivity to negative affect in emerging adults with cannabis use disorder: A preliminary test and proof of concept. *Behaviour Research and Therapy*, 150, 104032. <https://doi.org/10.1016/j.brat.2022.104032>

Wolitzky-Taylor, K., Guillot, C. R., Pang, R. D., Kirkpatrick, M. G., Zvolensky, M. J., Buckner, J. D., & Leventhal, A. M. (2015). Examination of anxiety sensitivity and distress tolerance as transdiagnostic mechanisms linking multiple anxiety pathologies to alcohol use problems in adolescents. *Alcoholism: Clinical and Experimental Research*. 39(3), 532-539.

World Health Organization., (2019). ICD-11: International classification of diseases. (11th revision). Geneva: WHO.