Table 2 The critical appraisal of the articles retrieved

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| **Article**  | **Year of publication** | **Authors**  | **Participants**  | **Sample size** | **Evidence of research**  | **Intervention**  | **Comparison** | **Outcome** | **Attrition** | **Treatment period** | **Follow up (FU)** | **Quality of research** |
| Slow and steady wins the race: A randomized clinical trial (RCT) of acceptance and commitment therapy targeting shame in substance use disorders [1] | 2012 | LuomaJB, Kohlenberg BS, Hayes SC, Fletcher L. | People with substance use disorder (SUD) coming to a treatment clinic | 133 | Level 1 evidenceRCT | ACT | Treatment as usual (TAU) | Decrease in shame and substance abuse; Increase in participation in treatment. The decrease in substance use was statistically significant P = .002. | 11% post-assessment of the intervention group and 44% at 4 months Follow up (FU) | three 2 hours session per week for 28 days | 4 months | Level CSmall sample size, therefore, lack of generalizability affecting external validity; lack of blinding leading to Hawthorne effect which will threaten the internal validity of the study; The lack of blinding can also make the treatment group receive special care and introduce bias in reporting |
| Randomized, controlled pilot trial of a smartphone app for smoking cessation using acceptance and commitment therapy [2] | 2014 | Bricker JB, Mull KE, Kientz JA, Vilardaga R, Mercer L D, AkiokaKJ, Heffner JL. | Participant who smoke | 196 | Level 1 (pilot study)RCT | ACT on a smartphone | Smokefree.gov Smartphone App | Decrease cigarette smoking in the smartphone app for smoking cessation. The difference was statistically significant 13% (95% at a confidence interval of : 6%-22%) in SmartQuit and 8% (95% at a confidence interval of: 3%-16%) in QuitGuide (OR = 2.7; 95% CI = 0.8-10.3) | 16% at 2 months FU | 2 months | 2 months | Level CSmall sample size lack of generalizability which can affect the external validity of the study; lack of blinding which can lead to treatment effects and reporting bias both affecting the internal validity of the study |
| Acceptance and commitment therapy versus cognitive-behavioral therapy in the treatment of substance use disorder with incarcerated women [3] | 2014 | Lanza PV, Garcia PF, Lamelas FR, Gonzalez-Menedez A. | Incarcerated women with SUD | 50 | Level 1 | ACT | CBT | Reduction in use of the substance on follow up treatment by the patient with ACT(27.8 %) rather than CBT(15.8%) which was statistically significant. P value = .000 post treatment and ACT (43.8%) and CBT ( 26.7%) at 6 months follow up | 12.5% at 6 months FU  | 16 weeks | 6 months | Level C small sample size and so lack of generalizability |
| Long-term outcomes of Acceptance and Commitment Therapy in drug-dependent female inmates: A randomized controlled trial [4] | 2014 | Gonzalez-Menendez A, Fernandez P, Rodriguez F, Villagra P. | Incarcerated women who are drug dependent  | 37 | Level 1 RCT | ACT | CBT | Reduction in substance abuse long term for ACT than CBT. Difference was statistically significant in the ACT group (Q3 = 15.343, p = .002) | 77.8% Attrition at 18 months follow up | - Not stated  | 18 months | Level C small sample size and large attrition rate |
| A stage I pilot study of acceptance and commitment therapy for methadone detoxificationAL Stotts, C Green, A Masuda, J Grabowski… - Drug and alcohol [5] | 2012 | Stotts A, Green C, Masuda A, Grabowski J, Wilson K, Northrup T, Moeller F G, Schmitz J. | People with a methadone use disorder | 56 | Level 1 RCT (pilot study) | ACT | Drug Counselling (DC) | No statistically significant difference in the rate of opioid use during the treatment P = 0.17. Increase rate of completion for the ACT vs the regular drug counseling | 40 % at 6 months  | 24 individual session | 24 weeks | Level C small sample size and large attrition making generalizability difficult |
| Acceptance and commitment therapy in the treatment of alcohol use disorder and comorbid affective disorder: a pilot matched control trial [6] | 2015 | Thekiso TB, Murphy P, Milnes J, Lambe K, Curtin A, Conor KF. | People with an alcohol use disorder | 56 | Level 2 quasi RCT | ACT | TAU | There was a statistically significant change in the cumulative abstinence duration in the ACT group more than the CBT group, P= 0.022 There was also an improvement in drinking, craving, depression, anxiety in the ACT combo | No attrition in the ACT group | 4 weeks of 5 sessions per week | 6 months | Level C small sample size, therefore, lack of generalizability |
| Acceptance and commitment therapy smoking cessation treatment for veterans with posttraumatic stress disorder: a pilot study [7] | 2014 | Kelly MM, Sido H, Forsyth JP, Ziedonis DM, Kalman D, Cooney JL | Veterans who smoke | 19 | Level 2 ( quasi-experimental- prospective study); a pilot study | ACT + Nicotine therapy  | None  | ACT led to a reduction in smoking. Statistical significance was not stated | 26 % attrition | 8 weeks of ACT and 9 weeks of Nicotine therapy | 3 months  | Level c – small sample size conclusions cannot be drawn |
| Web-based acceptance and commitment therapy smoking cessation treatment for smokers with depressive symptoms [8 | 2015 | Jones HA, Heffner JL, Mercer L, Wyszynski CM, Vilardaga R Bricker JB. | Smokers with depression | 98 | Level 1 RCT (preliminary)  | ACT (WebQuit.org) | Smokefree.gov. | No statistically significant difference between the web-based ACT and another web-based program for smoking cessation P = .42 | 52 % Attrition rate | Self-paced | 3 months | Level c (small sample size cannot be generalized)High attrition rate |
| A pilot randomized controlled trial of web-based acceptance and commitment therapy for smoking cessation [9] | 2013 | Bricker J, Wyszynski C, Comstock B, Heffner JL | smokers  | 111 | Level 1 RCT (Pilot study ) same as the web ACT for smokers with depression same population | WebQuit.org) | Smokefree.gov | Reduction in smoking with the ACT group. Though not statistically significant P = .42 may have been due to the small sample size | 46% attrition rate | Self-paced |  3 months | Level c small sample size |
| Acceptance and Commitment Therapy for drug abuse in incarcerated women [8] | 2013 | Lanza P V, Gonzalez-Mendez A,  | Incarcerated women with drug abuse problems | 36 | Level 1 RCT | ACT | Waiting list | Reduction in smoking with the ACT group. Though not statistically significant P = .42 may have been due to the sample size | Not stated | 16 session | 6 months | Level C small sample size not generalizable |
| Randomized trial of telephone-delivered acceptance and commitment therapy versus cognitive behavioral therapy for smoking cessation: a pilot study [6] | 2014 | Bricker JB, Bush T, Zbikowski SM, Mercer L D, Heffner JL. | Smokers | 121 | Level 1 RCT- Pilot study | ACT | CBT | A decrease in craving for cigarettes. This difference was statistically significant in the group that reported low acceptance in of craving P = .02 | Not stated | 5 session on the phone and weeks of NRT | 30 days | Level C small sample size not generalizable |
| A controlled trial of acceptance and commitment therapy for addiction severity in methamphetamine users: Preliminary study [2] | 2017 | Bahrami S, Asghari F. | Methamphetamine users | 30 | Level 2 Semi- experimental | ACT | Waiting list | Reduction in addiction and increase in psychological flexibility which was statistically significant P less than .05 | stated | 12 session of weekly 40 to 60 minutes | Not stated | Level C small sample size, uni substance abuse, results cannot be generalized Only Methamphetamine males |
| Acceptance and commitment therapy for co‐occurring posttraumatic stress disorder and alcohol use disorders in veterans: Pilot treatment outcomes [10] | 2018 | Meyer EC, Walser R, Hermann B, Bash HL, DeBeer BB, Kimbrel NA, Kwok O, Batten SV, Schnurr PP. | Veterans with PTSD and AUD | 43 | Level 2 – Uncontrolled experimental study | ACT | none | Reduction in addiction and increase in psychological flexibility which was statistically significant P less than .05 | 33% | 10 – 12 session | 3 months | Level C; small sample size No comparison group; relying on self-reporting  |
| The effects of acceptance and commitment therapy on man smokers' comorbid depression and anxiety symptoms and smoking cessation: A randomized …[8] | 2017 | Davoudi M, OmidiA, Sehat M, Sepehrmanesh Z,  | Male smokers with comorbid depression and anxiety symptoms | 70 | Level 1 double-blinded RCT- a pilot study | ACT | Psychological counseling | Increased rate of smoking cessation and decreased rate of depression and anxiety which is statistically significant ACT( 18%) versus Physiological counselling (9%) P less than .050 |  | 8 sessions | 1 and 6 weeks | Level C – a few samples and inability to generalize the study |
| Acceptance and Commitment Therapy and nicotine patch for smokers with bipolar disorder: preliminary evaluation of in‐person and telephone‐delivered treatment [11] | 2015 | Heffner JL, Mull KE, Anthenelli RM, Bricker JB. | Smokers with bipolar disorder | 16 | Level 1 RCT – a preliminary study | In-person ACT + Nicotine  | Telephonic ACT and nicotine  | Increase smoking cessation in the in-person group than the telephonic group. The difference is not statistically significant, but p value not stated | 20 % attrition in the in-person soul | 10 sessions  | 1 month | Level C- small sample size and inability to generalize the conclusion  |
| Single-arm trial of the second version of an acceptance & commitment therapy smartphone application for smoking cessation [3] | 2016 | Bricker JB, Copeland W, Mull KE, Zeng EY.  | Smokers  | 99 | Level 2 single-arm trial | SmartQuit 2.0 | None  | Decrease smoking, which was not statistically significant, P = .127 | 15 % attrition | Self-paced | 30 days  | Level C few sample sizes and inability to generalize |
| A randomized controlled trial of a mindfulness and acceptance group therapy for residential substance use patients [10] | 2017 | Shorey RC, Elmquist J, Gawrysiak MJ,  | People for residential substance use treatment  | 111 | Level 1 RCT  | Mindfulness and ACT  | TAU | Decrease smoking, which was not statistically significant , P = .127 | No attrition in the treatment group | 8 twice weekly, 1.5-hour, group sessions | Nofollow up | Level C small sample size and lack of follow up of the patients after the treatment |
| Formative, multimethod case studies of learn to quit, an acceptance and commitment therapy smoking cessation app designed for people with serious mental illness [12] | 2019 | Vilardaga R, Rizo J, RriesRK, Kientz JA. | Smokers | NA | Level 2 case series | Learn to Quit | QuitGuide | Decrease smoking, which was not statistically significant , P = .127 | Not stated  | Not stated | Not stated | Level C few sample sizes  |
| Acceptance and Commitment Therapy and Motivational Interviewing in the Treatment of Alcohol Use Disorder in a College Woman: A Case Study [13] | 2019 | Ehman AC. | Woman with an alcohol use disorder | 1 | Level 2 – case study  | ACT and Mindfulness intervention | none | Reduction in alcohol consumption in the patient. The statistical significance was not stated. |  | None  | None  | Level C- Few sample sizes cannot be generalized |
| Pilot Randomized Controlled Trial of Web-Delivered Acceptance and Commitment Therapy Versus Smokefree. gov for Smokers with Bipolar Disorder [12] | 2019 | Heffner, J.L., Kelly, M.M., Waxmonsky, J., Mattocks, K., Serfozo, K., Bricker, J.B., Mull, K.E, Watson, N.L., &Ostacher, M. | Bipolar patients who are smokers | 51 | Level RCT- trial design  | ACT | Smokefree. | Increased promising acceptability and cessation. Statistical significance not stated. | 20% | 10 weeks  | 1 month | Level C few sample sizes  |
| Randomized Controlled Trial of a Smartphone Application as an Adjunct to Acceptance and Commitment Therapy for Smoking Cessation [13] | 2020 | O’Connor, M., Whelan, R., Bricker, J., & McHugh, L. | Smokers | 150 | Level 1 – RCT  | ACT  | Smartquit, | Reduction of smoking in the non-abstinent group that was statistically significant P less than .001 | 11.33% posttreatment  | 6 weekly 90 minutes session |  | Level C; small sample size |
| Responding to tobacco craving: an experimental test of acceptance versus suppression.[10] | 2012 | Litvin, E.B., Kovacs, M.A., Hayes, P.L., Brandon, T.H. | smokers | 162 | Level 1 - RCT | ACT in one group, Suppression on another group | No intervention for the third control group | No statistically significant difference between the ACT and the Suppression group | 35% attrition in the ACT group | One day | 3 days | Level C- small sample size, high attrition, and lack of blinding may all introduce bias. |

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