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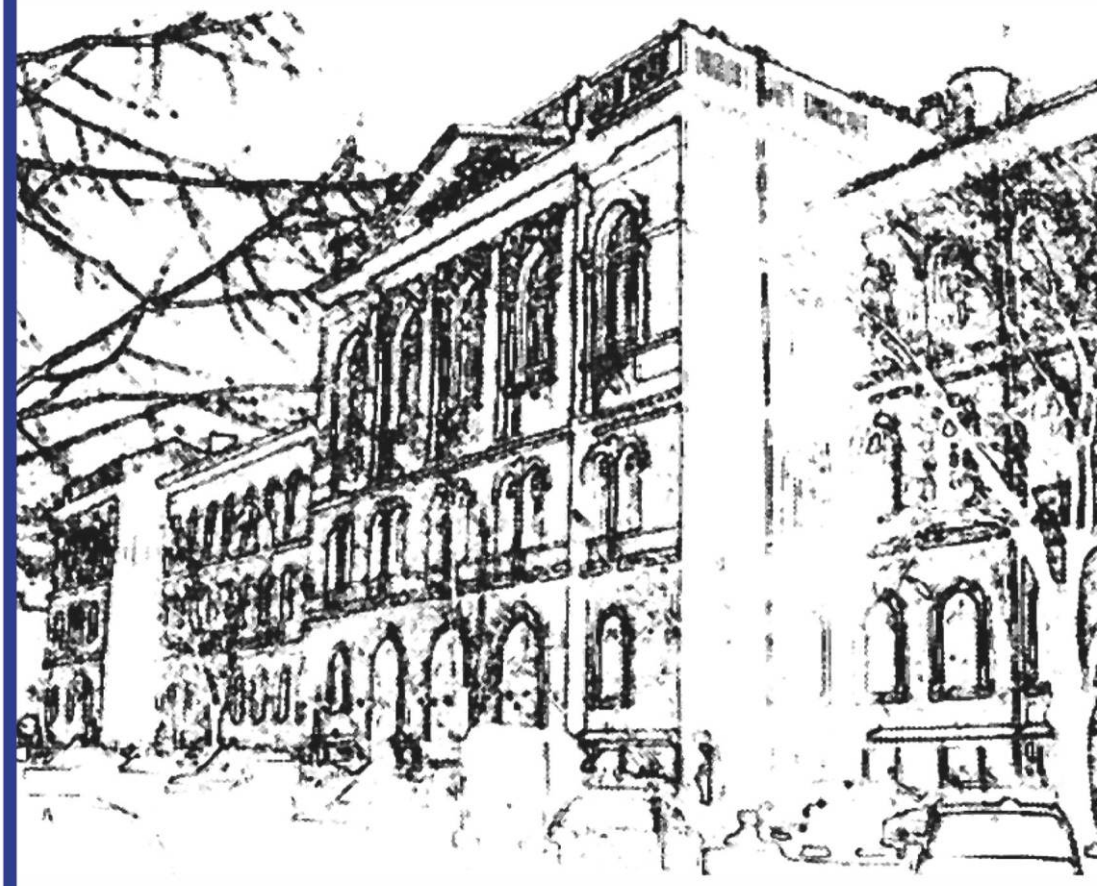

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**Journal of Evidence-Based Psychotherapies** is the successor of the Journal of Cognitive and Behavioral Psychotherapies (2001-2013) and is published biannually (in March and September) in one volume per year by the International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health. The journal is devoted to the advancement of the clinical theory and practice of evidence-based psychotherapies (EBP) (e.g., evidence-based psychological assessments, evidence-based psychological treatments). The journal publishes original papers dealing with EBP and psychology, psychiatry, the medical and mental specialties, and allied areas of science. Submissions include (1) articles referring to clinical and experimental studies, discussions of theory, and systematic reviews for inclusion in Article Section, (2) articles referring to clinical discussions/developments for inclusion in the Clinical Forum Section, and (3) commentaries, letters to the editor, reviews and abstracts of books, tapes, and films, salient findings in EBP, and other information relevant to the journal's goal for inclusion in the Development and Resources Section. Finally, the journal seeks to publish special issues devoted to topics of particular interest, suggestions for which are welcomed by the Editor.

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*ARTICLES SECTION*

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# PSYCHO-SOCIAL INTERVENTION FOR MANAGING DEPRESSION AMONG OLDER ADULTS – A META-ANALYSIS

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**Abstract**

Depression is the most frequent mental health problem in older people, and it's tough to manage because of late-life health issues and cognitive impairment. The study aim to investigate the efficacy of psycho-social intervention for managing depression in older adults and to explore whether types of interventions, specific aspects of the study, and research participants moderate the magnitude of the effectiveness of interventions. we searched different database and followed PRISMA guidelines. Include studies from 2001 to 2021 conducted among the elderly population aged 60 and above. The quality assessment technique developed by the Cochrane Collaboration was used to look for potential sources of bias. Comprehensive meta-analysis is used to analysing effect size. It is found that Psychosocial interventions are effective in reducing depression among older adults. The overall intervention effect size (hedges' g) was found to be 1.118 (95% CI: 0.835-1.402), significant at the 0.0001 level. Based on subgroup analysis it is clear that experimental design and severity of depression do not play changes in the effect size of intervention but cognitive impairments can influence the intervention effectiveness.

**Keywords:** Psycho-social intervention, Depression, older-adults, Meta- analysis.

The process of becoming old or obtaining the appearance and traits of old age is referred to as the ageing process. Ageing is an objectively defined process that begins at birth and is defined by the chronological age criterion. Behavioral and self-

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perception changes, as well as reactions to bodily changes, are all signs of ageing. Aging, in its most basic sense, relates to a person's ability to function in society. The term "older people" refers to those who are 60 years or older. Some people, however, live for more than 100 years. In most developed countries, the term "elderly" refers to those who are 65 years old or older, with those 65 to 74 years old referred to as "early elderly" and those above 75 years old referred to as "late elderly."

There are 600 million people over the age of 60 in the world today. By 2025, the elderly population will have more than doubled. Longer lives provide opportunities for elderly persons and their families, as well as for society as a whole. Additional years allow exploring new interests, such as higher education, a new career, or pursuing a long-neglected passion. Older individuals contribute to their families and communities in a variety of ways. In actuality, elderly persons contribute significantly to society. Health and social care expenditures for the elderly are an investment rather than a cost. These investments benefit older persons while also benefiting society as a whole. The scope of these opportunities and contributions, however, completely depends on their health. Nowadays researchers gave importance to older people above 60, and those researches are more related to their mental health issues. Especially depression, anxiety, insomnia, cognitive change, and degenerative disorders. A vast amount of intervention studies is published in the area. Intervention studies for the treatment of depression have received a lot of attention in recent years. Psychotherapy and psycho-social treatment is the most common nonpharmacological intervention for depression. The current study focuses on the effectiveness of non-pharmacological interventions such as psychotherapy and other psycho-social intervention for managing depression.

Many meta-analysis studies show that psychological interventions are effective for managing depression in adult population. Based on the previous meta-analysis, well established effective intervention includes cognitive behaviour therapy (Cuijpers et al., 2013), interpersonal psychotherapy (Cuijpers et al., 2011), brief psychodynamic therapy (Driessen et al., 2010), behavioural activation therapy (Ekers, Richards & Gilbody, 2008), problem-solving therapy (Malouff, Thorsteinsson & Schutte, 2007), and non-directive supportive counselling (Cuijpers et al., 2012). These studies focused on the effectiveness of specific interventions. Several reviews also summarized the existing evidence for psychological treatment for managing depression. There has been limited evidence indicating psychological intervention efficacy for managing depression among older adults. Depression is more chronic in elderly people than it is in younger people. Depression in older adults is difficult to manage due to its chronic nature such as medical condition,

cognitive impairment, loss, and grief, decreasing social support and so on. Weak health conditions and cognitive impairments are common in the elderly population. Psychotherapies and psycho-social intervention may be less effective in older adults than in the younger and middle adult population. The focus of this study was to understand the efficacy of non-pharmacological intervention for older adults.

Pinquart, Duberstein and Lyness, (2006) conducted a meta-analytic comparison of pharmacotherapy and psychotherapy, investigated the effects of psychotherapy and other behavioural therapies on clinically depressed older persons. Psychotherapeutic treatments for older depressed people (Wilson, Mottram & Vassilas, 2008), Cognitive behavioural therapy for depression (Gould, Coulson & Howard, 2012) reveal the development of research work in this area. Previous meta-analysis mostly focuses on the specific type of psychotherapy only, such as behavioural therapy (Samad, Brealey & Gilbody,2011), reminiscence interventions (Pinquart & Forstmeier,2012), group psychotherapy (Krishna eta al., 2011), cognitive behavioural therapy (Gould, Coulson, & Howard,2012). Many intervention studies for older adults are reporting day by day. Hence, decided to conduct meta-analysis by incorporating newly published studies and to investigate the effectiveness of the psycho-social intervention. The study also focusses on the subgroup analysis to understand the moderating effect of intervention type, selected design, and the difference in the effectiveness of the psycho-social intervention on clinical population, non-clinical population but having mild to moderate depression symptoms, and the cognitively impaired depressed elderly. In these subgroup analyses, we can investigate whether specific study characteristics, such as different types of psychotherapy, experimental design, depression severity in the sample population, and the presence of cognitive impairment are associated with higher or lower effect sizes.

*Objective*

To examine the efficacy of psychosocial treatments for the management of depression in older people and also to investigate whether there are any differences in the efficacy of psychotherapy and other psychosocial treatments for the management of depression in older people based on intervention type, selected design in the reported study, depression severity, and population characteristics such as clinical population with depression, normal population with depression symptoms, and depression with cognitive impairment.

## Methods

*Electronic database search*

Followed PRISMA guidelines for selecting studies for meta-analysis and searched the different databases such as Ebsco, Elsevier, PubMed, Springer, J-store, ProQuest, and Psy Info for collecting relevant articles to conduct meta-analysis in the last 20 years (2001-2021). The search terms were "aged," "elderly," "geriatrics," "older," "depressive disorder," "depression," "psychosocial intervention" and "Psychotherapy". The process for selection and inclusion of studies is shown in the given figure.

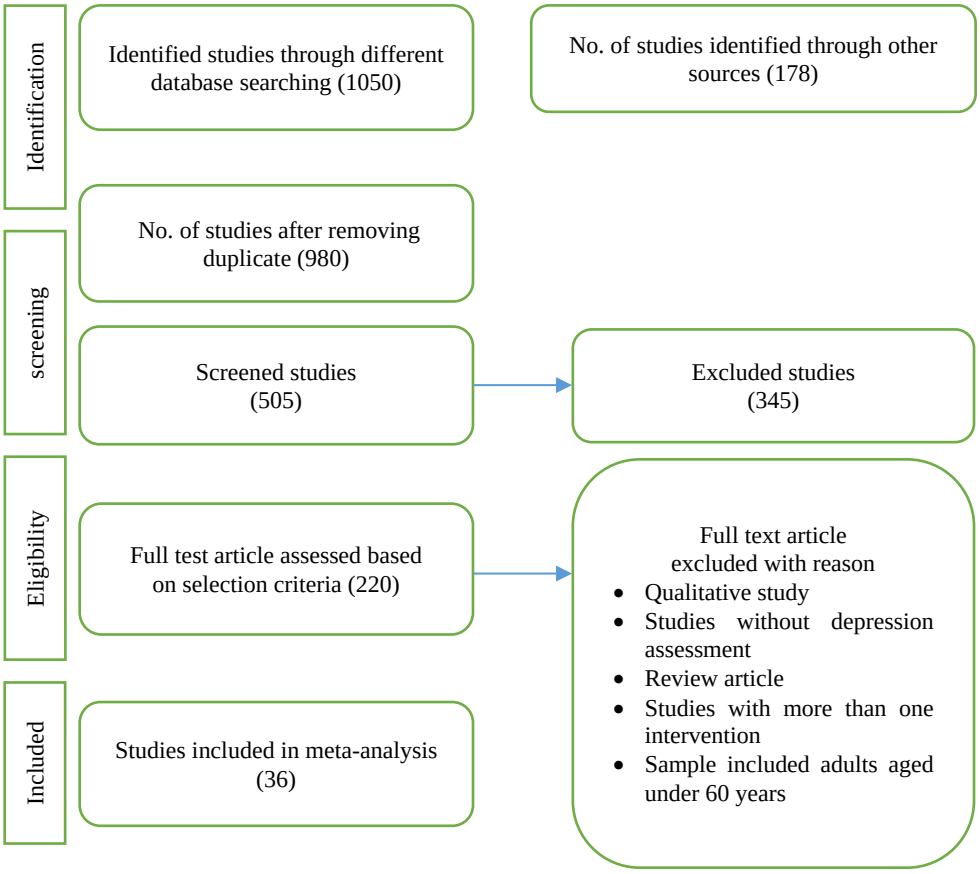


**Figure 1:** PRISMA flow chart

A total of 1050 citations were identified through different database searching and178 studies were identified through other sources. By removing duplicates from

980 titles screened, 505 studies are screened through abstract reading and 345 studies were removed. 220 full-text publications were retrieved for review. After a detailed review, 36 studies were found to match the criteria for inclusion and were incorporated in the meta-analysis.

*Inclusion criteria*

Randomized controlled trials (RCT) and quasi-experimental designs comparing psychosocial intervention to a control condition are included for meta-analysis. Control groups including any of the waitlist group or treatment as usual group, care as a usual group or placebo comparison group, or psychoeducation controls, etc Studies were restricted to older adults and age is 60 years and above. Where the majority of trial participants were diagnosed with depression using diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders or a predefined cut-off score on a standardized depression rating scale.

*Exclusion criteria*

Qualitative studies, theoretical studies, review articles, non-intervention studies, studies with more than one intervention are excluded in the final screening. A study with samples aged under 60 years was also not considered. Excluded studies with more than one intervention and studies with improperly reported data. The article did not provide sufficient data for meta-analysis also excluded during the quality assessment process.

*Quality assessment*

The quality assessment tool developed by the Cochrane Collaboration was used to assess potential sources of bias in included studies (Higgins & Green, 2008). Each study was evaluated using the tool's six criteria: randomization, concealment of allocation, blinding of participants and outcome assessors, and reporting of incomplete data or selective outcomes. Based on the criteria outlined in the tool, each domain was assigned a low, high, or unclear risk of bias. Table 1 shows the details of the quality assessment.

**Table 1.** Quality Assessment of the Included Study

| No. | Study | Year | Selection bias | | Performance bias | Detection bias | Attrition bias | Reporting bias | Other bias |
|---|---|---|---|---|---|---|---|---|---|
| | | | Random sequence generation | Allocation of concealment | Blinding of participants and personnel | Blinding of outcome assessment | Incomplete outcome data addressed | Selective reporting | |
| 1. | Lynch et al | 2003 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 2. | Bruce et al | 2004 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 3. | Serrano et al | 2004 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 4. | Haringsma et al | 2006 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 5. | Chao et al | 2006 | High Risk | High Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 6. | Van-schaik et al | 2006 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 7. | Smith et al | 2007 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 8. | Wang et al | 2007 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 9. | Laidlaw et al | 2008 | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk |
| 10. | Serfaty et al | 2009 | Low Risk | Low Risk | Low Risk | High Risk | Low Risk | Low Risk | Low Risk |
| 11. | Heisel et al | 2009 | Not Applicable | Not Applicable | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 12. | Sharif et al | 2010 | Not Applicable | Not Applicable | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 13. | Pot et al | 2010 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 14. | Lamers et al | 2010 | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk |
| 15. | Snarski et al | 2010 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 16. | Joling et al | 2011 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 17. | Ekkers et al | 2011 | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk |
| 18. | Korte et al | 2011 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 19. | Zhou et al | 2011 | Low Risk | Unclear | Unclear | Unclear | Unclear | Low Risk | Low Risk |
| 20. | Serrano et al | 2012 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 21. | Preschl et al | 2012 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 22. | Gallegos et al | 2013 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 23. | O'Connor, et al | 2013 | High Risk | High Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |

| No. | Study | Year | Selection bias | | Performance bias | Detection bias | Attrition bias | Reporting bias | Other bias |
|---|---|---|---|---|---|---|---|---|---|
| | | | Random sequence generation | Allocation of concealment | Blinding of participants and personnel | Blinding of outcome assessment | Incomplete outcome data addressed | Selective reporting | |
| 24. | Wuthrich | 2013 | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk |
| 25. | Gitlin et al | 2013 | Low Risk | Low Risk | Low Risk | High Risk | Low Risk | Low Risk | Low Risk |
| 26. | Chan et al | 2013 | Low Risk | Low Risk | High Risk | High Risk | Low Risk | Low Risk | Low Risk |
| 27 | Escolar-chua, et al | 2014 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 28. | Mallya et al | 2015 | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk | Low Risk |
| 20. | Xie et al | 2017 | Low Risk | Low Risk | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 30. | Lee et al | 2017 | High Risk | High Risk | Low Risk | Unclear | Low Risk | Low Risk | Low Risk |
| 31. | Ciasca et al | 2018 | Low Risk | Unclear | Low Risk | High Risk | Low Risk | Low Risk | Low Risk |
| 32. | Sadler et al | 2018 | Low Risk | Low Risk | Low Risk | Unclear | Low Risk | Low Risk | Low Risk |
| 33. | Siverova et al | 2018 | High Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 34. | Ching-Teng et al | 2019 | Low Risk | Unclear | Unclear | Unclear | Low Risk | Low Risk | Low Risk |
| 35. | Carandan et al | 2020 | High Risk | High Risk | High Risk | High Risk | Low Risk | Low Risk | Low Risk |
| 36. | Heidari et al | 2020 | Low Risk | Low Risk | Low Risk | Unclear | Low Risk | Low Risk | Low Risk |

**Table 2.** Basic characteristic of the selected study

| First Author | Year | Country | No of sample | Age | Tool | Intervention | Design | Popu-lation | Outcomes |
|---|---|---|---|---|---|---|---|---|---|
| Lynch, et al | 2003 | USA | Ex=15 Cg=16 | age 60 and older | HAM-D | Dialectical behaviour therap | Randomized Controlled Trial | CD | Patients receiving DBT showed significant improvement |
| Bruce et al | 2004 | Pennsylvania USA | Ex=320 Cg=278 | 67-74 | HAM_D | Primary care intervention | Randomized Controlled Trial | CD | Statistically significant deduction in outcome measure. |
| Serrano et al | 2004 | Spain | Ex=20 Cg=23 | Age 65=93 | CES-D | life review therapy | Randomized Controlled Trial | NCD | The results indicated significant differences between experimental and control groups after 4 weeks of autobiographical retrieval practice. showed fewer depressive symptoms, less hopelessness, improved life satisfaction, and retrieval of more specific events. |
| Haringsma et al. | 2006 | Netherlands | EX=21 Cg=22 | aged 55–85 years | CES-D | CWD- coping with depression course | Randomized Controlled Trial | CD | Older adults in the intervention group showed a significant decrease in depression symptoms. Gains were maintained over 14 months. The course was beneficial for participants with mild or severe depression, and treatment acceptability was high |
| Chao et al | 2006 | Taiwan | Ex=12 Cg=12 | 65 to 85 years | GDS | Group reminiscence therapy, | Quasi-experimental study | NCD | Results indicated that group reminiscence therapy significantly improved self-esteem, although effects on depression and life satisfaction were not significant. |
| Van-schaik et al | 2006 | The Netherlands | Ex=69 Cg=74 | Mean age 65 | MADRS | Interpersonal Psychotherapy | Randomized Controlled Trial | CD | IPT was more effective than care as usual for elderly patients with moderate to severe major depressive disorder in general practice |
| Smith et al | 2007 | US | Ex=15 Cg=16 | ≥60 years old | BSI | Reminiscence therapy | Randomized Controlled Trial | NCD | The research supports the Life Story Workshop as an effective intervention for improving depressive symptoms in older adults. |
| Wang et al | 2007 | Taiwan | Ex=51Cg =51 | ≥65 years old | GDS | Group reminiscence therapy | Randomized controlled trial | Cog D | Study indicating that the cognitive function of the experimental subjects increased and their depressive symptoms diminished following intervention. |
| Laidlaw et al | 2008 | UK | Ex=20 Cg=20 | age 60 years and over | HAM_D | CBT- cognitive behavioural therapy | Randomized Controlled Trial | CD | CBT on its own is shown to be an effective treatment procedure for mild to moderate late life depression and has utility as a treatment alternative for older people who cannot or will not tolerate physical treatment approaches for depression. |

| First Author | Year | Country | No of sample | Age | Tool | Intervention | Design | Popu-lation | Outcomes |
|---|---|---|---|---|---|---|---|---|---|
| Serfaty et al | 2009 | London | Ex=70 Cg=67 | aged 65 years & above | BDI | Cognitive behavioural therapy | Randomized Controlled Trial | CD | Cognitive behavioural therapy is an effective treatment for older people with depressive disorder |
| Heisel et al | 2009 | London, | EX= 17 | adults 60 years & above | HAM-D | Interpersonal Psychotherapy (IPT | One group pre post design | CD | Findings indicate a substantial reduction in participant suicide ideation, death ideation, and depressive symptoms; controlled trials are needed to further evaluate these findings |
| Sharif, et al | 2010 | Iran | Ex=49 | 60+ years | GDS | Group reminiscence therapy | One group Quasi design | NCD | Study showed a statistically significant difference in depression scores comparing before and after the intervention. |
| Pot et al. | 2010 | Netherlands | Ex=83 Cg= 88 | >50 years | CES-D | life review | Randomized Controlled Trial | NCD | Depressive symptoms, a decrease that was retained during follow-up |
| Lamers et al | 2010 | The Netherlands | Ex=183 Cg=178 | aged 60 year & older | BDI | MPI Minimal psychological intervention | Randomized Controlled Trial | CD | Result shows reductio in depression |
| Snarski et al | 2010 | US | Ex =16 Cg=13 | 65 years of age & above | GDS | Behavioral Activation Therapy (BAT) | Randomized Controlled Trial | CD | Behaviour activation therapy shows rapid treatment effect, the majority of the improvement in depressive symptoms occurred between pre- and mid treatment sessions. |
| Joling et al | 2011 | Netherland | Ex=86 Cg=84 | aged 75 year&older | CES-D | Bibliotherapy | Randomized Controlled Trial | NCD | Bibliotherapy as a stand-alone intervention for the elderly (aged 75 years and older) did not reduce depressive symptoms more than usual care. This might indicate that bibliotherapy can only be effective for patients who are motivated and acknowledge their depression. |
| Ekkers et al | 2011 | Netherlands | Ex=53 Cg=38 | aged _65 years | GDS | COMET-Competitive Memory Training | Randomized Controlled Trial | CD | COMET with TAU showed a significant improvement in depression and rumination compared with TAU alone. |
| Korte et al | 2011 | Netherlands | Ex=100Cg=102 | ≥65 years old | CES-D | Life review therapy | A pragmatic randomized controlled trial | CD | This study shows the effectiveness of life review therapy as an early intervention for depression. The intervention is also effective in reducing anxiety symptoms and strengthening positive mental health. |
| Zhou. et al | 2011 | China | Ex=59 Cg=66 | ≥60 years old | GDS | RT reminisce therapy | Randomized Controlled Trial | NCD | Group reminiscence therapy was effective in reducing symptoms of depression, improving affect balance, and promoting mental health of community-dwelling elderly |

| First Author | Year | Country | No of sample | Age | Tool | Intervention | Design | Popu-lation | Outcomes |
|---|---|---|---|---|---|---|---|---|---|
| Serrano et al | 2012 | Spain | Ex=9 Cg=8 | Agw 63-82 | GDS | life review therapy | Randomized Controlled Trial | CD | Found that life review therapy produced a significant improvement in depressive symptoms and also indicate that specific autobiographical retrieval practice can reduce symptoms of depression in older adult outpatients. |
| Preschl et al | 2012 | Switzerland | Ex=20 Cg=16 | adults aged 65 and over. | BDI | Life-review therapy(RT) | Randomized Controlled Trial | CD | the results indicate that the life-review therapy in this combined setting could be recommended for depressive older adults |
| Gallegos et al | 2013 | Newyork, USA | Ex=100 Cg=100 | Mean age 60 | HAM-D | MBSR (mindfulness-based stress reduction) | Randomized Controlled Trial | NCD | MBSR improves positive affect for older adults with lower depressive symptom severity |
| O'Connor, et al | 2013 | Denmark | Ex=18 Cg=18 | 65 - 80 years | BDI | Mindfulness-Based Cognitive Therapy | Quasi experimental design | NCD | The study suggests that MBCT may be an effective intervention for reducing symptoms of distress, and especially depressive symptoms, as well as for possibly improving working memory function among elderly bereaved with problematic grief reactions. |
| Wuthrich | 2013 | Australia | Ex=27 Cg=35 | Aged over 60 years | GDS | group cognitive behavioural therapy | Randomized Controlled Trial | CD | Group cognitive behavioural therapy is efficacious in reducing comorbid anxiety and depression |
| Gitlin et al | 2013 | African American | Ex= 106 Cg=102 | ≥60 years old | CES-D | A multicomponent, home-based intervention | Randomized Controlled Trial | NCD | A home-based intervention delivered by social workers could reduce depressive symptoms and enhance quality of life in older African Americans |
| Chan et al | 2013 | Singapore | Ex=14 Cg=12 | Aged over 60 years | GDS | Life story -review | Randomized Controlled Trial | NCD | This study supports the life storybook creation process as an effective intervention for depressed older Chinese adults living in the community. |
| Escolar chua, et al. | 2014 | Philippines | Exp=20 Cg=20 | 60 to 80 years | GDS | Third Age Learning Programs | Quasi experimental design | NCD | The results of t tests showed statistically significant group differences between the experimental and control group, with the higher life satisfaction, self-esteem, and lower depression level compared to the control group. |
| Mallya et al | 2015 | Canada | Exp=57 Cg=40 | ≥60 years old | GDS | Mindfulness Training | Randomized Controlled Trial | NCD | The MBSR group would display significant improvements in measures of executive function, episodic memory, mindfulness, mood, self-esteem, and quality of life. |

| First Author | Year | Country | No of sample | Age | Tool | Intervention | Design | Popu-lation | Outcomes |
|---|---|---|---|---|---|---|---|---|---|
| Xie et al | 2017 | China | Ex=37 Cg=36 | Age over 65 | GDS | MBAT- Modified behavioural activation treatment | Randomized Controlled Trial | NCD | BAT produced a significantly greater reduction in depressive symptoms than regular care in rural left-behind elderly. |
| Lee et al | 2017 | Taiwan | Exp=11 Cg= 10 | ≥60 years old | GDS | Exercise | Quasi experimental design | NCD | Exercise can help adults older than 80 to ameliorate depressive symptoms and enhance body balance ability |
| Ciasca et al | 2018 | Brazil. | Ex=31 Cg= 25 | ≥60 years | GDS | Art therapy | Randomized Controlled Trial | CD | Treatment is effective to Reduce depressive and anxiety symptoms |
| Sadler et al | 2018 | Australia. | Exp=25 Cg=23 | Aged 65 years old or above | GDS | cognitive behavior therapy | Randomized Controlled Trial | CD | Differences between outcomes of the two treatment conditions were not statistically Significant |
| Siverova et al | 2018 | Czech Republic | Ex=31 Cg=33 | ≥60 years | GDS | Reminiscene therapy with narrative approach | Quasi-experimental design | Cog D | Reminiscence therapy can positively affect selected aspects of quality of life, attitudes towards old age, and symptoms of depression in the elderly in long-term healthcare facilities |
| Ching-Teng et al | 2019 | Taiwan | Ex= 29 Cg=26 | aged 65 years or older | GDS | Art therapy | A quasi-experimental design with random assignment | NCD | The art therapy programs showed promising effects in improving the depression and self-esteem of older adults |
| Carandan, et al | 2020 | Philippines, | Ex=65 Cg=68 | ≥60 years old | GDS | Peer counselling, social engagement combined intervention | Quasi experimental design | NCD | Significant improvements were seen in psychological Resilience, social support. Effective for depression but No interventions, however, significantly improved the loneliness score |
| Heidari, et al. | 2020 | Iran. | Ex=45 Cg=45 | 60-99 years | GDS | Laughter therapy | Quasi experimental design | NCD | Improve the mental status, depression and Quality of life |

Note. HAM-D: Hamilton depression rating scale, CES-D: Center for Epidemiologic Studies Depression Scale, GDS: Geriatric depression scale, BDI: Beck depression inventory, MADRS- Montgomery Ashberg Depression Rating Scale, Brief Symptom Inventory-BSI,CD: Clinical depression, NCD: No- Clinical depression, CogD-Cognitive impairment with depression.

*Data extraction*

Data extracted from included studies. Participant characteristics including age, gender, assessment tool used, intervention, population, study design, etc. are recorded for each study. Scores of the standardized measures of depression were also recorded for analysis. Some studies use more than one outcome measure depression questionnaire. To balance similarity in outcome measures of different studies most commonly used depression measure scores are extracted for data analysis. The most commonly used depression questionnaires are GDS- Geriatric depression scale, BDI- Beck depression inventory, CES-D = Center for epidemiologic studies depression scale, and HAM-D- Hamilton depression rating scale. The primary outcome of the study was a change in depressive symptoms by using psychosocial intervention when compared to control conditions. The mean difference between the pretest and the first score point immediately after the intervention was used to assess change in depressive symptoms. Apart from outcome measures number of samples, experimental design, population characteristics, presence of cognitive impairment, and types of the invention for managing depression were coded for subgroup analysis. Summarized the characteristics of included studies are given in Table 2.

*Data synthesis and Statistical analysis*

All data were analyzed using comprehensive meta-analysis and effect size for outcome measures were reported using hedges g. Efficacy of the intervention outcomes assessed using the mean difference from pre-test to first measured score immediately after the intervention. Secondary and tertiary preventive intervention, relapse prevention intervention, and pharmacological intervention were not considered. Hence Follow-up data were not included for analysis. The effect size is calculated by the standardized mean differences between the experimental group or intervention group and the control group. some studies use control comparison group as weighting list group, treatment as usual group, care as a usual group or placebo comparison group, etc. In quasi one group, the pre-post design used studies, t value, and pre-post differences are used for calculating the effect size. All the statistical analyses are done by using a comprehensive meta-analysis. Some of the studies reported hedges' g value. In such cases, comprehensive meta-analysis software is used to confirm the reported effect size value. Effect sizes were calculated using standardized mean differences using hedges 'g'. A hedge's g of 0.2, 0.5, 0.8 represents a small, medium, and large effect size, respectively. To assess the degree of statistical heterogeneity between studies, the Q and I-squared statistics were computed. A value of 0% indicates no observed heterogeneity, while higher values

indicate increasing heterogeneity, with 25% indicating low, 50% indicating moderate, and 75% indicating higher heterogeneity (Higgins et al., 2003). Two-tailed P values of <0.05 were used to define statistical significance.

Conducted sub-group analyses of studies based on whether participants in clinical population, normal population such as community-dwelling older adults with depression symptoms and depression with cognitive impairment. The study also analyzes whether the differences in effect size are based on the type of psychosocial intervention, and the type of experimental design used. Subgroup analysis was performed according to the mixed effect model, that pooled studies within subgroups with the random-effects model, but tested for significant differences between subgroups with the fixed effects model

Publication bias is assessed through funnel plot, Egger test, and Begg and Mazumdar rank correlation test. Orwin's fail-safe number was used to calculate the number of unpublished nonsignificant studies required to reduce the overall significant effect to non-significance (Orwin,1987). Trim and fill are methods for adjusting the pooled effect size to account for the results of missing studies.

## Results

The study aims to find out the effectiveness of different psychosocial interventions in older adults for reducing depression and which intervention technique is more effective based on the published study result. For comprehensive meta-analysis 36 studies are included from a different database. Overall, 4148 subjects were included for analysis, among them, 2224 participants were in the intervention group and 1924 participants in control groups. All 34 studies have at least two groups, one group as an intervention group and another group as a control group. Most of the studies are RCT and a few of them are Quasi-experiment. Out of 36 studies, two studies are carried out using quasi one group pre-post design.

The types of intervention included are Cognitive behaviour therapy, Behavioural activation therapy, Dialectical behaviour therapy, Art therapy, Laughter therapy, Bibliotherapy, Interpersonal psychotherapy, Life review or reminiscence therapy, Mindfulness-based intervention such as mindfulness-based cognitive therapy (MBCT), and mindfulness-based stress reduction training (MBSR). and other psychosocial interventions such as Exercise, Third age learning programs, Peer and social engagement intervention, (PI) Primary care intervention, (COMET) Competitive memory training, (MPI) Minimal psychological intervention, (CWD) Coping with depression course, A multicomponent home-based intervention. Table

3 shows, overall effect size value, and figure 2 show the forest plot of each 36 selected studies.

**Table 3.** Result of A Meta-Analysis Examining Overall Effect Size

| Analysis | No. of studies | Effect size | | | Heterogeneity | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hedge's g | 95% CI | p-value | Q-value | p-value | $I^2$ | $Tau^2$ |
| Main effect | 36 | 1.118 | 0.835-1.402 | 0.0001 | 797.309 | 0.0001 | 95.610 | 0.668 |

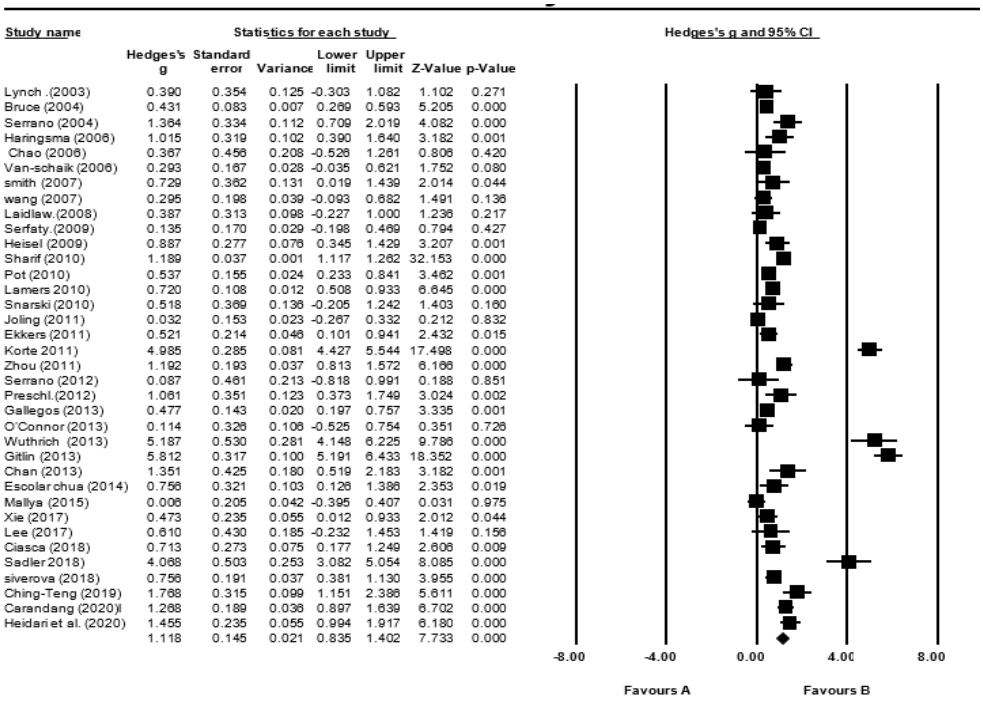


**Figure 2.** Forest plot of effect on psychosocial intervention for depression in older adults

The mean overall effect size (Hedge's g) of the psycho-social intervention on depression was found to be g=1.118 (95% CI: 0.835-1.402) which is significantly large. From the above forest plot, it is clear that four studies show a very high effect size compared to other studies, and it's above 4. Overall, the pooled analysis shows that psychosocial intervention had a strong and statically significant effect on reducing depression symptoms. The assessment for heterogeneity was determined using the Q statistic. In test for heterogeneity (Q value = 797.309, I square = 95.610, tau square= .668). A high Heterogeneity value indicates that the variation in effect

size between studies was caused by a large amount of heterogeneity rather than a random error.

*Subgroup analysis*

A series of subgroup analyses were performed to investigate potential sources of heterogeneity. There was sometimes a significant impact on the effect sizes and heterogeneity levels of the subgroups.

The study focused on three major subgroups for analysis, it includes moderating effect of different intervention types, moderating effect of selected experimental design in a study, and moderating effect of the sample population.

*Moderating effect of intervention*

The analyses of moderating effect of intervention provide the effect size of studies for different intervention types. Figure 3 shows the forest plot and Table 4 shows the result of moderating effect of intervention type by using subgroup analysis.

**Table 4.** Result of Subgroup Analysis
Showing the Moderating Effect of the Intervention

| | | Effect size | | | Heterogeneity | | | |
|---|---|---|---|---|---|---|---|---|
| **Subgroup based on intervention** | **No.** | **Hedge's g** | **95% Cl** | **p-value** | **Q value** | **p-value** | **$I^2$** | **$Tau^2$** |
| Art therapy | 2 | 1.247 | 0.197-2.296 | 0.020 | 6.403 | 0.011 | 84.382 | 0.484 |
| Behaviour activation therapy | 2 | 0.493 | -0.099-0.888 | 0.014 | 0.015 | 0.901 | 0.000 | 0.000 |
| Bibliotherapy | 1 | 0.032 | -0.268-0.333 | 0.832 | 0.000 | 1.000 | 0.000 | 0.000 |
| Cognitive behavioural therapy | 4 | 2.432 | 0.250-4.613 | 0.029 | 127.973 | 0.0001 | 97.656 | 4.788 |
| Dialectical behaviour therapy | 1 | 0.400 | -0.311-1.111 | 0.271 | 0.000 | 1.000 | 0.000 | 0.000 |
| Interpersonal psychotherapy | 2 | 0.569 | -0.049-1.187 | 0.002 | 3.598 | 0.058 | 72.206 | 0.146 |
| Laughter therapy | 1 | 1.468 | 1.002-1.933 | 0.0001 | 0.000 | 1.000 | 0.000 | 0.000 |
| Mindfulness-based intervention | 3 | 0.247 | -0.088-0.582 | 0.149 | 3.873 | 0.144 | 48.355 | 0.042 |
| Other psycho-social intervention | 8 | 1.390 | 0.59-2.189 | 0.001 | 279.491 | 0.0001 | 97.495 | 1.253 |
| Reminiscence therapy | 12 | 1.190 | 0.676-1.705 | 0.0001 | 230.528 | 0.0001 | 95.228 | 0.728 |

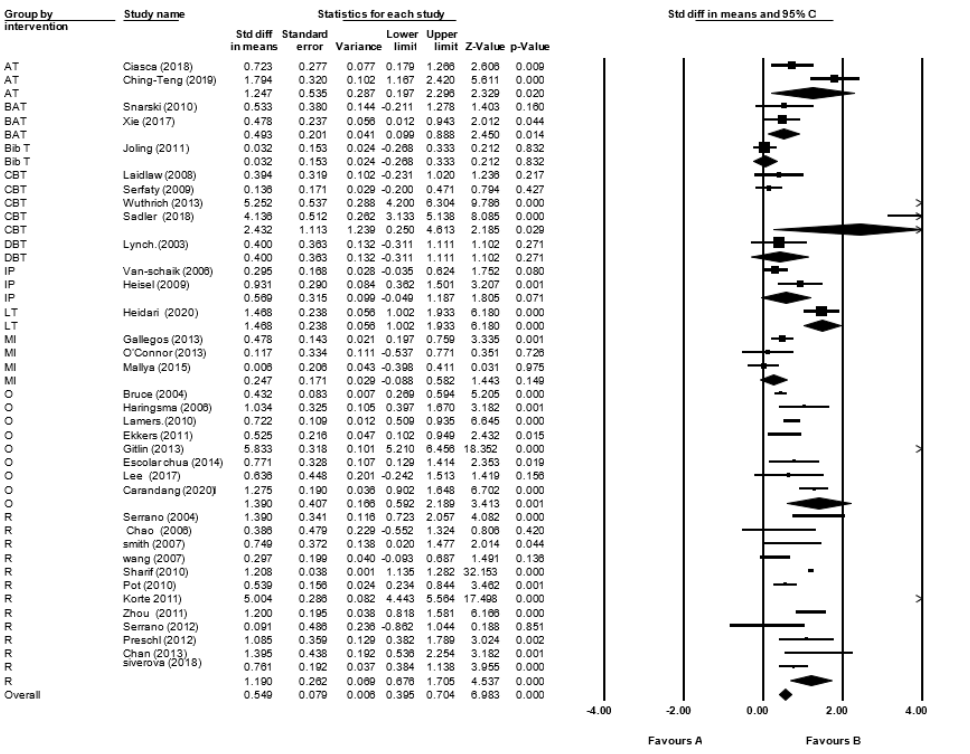


**Figure 3.** Forest plot of Moderating effect of psycho-social intervention for depression in older adults

Moderating analysis reveals that out of 10 intervention categories. Cognitive behaviour therapy shows a high effect size. Four trials used cognitive behaviour therapy as a treatment method and analyzed effect size showed high value (Hedge's g= 2.432). Here the variation in the lower limit (0.250) and upper limit (4.613) is very high. In cognitive behaviour therapy studies, two of them show low effect size and two of them show very high effect size. Art therapy, life review reminiscence therapy, and laughter therapy show a higher effect size compared to other intervention techniques. Laughter therapy shows the next higher effect size (Hedge's g= 1.468). but only one trial used laughter therapy intervention hence the heterogeneity is low. Reminiscence therapy also shows a higher effect size (Hedge's g=1.190). Compared to other interventions reminiscence therapy reported studies are more in this last 20 years period. Two trials used art therapy intervention, showing a high effect size (Hedge's g= 1.247). Behaviour activation therapy, bibliotherapy,

dialectical behaviour therapy, interpersonal psychotherapy, and mindfulness-based intervention show a low effect size compared to other psychotherapy and psycho-social interventions. For, computing effect size of psychosocial intervention we included all the 8 psycho-social interventions such as exercise, Third Age Learning Programs, Peer and social engagement intervention, (PI) Primary care intervention, (COMET) Competitive Memory Training, (MPI) minimal psychological intervention, (CWD) coping with depression course, A multicomponent home-based intervention in a single group as other psychosocial intervention. The overall effect size of other psychosocial interventions was found to be high value (Hedges's g= 1.390) and in the test for heterogeneity (Q value =279.491, I square =97.495. tau square=1.253) High Heterogeneity value shows that, the between studies variability in effect size. In the florest plot of moderator analysis, it is clear that primary care intervention (PI) effectiveness is low compared to other psycho-social interventions. A multicomponent home-based intervention shows a very high effect size. Peer and social engagement intervention, and (CWD) coping with depression course also show high effect size, and its effect size score is found to be above one. All other psych-social intervention shows a moderate level of effectiveness.

*Moderating effect of the sample population*

Analyzing the moderating effect of a subgroup based on sample population's depression level and characteristics, after classifying three groups as studies of clinical population trial, normal population with depression symptoms and depression with cognitive impairment. Table 5shows the result of moderating effect of subgroups based on a sample population and Figure 4 shows the forest plot on moderating analysis.

**Table 5.** Result of Subgroup Analysis
Showing the Moderating Effect of Severity of Depression

| Sub group-based sample population | No. of studies | Effect size | | | Heterogeneity | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hedge's g | 95% Cl | p-value | Q value | p-value | $I^2$ | $Tau^2$ |
| Clinical population | 16 | 1.296 | 0.761-1.832 | 0.0001 | 377.469 | 0.0001 | 96.026 | 1.088 |
| Normal population | 18 | 1.088 | 0.687-1.490 | 0.0001 | 368.439 | 0.0001 | 95.386 | 0.673 |
| Depression with cognitive impairment | 2 | 0.532 | 0.077-0.986 | 0.022 | 2.806 | 0.094 | 64.361 | 0.069 |

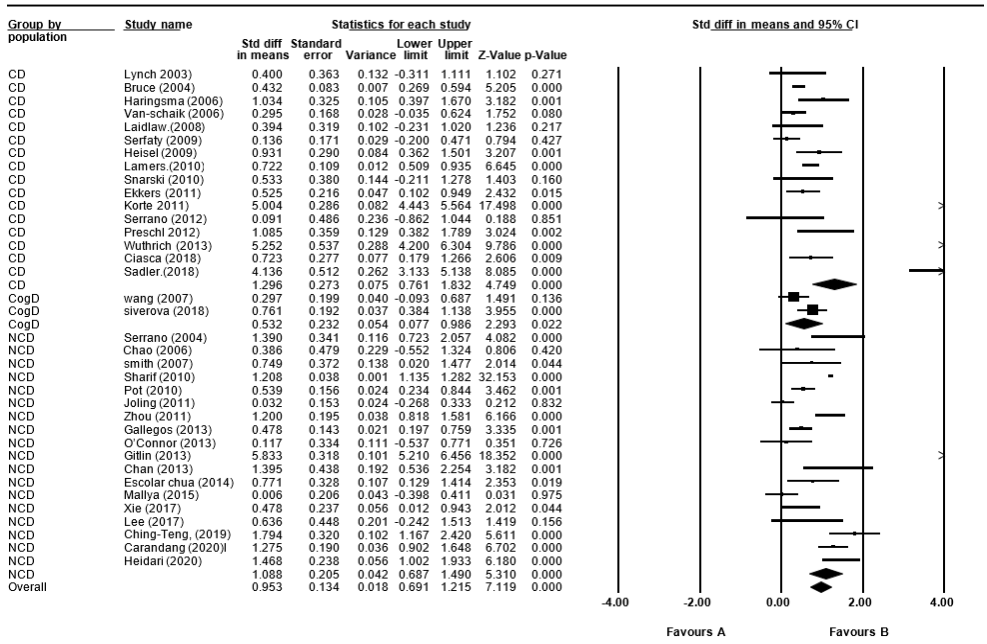


**Figure 4.** Forest plot on Subgroup analysis-based on sample population's depression level

Results show that out of 36 studies, 16 studies were conducted in the clinical population, 18 studies used non-clinical population but had depression symptoms, and two studies were conducted in depression with cognitive impairment group. The moderator analysis reveals that the effect size was found to be higher for the clinical depression subgroup (Hedge's g=1.296) compared to the non-clinical population (Hedge's g=1.088) and depression with cognitive impairment (Hedge's g=0.532). The heterogeneity value was also found to be very higher for the clinical population and non-clinical population compared to the depression with cognitive impairment subgroup.

*Moderating effect of selected experimental design*

From the selected studies, 27 studies were RCT, 7 studies were quasi-experimental design with two groups, 2 studies used quasi-experiment with one group pre-post design, and no control group is included in these two studies. Except for two studies, other studies have both control group and experimental group for comparing the intervention effectiveness. Table 6 shows the Result of subgroup analysis on moderating effect of experimental design and figure 5 portrait forest plot.

**Table 6.** Result of Subgroup Analysis
Showing the Moderating Effect of Experimental Design

| Sub group-based design | No. of studies | Effect size | | | Heterogeneity | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hedge's g | 95% Cl | p-value | Q value | p-value | $I^2$ | $Tau^2$ |
| Randomized control trial | 27 | 1.210 | 0.799-1.621 | 0.0001 | 689.711 | 0.0001 | 96.230 | 1.099 |
| Quasi experimental design | 7 | 0.975 | 0.566-1.383 | 0.0001 | 22.778 | 0.001 | 73.659 | 0.209 |
| One group pre-post design | 2 | 1.204 | 1.131-1.277 | 0.0001 | 0.895 | 0.344 | 0.000 | 0.000 |

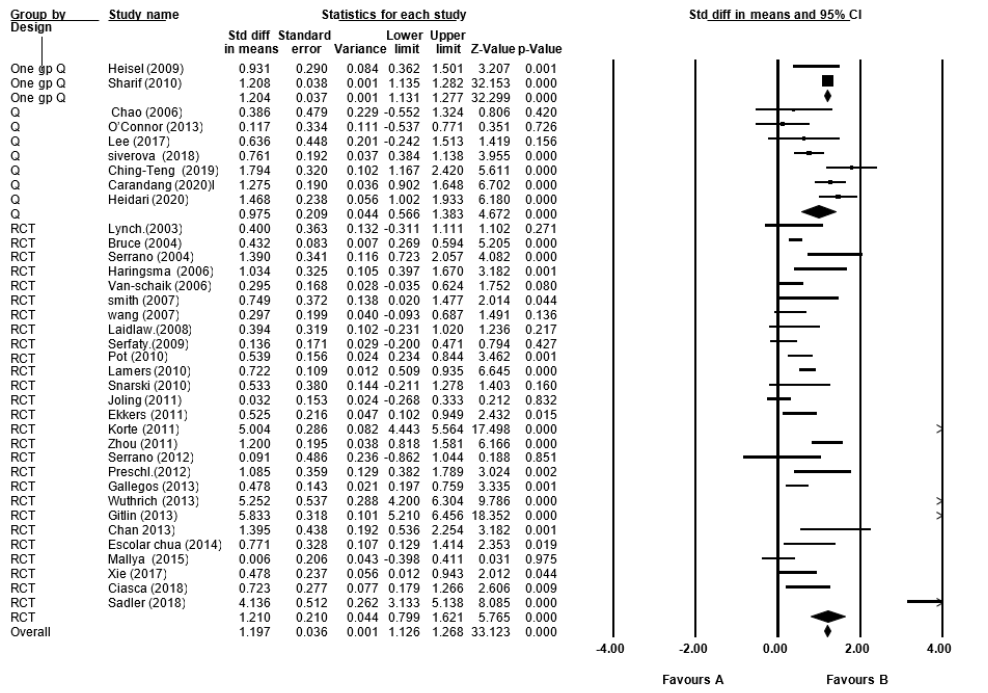


**Figure 5.** Forest plot on Moderating effect of experimental design

Results of moderator analysis reveal that effect size was found to be higher for quasi one group pre-post design (Hedge's g=1.204), and randomized control trial (Hedge's g=1.210) compared to a quasi-experimental design with two group designs (Hedge's g=0.975). but almost all subgroup shows a higher effect size irrespective

of the selected experimental design. The heterogeneity value was also found to be very higher for the subgroup with the greater number of studies.

*Publication Bias Assessment*

Funnel plots were used to assess publication bias and the possibility of study bias. When there is no publication bias, the observed studies should be distributed symmetrically around the pooled effect size in a funnel plot. The examination of the funnel plot presented in figure 6, revealed no risk of publication bias for reviewed studies related to depression.

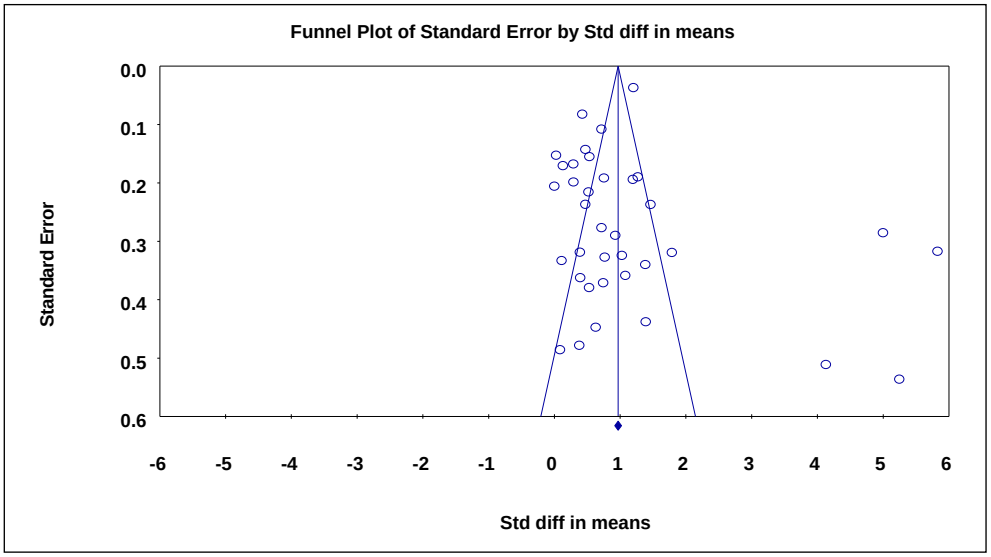


**Figure 6:** Funnel plot of standard error by Hedges's g

The funnel plot revealed no evidence of significant publication bias. Egger's test of the intercept was also not significant (intercept: 0.24331; 95% CI: -2.24~2.73; p=0.84). Duvall and Tweedie's trim and fill procedure indicated that no studies were missing and hence effect size have no significant change and it is g=0.96968 (95% CI: 0.91882~1.02054). According to Egger's test (p= 0.84335), and Duvall and Tweedie's trim and fill procedure, no studies were trimmed and hedges g shows no significant change. The Begg and Mazumdar rank correlation test also suggests a low risk of publication bias and it is significant at 0.01 level for the reviewed depression studies.

## Discussion

The main objective of this meta-analytic evaluation was to directly investigate whether psychosocial interventions are useful in treating depression in older persons**.** Overall, 36 studies are selected for data analysis. Different prominent psycho-therapy and eight other psycho-social intervention studies are included for the meta-analysis. Comprehensive meta-analysis results reveal that cognitive behaviour therapy is the most effective psychotherapeutic treatment for depression. Cognitive behaviour therapy (CBT) is a well-known multicomponent treatment method that combines educational, cognitive, and behavioural interventions. Wuthrich (2013) and Sadler (2018) studies show a very high effect size value. Wuthrich et al., (2013), in their study, give importance to both depression and anxiety symptoms. The session includes psycho-education, cognitive restructuring, problem-solving, graded exposure, sleep hygiene, and assertiveness training, which is a core skill for anxiety treatment, as well as an activity schedule, which is a core skill for depression treatment. They also concentrated on issues pertinent to this stage of life, such as physical disability, dementia fear, bereavement, and loneliness. Sadler et al., (2018) use cognitive behaviour therapy standards and advanced for comparing the effectiveness of the treatment. The advanced CBT intervention was identical to the standard CBT intervention, but it included three additional CBT strategies some of which were specifically targeted to depression symptoms: daily positive activity scheduling, cognitive reframing or cognitive restructuring exercises (thought diaries), and positive affirmations exercises that used positive data logs and cue cards to increase hopefulness. Hence it may be the reason for the high effect size value in advanced cognitive behaviour therapy. But compared to other prominent psychotherapy, it is clear that cognitive behaviour therapy is the most prominent and well apt treatment for depression.

Art therapy, Reminiscence therapy, and Laughter therapy also show effectiveness for managing depression. Ciasca et al (2018), Ching-Ten et al., (2019) shows the effectiveness of art therapy. Art therapy interventions are effective in the management of depression and the improvement of self-esteem. Like art therapy, another expressive therapy such as laugher therapy also shows a high effect size value. Heidari et al., (2020) focus on depression and the quality of life of older adults. Laughter therapy was conducted in each session by playing musical or visual slides, humorous video clips, and also holding joyous games with a sense of humour or joke-telling, etc. Overall, from the study, it is clear that laughter therapy is one of the treatment alternatives for depression.

Overall, 12 studies use reminiscence therapy as an intervention to manage depression. All most all the studies show the efficacy of reminiscence therapy for

depression in older adults. It includes life story review, reminiscence therapy with a narrative approach, etc. Reminiscence intervention is mainly focusing on cognitive aspects. Reminiscence therapy sessions were conducted using memory triggers such as home goods, old photographs, old-time music, old-time food flavours and other familiar items from the past etc. Based on the above findings, it is clear that reminiscence therapy is one of the effective intervention alternatives for the management of depression in older adults, quite apart from cognitive impairments related to dementia and Alzheimer's diseases. Korte et al., (2011) study on the life story review shows a very high effect size value similar to cognitive behaviour therapy intervention studies conducted by Wuthrich et al., (2013). The intervention consists of three main components. First, participants integrate difficult life events from the past; Second, they create life stories that help people cope with current circumstances and set new goals; third, they collect specific positive experiences that can be used to create new life stories. The first two components were created by incorporating a life review into narrative therapy. Narrative therapy facilitates the restoration of a sense of purpose in life. As a result, there is ample space for clients to experiment with different stories and preferences. In addition, therapists may ask questions that aid in the construction of alternative stories about negative life events. Clients are also consistently encouraged to express their beliefs, memories, or past experiences by comparing them to identity and future goals, and alternative stories are further extended by relating them to identity, future goals, and activities. During the intervention sessions, the participants were allowed to focus on new alternative stories, possibilities, and opportunities to exchange their experiences with the other participants, which may increase the therapeutic intervention's effectiveness in the treatment of depression in older adults.

Apart from prominent psychotherapy studies also analyses the effectiveness of other psychosocial interventions in the elderly. The study includes 8 interventions for this category. All the eight psychosocial interventions were grouped as other psychosocial interventions for examining effect size. Exercise, Third age learning programs, Peer and social engagement intervention, (PI) Primary care intervention, (COMET) Competitive memory training, (MPI) minimal psychological intervention, (CWD) Coping with depression course, A multicomponent home-based intervention is the selected psycho-social intervention based on the published studies. All together these psychosocial intervention shows an above-average effect size. Among them coping with depression course, Peer counselling with social engagement combined intervention and multicomponent home-based intervention shows higher effectiveness for managing depression compared to other psychosocial interventions. The course content for coping with depression is based on a social learning perspective of depression. Relaxation, pleasurable activities, social skills,

constructive thinking, and maintaining functional outcomes are some of the skills taught in the coping with depression intervention course. Peer counselling with social engagement combined intervention includes individual-focused counselling and social engagement activities such as 15–20 minutes dancing, group discussion, group activity, educational talk, games, and karaoke etc. Overall, both coping with depression course and peer counselling with social engagement focus not only on depressive symptoms but also on social relationship skill-building activities. Hence this intervention may enable older adults to expand their social network and enhance active social participation. Multicomponent home-based intervention is also called BTB (beat the blue) intervention. It consists of five interconnected components: care management, referral or linkage, depression symptom recognition, stress reduction techniques, and behavioural activation techniques. The goal of a home-based intervention activity is to manage chronic conditions, socialize, exercise, address unmet care needs, prepare family meals, travel, and attend classes. As a result, focusing on different areas may be the reason for the increased effectiveness of home-based intervention in managing depression.

To present study also examine the differences in the efficacy of the psycho-social intervention in a clinical population, non-clinical population but having mild depression symptoms, and the presence of cognitive impairments with depression symptoms. 16 studies are done in a clinical population and 18 studies are done in a non-clinical population such as community-dwelling older adults and institutional older adults. 2 studies are conducted in cognitively impaired depressed older adults. Both clinical population subgroup and non-clinical population subgroup show the effectiveness of intervention compared to depression with cognitive impairment. The clinical population sub-group shows a very higher effect size value. Clinical population groups include hospital patients and care center patient groups having clinical diagnoses with major depressive disorder and severe depression. Non-clinical normal population groups include community-dwelling older adults and institutionalized older adults but having depression symptoms by analyzing scores on any depression rating scale. Leger effect size in non-clinical depression may not be visible mainly because depression symptoms are already low range related to the clinically depressed group. significant improvement is, therefore, cannot be observable for non-clinical populations compared to psychological intervention for the treatment of clinical depression. Depression with cognitive impairment group shows moderate effect size only. Hence it is clear that cognitive impairment may influence the intervention's effectiveness. By analysing the population and intervention it is also clear that reminiscence therapy is the most commonly used effective intervention for cognitively impaired older adults with depression.

The study also examines differences in the efficacy of these interventions based on selected experimental design. Randomized control group, quasi-experimental two-group design, and quasi-experimental one-group pre-post studies were also included for the present study. After analyzing each experimental design separately, it is clear that one group pre-post design shows a higher effect size than quasi-experimental study with both control and experimental group. But randomized control trial also shows a high effect size. So, it is clear that experimental design selection does not play changes in the effect size of the intervention. No significant moderating effect was identified. Publication bias assessment revealed no risk for reviewed studies.

## Strength and Limitation

To examine the effectiveness of psychosocial intervention for managing depression in the older adult current study uses a large number of eligible studies as per systematic searching and PRISMA guidelines. The studies from different countries have been included and all the collected studies are analyzed only after the detailed evaluation of methodological quality by using Cochrane criteria. Heterogeneity test, subgroup analysis, and publication bias were also performed for the current study. But this study is limited to English language journal articles only and this makes automatically excludes any studies that might have been reported in the non-English language. The studies were collected mainly from a few databases including Ebsco, Google Scholar, Elsevier, PubMed, Springer, J-store, ProQuest, and Psy Info. Various other databases also could be included to widen the search.

## Summary & Conclusion

The aim of the study was to examine the efficacy of psychosocial treatments for the management of depression in older people and also to investigate whether there are any differences in the efficacy based on intervention type, selected design, depression severity and population characteristics. Searched the different databases and followed PRISMA guidelines for selecting studies. Comprehensive metanalysis software is used to analyse the collected data. subgroup analyses were also performed to investigate potential sources of heterogeneity. Meta-analysis result shows that psychotherapy and other psychosocial intervention are effective in reducing depression in older adults. Cognitive behaviour therapy is a very effective treatment for managing depression among older adults. Art therapy, Reminiscence

Therapy, Laughter therapy are also effective in reducing depression in older adults. Apart from prominent psychotherapy other psycho-social intervention also shows comparatively good effect size. Bibliotherapy and occupational therapy show less effective therapy compared to other psychosocial interventions based on the published studies in the last 20 years. The study also provides light on the effectiveness of psychological intervention in both clinically diagnosed depression and the person with no clinically significant depression but having depression symptoms. The person struggling with age-related cognitive impairment combined with depressive symptoms shows a moderate effect size compared to depressed older adults without cognitive impairment. Subgroup analysis for comparing studies with different experimental designs shows no significant difference in effect size.

## Disclosure statement

The authors have no potential conflict of interest to disclose.

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# LONGITUDINAL RELATIONSHIP BETWEEN CHILDREN'S EMOTION DYSREGULATION AND PARENT'S NEGATIVE EXPERIENCE OF THE COVID-19 LOCKDOWN IN FRANCE

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**Abstract**

**Introduction:** At the beginning of the COVID-19 pandemic, a lockdown was implemented in France, leading to profound changes in families' life. Studies showed emotional and behavioral difficulties in children and adults during this period. However, few research has focused on the longitudinal interactions between children's emotion regulation and parental emotional experience of the lockdown.

**Aim**: This study aimed to examine the longitudinal bidirectional relationships between children's emotion regulation and parental emotional experience of the lockdown.

**Method**: One hundred and twenty parents of children aged 5 to 12 answered two online questionnaires, at the start of the first lockdown (Time 1), and one month later (Time 2). Emotional dysregulation in children and parental emotional experience of the lockdown were assessed.

**Results**: The results of the autoregressive cross-lagged analyses revealed that children's emotion regulation at Time 1 predicted lockdown-related parental emotional experience at Time 2, whereas lockdown-related parental emotional experience at Time 1 didn't predict children's emotion regulation at Time 2.

**Conclusion**: This study suggested that parents of children with greater emotion regulation difficulties have had a worse emotional experience of the lockdown, without affecting the emotional regulation of children. Clinical implications and protective factors are discussed.

**Keywords**: lockdown; parental quality of life; school-aged children; social-emotional difficulties.

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Since the beginning of 2020, France has lived with the COVID-19 pandemic. To limit the spread of the virus by social distancing, lockdown and schools' closure were decided by French authorities in March 2020. These decisions involved remote school and work, which led to profound changes in family relationships and functioning (Coum, 2020). Mandatory for sanitary purposes, these precautions raised the question of mental health's population (Brooks et al., 2020). The literature review conducted by Brooks et al. (2020) showed the impacts of previous lockdowns in parents and children, such as symptoms of psycho-traumatic stress, confusion and anger (Brooks et al., 2020). Lockdown-related stressors have also been highlighted during and after lockdown. During lockdown, a length exceeding 10 days, physical symptoms, frustration and boredom, isolation, restricted access to equipment and care, insufficient information, and the fear of being infected or of infecting other people can be mentioned. After lockdown, the socio-economic consequences, stigmatization by others and back to "normal" life were identified as psychological stressors.

During the COVID-19 pandemic, higher rates of anxiety, depression, alcohol consumption compared to usual rates in adults (Ahmed et al., 2020), emotional and behavioral difficulties in children and adolescents (Jiao et al., 2020) were observed. Jiao et al. (2020) also reported emotional and behavioral changes in children during lockdown. Pearcey et al. (2020) found a significant difference in emotional, behavioral and attentional difficulties in children aged from 4 to 10 years old over a one-month period of lockdown. In France, lockdown would have increased the difficulties in some children (sleep, behavior, emotions) but half of the children would not have encountered any particular issue (Thierry et al., 2021). The impacts of lockdown in families were wide-ranging. Thierry et al. (2021) found that family climate was improved in 25% of families, whereas in Gherasim & Danet's study (2022), 89% of parents said they had been negatively affected by the pandemic context and 91% that their child (6-12 years old) had been negatively affected by the pandemic too.

Several factors could explain the differences in the way parents and children have experienced and perceived COVID-19 lockdown. As mentioned above, during lockdown, parents and children had to create new functioning and organization due to remote school and work, whenever possible. In "Co-Space" study, parents were stressed and concerned by work (53%) and children well-being (50.4%) (Waite et al., 2020). Many parents (60%) felt unable to address their child's needs (Creswell et al., 2021). According to Creswell et al. (2021), this lack of parental availability would lead to changes in school-aged children's difficulties during lockdown. Other vulnerability factors have been identified during the COVID-19 pandemic: parental stress, parental anxiety related to the pandemic, single-parenthood, a low educational level in parents, former socio-emotional difficulties in children (Dubois-Comtois et

al., 2021; Spinelli et al., 2020; Vandentorren et al., 2021; Zaouche Gaudron et al., 2022). The relationship between parents' stress and feeling and children's behaviors has been previously found, outside pandemic (Vaughan et al., 2013). Greater internalized and externalized symptoms in children (5 to 18 years old) were related to greater parental stress, characterized as caregiver strain (objective strain, subjective external strain and subjective internalized strain). The Caregiver strain concept developed by Brannan and her colleagues (1997) provided a conceptual framework for the understanding of parental experience in lockdown context. This concept refers to "the extent to which aspects of caring are problematic (e.g., financial strain) and engender particular feelings toward the child (e.g., anger, sadness)" (Vaughan et al., 2013, p. 4). During the COVID-19 lockdown, parents had to face additional strains to usual, such as those previously mentioned (remote school and work), but also financial and health difficulties. In this context, parental daily experience and quality of life could be more impacted by emotional and behavioral difficulties in children.

Studies run during prior pandemics also suggested that pandemic and lockdown experience in parents and children were related (Sprang & Silman, 2013). During the COVID-19 pandemic, Gherasim & Danet (2022) found a relationship between the reported psychological effect of the pandemic on parents and the school-aged children's state anxiety. Similar results were found in a longitudinal study with one-month follow-up among parents of younger children (1 to 7 years old) (Robertson et al., 2021). According to Di Giorgio et al. (2021), the daily stress of mothers caused by the COVID-19 pandemic, related to the compliance with sanitary measures and lockdown, has had an impact on the psychological well-being of their children, especially on their emotion regulation abilities. Likewise, as part of a cross-sectional study, Spinelli et al. (2020) have found a negative relationship between parental stress and emotional regulation in children during the first COVID-19 lockdown. In line with Neece et al. (2012) - whose research highlighted the transactional relationship between parent stress and child behavior issues - parental daily experience during lockdown and children's behaviors would be bidirectionally related.

This study aimed to examine the relationships between emotional and behavioral difficulties in school-aged children, especially emotional dysregulation, and parental experience, especially emotional experience, during the first COVID-19 lockdown in France. This study focused on parents of children between 5 and 12 years old, as many emotional and behavioral changes have been reported in those age-range (Creswell et al., 2021; Skripkauskaite et al., 2021; Waite et al., 2021). Research showed relationships between parental stress and emotional and behavioral difficulties in children (Sprang & Silman, 2013; Vaughan et al., 2013). Research also suggested that lockdown has impacted parents and children. As a consequence, we predicted a bidirectional relationship between children's emotional and behavioral

difficulties and parental experience during the COVID-19 lockdown. More specifically, we hypothesized that children's emotional dysregulation and lockdown-related parental emotional experience would be bidirectionally related, such that children's emotional dysregulation would predict worse lockdown-related parental emotional experience, and lockdown-related parental emotional experience would predict more children's emotional dysregulation.

## Method

### *Procedure and ethical considerations*

This study was conducted online between March and May 2020. There were two waves of data collection with one-month follow-up. To recruit participants, advertisements with a link to the survey were posted and shared on Facebook and Twitter pages (administered by associations and individuals). Emails were also sent to professional contacts encouraging them to share the link to the questionnaire. In order to avoid bias (e.g., choosing the less concerning child or, on the contrary, the more concerning child), parents who had more than one child of the targeted age had to answer the questionnaires with respect to only one child, namely the one whose birthday was coming up next. After they gave their consent, participants completed the questionnaires online. The questionnaires assessed children's emotional dysregulation and lockdown-related parental emotional experience.

Socio-demographic data, such as child and parent age, estimated standard of living, parent's level of education, marital status, were also collected. The completion duration was about 10-15 minutes. As in the Co-Space (Pearcey et al., 2020) and Robertson et al. (2021) study, parents who gave their agreement were contacted a month after the first completion (Time 1) to complete the questionnaires again (Time 2). The one-month period between Time 1 and Time 2 also corresponded to the period of the first lockdown, as it was initially planned when it was implemented in France. Indeed, the first lockdown was supposed to be temporary and transitional and was not intended to be prolonged over time. The procedure met the recommendations of the French National Code of Ethics for Psychologists - Revised (Commission Nationale Consultative de Déontologie des Psychologues, 2012) and complied with the Declaration of Helsinki of 1964 and its subsequent amendments. The study was carried out with the free and informed consent of the parents and was deposited in the treatment register of the University of Lille under the number 2020-79 and declared to the data protection officer of the University of Lille. All the data were confidential and anonymized.

*Participants*

The first wave of data collection (Time 1) was conducted among a sample of 347 French parents. One hundred twenty parents completed the Time 2 questionnaires. The final sample of this study thus included 120 parents (5 fathers, 115 mothers), aged from 26 to 61 years old (M= 39.33 years, SD= 5.00 years). Parents were mainly married or in a couple relationship (89%), had at least a bachelor degree (87.4%) and were employed (66.7%). Children were aged from 5 to 12 years old (M= 7.71 years, SD= 2.14 years) and included 66 girls and 54 boys. All demographic characteristics of the sample are displayed in Table 1.

**Table 1.** Demographic characteristics of the longitudinal sample (N=120)

| Longitudinal sample | Number | Percentage |
|---|---|---|
| **Parents** | | |
| Mother | 115 | 95% |
| Father | 5 | 5% |
| **Level of Education** | | |
| High School diploma or less | 15 | 12.5% |
| Bachelor's degree | 16 | 13.3% |
| Master's degree | 76 | 63.3% |
| Ph.D | 13 | 10.8% |
| **Marital Status** | | |
| Married or in couple | 107 | 89% |
| Divorced | 8 | 6.7% |
| Widower | 1 | 0.8% |
| Other | 4 | 3.3% |
| **Professional Status** | | |
| Self-employed | 21 | 17.5% |
| Employed | 80 | 66.7% |
| Unemployed | 7 | 6% |
| Stay-at-home parent | 3 | 2.5% |
| Retired | 9 | 7.5% |
| **Children** | 0 | |
| Girl | 66 | 55% |
| Boy | 54 | 45% |
| **Birth Order** | | |
| Only child | 27 | 22.5% |
| First born | 52 | 43.3% |
| Cadet | 22 | 18.3% |
| Youngest born | 19 | 15.8% |

*Measures*

*General information*

The demographic questionnaire included questions on the child and parent age and gender, the birth order of the child. We also collected data on parents' level of education and professional status. The standard of living perceived by parents was

assessed using a Cantril scale (Ngantcha et al., 2018), with responses ranging from 0 (representing people who consider themselves the most disadvantaged) to 10 (representing those who consider themselves the most advantaged).

*Children's emotional dysregulation*

We used the French version of the Emotion Regulation Checklist (ERC-vf: Nader-Grosbois & Mazzone, 2014; Shields & Cicchetti, 1997) to assess children's emotional dysregulation. The original scale has two subscales: emotional regulation and emotional dysregulation. In this study, we only used the emotional dysregulation subscale which evaluated the lability, negativity of the expression of positive and negative emotions or their adequacy, with 15 items. Parents had to rate their perception of intra- and interpersonal emotional dysregulation of their child on a 4-points Likert scale (from 1 = never to 4 = almost always). The items were summed to obtain a score of emotional dysregulation. The higher the score was, the higher the child had difficulties to regulate his/her emotions. ERC-vf had good inter-rater reliability, test-retest stability and good internal consistency reliability (Nader-Grosbois & Mazzone, 2014). In our sample, Cronbach's alpha coefficient for the emotional dysregulation subscale was .82 at Time 1 and .84 at Time 2. This subscale demonstrated a good internal consistency reliability.

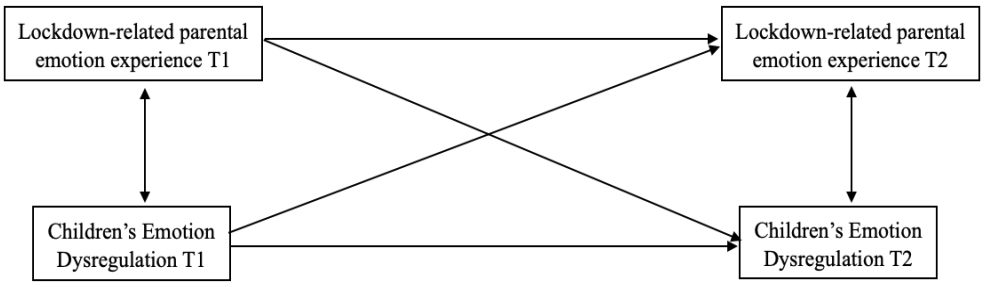
*Lockdown-related parental emotional experience*

Parental emotional experience during lockdown was assessed using a self-administered questionnaire adapted from the PAR-DD-QoL (Parental-Developmental Disorder – Quality Of Life; Baghdadli et al., 2014). The original questionnaire is a 17 items questionnaire assessing quality of life of parents who have a child with a neurodevelopmental disorder, on two dimensions: emotional and daily disturbances. In the present study, the items of the emotional disturbances dimension of Par–DD-QoL that were relevant to the lockdown situation were retained (7 items; e.g.: "Do you feel more stressed than usual?") and one item was edited ("Are your child's troubles a source of tension or conflicts within your family?" has been replaced by "Is the situation of lockdown a source of tension or conflicts within your family?"). The instruction of the scale of the lockdown-related parental emotional experience was " Currently, due to lockdown :…" and the scale included 8 items assessing parents' quality of life during lockdown based on parents' emotional disturbances (feeling worried, annoyance, impact of lockdown on personal and family life; e.g.: "Do you feel upset?", "Is your moral affected?"). We performed factor analyses with Varimax rotation using the 8 selected and modified items of the emotional subdimension of Par–DD-QoL to confirm the items were in the same factor, for Time 1 and Time 2. Both times, the results of the analyses suggested a one-factor model that accounted for 62.70 % of the total variance at Time 1, and 63.11% at Time 2. Good internal consistency reliability was observed for both. Cronbach's alpha coefficient was .91 at Time 1 and at Time 2. Each item was rated on a Likert scale from 1 (not at all) to 5 (extremely). A score was computed

by the mean of the 8 items. Higher scores indicated that the parent had a worse lockdown-related emotional experience.

*Analytic plan*

Means comparisons were carried out to check the representativeness of the longitudinal group (N=120) with the total sample (N=347). Secondly - before proceeding to the main analyses - we performed bivariate correlations and series of one-way ANOVA in order to control the effect of some variables (standard of living estimated by the parents, parents' level of education, children's birth order, children and parents' age) on our main variables (children's emotional dysregulation and lockdown-related parental emotional experience). Then, we carried out bivariate correlations between children's emotional dysregulation and lockdown-related parental emotional experience, at Time 1 and Time 2. These analyses were performed with SPSS version 27 (*IBM SPSS Statistics for Macintosh, Version 27.0*, 2020). Finally, in order to test the hypothesis of the bidirectional relationship between children's emotional dysregulation and lockdown-related parental emotional experience, a cross-lagged path model (Selig & Little, 2012) was constructed within Mplus version 8.6 (Muthen & Muthen, 2017) to examine the longitudinal associations between children's emotional dysregulation and lockdown-related parental emotional experience at Time 1 and Time 2 (see figure 1) [insert Figure 1 here]. Autoregressive cross-lagged path models assess the relationship between variables at Time 1 and Time 2. "The autoregressive effects describe the stability of the constructs from one occasion to the next" (Selig & Little, 2012, p. 265). In this model, the cross-lagged effects are estimated controlling for the prior level of the construct being predicted. Thus, variable X at Time 1 predicts variable Y at Time 2, while controlling for variable Y at Time 1. Model fit was estimated using root mean square error of approximation (RMSEA; less than 0.05 is considered excellent fit), the comparative fit index (CFI), and the Tucker-Lewis index (TLI; values greater than 0.9 suggest excellent fit).




**Note**. T1 = Time 1; T2 = Time 2.

**Figure 1.** Theorical cross-lagged model. Relationship between relationship between Children's Emotion Dysregulation and Lockdown-related parental Emotional Experience.

## Results

*Preliminary analysis*

In order to test the representativeness of the longitudinal sample (N=120) with the whole sample (N=347), we conducted mean comparisons on children and parents' age, as well as on the score of each measure using Student's tests for independent samples. Only one significant difference was found between the two groups, with the longitudinal sample scoring higher in the estimated standard of living than the total sample. All results are displayed in Table 2.

**Table 2**. Mean comparisons between the total sample (N=347) and the longitudinal sample (N=120) at Time 1

| | Total sample **Mean (SD)** | Longitudinal sample **Mean (SD)** | ***t*** | ***p*** |
|---|---|---|---|---|
| **Parents** | | | | |
| Age | 39.43 (5.23) | 39.33 (5.00) | -.22 | .83 |
| LR parental Emotional Experience | 2.17 (.88) | 2.12 (.86) | -0.64 | .52 |
| Estimated standard of living | 6.09 (1.29) | 6.72 (1.10) | **6.35** | **.001** |
| **Children** | | | | |
| Age | 7.90 (2.18) | 7.71 (2.14) | -0.93 | .35 |
| Children's Emotion Dysregulation | 27.42 (6.73) | 26.46 (6.10) | -1.72 | .09 |

**Note**. LR = Lockdown-related.

Nevertheless, as there was no difference in the main measures, the longitudinal sample was considered as broadly representative of the whole sample.

The results of the bivariate correlations conducted to assess the effect of the standard of living estimated by the parents, children and parents' age on our main variables (children's emotional dysregulation and lockdown-related parental emotional experience) showed no significant correlation (see Table 3).

**Table 3.** Descriptive and bivariate correlations between child age, parent age, perceived standard of living, children's emotion dysregulation and lockdown-related parental emotional experience at Time 1 and Time 2

| **Variables** | **Mean (SD)** | **Min.** | **Max.** | **1** | **2** | **3** | **4** | **5** | **6** |
|---|---|---|---|---|---|---|---|---|---|
| 1. Child age | 7.71 (2.14) | 5 | 12 | - | | | | | |
| 2. Parent age | 39.33 (5.00) | 26 | 61 | **.359**$^{***}$ | - | | | | |
| 3. Estimated standard of living | 6.72 (1.10) | 3 | 9 | -.022 | .138 | - | | | |
| 4. Children's Emotion Dysregulation T1 | 26.46 (6.10) | 15 | 46 | -.129 | -.047 | .020 | - | | |
| 5. LR parental emotional experience T1 | 2.12 (.86) | 1 | 4.63 | -.082 | -.120 | -.052 | **.358**$^{***}$ | - | |
| 6. Children's Emotion Dysregulation T2 | 26.31 (6.34) | 15 | 43 | -.092 | .040 | .043 | **.765**$^{***}$ | **.268**$^{**}$ | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7. LR parental emotional experience T2 | 2.11 (.87) | 1 | 4.50 | -.148 | .029 | -.060 | **.400**$^{***}$ | **.702**$^{***}$ | **.413**$^{***}$ |

**Note**. $^{**}p$ <.01; $^{***}p$ <.001. T1 = Time 1; T2 = Time 2; LR = Lockdown-related.

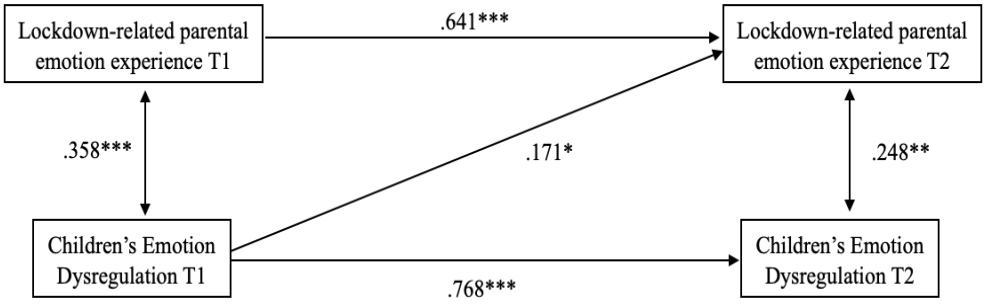
The results of the series of one-way ANOVA showed no significant difference on the score of children's emotional dysregulation at Time 1 ($F_{3,119}$=1.175, $p$ =.322) and Time 2 ($F_{3,119}$=.180, $p$ =.910), and on the score of lockdown-related parental emotional experience at Time 1 ($F_{3,119}$=.864, $p$ =.462) and Time 2 ($F_{3,119}$=.488, $p$ =.691) by the level of parent's education. There was also no significant difference on the score of children's emotional dysregulation at Time 1 ($F_{3,119}$=.409, $p$ =.747) and Time 2 ($F_{3,119}$=.297, $p$ =.827), not either on the score of lockdown-related parental emotional experience at Time 1 ($F_{3,119}$=.238, $p$ =.870) and Time 2 ($F_{3,119}$=.245, $p$ =.865) by children's birth order.

Hence, the standard of living estimated by the parents, the parent's level of education, the children's birth order, children and parents' age were not controlled for in the main analyses.

*Main analyses*

Bivariate correlation analyses showed a significant relationship between children's emotional dysregulation and lockdown-related parental emotional experience at Time 1, at Time 2, as well as at Time 1 with Time 2 (see Table 3).

The results of the cross-lagged model testing the associations among children's emotional dysregulation and lockdown-related parental emotional experience are presented in Table 4 and figure 2.




**Note.** $^{*}p$ <.05; $p$ <.01; $^{***}p$ <.001. T1 = Time 1; T2 = Time 2.

**Figure 2.** Relationship between relationship between Children's Emotion Dysregulation and Lockdown-related parental Emotional Experience. Standardized coefficients are reported.

**Table 4.** Standardized estimates for cross-lagged path model assessing the bidirectional relationship between Children's Emotion Dysregulation and Lockdown-related parental Emotional Experience

| Measure | Estimate | S.E. | p-value |
|---|---|---|---|
| Autoregressive coefficient | | | |
| Children's ED T1 → Children's ED T2 | **.768** | **.047** | **.001** |
| LR parental EE T1→ LR parental EE T2 | **.641** | **.065** | **.001** |
| Predicting Children's Emotion Dysregulation | | | |
| LR parental EE T1 → Children's ED T2 | -.007 | .069 | .925 |
| Predicting Lockdown-related parental EE | | | |
| Children's ED T1 → LR parental EE T2 | **.171** | **.071** | **.016** |

Note. LR = Lockdown-related; ED = Emotion Dysregulation; EE = emotional experience; T1 = Time 1; T2 = Time 2.

The results showed that the model fit to the data well (RMSEA = 0.00; CFI/TLI = 1.0/1.0; SRMR = 0.00). The stability paths were significant for children's emotional dysregulation (*ß*=.768, *p*=.001) and for lockdown-related parental emotional experience (*ß*=.641, *p*=.001), suggesting high levels of stability of these two variables over time (Selig & Little, 2012). Children's emotional dysregulation at Time 1 predicted lockdown-related parental emotional experience at Time 2, such that higher children's emotional dysregulation predicted worse lockdown-related parental emotional experience (*ß*=.171, *p*=.0116). In contrast, lockdown-related parental emotional experience at Time 1 didn't predict children's emotional dysregulation at Time 2. At Time 1 and Time 2, children's emotional dysregulation and lockdown-related parental emotional experience were related (respectively: *ß*=.348, *p*=.001 and *ß*=.248, *p*=.01).

## Discussion

The aim of this study was to examine the bidirectional relationship between school-aged children's emotional behaviors and parental emotional experience during the COVID-19 pandemic among French families. In line with previous studies underlying the transactional interactions between children's behaviors and caregivers' emotional state (Creswell et al., 2021; Robertson et al., 2021; Vaughan et al., 2013), we hypothesized that children's emotional dysregulation would predict worse lockdown-related parental emotional experience and that lockdown-related parental emotional experience would predict more children's emotional dysregulation.

The bivariate correlations analyses showed a significant relationship between children's emotional dysregulation and lockdown-related parental emotional experience each Time (1 and 2), as well as at Time 1 with Time 2. The cross-lagged panel model showed that lockdown-related parental emotional

experience at Time 2 was predicted by children's emotional dysregulation at Time 1, partially supporting our hypothesis. Specifically, worse children's emotional dysregulation at the beginning of the Covid-19 pandemic and lockdown in France predicted a worse lockdown-related parental emotional experience (restlessness, sleep difficulties, worries, feeling helpless, feeling stressed and upset) a month later. This finding is consistent with previous works run during the Covid-19 pandemic and earlier (Baghdadli et al., 2014; Neece et al., 2012; Vaughan et al., 2013; Waite et al., 2020; Zaouche Gaudron et al., 2022) and in line of the Strain Caregiver concept (Brannan et al., 1997) indicating that children's difficult behavior increased parental stress and impacted parents' quality of life. Indeed, in a sample of French parents of young children (less than 6 years old), parents of children with developmental difficulties have experienced more stress and strain than others (Zaouche Gaudron et al., 2022). This result suggested that the child's difficulties in emotional regulation may have been added to the life changes imposed by lockdown, bringing an additional challenge to the parents.

However, contrary to our hypothesis and previous works (Di Giorgio et al., 2021; Robertson et al., 2021), worse lockdown-related parental emotional experience at Time 1 did not predict worse children's emotional dysregulation at Time 2. This result was nevertheless similar to the cross-sectional study of Gherasim & Danet (2022), which showed no relationship between children's emotional regulation and the negative perceived impact of the pandemic in the parents. In that study, children's emotional regulation was related to the negative perceived impact of the pandemic in the children. Parents' and children's experience of lockdown and pandemic were associated in other studies (Gherasim & Danet, 2022; Shorer & Leibovich, 2020). It could thus have been interesting to investigate an indirect moderation of the relationship between lockdown-related parental emotional experience and children's emotional dysregulation by children's lockdown-related emotional experience. Several researchers demonstrated the importance of communication within families during lockdown (Dalton et al., 2020; Ghosh et al., 2020; Lee, 2020; Tang et al., 2021; Wang et al., 2020). Tang et al. (2021) have thus highlighted the importance of an open and adapted communication between children and their parents during lockdown, which is a potentially stressful and anxiety-provoking situation. Communication could be a protective factor to child difficulties during this period (Melchior et al., 2021). It could be possible that, despite many challenges and difficulties in their emotions and feelings during lockdown, parents were able to maintain a secure communication with their child, limiting the impact of parental stress on the child's emotional dysregulation. It is also important to note that our sample's baseline negative lockdown-related parental emotional experience was moderate, suggesting that parents in our sample may have been relatively few emotionally impacted by lockdown or may have found efficient coping strategies to reduce their stress in this period (e.g. emotion regulation; Vertsberger et al., 2022). The baseline lockdown-related parental emotional experience was moderately negative, which might also suggest that parents in our sample have faced few

difficulties during the pandemic. Indeed, researchers have highlighted the heterogeneity of lockdown experience within families (Bruining et al., 2021), which proved positive for many of them (Gindt et al., 2021; Thierry et al., 2021). This might partially be due to the presence of protective factors in our sample, such as being in a biparental family (Spinelli et al., 2020; Zaouche Gaudron et al., 2022) and having a high education level (Vandentorren et al., 2021). Future work may explore the impact of pandemic-related parental emotional experience on children's emotional regulation among vulnerable families.

The autoregressive coefficient for children's emotional dysregulation over time was high. According to Selig & Little (2012), "a sizable autoregressive coefficient means that individuals' relative standings on the construct has changed very little over time" (p. 266). This result suggested that there were few changes in the emotional dysregulation behaviors of children in our study during lockdown. One might assume that the one-month follow-up failed to capture the changes in children's behaviors. Nevertheless, other studies (Bourdeau-Lepage, 2020; Orgilés et al., 2020) found an increase of children's difficulties during lockdown, using the same time lapse follow-up. As a consequence, the few changes in children's emotional dysregulation behaviors in our sample might instead be explained by the presence of protective factors. Whereas single parenting and parents' lower education level have been identified as vulnerabilities factors for negative outcomes in children during the Covid-19 pandemic, our sample essentially included parents living as a couple and with a high level of education. The results of our analyses also showed that the autoregressive coefficient for lockdown-related parental emotional experience over time was also high. This result suggested that there were few changes in the lockdown-related parental emotional experience in our study, which is a promising finding that assumes parental emotional experience, on average, did not deteriorate during the first month of the pandemic.

## Strengths and Limitation

A strength of this study was the longitudinal design with data collection that started early after the beginning of the first COVID-19 lockdown in France. Indeed, literature available with this method in France, within this period, is sparse. Longitudinal design is important to capture the bidirectional interactions between children and parents' functioning, which was allowed by the use of cross-lagged models panel (taking account for autoregressive and correlational relationships within Time 1 and Time 2).

This study also had several limitations. Parents in our sample have a higher level of education than the general French population: 87.4% had at least a bachelor degree versus 29.9% in the French general population within the 35-44 years old (INSEE, 2021). A high proportion of respondents were in couple (89%), which is

why we were unable to assess single parenthood specificities. This limitation leads to interpreting the results with caution given that parents in our sample may not be the most vulnerable. A high proportion of participants were mothers, so we were unable to assess fathers' unique experience. However, this is a common pitfall in developmental studies. Additionally, although we started the data collection a few weeks after the beginning of lockdown, we have no data regarding family functioning prior to lockdown. Also, we have no data regarding the period following the first lockdown, limiting the possibility to assess long-term impacts of the pandemic on children and parents functioning.

## Clinical implications and futures directions

Given the impacts of the pandemic on children's mental health (Gherasim & Danet, 2022; Jiao et al., 2020; Waite et al., 2021) and the way children's mental health may impact parental well-being, it seems important to implement interventions focusing on children functioning, especially regarding emotional regulation. Web-based interventions such as the REThink therapeutic game could be particularly relevant during the pandemic and after. Such interventions allowed an improvement in children's emotional regulation that can be maintained in the long run (David & Fodor, 2022). Our results also suggest that it is important to support the parents of children with difficulties in emotional regulation in order to avoid parental burn out (Vertsberger et al., 2022; Zaouche Gaudron et al., 2022). Parents with lower levels of stress may be more supportive towards their children (Di Giorgio et al., 2021; Tang et al., 2021).

Given research suggesting that parental emotional regulation moderates the relationship between stressors and parental burn out (Vertsberger et al., 2022), research should take into account emotional regulation in parents in longitudinal studies on children's emotional regulation and parental quality of life. As mentioned above, a lower level of education and single-parenthood are vulnerability factors for children's difficulties and parental stress (Vandentorren et al., 2021; Zaouche Gaudron et al., 2022). Research should include more vulnerable families.

## Conclusion

This research highlighted the longitudinal impact of children's emotional dysregulation on lockdown-related parental emotional experience over a short period of time. Although moderate, this impact appeared despite many protective factors in parents. It is thus possible that more vulnerable families had encountered more difficulties over this period and that the pandemic experience varied depending on

the protective factors and supports parents may have had. Supporting parents and children in emotional regulation is thus an urge as the pandemic seems ongoing.

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# THERAPEUTIC MECHANISM AND EFFECTIVENESS OF THE SINGLE-SESSION SUICIDE CRISIS INTERVENTION

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**Abstract**

**Background:** The research of the Single Session Therapy in the suicide intervention mainly adopted quantitative studies in the past but lacked qualitative data to understand the meaning of the effect. Therefore, we conducted in-depth interviews to collect the data for the Single-Session Suicide Crisis Intervention (SSSCI) change mechanism and evaluate its effects. **Methods:** The study implemented mixed methods research in which qualitative analysis was the primary research method, and quantitative analysis was auxiliary to support the findings of qualitative research, excluded patients with more than two psychiatric hospitalizations and who had been diagnosed with personality disorders, finally recruiting nine suicide clients. **Results:** Qualitative data can be integrated into three levels: the individual, the relationship, and the spirituality level. The test of before and after depression and living and coping with beliefs reached a significant level of .05. With the two tracking scores, the risk of suicide continued to decrease, and the positiveness increased steadily. **Conclusion:** This showed the SSSCI effects on the suicide intervention, and the case reported a multifaceted harvest.

**Keywords:** Suicide Crisis Intervention; Single Session Therapy; Mixed Methods Research.

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The Single-Session Suicide Crisis Intervention (SSSCI) emphasizes the concept of structural counseling and the occurrence of change, which is mainly derived from the idea of Single Session Therapy (SST) by Talmon in 1990. Kaffman (1995) believed that the beginning of the counseling represents the possibility of change and strengthens the belief that change will occur at the end of the counseling. Most research showed that nearly half or more clients tended to receive one to two treatments, and less than 50% of clients receive three to four treatments or more (Mackenzie, 1991; Rosenbaum et al., 1990; Young et al., 2012).

SST is a service orientation, not a treatment model, meaning practitioners can adopt individualized treatment styles but integrate the spirit and principles of SST. Rosenbaum et al. (1990) pointed out that any treatment approach can be applied to SST, as long as it follows that each time is the last time and has a complete and independent spirit and structure (Cox & Campbell, 2003). In the same way, Bloom (2001) pointed out the perspective of the ceiling effect of change, suggesting that the space for change is limited and that the first treatment session can exert the most significant benefit. The number of treatments for a typical SST is one (Rosenbaum et al., 1990), and the average number of SST is three (Gelso & Johnson, 1983). The therapist regards each treatment as only one and agrees that one treatment can be effective.

Cameron (2007) pointed out that SST was particularly suitable for people who felt trapped and struggled to change. Perkins (2006) proposed a two-hour treatment approach appropriate to cover both assessment and treatment. Traditional treatment focuses on evaluation at the initial stage and treatment at the back end. Perkins further put forward the advantages of SST, such as early assessment and treatment, empowering clients to increase confidence in solving problems, and more cost-effective considerations. Boyhan (1996) stated in a literature review article that nearly half of the clients receiving SST require more time treatments, and Campbell (2012) further proposed that therapists who have experienced and were familiar with various psychotherapy techniques were the most appropriate to perform SST.

Hopkins et al. (2017) indicated that young people and their families believe that their mental health and well-being improved after the single session therapy intervention, especially with mothers rating the young person's improvement most highly. Single session therapy effectively enhances young people’s personal, interpersonal, social, and overall well-being receiving mental health services. Lamprecht et al. (2007) focused on patients who had received emergency care due to self-harm for the first time and performed SST focused on problem-solving treatment. They found that only two out of 32 patients reappeared in the emergency room due to self-harm within one year (6.25%), showing that the recurrence rate of the emergency room due to self-injury had decreased. Therefore, Simpson (2019) suggested that single-session crisis intervention complements the traditional expectations of emergency psychiatric evaluations by providing clinicians with a way to treat symptoms of anxiety and depression in the emergency departments. This

model may also assist in treating psychiatric inpatients and encourage further psychotherapy studies in the emergency setting.

The application of SST to suicide intervention requires some modifications. We propose a combination of assessment and intervention, using risk assessment and buffer factors, and formulate the following seven stages and 8-procedure framework based on SST. The interlock of each program can be flexibly adjusted according to the patients' situation, and we named it "Single-Session Suicide Crisis Intervention."

The theory and technology of Single-Session Suicide Crisis Intervention (SSSCI) adopts a diverse perspective, which integrates short-term counseling with a focused solution orientation, narrative therapy, client-centered therapy, meaning treatment, and Adler's concepts and techniques. The SSSCI includes seven stages and eight procedures, which were introduced as follows:

1. *Stage one:* Suicide warning and assessment of protection factor.

2. *Stage two:* Establishing a supportive relationship and affirming the help-seeking behavior, including 1.) Establish a therapeutic relationship. 2.) Affirm the case's help-seeking behavior and the courage to face the problem.

3. *Stage three:* Listening to suicide stories and providing empathy and hope, including 3.) Emphasize the possibility of change and strengthen the confidence in problem- solutions.

4. *Stage four:* Exploring alternative solutions, including 4.) Find out the problems that can be solved by counseling.

5. *Stage five:* Find out the case's life meaning and strength of the case, including 5.) Find out the life meaning and power of the case.

6. *Stage six:* Developing short-term and positive actions to enhance positive experiences and the sense of efficacy, including 6.) Put forward tasks that can provide concrete change and practice possible solutions, 7.) Affirm the counseling and the results of the individual's efforts.

7. *Stage seven:* Evaluating the effectiveness of the treatment, tracking, or resource referrals, including 8.) Follow up or consult for the next session.

The SSSCI emphasizes the follow-up after the intervention. The single-session intervention also believes that tracking can help individuals strengthen their growth and change and strengthen their sense of responsibility. If individuals seek counseling again, it does not mean they are not good enough.

Reviewing the previous literature, SST was applied to patients with various problems, mainly adopted quantitative research to achieve positive results, but lacks qualitative data to understand the connotation of the effect. Furthermore, we combined suicide assessment and intervention in a single session to develop the SSSCI for suicide clients and conducted in-depth interviews to collect the experience of the process and curative effects of the consultation; mixed methods research was used to check the effectiveness of the intervention.

## Methods

This study aimed to understand the experience and process of a case undergoing the SSSCI. Our study used qualitative data analysis; it also included quantitative data to understand the change mechanism and effectiveness of the treatment; therefore, the mixed methods design was adopted for the research.

### *Participants*

The study subjects were nine suicide risk clients referred from suicide prevention centers, Lifeline International, community counseling centers, school counseling centers, and hospital outpatient clinics. The exclusion criteria included patients with more than two psychiatric hospitalization experiences and who had been diagnosed with personality disorders. Written informed consents were obtained from all participants.

### *Research Tools*

#### *The scale of Suicidal Risk*

This study used the ranking compiled by Hsu and Zhong (1997) on suicide risk content, including death ideas, death motives, previous suicide attempts, suicide plans, and end-of-life arrangements. The scale consists of 24 questions scored according to a four-point scale, with a higher score indicating a higher risk of suicide. The internal consistency was in the range of .85-.90. In the validity test, the absolute value of the correlations between the Scale of Suicidal Risk and the "Suicide Probability Scale," "Hopelessness Scale," and "Suicide Propensity Scale" was all greater than .40.

#### *Hopelessness Scale*

The hopelessness scale was developed by Eggert et al. (1994) to assess adolescents' mental health, deviant behaviors, social support, school, and family life adaptation, and it has good reliability and validity. The Chinese version was translated by Wang et al. (2006) and passed two tests of cultural suitability and translation equivalence assessments. This questionnaire contains five sub-scales, including support and help, activity, drug knowledge and involvement, and life experience, with a Likert 7-point scale. A higher score indicates a more profound sense of hopelessness. The questionnaire's Cronbach $\alpha = .74$ showed good internal consistency and reliability.

#### *Taiwanese Depression Screening Questionnaire*

The "Taiwanese Depression Screening Questionnaire" (TDSQ) developed by Lee (1999) is used to assess the degree of depression in a case. The scale is a localized Taiwanese depression screening questionnaire and contains culturally

characteristic phrases. The questionnaire's Cronbach α = .90 showed good internal consistency and reliability. It was a culturally sensitive and applicable depression screening questionnaire used by the native Taiwanese.

*The Reasons for Living Inventory*

The Reasons for Living Inventory was developed by Chang (2008) and uses the Reasons for Living Inventory developed by Linehan et al. (1983) as the basis for scale development. The assessment and the localized Reasons for Staying Alive inventory developed by Kao (1998) appropriately included infeasible test questions to expand the richness and completeness of the scale. Six sub-scale were constructed, namely, living and coping with beliefs; responsibility to relatives, friends, and family; fear of suicide; fear of social evaluation; caring for children; and moral controversy; the total explained variance was 55.58%, and the internal consistency coefficient of each dimension ranged from .73 to .95.

*Interview Outline*

Semi-structured in-depth interviews were used to ensure that the discussions did not deviate from the research questions. There were four directions, and the clients were gradually guided through multiple interactive modes to share the history and experience of SSSCI. The contents included: 1) What factors slowed down the suicide crisis in counseling? 2) What factors improved the chances of living in counseling? 3) How and why was the SSSCI effective? 4) What were the benefits of SSSCI?

*Statistical Methods*

*Qualitative Data Analysis*

The researcher carefully read the content of each verbatim manuscript, referred to the interview log, did not presuppose any position, used sentence-by-sentence or paragraph-by-paragraph analysis, conceptualized meaningful data, and utilized naming codes. Lieblich et al. (1998) proposed the strategy and steps of the "category-content" analysis method 1998. In addition, two researchers were arranged to compare the data.

*Quantitative Data*

SPSS version 21.0 statistical package software was used for analysis, including descriptive statistics, the Mann-Whitney U test for independent sample difference test, and the Wilcoxon matched-pairs signed-ranks test for dependent sample difference test. The statistical significance level was set as α = .01.

## Results

### *Demographic Variables*

The average age of the participants was 33.89 years old, and the age range was 15 to 52 years old. Female members were the majority, accounting for 66.7%; college graduates accounted for the majority education level, accounting for 66.7%. The detailed information was as shown in Table 1.

**Table 1.** Demographic data (N=9)

| | | N | % |
|---|---|---|---|
| Gender | male | 3 | 33.3 |
| | female | 6 | 66.7 |
| Education | primary school | 1 | 11.1 |
| | Middle school | 1 | 11.1 |
| | junior high school | 1 | 11.1 |
| | College/university | 6 | 66.7 |
| Number of children | 0 | 5 | 55.6 |
| | 1 | 1 | 11.1 |
| | 2 | 2 | 22.1 |
| | 3 | 0 | 0.0 |
| | 4 | 1 | 11.1 |
| Marriage | unmarried | 5 | 55.6 |
| | married | 3 | 33.3 |
| | divorced | 1 | 11.1 |
| Religion | No | 2 | 22.2 |
| | Taoism | 2 | 22.2 |
| | Buddhism | 2 | 22.2 |
| | Believe in God but no specific religion | 3 | 33.3 |
| Live alone | No | 7 | 77.8 |
| | Yes | 2 | 22.2 |
| Family psychiatric history | No | 7 | 77.8 |
| | Yes | 2 | 22.2 |
| Psychiatric medical history | No | 1 | 11.1 |
| | Yes | 8 | 88.9 |
| Drinking recently | No | 8 | 88.9 |
| | Yes | 1 | 11.1 |

*The therapeutic mechanism of Single-Session Suicide Crisis Intervention*

The aspects of the participants' perceptions and gains in the counseling included what had changed and how to influence these changes. Qualitative data analysis was based on three parts: the personal level, the relationship level, and the spiritual level. The data was organized at three levels: emotion (experience), cognition, and behavior at the personal level. The qualitative data are summarized in Table 2. please see Appendix I： The connotations for the therapeutic mechanism of single-session suicide crisis intervention for detailed interview information.

**Table 2.** Summary of the experience and feedback of the single session suicide crisis intervention

| Level | Theme | Category |
|---|---|---|
| 3.2.1 Personal level | | |
| Emotion (Experience) | A. Emotional relief | |
| | B. Energy enhancement and cherishing the current life | |
| Cognitive | A. Letting go of control through self-understanding, self-acceptance and learning | (1) Self-understanding |
| | | (2) Accept weaknesses and deficiencies |
| | | (3) Handle business in a soft and flexible way |
| | B. Motivation and self-encouragement to make changes through the struggle to survive | |
| | C. Learning multiple perspectives and loosening rigid ideas | |
| | D. Reinterpretation of the predicament and transformation of perspective | |
| | E. Finding a sense of positiveness from the experience of others | |
| | F. Repositioning the value and sequence of life | |
| Behaviour | A. Actively taking medication in accordance with the doctor's advice | |
| | B. Arranging pleasurable activities to enhance the sense of positiveness | |
| | C. Using clear and specific treatment strategies | |
| | D. Facing a dilemma | |
| 3.2.2 Relationship level | | |
| | A. Social support | |
| | B. Concern for family and support for friends | |
| 3.2.3 Spiritual level | | |
| | A. Experiencing the mission and meaning of life | |
| | B. Having a new perspective on death | |

*The Trend of Suicide Risk for All Participants*

The suicide risk after receiving the SSSCI was reduced, especially after the first session. The subsequent sessions strengthened the previous session. The first

session of suicide intervention was practical, and the next sessions had an enhanced effect. The application of the SSSCI to suicide clients had a good product. The figure shows below.

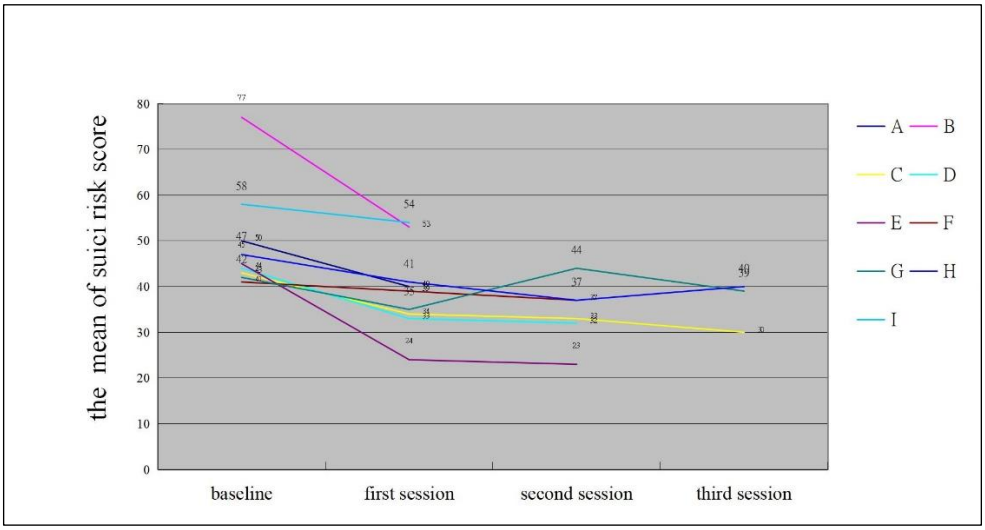


**Figure 1.** Suicide risk trend for all participants

*Effectiveness of the Single-Session Suicide Crisis Intervention*

*Test of the Difference between Depression, Hopelessness, and Reasons for Living*

As shown in Table 3, the significance test of the SSSCI before and after depression (z= -1.99, $p$ = .046) and living and coping with beliefs (z= -2.20, $p$= .028) reached a significant level of .05. At the same time, the other variables were not significant before and after the test.

**Table 3.** The difference test of depression, hopelessness, and reason to survive

| Variables | M Post/ Pre | S.D. Post/ Pre | Mean Rank Post/ Pre | Rank Sum Post/ Pre | z | *p* |
|---|---|---|---|---|---|---|
| Depression | 25.17/35.17 | 18.25/15.25 | 4.00/1.00 | 20.00/1.00 | -1.99 | .046* |
| Hopelessness | 5.83/8.00 | 3.54/2.61 | 4.00/1.50 | 12.00/3.00 | -1.23 | .221 |
| Reason to living | | | | | | |
| Living and coping beliefs | 95/84 | 15.95/19.60 | 0.00/3.50 | 0.00/21.00 | -2.20 | .028* |
| Responsibility to friends/ family | 32/31 | 5.01/4.34 | 2.00/3.67 | 4.00/11.00 | -.96 | .336 |

| Variables | M Post/ Pre | S.D. Post/ Pre | Mean Rank Post/ Pre | Rank Sum Post/ Pre | z | *p* |
|---|---|---|---|---|---|---|
| Fear of suicide | 22.67/22.33 | 5.47/5.82 | 0.00/1.500 | 0.00/3.00 | -1.41 | .157 |
| Fear of social evaluation | 12.17/13.67 | 4.02/3.67 | 2.50/0.00 | 10.00/0.00 | -1.84 | .066 |
| Care for children | 11.17/11.33 | 6.79/6.02 | 1.50/3.00 | 3.00/3.00 | 0.00 | 1 |
| Moral controversy | 7.17/7.67 | 3.66/3.56 | 3.00/2.00 | 6.00/4.00 | -.378 | .705 |

* $P < .05$; ** $P < .01$

*Single-Session Suicide Crisis Intervention Tracking*

*First Tracking Point (2 months after the end)*

The tracking results found that the average score of suicide risk was 3; the sense of the meaning of life was 5.29; the courage to face the problem was 6.43, and the alternative problem- solution was 5.14 (see figure 2). The average score for positive sense was 5.62 (the min. score = 2.67, the max. =10).

*Second Tracking Point (8months after the end)*

The second tracking point found that the total average score for suicide risk was 1.86; the sense of the meaning of life was 5.14; the courage to face the problem was 6.86, and the alternative problem- solutions was 6.00 (see Figure 2). The average score for positive sense was 5.57 (the min. score = 3.67, the max. =10).

Overall, at the second tracking, the participants' average score for suicide risk fell to 1.86 points, compared with 10 points when they asked for help, and three points for the first tracking, representing a continuous improvement. In addition, the average for the meaning of life was at a medium level, while the alternative of the problem- solutions and courage to face problems was above medium, indicating that the second tracking was more favorable for the meaning of life, courage to face problems, and the ability of problem- solutions. The participants' self-assessment of positive feelings was medium to medium or above.

*Comparison of the Two Tracking Points*

The suicide risk at the second tracking was lower than that at the first tracking, and the positive sense was higher than that of the first tracking point. In detail, the positive sense included the meaning of life, the courage to face problems, and problem-solving. The SSSCI continued to reduce the risk of suicide and enhance the understanding of positiveness.

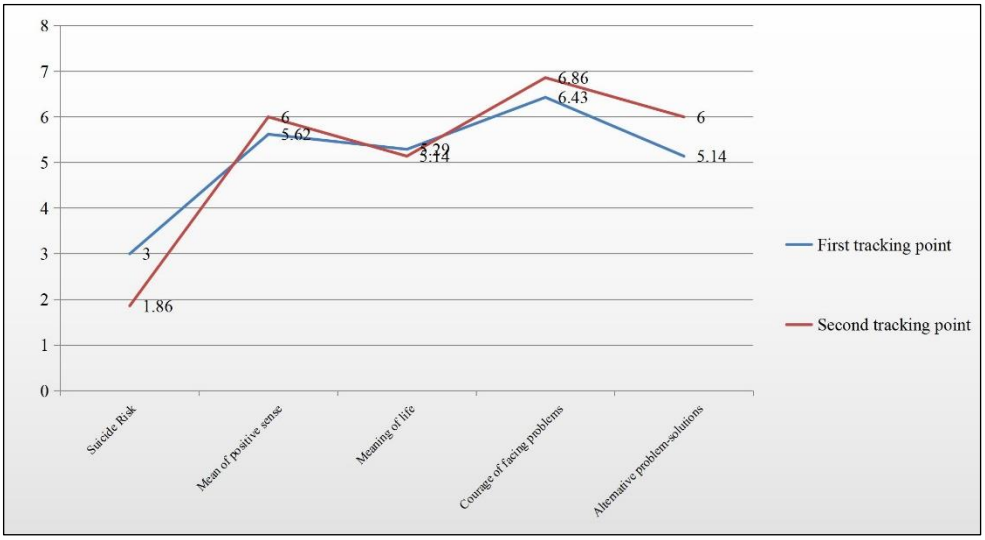


**Figure 2.** Graph of the scores of the two tracking points

## Conclusion and Discussion

*The Concept of Single-Session Suicide Crisis Intervention*

After reviewing past SST research studies, we developed an SSSCI that combined evaluation and intervention and found that it could effectively reduce the risk of suicide and increase a sense of positiveness. This model required about 90 to 120 minutes. It took the therapeutic relationship as the core to understanding the suicide problem, assisted the case's emotional relief, relieved the suicidal ideation, and found other solutions to the patient's issues to enhance the sense of hope and the meaning of life.

Linehan et al. (1983) developed the Reason for Living Inventory, and they had innovative and completely different views on the study of suicide risk assessment. For the treatment of suicide patients, both clinicians and patients must prepare systematically to eliminate the reasons for wanting to die and, at the same time, devote themselves to cultivating, instilling, and adding more reasons to survive. Therefore, in this study, under the concept of combining the ideas of suicide risk assessment with treatment and examination of the reason for living, it was found that the intervention of the reason for living could effectively reduce the risk of suicide.

As Rudd et al. (2001) mentioned, clinicians need to complete two tasks during the first meeting: the suicide assessment and second: the suicide intervention. Therefore, a clear risk assessment plan can ideally be transformed into a direct, clinically symbolic, and practical decision.

The SSSCI combined the concepts of assessment and intervention in one session. It was found that this was an effective strategy that could meet the needs of suicide crisis clients.

*The therapeutic mechanism and Effectiveness of the Single-Session Suicide Crisis Intervention*

The qualitative analysis showed that the participants reported that the changes caused by SSSCI came from the emotional level at the personal level, including emotional relief, positive energy enhancement, and cherishing the current life. At the cognitive level, there were enhancements to self -understanding and acceptance, learning to let go of control, experiencing the struggle for a living, generating change motivation and self-encouragement, learning multiple perspectives and loosening rigid ideas, reinterpreting and changing the frame of adversity, finding positive power from the experience of others, and repositioning the value and order of life. At the behavioral level, cooperate with doctors to improve the initiative of taking medicine, specifying specific intervention directions, and learning to deal with frustrations. The relationship level had the support of relatives and friends. The spiritual level included that life has a mission and meaning and a new understanding of life.

The quantitative analysis found that SSSCI can effectively reduce the risk of suicide and depression and improve survival and coping with beliefs. Tracking at two points in time found that the overall risk of suicide at the second tracking was lower than at the first tracking, and the sense of positiveness increased in follow-up tracking, showing that the SSSCI continued to maintain the effect of reducing the risk of suicide and stabilized the positive feeling.

The participants reported that the changes occurred at the individual level of emotion, cognition, and behavior and the relationship level and spiritual level.

*The Improvement Rate of the Suicide Risk*

The participants in this study had a wide range of complex suicide problems. After the SSSCI, there was a significant effect on reducing the risk of suicide. Four of the nine participants received a single session suicide intervention, and five received two or three sessions.

In terms of the effectiveness of single-session suicide intervention, the average improvement rate of the suicide risk was 21.35%, indicating that only one-session suicide crisis intervention could effectively reduce the risk of suicide. In addition, for the five participants who performed more than two sessions, the improvement rate for the second session was between 3.03~9.76%. Just like the view of maximizing the effect of the SST, the ceiling effect was reached the first time, and the subsequent treatment effect was slowed down.

In summary, the SSSCI can effectively reduce the risk of suicide in the first session. This model could provide a reference for front-line practitioners and effectively mitigate the suicide crisis during the subsequent treatment, especially in workplaces where only a single or limited intervention can be provided; in addition, the suicide treatment during subsequent sessions also has the effect of maintaining the efficacy of the treatment, making the SSSCI an effective model for suicide cases.

## Authors note

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**Data availability statement**: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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# COGNITIVE PROCESSING THERAPY VERSUS MEDICATION FOR THE TREATMENT OF COMORBID SUBSTANCE USE DISORDER AND POST-TRAUMATIC STRESS DISORDER IN EGYPTIAN PATIENTS (RANDOMIZED CLINICAL TRIAL)

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**Abstract**

Earlier research has established that posttraumatic stress disorder (PTSD) and substance use disorder (SUD) frequently coexist.

**Aims:** Cognitive Processing Therapy was compared to Sertraline and a placebo in an RCT for treating patients with comorbid SUD and PTSD.

**Methods:** 150 patients with SUD and PTSD were interviewed by clinicians and asked to fill out the Clinician-Administered PTSD Scale (CAPS-5), Posttraumatic Stress Disorder Checklist (PCL-5), Beck Depression Inventory (BDI-II), Timeline Follow Back Interview (TLFB), and Brief Addiction Monitor (BAM). Patients were randomly assigned to the following conditions: CPT ($n$=50), Sertraline ($n$=50), or Placebo ($n$=50). Pretreatment, posttreatment, six and, twelve-month follow-up assessments were conducted.

**Results:** When compared to the sertraline group, CPT resulted in much higher reductions in CAPS scores at posttreatment assessment ($d$=0.93, $p$ < .000). When compared to the control group, CPT considerably reduced PTSD symptoms (the effect size, $d$=1.9, $p$ < .000). Sertraline resulted in

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many significant decreases in CAPS when compared to control groups (the effect size, $d$=1.11, $p < .000$). At posttreatment, SUD and depression severity were significantly reduced in both CPT and Sertraline groups. After six and twelve months of follow-up, these differences persisted.
**Conclusion:** Comparatively to the control group, CPT and Sertraline significantly decreased PTSD, SUD, and depression.

**Keywords:** Cognitive processing therapy, Sertraline, Posttraumatic stress disorder, Substance use disorder, Depression.

As the name suggests, substance use disorders (SUDs) are a set of symptoms that emerge from the continued use of an addictive substance despite experiencing problems. (American Psychiatric Association, 2013). Substance use disorders affect a person's brain, actions, and emotions, and are linked to heredity as well as to psychological, emotional, cognitive, and familial factors (such as family beliefs and attitudes) and social factors (friends). (Goldman, Oroszi & Ducci, 2005; Hawkins, Catalano & Miller, 1992, Mayberry, Espelage & Koenig, 2009). As a maladaptive stress-coping technique, prolonged exposure to trauma and stress may raise the chance of excessive substance usage. (Chilcoat & Breslau, 1998, McLellan, 2017). Experiencing trauma(s) is linked in many cases to the onset of SUD. Substance Use Disorder (SUD) and Post-Traumatic Stress Disorder (PTSD) are usually associated (Grant et al., 2015, Gulliver & Steffen, 2010, Seal et al., 2011). Posttraumatic Stress Disorder (PTSD) is characterized by invasive, avoidance, hyperarousal, and cognitive and emotional changes (American Psychiatric Association, 2013). As a result of trauma, a person may experience physical discomfort, mental distress, harmful ideas, and/or destructive acts (Fernandez et al., 1999, Fernandez & Kerns, 2012). Trauma can negatively affect a person's quality of life, manifesting as a decline in activity, guilt, shame, and unworthiness as well as damaging self-perception (Kilpatrick, et al., 2013).

Avoidance and escaping are very common maladaptive strategies among PTSD patients. One example of escaping maladaptive strategies of PTSD patients is using alcohol and/or drugs to avoid thinking of trauma/s they experienced. Therefore, PTSD patients have a significant incidence of (SUD) according to various research (Flanagan et al., 2016, Debell et al., 2014, Breslau, Davis, & Schultz, 2003). As a result, patients with SUD and PTSD are less likely to comply with therapy, more likely to quit therapy, more probably to engage in self-destructive actions, and less likely to seek medication and psychological assistance (Smith & Randall, 2012, Brady et al., 1994). Because of this, both disorders must be addressed through the development of new treatments.

The results of a meta-analysis showed that medicine is considered an alternative for treating PTSD and SUD patients (Lee et al., 2016). The Food and Drug Administration has approved sertraline and paroxetine for the treatment of PTSD (Brady et al., 2005). As a first-line treatment for PTSD, sertraline has been proven to have a positive impact on substance abuse outcomes (Huang et al., 2020). Sertraline would be expected to treat SUD based on prior literature (Petrakis & Simpson, 2017). PTSD and alcohol use disorder patients were treated with Seeking Safety (SS) together with Sertraline or a placebo in a study done by Hien, et al. (2015). Seeking Safety is a psychosocial treatment for comorbid substance use disorder and PTSD (Najavits et al., 1998). At the end of the treatment, patients who had taken both sertraline and SS showed significantly less severity of PTSD symptoms than those who had received SS and placebo.

Studies suggest that treatments that address PTSD and SUD simultaneously can be cost-effective, and have more effective outcomes (Mills et al., 2012). The study by Foa, Hembree, & Rothbaum, 2007) suggested that Prolonged Exposure (PE) is an effective treatment for PTSD and SUD. PTSD and SUD patients benefit from cognitive behavioral therapy (CBT), which teaches individuals how to identify destructive and maladaptive beliefs and challenge them with logic (Sannibale et al., 2013). Aside from gaining important behavioral skills, CBT helps patients boost their quality of life and create healthy connections with others (Lydecker et al., 2010, Roberts et al., 2015).

PTSD treatment guidelines were issued in 2017 by the Veterans Health Administration, Department of Defense, and American Psychological Association (APA). The guidelines consist of a set of recommendations for therapists dealing with PTSD patients. The guidelines recommended CPT as a first-line treatment for PTSD. The guidelines also recommended Sertraline, Paroxetine, Fluoxetine, and Venlafaxine for the treatment of PTSD (American Psychological Association, 2017; VA/DoD Clinical Practice Guideline Working Group, 2017). Also, for patients with post-traumatic stress disorder, the International Society for Traumatic Stress Studies suggests Cognitive Processing Therapy (CPT). (Bisson et al., 2019). Clinically proven trauma-focused treatments, CPT and PE, are highly beneficial for patients with PTSD and substance use disorder (Chard et al., 2012). Developed by Resick and Schnicke (1993) and modified by Resick, the CPT is a well-documented treatment program (2001, 2008, 2014, 2016). CPT is a 12-session treatment that includes managing stuck points related to traumas (Resick, Monson, Chard, 2014).

Randomized clinical trials reported that (CPT) is successful in the management of PTSD with long-lasting 5 to 10-year outcomes and the highest impact and effect size of any PTSD therapy (e.g., Forbes, et al., 2012, Haagen, et al., 2015). In a six-week residential treatment program for PTSD and SUD, veterans with and without SUDs both benefited from CPT. (McDowell & Rodriguez, 2013). In a separate study, Kaysen et al. (2014) examined the effectiveness of CPT for individuals with PTSD and AUD who attended at least one CPT session. CPT has been demonstrated to reduce PTSD and depression over time. PTSD and SUD

patients were treated with CPT for six weeks, according to Peck et al. (2018). Their results showed that CPT significantly decreases maladaptive trauma-related cognitions. Bryan et al., (2018) examined the effectiveness of an intensive, 2-week CPT treatment program for veterans diagnosed with PTSD. They found that CPT significantly reduced PTSD symptom severity, rates of PTSD diagnosis, and suicide ideation.

Studies suggested that effective treatment approaches for PTSD in Egypt include CBT (e.g., Jalal et al., 2017), trauma-focused therapy (e.g., Lambert & Alhassoon, 2015), and interpersonal psychotherapy (Meffert et al., 2014).

However, The Veterans Health Administration and Department of Defense or the American Psychological Association do not suggest combining psychotherapy and medication to treat PTSD (Watkins et al., 2018). Therefore, our study compared the effectiveness of CPT and Sertraline in treating comorbid PTSD and SUD in Egyptian patients.

Although individuals with comorbid SUD and PTSD experience significant suffering, disability, and a challenging clinical course, there are still significant gaps in the evidence addressing effective treatment options. Therefore, in the current study CPT and Sertraline were compared to determine their effectiveness in treating patients with comorbid SUD and PTSD. It was hypothesized that treating PTSD will echo improvements in SUD. CPT and Sertraline were compared in the current study for the first time in an Arabic population. The current study is the first in Egypt to establish that Cognitive Processing Therapy may be effectively administered to patients with comorbid SUD and PTSD in a typical clinical environment. It joins an increasing number of studies that have similarly demonstrated this point (Forbes et al., 2012; Nixon et al., 2017). In addition, the most important and useful aspect of CPT is that it teaches individuals with co-occurring PTSD and substance use disorders practical self-help techniques. These are developed to immediately boost the patients' quality of life. This research contributes significantly to the current body of knowledge because it is unique in the Arabic world.

## Methods

### *Design*

The current study is a Randomized Control Trial (RCT) that includes three groups with repeated measurements. Patients in Sertraline and placebo and assessor were blind to treatment condition assignment. Three-block randomization was utilized to maintain an equal group size. Participants were assessed at pretreatment, post-treatment, and 6, and 12 months post-treatment. Outcome assessments were PTSD severity, substance use severity, and depression. Using single-identification numbers, the pharmacy at Ain Shams Hospital manufactured sertraline and placebo

kits for patients, and a random code is given to an unblinded statistician. The statistician (---------) informed the psychiatrist on how to allocate kits to patients.

*Population and Study Sample*

Patients were recruited from Cairo, Egypt's Ain Shams University Teaching Hospital. They were all outpatients seeking therapy for their substance use disorder. CAPS was used to make PTSD diagnoses. The psychiatrist assessed the patients' cravings and physical health via clinical interviews. None of the patients were on medication, and none were experiencing withdrawal symptoms.

*Inclusion & Exclusion criteria*

Inclusion criteria were as follow: 1) age older than 18 years 2) patients meeting current diagnostic criteria for both PTSD and SUD as defined in DSM-5 3) have a good knowledge of the English language because all assessments and therapy materials were in English. Exclusion criteria were having 1) people with cognitive disorders, 2) schizophrenia (or any other psychotic disorders), and/or 3) being pregnant. The study biostatistician produced the randomization sequence, which was kept secret from the researcher conducting study assessments. A participant's study arm was assigned by the researcher after confirmation that he or she had met the study's inclusion requirements. Recruitment occurred from January 2016 to July 2017. The study was conducted between July 2017 and Jan 2020. All patients' data and demographic information are stored at a much-secured place at the British University in Egypt (BUE).

*Settings*

The study was conducted at Ain Shams University Hospital, psychiatry department, Cairo, Egypt.

*Ethics statement*

The study was approved by the Institutional Review Board of the British University in Egypt. (IRB Protocol CL-006). The study was registered in Clinical Trials (ClinicalTrials.gov Identifier: NCT03469128) with all details about the three arms of the underlying investigation. According to the Helsinki Declaration, the study was conducted in strict conformity with all human subject protections. The patients signed the participants' information sheet and consent form and were informed that the experiment included psychological assessments for (PTSD, SUD, and depression) and treatment protocol to investigate the efficacy of the treatment.

*Study therapists*

The therapist who delivered the CPT is a clinical psychologist and certified CPT therapist. The medicine and placebos were delivered by the psychiatrist who was working in the addiction department at Ain Shams University hospital. `

*Study interventions*

*Cognitive Processing Therapy* **(**CPT) is a manual-guided therapy for PTSD symptom reduction that utilizes cognitive processing techniques (Resick et al., 2016). Sessions last 45–50 minutes each and are held once a week for 12 weeks. The outlines of the therapy during the sessions were as follows. The CPT therapist begins by educating the patient on PTSD, as well as providing an outline of the treatment and its rationale for success. They were required to produce an impact statement regarding the event's meaning to them. Clients were taught how to identify events, thoughts, emotions, and the relations between them. Clients were asked to describe the most painful traumatic event in detail. Clients were asked to express their emotions when they wrote about the experience and were invited to read it to themselves regularly. Self-blame and other distortions of the situation were addressed using Socratic questions. Clients were taught how to recognize and challenge their stuck points, as well as how to express themselves in a more balanced way. Clients were asked to modify any stuck points related to safety, trust, power, control, esteem, and intimacy. Their impact statements included their emotional and cognitive reflections related to traumatic experiences.

*Medication*: Tests on drug compliance were conducted using sertraline or placebo in combination with the vitamin riboflavin. Pill count was also used to check compliance. Over two weeks, patients in the sertraline group were gradually increased from 50 mg to 200 mg daily. All patients received the full dose of sertraline until the trial's completion (12 months). The patients were told to continue taking their pills.

*Supervision and fidelity***:** More than half of the recordings of CPT sessions have been examined. by an expert supervisor for conformity to (Resick and colleagues, 2016) guidelines. The therapist and supervisor met regularly during the experiment. There was greater supervision offered if manual compliance did not meet the competency criteria. Supervisor fidelity was defined using the Adherence Rating Scale (ARS) for CPT developed by Dittmann, et al., (2017). Fidelity was defined as the overall rating of the therapist's adherence to the manual of ARS on the following scale (0: Not adherent to the manual, 1: Great deviation, 2 Minor deviations, 3: Very adherent to the manual). Based on past research, we established the cutoff score of 2 and above as the threshold for “sufficient” adherence and competency (Marques, et al., 2019).

## Measures

During the time of the study, all patients met weekly with psychiatrists and their urine samples were collected to investigate drug use and adverse reactions. Blinded professional assessor. conducted evaluation interviews at the end of the treatment phase, six months, and twelve months after treatment.

*Patient demographics:* Personal information and inquiries, including participants' sociodemographic, family-related, social, financial, and academic-related information.

*Clinician-Administered PTSD Scale* (CAPS-5; Weathers et al., 2015) is the gold standard for assessing PTSD symptoms before and after therapy. It was developed by the National Center for PTSD at the U.S. Department of Veterans Affairs. The interview can be conducted within 45-60 minutes. According to CAPS, each PTSD symptom is assessed in terms of its frequency and intensity in each inquiry. These questions have been divided into categories for ease of reference. Scores for each criterion are totaled together at the end. Each criterion comprises numerous questions. This test has shown strong psychometric qualities (Weathers, et al., 2018). A high level of inter-rater reliability (κ=.90) was observed in the present investigation. To test the CAPS' inter-rater reliability, a random sample of 35 recordings was selected at random. There was 100% agreement, the kappa coefficient was 1. There was 89.7% agreement among the three clusters of PTSD symptoms, with a combined Kappa value of 0.90. At both time points, the internal consistency (Cronbach's alpha) of the current sample was outstanding (α = 0.94 and 0.96).

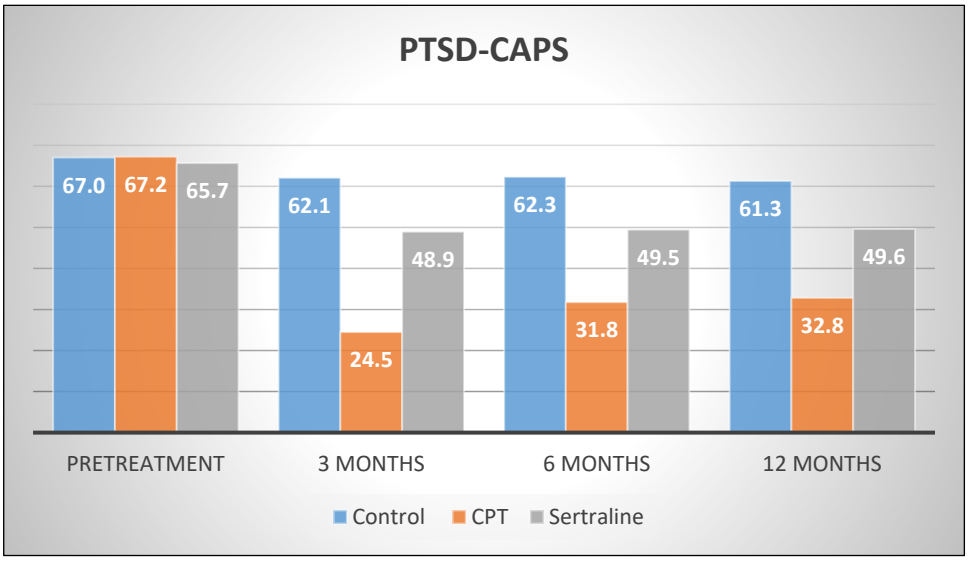


**Figure 1:** Change in Clinician-Administered PTSD Scale (CAPS)

*Posttraumatic Stress Disorder Checklist (PCL-5):* By using the 20 items on the (PCL-5) scale, PTSD symptoms are assessed. Individuals self-report their experience with PTSD symptoms as outlined in DSM-5 using the PCL-5 scale (Weathers et al., 2013). On a 5-point Likert scale, items range from 0 (not at all) to 4 (extreme). Items in each of the four PTSD symptom clusters (intrusions, avoidance, negative cognitions and mood, and changes in arousal and reactivity) are added together to create subscale scores. Evidence suggests that a 5- to 10-point change on PCL-5 constitutes a reliable change and a 10- to 20-point shift represents a clinically meaningful change (Weathers, et al. 2013). Psychometric parameters of the PCL are acceptable (Sveen et al., 2016). Internal consistency was adequate at both time points in the current experiment ($\alpha = 0.81$ and 0.94).

*Beck Depression Inventory (BDI-II):* Depressive symptoms were assessed using the (BDI-II) scale. There are 21 items in the self-report BDI II, which assesses depression-related attitudes and symptoms (Beck, et al., 1996). About 10 minutes are required to complete the BDI. Minimum depression ranges from 0 to 13, mild depression ranges from 14 to 19, and severe depression is from 29 to 64. There has been good reliability and validity proven with the BDI-II test (Beck et al., 1996). In the current study, Cronbach's alpha was excellent both before and after treatment (=0.90 and 0.91, respectively), and test-retest stability was great after one week (.90).

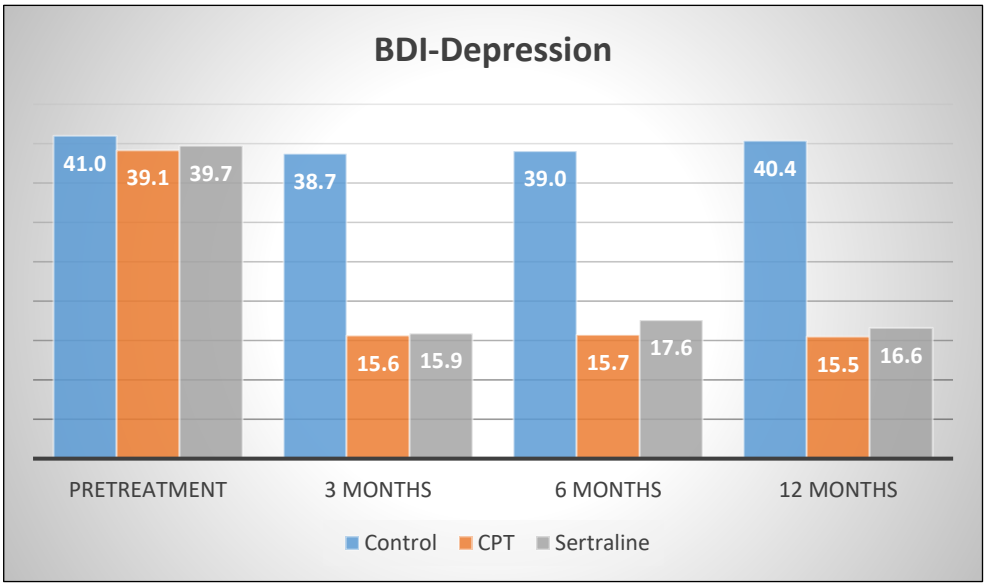


**Figure 3:** Change in Beck Depression Inventory (BDI-II)

*Timeline Follow Back Interview* was given to evaluate substance use using a thorough calendar, participants evaluated their daily substance use over the past 30

days. As an instrument for estimating daily substance use, the TLFB is highly reliable (Sobell, Sobell, Leo, & Cancilla, 1988; Sobell and Sobell, 1992).

*Brief Addiction Monitor (BAM)* to measure the SUD symptoms. BAM is a self-report instrument consisting of 17 items. There are several subscales within this scale, including 1) Use any alcohol or drug, a patient's score of 1 or above indicates that additional clinical attention is needed. 2) The presence of risk factors such as cravings, physical and mental, sleep and mood, as well as family and social problems. If a patient's risk factor score is 12 or above, he needs medical intervention. 3) the protective aspects include self-efficacy, self-help practices, religion/spirituality, engagement in the work or education, a sufficient income, and sober support. Patients with a protective factor score of 12 or less should be evaluated by a clinician. The psychometric qualities of BAM were found to be acceptable in the prior investigations (e.g., Cacciola et al., 2013). This study's internal consistency (Cronbach's alpha) for both time points ($\alpha$= 0.90 and 0.91) was excellent.

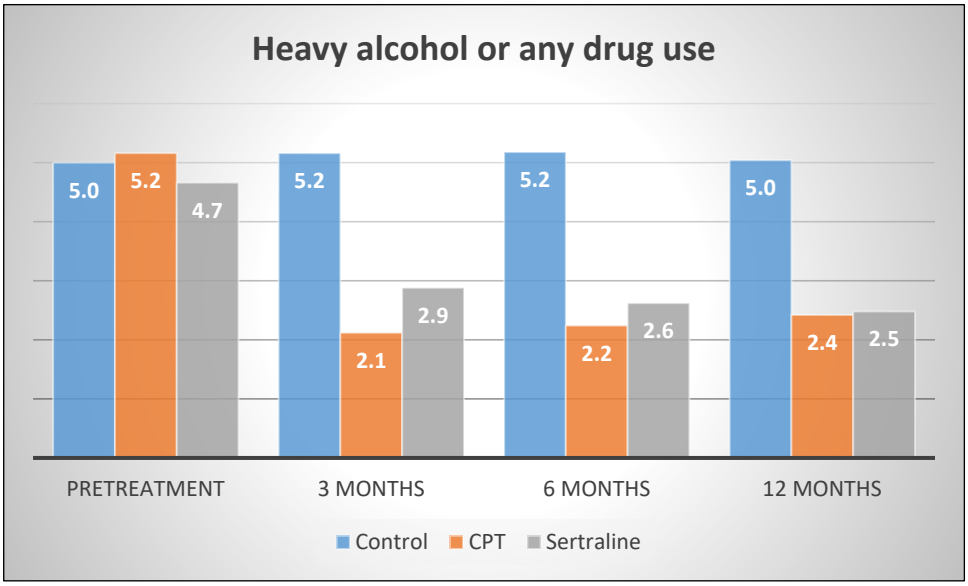


**Figure 2:** Change in Heavy alcohol use, any drug use according to Brief Addiction Monitor (BAM)

*Urine drug screen (UDS) tests* (CLIAwaived Inc.) were delivered regularly to check for cocaine, marijuana, benzodiazepines, opioids, and amphetamines in the urine. Patients in the Sertraline and placebo groups had their urine tested for riboflavin to determine whether they were complying with their prescription regimens.

*Procedure*

At the time of admission, 587 SUD patients completed the PCL. PTSD and SUD were diagnosed according to the DSM-5. Each participant was randomly assigned to one of the three trial arms based on a 1:1:1 ratio of randomization.

We found (170 patients) who were diagnosed with both PTSD & SUD. 150 patients agreed to participate in the trial. The comorbid PTSD & SUD patients were divided into three groups 1) the CPT group (*N*=50 patients), 2) the "medication group" (50 patients) that received the Sertraline. The third group was the control group (50 patients) who received a placebo. Of the (*N*=150) patients who enrolled in the current experiment, there were (*N*=124) patients who completed posttreatment assessments, (*N*=144) patients who completed 6-month follow-up posttreatment assessments, and (*N*=148) patients who completed 12-month follow-up posttreatment assessments. To decrease the patients' dropout to the minimum, each patient was paid (250 EGP) if he showed up at the 6- and 12-month appointments. Standardized tests and checklists of PTSD/SUD symptoms were administered to participants in all groups at baseline; posttreatment, 6 months, and 12 months posttreatment (see CONSORT 2010 Flow Diagram in Appendix A). This trial encountered no adverse effects.

*Outcome measures*

These were the key outcome measures: the CAPS score, the BAM score, the TLFB, the PCL score, and the BDI II score. After Posttreatment, six months, and twelve months after therapy, all results were assessed. It was determined that the sample size was large enough to detect meaningful differences in primary outcomes using SPSS Sample Power. A two-tailed test of significance, the desired power of 0.80, and an unstructured covariance matrix with four-time points were used. The correlation coefficient was 0.40 between repeated assessments and there was a 5% margin of error and a 30 percent attrition rate from pretreatment to posttreatment. With a (50 per group), the study has 80% power to detect a group (treatment type) difference with a mean effect size of 0.55.

*Data analysis strategy*

The sociodemographic and baseline characteristics of this sample were described using descriptive statistics (means, standard deviations, frequencies, and percentages). As part of the primary omnibus analyses, bivariate analyses were used to compare demographics and baseline symptom severity between the CPT group, sertraline group, and placebo group. It was administered at pretreatment (baseline) and all follow-up assessments to determine the CAPS and PCL total scores, which

were the key outcome variables for PTSD. The BDI-II total score was the main outcome variable for depression, and it was administered at baseline and all subsequent evaluations. BAM, PDU, and self-reported abstinence from substance use or alcohol in the prior 7 days were considered the key outcome factors for SUD, together with negative urine tests during follow-up evaluations.

All analyses were conducted on the sample that was intended to be treated. Generalized estimating equations GEEs were used to analyze PTSD and SUD outcomes (Ballinger, 2004). A temporal within-subjects autoregressive [AR (1)] correlation matrix was used to represent people across time points according to the distributions of the outcome measures. To model CAPS, PCL, BDI II, and BAM severity ratings, normal distribution identity link functions were used. Negative binomial models with a logit link were used to describe SUD measures of SUD, SU, and PDU, and a binary distribution logit link was used to model the previous 7 days' abstinence rate. GEE was used as it extends the generalized linear model, which processes corresponding data from repeat measurements, needs no assumption of parametric distribution and robust inference for an incorrect description of the internal correlation of subjects, and has good indications of the within-subject correlations (Zeger et al., 1988). For this reason, findings are provided using parameter estimates for CAPS and PCL, as well as for the BDI II and RF, as well as incidence rate ratios for SU and PDU, and odds ratios for abstinence rate... Time, treatment, time-by-treatment interaction, and any demographic or baseline diagnostic factors that differed significantly across groups were included in all models. Interactions with a trend level of at least (i.e., $\alpha < .10$) were investigated for simple effects at the end of treatment and follow-up time points, by prior studies using similar analytic methods and comparable sample sizes (Schneier et al., 2012) and to reduce the probability of Type-II errors (Selvin, 1996). It was decided to model outcomes as the main effects in cases where an interaction did not fit this condition. All simple and main effects were deemed significant at the =.05 level of statistical significance (two-tailed). Missing data in significant models were further evaluated using sensitivity analyses with multiple imputations.

## Results

### *Demographic and Baseline Characteristics*

The baseline assessment, as shown in Table 1, contains demographic and descriptive information. In terms of SUD, PTSD severity, depression, and demographic characteristics, there were no significant changes across the treatment conditions.

**Table 1.** Baseline Demographic and Diagnostic Characteristics by Treatment Group (N = 150).

| Variables | | Control | | Psychotherapy | | Sertraline | |
|---|---|---|---|---|---|---|---|
| | | *N* | *%* | *N* | *%* | *N* | *%* |
| **Sex** | **Female** | 1 | 1 | 2 | 1 | 4 | 3 |
| | **Male** | 49 | 33 | 48 | 32 | 46 | 31 |
| **Age** | **20 - 30** | 39 | 26 | 38 | 25 | 38 | 25 |
| | **31 - 40** | 7 | 5 | 6 | 4 | 6 | 6 |
| | **41 - 50** | 3 | 2 | 4 | 3 | 6 | 4 |
| | **>50** | 1 | 1 | 2 | 1 | 0 | 0 |
| **Marital status** | **single** | 36 | 24 | 37 | 25 | 33 | 22 |
| | **married** | 12 | 8 | 7 | 5 | 14 | 9 |
| | **divorced** | 1 | 1 | 4 | 3 | 1 | 1 |
| | **widowed** | 1 | 1 | 1 | 1 | 1 | 1 |
| | **Separated** | 0 | 0 | 1 | 1 | 1 | 1 |
| **Educational background** | **High school** | 11 | 7 | 7 | 5 | 8 | 5 |
| | **University** | 39 | 26 | 43 | 29 | 42 | 28 |
| **Current Employment status** | **Full time job** | 29 | 19 | 27 | 18 | 29 | 19 |
| | **Part time job** | 6 | 4 | 4 | 3 | 7 | 5 |
| | **unemployed** | 14 | 9 | 15 | 10 | 10 | 7 |
| | **Student** | 1 | 1 | 4 | 3 | 4 | 3 |
| **Income status** | **Income lower than expenses** | 8 | 5 | 9 | 6 | 12 | 8 |
| | **Equal income and expenses** | 31 | 21 | 31 | 21 | 28 | 19 |
| | **Income higher than expenses** | 11 | 7 | 10 | 7 | 10 | 7 |
| **Substance used** | **Alcohol** | 0 | 0 | 0 | 0 | 1 | 1 |
| | **Cannabis** | 23 | 15 | 23 | 15 | 26 | 17 |
| | **Hallucinogen** | 14 | 9 | 14 | 9 | 6 | 4 |
| | **Inhalant** | 6 | 4 | 6 | 4 | 2 | 1 |
| | **Opioid** | 2 | 1 | 2 | 1 | 7 | 5 |
| | **Sedative, hypnotic, or anxiolytic** | 0 | 0 | 1 | 1 | 0 | 0 |
| | **Amphetamine (or another stimulant)** | 0 | 0 | 0 | 0 | 1 | 1 |
| | **Other unknown** | 5 | 10 | 4 | 8 | 7 | 14 |

| Variables | | Control | | Psychotherapy | | Sertraline | |
|---|---|---|---|---|---|---|---|
| | | *N* | *%* | *N* | *%* | *N* | *%* |
| Trauma | War | 1 | 1 | 2 | 1 | 1 | 1 |
| | Threatened, or actual physical assault | 11 | 7 | 15 | 10 | 12 | 8 |
| | Threatened or actual sexual violence | 28 | 19 | 28 | 19 | 28 | 19 |
| | Severe motor vehicle accidents | 10 | 7 | 5 | 3 | 9 | 6 |
| Duration of the PTSD | >6 months | 1 | 1 | 2 | 1 | 1 | 1 |
| | 12-24 months | 11 | 7 | 15 | 10 | 12 | 8 |
| | 2-5 years | 28 | 19 | 28 | 19 | 28 | 19 |
| | 6-10 years | 10 | 7 | 5 | 3 | 9 | 6 |
| Duration of SUD | >12 months | 1 | 1 | 0 | 0 | 1 | 1 |
| | 2-5 years | 8 | 5 | 0 | 0 | 6 | 4 |
| | 5-10 years | 34 | 23 | 43 | 29 | 35 | 23 |
| | >10 years | 7 | 5 | 7 | 5 | 8 | 5 |
| Physical health (past 30 days)1 | Excellent | 6 | 4 | 6 | 4 | 8 | 5 |
| | very good | 12 | 8 | 17 | 11 | 14 | 9 |
| | Good | 10 | 7 | 10 | 7 | 9 | 6 |
| | Fair | 17 | 11 | 9 | 6 | 16 | 11 |
| | Poor | 5 | 3 | 8 | 5 | 3 | 2 |
| Craving food or drugs | Not at all | 10 | 7 | 11 | 7 | 7 | 5 |
| | Slightly | 13 | 9 | 13 | 9 | 10 | 7 |
| | Moderately | 11 | 7 | 11 | 7 | 11 | 7 |
| | Considerably | 12 | 8 | 10 | 7 | 17 | 11 |
| | Extremely | 4 | 3 | 5 | 3 | 5 | 3 |

*Adherence to Treatment*

Riboflavin levels in urine did not differ between the sertraline and placebo groups in terms of medication adherence, $\chi 2(1) = 2.1$, $p = .35$. Detection rates for riboflavin in the Sertraline and placebo groups were 45% and 40%, respectively. All patients in the CPT group attended at least six therapy sessions [$\chi 2(2) = 1.4$; $p = .5$]. Patients on Sertraline (70%) and placebo (78%) had at least six medication visits.

*Post-Traumatic Stress Disorder symptoms:*

Table 2 displays the pretreatment, posttreatment, six- and twelve-month follow-up periods. The ratings for PTSD severity are reported in Table 3. An interaction variable between time and therapy was added in the final model for PTSD

outcome. A preliminary review of the data indicated that not all participants attended all three follow-up evaluations (the end of treatment, 6- and 12-month follow-ups), with all Ps >.20 in Little's MCAR test (Little, 1988) finding that data were missing at random.

**Table 2.** Intent-to-Treat Differences (CPT, Sertraline, control) In Observed Means of PTSD and Substance Use Outcomes at Baseline, Post-treatment and 6- and 12-month Follow-up with Model-Based Treatment Effects.

| **Outcomes** | **CPT** | | **Sertraline** | | **Control** | | **TOTAL** | | ***Esti-*** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CAPS total** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 67.2 (2.8) | 50 | 65.6 (6) | 50 | 67.02 (3.1) | 150 | 66.6 (4.2) | _ | _ | _ | _ |
| Post-treatment | 50 | 24.4 (11.8) | 35 | 48.9 (9.7) | 39 | 62.1 (5.3) | 124 | 45.1 (18.2) | 0.007 | -24.4 | -18.5 | .000 |
| 6-month | 47 | 31.7 (9.8) | 48 | 49.4 (10.8) | 49 | 62.3 (6.4) | 144 | 47.8 (15.5) | 0.009 | -21.1 | -16.3 | .000 |
| 12-month | 50 | 32.8 (9.5) | 50 | 49.9 (10.2) | 48 | 61.3 (5.6) | 148 | 47.9 (14.5) | 0.003 | -20.9 | -16.3 | .000 |
| **PCL total** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 67.1 (7.1) | 50 | 65.9 (8.2) | 50 | 66.9 (7.2) | 150 | 66.6 (7.5) | _ | _ | _ | _ |
| Post-treatment | 50 | 26.3 (7.3) | 35 | 48.1 (9.3) | 39 | 59.9 (7.1) | 124 | 44.8 (16.1) | 0.001 | -24.6 | -19.1 | .000 |
| 6-month | 47 | 31.3 (8.5) | 48 | 47.7 (10.5) | 49 | 60.1 (8.1) | 144 | 46.4 (14.9) | 0.003 | -22.8 | -17.6 | .000 |
| 12-month | 50 | 32.9 (7.7) | 50 | 48.2 (10.4) | 48 | 59.4 (7.6) | 148 | 46.8 (13.9) | 0.001 | -22.2 | -17.2 | .000 |
| **BDI-II total** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 39.1 (7.1) | 50 | 39.7 (5.8) | 50 | 41 (4.5) | 150 | 39.9 (5.9) | _ | _ | _ | _ |
| Post-treatment | 50 | 15.4 (2.7) | 35 | 16.6 (5.1) | 39 | 40.3 (5.2) | 124 | 24.1 (12.3) | 0.1 | -17.9 | -13.6 | 0.04 |
| 6-month | 47 | 15.7 (3.6) | 48 | 17.5 (4.6) | 49 | 39.1 (7.2) | 144 | 24.1 (11.8) | 0.1 | -18.1 | -14.1 | .08 |
| 12-month | 50 | 15.9 (3.1) | 50 | 16.5 (3.2) | 48 | 38.7 (6.8) | 148 | 23.7 (11.6) | 0.5 | -18.5 | -14.5 | 0.5 |
| **BAM (SU)** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***IRR*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 5.1 (2.3) | 50 | 4.6 (2.2) | 50 | 5 (2.3) | 150 | 4.9 (2.3) | 0.6 | .5 | 0.7 | .000 |
| Post-treatment | 50 | 2.1 (2.2) | 35 | 2.8 (2.4) | 39 | 5.1 (2.6) | 124 | 3.3 (2.7) | | | | |
| 6-month | 47 | 2.2 (2.1) | 48 | 2.6 (2.3) | 49 | 5.1 (2.4) | 144 | 3.3 (2.6) | | | | |
| 12-month | 50 | 2.4 (2.2) | 50 | 2.4 (2.2) | 48 | 5.1 (2.1) | 148 | 3.3 (2.5) | | | | |
| **BAM (Risk Factors)** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 16.1 (2.1) | 50 | 16.2 (2.7) | 50 | 16.7 (1.8) | 150 | 16.3 (2.2) | - | - | - | - |
| Post-treatment | 50 | 4.7 (1.9) | 35 | 15.1 (3.04) | 39 | 14.6 (2.8) | 124 | 11.4 (5.4) | 0.008 | -3.9 | .008 | .000 |
| 6-month | 47 | 3.8 (1.5) | 48 | 14.3 (2.7) | 49 | 15.5 (3.2) | 144 | 11.2 (5.8) | 0.006 | -4.1 | 0.006 | .000 |
| 12-month | 50 | 3.5 (1.2) | 50 | 15.2 (3.3) | 48 | 17.1 (2.8) | 148 | 11.9 (6.5) | 0.012 | -3.3 | 0.01 | .000 |
| ***BAM (Protective Factors)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 3.9 (1.5) | 50 | 4.3 (1.5) | 50 | 4.2 (1.5) | 150 | 4.1 (1.5) | - | - | - | - |
| Post-treatment | 50 | 15.1 (4.1) | 35 | 4 (1.6) | 39 | 4.3 (1.3) | 124 | 7.8 (5.7) | 38.3 | 14.7 | 99.7 | .000 |
| 6-month | 47 | 16.3 (1.7) | 48 | 3.9 (1.5) | 49 | 4.3 (1.5) | 144 | 8.1 (5.9) | 55.7 | 20.6 | 149.9 | .000 |

| **Outcomes** | **CPT** | | **Sertraline** | | **Control** | | **TOTAL** | | ***Esti-*** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CAPS total** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***mate*** | ***95% CI*** | | ***p*** |
| 12-month | 50 | 13.9 (5.3) | 50 | 4.5 (2.3) | 48 | 4.02 (2.6) | 148 | 7.5 (5.7) | 28.2 | 10.7 | 73.9 | .000 |
| ***PDU*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***IRR*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 39.3 (11.3) | 50 | 36.3 (12.2) | 50 | 39.9 (10.8) | 150 | 38.5 (11.5) | 0.5 | 0.4 | 0.6 | .000 |
| Post-treatment | 50 | 10.2 (7.7) | 35 | 22.3 (10.4) | 39 | 37.7 (11.4) | 124 | 23.4 (15.1) | | | | |
| 6-month | 47 | 10 (8.2) | 48 | 22.6 (14.2) | 49 | 37.5 (9.1) | 144 | 23.4 (15.5) | | | | |
| 12-month | 50 | 12.9 (8.1) | 50 | 22.9 (13.6) | 48 | 38.9 (11.4) | 148 | 24.9 (15.5) | | | | |
| **Abstinence** | ***n*** | ***M (%)*** | ***n*** | ***N*** | ***n*** | N | ***n*** | | ***OR*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 4 (8) | 50 | 5 (10) | 50 | 5 (10) | 150 | 14 (9.3) | 0.7 | 0.1 | 3.1 | 0.7 |
| Post-treatment | 50 | 15 (30) | 35 | 12 (24) | 39 | 6 (12) | 124 | 33 (22) | | | | |
| 6-month | 47 | 15 (30) | 48 | 13 (26) | 49 | 8 (16) | 144 | 36 (24) | | | | |
| 12-month | 50 | 13 (26) | 50 | 14 (28) | 48 | 7 (14) | 148 | 34 (22.7) | | | | |

*Note*. CPT= Cognitive Processing Therapy, CAPS-5=Clinician-Administered PTSD Scale; PCL-5=post-traumatic stress disorder checklist. BDI-II=Beck Depression Index-II. BAM = Brief Addiction Monitor, SU= In the past 30 days, heavy alcohol use, any drug use, specific drug use; PDU= Percent days using substance or drinking alcohol; Abstinence = using substance or drinking alcohol for previous 7 days, CI=confidence interval; IRR = incident rate ratio, OR = odds ratio. PTSD, SUD, and depression outcomes were probed at each timepoint after trend-level time-by-treatment interaction.

CPT resulted in much greater PTSD reductions than Sertraline, as evidenced by CAPS ratings in Tables 2 and 4 (the effect size, $d$=0.93, $p$<.000), CPT resulted in much greater PTSD reductions than the control condition (the effect size, $d$=1.9, $p$ < .000). Sertraline led in significantly greater CAPS reductions compared to placebo groups (the effect size, $d$=1.11, $p$ < .000).

Following therapy, PCL-5 scores decreased significantly across all groups (CPT: *M difference* = − 40.70, *CI95*: − 38 to − 43.39, $p$ < .000; Sertraline: *M difference* =− 17.84, CI95: − 14.72 to − 20.95, $p$ < .000, Control: *M difference* =−6.98, CI95: − 4.59 to − 9.36, $p$ < .000) which were maintained at the 6-month follow-up point (CPT: *M difference* = − 35.74, *CI95*: − 33.11 to − 38.36, $p$ < .000; Sertraline: *M difference* = − 18.18, *CI95*: − 14.68 to − 21.67, $p$ < .000, Control: *M difference* =− 6.80, *CI95*: − 3.65 to − 9.94, $p$ < .000) and 12-month follow-up (CPT: *M difference* = − 34.10, *CI95*: − 31.45 to − 36.74, $p$ < .000; Sertraline: *M difference* = −17.68, *CI95*: − 14.58 to – 20.77, $p$ < .000, Control: *M difference* = -7.50, *CI95*: -10.46 to -4.53, $p$ < .000) (see Table 3)

**Table 3.** Intent-to-Treat Differences (CPT, Sertraline, control) on CAPS Subscales at Baseline, Post-treatment, 6- and 12-month Follow-up with Model-Based Treatment Effects.

| **Outcomes** **CAPS total** | **CPT** | | **Sertraline** | | **Control** | | **TOTAL** | | **Treatment Group effects** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Re-experiencing** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 17.2 (2.6) | 50 | 16.7 (3.1) | 50 | 17.2 (1.9) | 150 | 17.1 (2.6) | _ | _ | _ | _ |
| Post-treatment | 50 | 6.9 (5.1) | 35 | 12.3 (5.3) | 39 | 14.7 (2.9) | 124 | 11.3 (5.5) | 0.003 | 6.7 | 4.7 | <.000 |

| **Outcomes** / **CAPS total** | **CPT** | | **Sertraline** | | **Control** | | **TOTAL** | | **Treatment Group effects** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-month | 47 | 9.5 (5.1) | 48 | 14.1 (4.7) | 49 | 16.2 (3.2) | 144 | 13.2 (5.2) | 0.02 | 4.7 | 2.8 | <.000 |
| 12-month | 50 | 10.5 (5.6) | 50 | 12.4 (4.4) | 48 | 15.1 (3.3) | 148 | 12.6 (4.9) | 0.01 | 5.2 | 3.5 | <.000 |
| **Avoidance** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 6.1 (1.4) | 50 | 5.6 (1.7) | 50 | 5.7 (1.3) | 150 | 5.8 (1.5) | _ | _ | _ | _ |
| Post-treatment | 50 | 3.1 (1.6) | 35 | 5.1 (1.6) | 39 | 5.1 (1.3) | 124 | 4.4 (1.8) | 0.2 | 1.7 | 1.02 | <.000 |
| 6-month | 47 | 3.4 (1.6) | 48 | 5.1 (1.3) | 49 | 5.5 (1.5) | 144 | 4.6 (1.7) | 0.3 | 1.5 | 0.8 | <.000 |
| 12-month | 50 | 3.3 (1.8) | 50 | 4.8 (1.5) | 48 | 5.5 (1.6) | 148 | 4.5 (1.8) | 0.2 | 1.6 | 0.8 | <.000 |
| **Cognitions & Mood** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 23.4 (2.3) | 50 | 23.1 (3.2) | 50 | 23.2 (2.1) | 150 | 23.2 (2.5) | _ | _ | _ | _ |
| Post-treatment | 50 | 6.9 (4.4) | 35 | 16.6 (6.3) | 39 | 22.5 (2.9) | 124 | 15.3 (7.9) | 0 | 9.1 | 6.5 | <.000 |
| 6-month | 47 | 10.3 (5.1) | 48 | 15.7 (7.3) | 49 | 22.1 (3.6) | 144 | 15.1 (7.3) | 0.001 | 8.3 | 6.01 | <.000 |
| 12-month | 50 | 10.1 (5.1) | 50 | 17.8 (4.7) | 48 | 22.6 (2.6) | 148 | 16.8 (6.7) | 0.002 | 7.5 | 5.2 | <.000 |
| **Arousal and reactivity symptoms** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 20.4 (1.7) | 50 | 20.1 (3.1) | 50 | 20.7 (1.8) | 150 | 20.4 (2.3) | _ | _ | _ | _ |
| Post-treatment | 50 | 7.4 (5.7) | 35 | 14.8 (5.9) | 39 | 19.7 (2.3) | 124 | 13.9(7.1) | 0.002 | 7.6 | 5.2 | <.000 |
| 6-month | 47 | 8.4 (4.5) | 48 | 14.6 (5.3) | 49 | 18.4 (3.5) | 144 | 13.8 (6.1) | 0.001 | 7.6 | 5.6 | <.000 |
| 12-month | 50 | 8.7 (4.9) | 50 | 14.5 (5.2) | 48 | 18.1 (4.6) | 148 | 13.7 (6.2) | 0.001 | 7.6 | 5.6 | <.000 |
| **Depersonalization** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 2.8 (0.8) | 50 | 2.8 (0.9) | 50 | 2.7 (0.8) | 150 | 2.8 (0.9) | _ | _ | _ | _ |
| Post-treatment | 50 | 0.3 (0.4) | 35 | 2.1 (0.9) | 39 | 2.6 (1.1) | 124 | 1.7 (1.2) | 0.1 | 2.3 | 1.4 | <.000 |
| 6-month | 47 | 0.5 (0.7) | 48 | 1.8 (1.1) | 49 | 2.7 (0.9) | 144 | 1.7 (1.2) | 0.1 | 2.5 | 1.6 | <.000 |
| 12-month | 50 | 0.2 (0.4) | 50 | 1.5 (0.8) | 48 | 2.1 (1.3) | 148 | 1.3 (1.2) | 0.06 | 3.2 | 2.1 | <.000 |
| **Derealization** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 2.4 (1.1) | 50 | 2.5 (1.1) | 50 | 2.4 (0.9) | 150 | 2.4 (1.04) | _ | _ | _ | _ |
| End-of-treatment | 50 | 0.3 (0.4) | 35 | 1.9 (0.9) | 39 | 2.3 (0.9) | 124 | 1.5 (1.2) | 0.2 | 1.8 | 0.9 | <.000 |
| 6-month | 47 | 0.4 (0.7) | 48 | 1.7 (1.1) | 49 | 2.4 (0.9) | 144 | 1.5 (1.2) | 0.2 | 1.7 | 0.8 | <.000 |
| 12-month | 50 | 0.2 (0.4) | 50 | 1.5 (0.8) | 48 | 1.7 (1.2) | 148 | 1.2 (1.1) | 0.1 | 2.6 | 1.5 | <.000 |
| **SD** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***p*** |
| Baseline | 50 | 3.5 (0.8) | 50 | 3.4 (0.8) | 50 | 3.5 (0.8) | 150 | 3.5 (0.8) | _ | _ | _ | _ |
| Post-treatment | 50 | 1.3 (0.5) | 35 | 2.4 (1.1) | 39 | 3.3 (0.7) | 124 | 2.3 (1.1) | 0.2 | 1.6 | 0.8 | <.000 |
| 6-month | 47 | 1.4 (0.6) | 48 | 2.2 (1.1) | 49 | 3.5 (0.6) | 144 | 2.4 (1.1) | 0.9 | 0.5 | 0.5 | 0.9 |
| 12-month | 50 | 0.9 (0.6) | 50 | 2.2 (1.03) | 48 | 3.5 (0.6) | 148 | 2.2 (1.3) | 1.007 | 0.5 | 0.6 | 0.9 |
| **ISF** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***P*** |
| Baseline | 50 | 3.1 (0.6) | 50 | 3.2 (0.6) | 50 | 3.1 (0.6) | 150 | 3.1 (0.6) | _ | _ | _ | _ |
| Post-treatment | 50 | 1.4 (0.6) | 35 | 2.8 (0.8) | 39 | 3 (0.7) | 124 | 2.4 (1.1) | 0.2 | 1.8 | 0.8 | <.000 |
| 6-month | 47 | 1.1 (0.7) | 48 | 2.7 (0.9) | 49 | 3.1 (0.7) | 144 | 2.3 (1.1) | 0.1 | 2.5 | 1.5 | <.000 |
| 12-month | 50 | 0.8 (0.5) | 50 | 2.7 (0.9) | 48 | 2.9 (0.8) | 148 | 2.1 (1.2) | 0.1 | 2.5 | 1.5 | <.000 |
| **IO** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***n*** | ***M (SD)*** | ***Esti-mate*** | ***95% CI*** | | ***P*** |
| Baseline | 50 | 3.3 (0.7) | 50 | 2.9 (0.7) | 50 | 3 (0.7) | 150 | 3.1 (0.7) | _ | _ | _ | _ |
| Post-treatment | 50 | 1.3 (0.6) | 35 | 2.8 (0.8) | 39 | 2.8 (0.8) | 124 | 2.3 (1) | 8.8 | 0.6 | 3.7 | <.005 |
| 6-month | 47 | 1.1 (0.6) | 48 | 2.5 (1.0) | 49 | 2.9 (0.8) | 144 | 2.2 (1.1) | 4.5 | 0.8 | 2.1 | <.000 |
| 12-month | 50 | 0.6 (0.5) | 50 | 2.6 (1.0) | 48 | 3.1 (0.7) | 148 | 2.1 (1.3) | 0.8 | 0.5 | 0.1 | 0.2 |

*Note*. CPT= Cognitive Processing Therapy, CAPS=Clinician-Administered PTSD Scale; CI=confidence interval; SD= Subjective distress; ISF=Impairment in social functioning; IO= CAPS-Impairment in occupational or other important area of functioning.

**Table 4.** The Diagnostic Remission of the Patients at Baseline, Post-treatment, 6- and 12-month Follow-up with Model-based Treatment Effects.

| **Outcomes** | | **CPT** | | **Sertraline** | | **Placebo** | **CPT Vs. Sertraline** | | | | **CPT Vs. Placebo** | | | | **Sertraline Vs. Placebo** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CAPS total** | ***n*** | ***%*** | ***n*** | ***%*** | ***n*** | ***%*** | **Estimate** | ***95% CI*** | | ***P*** | ***Estimate*** | ***95% CI*** | | ***P*** | **Estimate** | ***95% CI*** | | ***P*** |
| Post-treatment | 50 | 80 | 35 | 28 | 39 | 2 | 10.2 | 4.1 | 26 | .000 | .005 | .001 | .04 | .000 | .05 | .007 | .4 | <.000 |
| 6-month | 47 | 76 | 48 | 22 | 49 | 18 | 11.2 | 4.4 | 28.5 | .00 | .06 | .02 | .2 | .000 | .77 | .2 | 2.1 | .6 |
| 12-month | 50 | 80 | 50 | 18 | 48 | 22 | 18.2 | 6.7 | 49.5 | .000 | .07 | .02 | .1 | .000 | 1.2 | .4 | 3.4 | .6 |
| BAM total | *n* | *%* | *n* | *%* | *n* | *%* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* |
| Post-treatment | 50 | 3.04 | 35 | 1.7 | 39 | -.1 | 1.2 | .08 | 1.7 | .000 | 3.2 | 2.7 | 3.6 | .000 | 1.9 | 1.4 | 2.3 | <.000 |
| 6-month | 47 | 2.9 | 48 | 2.04 | 49 | -.1 | .8 | .2 | 1.5 | .01 | 3.1 | 2.4 | 3.7 | .000 | 2.2 | 1.5 | 2.8 | <.000 |
| 12-month | 50 | 2.7 | 50 | 2.1 | 48 | -.04 | .5 | -.2 | 1.3 | .2 | 2.7 | 1.9 | 3.5 | .000 | 2.2 | 1.4 | 3 | <.000 |
| PDU | *n* | *%* | *n* | *%* | *n* | *%* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* |
| Post-treatment | 50 | 29.1 | 35 | 13.9 | 39 | 2.2 | 15.1 | 7.1 | 23.1 | .000 | 26.8 | 18.8 | 34.8 | .000 | 11.6 | 3.6 | 19.6 | <.00 |
| 6-month | 47 | 29.3 | 48 | 13.6 | 49 | 2.4 | 15.6 | 7.9 | 23.3 | .000 | 26.8 | 19.1 | 34.5 | .000 | 11.2 | 3.4 | 18.9 | <.00 |
| 12-month | 50 | 26.4 | 50 | 13.3 | 48 | 1.02 | 13.1 | 5.03 | 21.1 | .000 | 25.4 | 17.3 | 33.4 | .000 | 12.3 | 4.2 | 20.3 | <.00 |
| BDI-II | *n* | *%* | *n* | *%* | *n* | *%* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* | *Estimate* | *95% CI* | | *P* |
| Post-treatment | 50 | 23.5 | 35 | 23.8 | 39 | 2.2 | -.2 | -2.5 | 2.1 | .9 | -23.1 | -25.3 | -20.8 | .000 | -22.8 | -25.1 | -20.5 | <.000 |
| 6-month | 47 | 23.4 | 48 | 21.05 | 49 | 1.9 | -1.8 | -4.4 | .7 | .2 | -23.3 | -25.9 | -20.7 | .000 | -21.4 | -24.1 | -18.8 | <.000 |
| 12-month | 50 | 23.6 | 50 | 23.1 | 48 | .6 | -1.1 | -3.3 | 1.1 | .6 | -24.8 | -27.1 | -22.6 | .000 | -23.7 | -25.9 | -21.5 | <.000 |

*Substance Use disorder Outcomes:*

Tables 2 and 4 demonstrate a reduction in Substance Use ratings across all groups from pretreatment to posttreatment (*M difference* = − 1.55, *CI95*: -1.29 to − 1.81, *p* = .64) which were maintained at the 6-month follow-up point (*M difference* = − 1.59, *CI95*: − 1.28 to − 1.90, *p* = .54) and 12-month follow-up (*M difference* = − 1.62, CI95: − 1.29 to – 1.95, *p* = .93). CPT resulted to a reduction in excessive alcohol or drug use (SU) compared to Sertraline, although the change was not statistically significant, as revealed by BAM (the effect size, *d*=0.07, *CI95:* -.41 to 0.06, *p* = .34) CPT resulted in significant greater reductions in SU compared to the control condition (the effect size *d*=0.85, *CI95*: -2.37 to -1.84, *p* < .000). In comparison to control group, sertraline significantly decreased Substance Use (the effect size *d*=0.79, *CI95*: -2.14 to -1.72, *p*<.000).

Comparing CPT to Sertraline groups, SUD risk factors were considerably decreased (the effect size, *d*=1.91, *CI95:* - 8.76 to -7.59, *p*<.000). Compared to the control group, CPT led to considerably larger reductions in Risk factors (the effect size *d*=1.59, *CI95*: - 9.52 to -8.39, *p*<.000). Compared to control groups, sertraline resulted in significant reductions in Risk factors (the effect size *d*=0.26, *CI95*: - 1.47 to -0.08, *p*<.05).

Patients in the CPT group increased their protective factors against substance use disorder much more than those in the Sertraline group (the effect size, *d*=2.07, *CI95*: - 7.43 to – 8.80, *p* < .000) Compared to the control group, patients in the CPT group exhibited a significant increase in protective factors against substance use disorder. (the effect size *d*=2.14, *CI95*: - 7.37 to – 8.78, *p* < .000).

The PDU score and the seven-day abstinence rate reduced in all treatment groups from pretreatment to posttreatment Ps<.00, as shown in Table 2.

*Depression outcomes*

As indicated in Tables 2 and 4, there was a significant decrease in BDI-II scores between pretreatment and posttreatment for all groups. Compared to the control condition, CPT caused significantly greater decreases in BDI-II scores (the effect size *d*=2.12, CI95: − 19.49 to – 17.07, *p* < .000). Sertraline significantly reduced BDI-II scores compared to control groups (the effect size *d*=2.01, CI95: − 18.62 to – 16.02, *p*<.000).

## Discussion

Cognitive Processing Therapy (CPT) was compared to Sertraline and a placebo in a randomized controlled trial in patients with SUD and PTSD. Cognitive Processing Therapy and sertraline are both beneficial in treating PTSD, with some suggestion that CPT is more effective. According to some study, trauma-focused treatment may be preferable than medicine (e.g., Lee et al., 2016). However, research

comparing psychotherapy and medication for the treatment of PTSD have revealed similar results. (e.g., Zoellner et al., 2019).

(28.9%) of patients seeking treatment for SUD fit the criteria for PTSD, according to our findings. However, while estimating the incidence of PTSD and SUD in our sample, it is essential to consider the sample's unique features, as well as its generalizability and representativeness. This outcome may be explained by the fact that people with PTSD typically struggle with communicating with themselves and others. They avoid connections with loved ones out of fear of experiencing the bad emotions again. Patients with PTSD may thus turn to alcohol or drugs to avoid experiencing the distressing experience. This avoidance state can result in considerable social isolation and impair the capacity of PTSD patients to feel happy emotions (Moore et al., 2021).

Our findings, which are consistent with the findings of previous research (e.g., Moore et al., 2019; Petrakis, Rosenheck, & Desai, 2011), indicate that many individuals who use substances have had traumatic events and may also be depressed. As a result of trauma-related stress or emotional memories, a person may choose unhealthy escape methods. Substance abuse, alcohol abuse, and overeating are examples of maladaptive coping mechanisms (Browne et al., 2016). Consequently, educating patients about harmful thoughts and emotions, stuck points, and recovery procedures would assist them in accepting their trauma-related memories. Patients are instructed in flexible, balanced thinking, the promotion of protective factors, and the reduction of SUD risk factors (Resick & Monson, 2017). Therefore, they would not require the use of substances such as alcohol or narcotics to enhance their mood or escape their feelings and emotions. In other words, patients will develop more adaptable and healthier coping strategies for stressors and traumas (Moring et al., 2020, Resick et al., 2017, Mcfall, et al 1992).

Our study also intended to evaluate the therapeutic impact of CPT on the management of co-occurring PTSD and SUD patients. It has been discovered that CPT reduces the intensity of SUD and PTSD symptoms. We discovered that the intensity of PTSD symptoms altered substantially over time in response to treatment conditions. Our findings resembled those of prior study (e.g., Kaysen et al., 2014; Resick et al., 2002, 2008; Monson et al., 2006; Hein et al., 2014) indicating that the treatment of PTSD patients improved significantly when CPT was utilized.

Our findings demonstrated that CPT substantially decreased the intensity of PTSD symptoms as compared to medication and the control group.

Compared to Sertraline, CPT produced much greater PTSD reductions. Consequently, therapy improves substance use disorder symptoms. Our findings were consistent with those of Haller et al. (2016), who demonstrated that CPT was effective in treating individuals with co-occurring SUD, PTSD, and depression.

Our outcomes in the current experiment were quite comparable to those obtained when we used CPT to Syrian refugee war trauma survivors (ElBarazi et al., 2022; ElBarazi & Ahmed, 2022). During our therapy work with Syrian refugees, we discovered that PTSD is accompanied with complex feelings of guilt, anxiety, dread,

and depression. Cognitive processing treatment greatly improved the symptoms of post-traumatic stress disorder (PTSD), depression, and anxiety, according to our experience dealing with individuals who had suffered the tragedy of war.

It is crucial to emphasize, however, that the current study has numerous critical limitations. First, the study's small number of female participants precluded the study's analysis of gender disparities. Further research is needed to determine whether female patients responded differently than male ones. As a second point, CPT (12 sessions) and medication/placebo interventions have varied periods of intervention (daily for 12 months). Because the sample size was small, it is necessary to conduct bigger randomized controlled studies on the therapeutic effectiveness of CPT in similar groups to confirm the present findings. Third, only having one CPT therapist can be considered another limitation.

In conclusion, CPT can be a useful treatment intervention for treating PTSD and SUD symptoms. SUD and PTSD have a strong link. Research in the future should include contemporaneous integrated treatment strategies for SUD and PTSD. As a result of the scarcity of empirical evidence on the effectiveness of therapy for comorbid SUD and PTSD, there is a growing urgency to find a solution.

## Author Note

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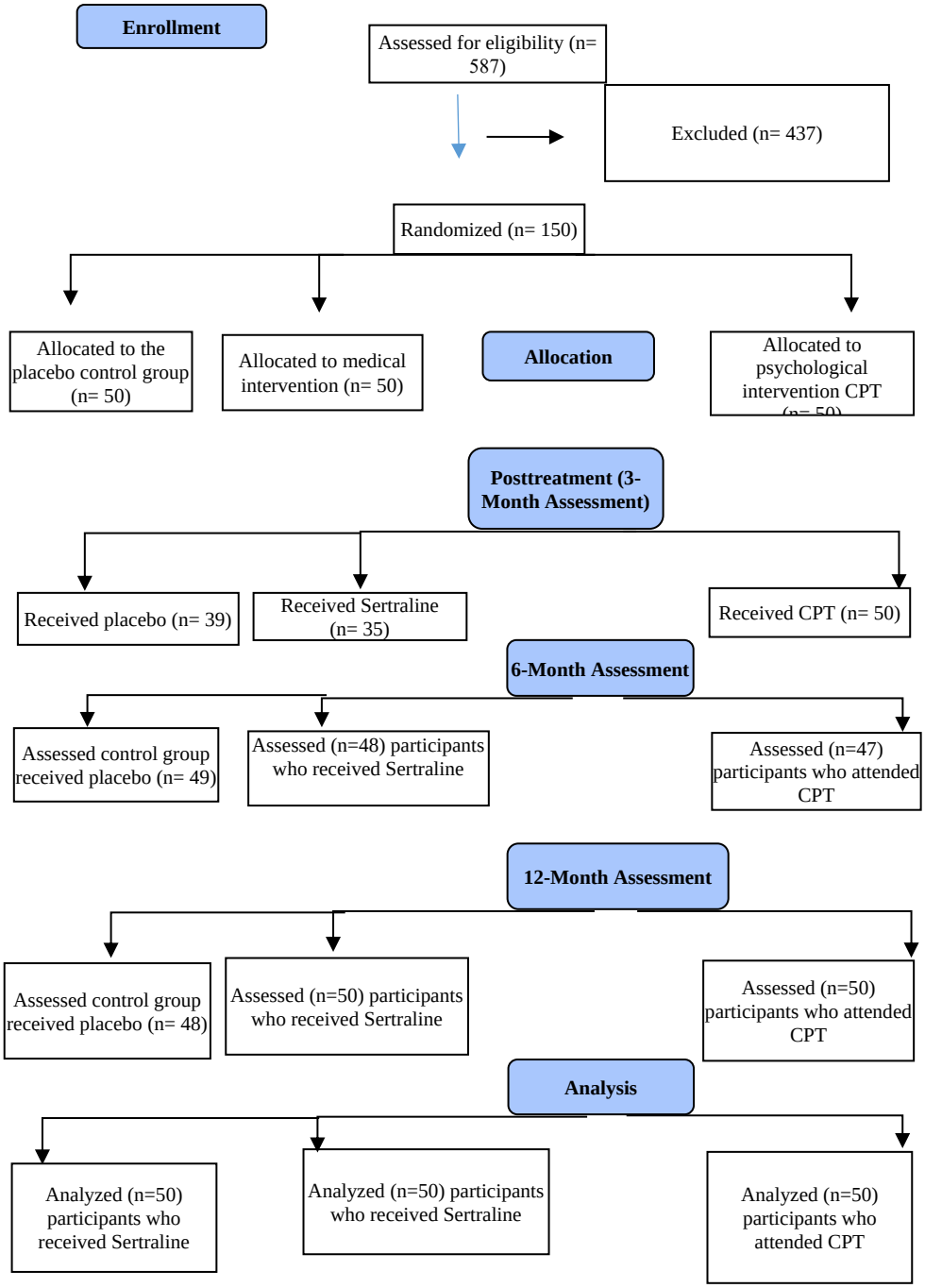
## Appendix A: CONSORT 2010 Flow Diagram



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# THE CONVERGENT VALIDITY OF THE ROMANIAN VERSION OF THE BEHAVIORAL ASSESSMENT OF CHILDREN: A MULTITRAIT-MULTIMETHOD ANALYSIS

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**Abstract**

This study assessed the validity of the Behavior Assessment System for Children 2nd Edition, by providing evidence based on a multitrait-multimethod (MTMM) analysis performed on data obtained with a culturally adapted form of the test. The study included two Romanian samples (161 adolescents aged 12-18 years and 91 children aged 8-12 years) that were each assessed with all the three age corresponding forms (self, parent, and teacher) of the test. We used a confirmatory factor analytic framework in order to test the convergent and discriminant validity of BASC-2, by generating a CFA-based multi-trait, multi-method latent factor correlation matrix. Results showed that, for both the Adolescent and Child forms, the coefficients falling under the validity diagonal (mono-trait, hetero-method) have the highest median values, compared to the coefficients encountered in the monomethod block and those in the heteromethod-heterotrait triangles. The study provides evidence for the construct validity of the multi-trait, multi-rater assessment system that is the basis of the BASC-2.

**Keywords:** multi-rater assessment, multi-trait-multi-method, confirmatory factorial analysis.

This paper discusses the convergent and discriminant validity of multi-rater behavioral assessment systems. The focal issue is of interest in light of current

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discussions regarding both (a) the fundamental question of the measurement quality of multi-informant assessments in clinical practice and (b) methods of choice in assessing said measurement quality for the more complex multi-form and multi-rater assessment systems, especially considering the newer evolutions in statistical modeling. This paper discusses and illustrates a statistical approach to this problem by performing a multitrait-multimethod (MTMM) confirmatory factor analysis (CFA) on data collected with the Behavior Assessment System for Children 2nd Edition (BASC-2; Reynolds & Kamphaus, 2004).

Multi-rater behavioral rating systems are broadband mental health assessments that are typically used for assessing aspects pertaining to social, emotional, and behavioral problems (Shapiro & Heick, 2004). From a measurement point of view, the main feature of these comprehensive assessment systems is that they employ multi-trait, multi-method, and multi-informant assessments (Haynes & O'Brien, 2000), collecting information about the existence and/or frequency of specific thoughts, feelings and behaviors corresponding to different traits, across multiple settings (Ramsay et al., 2002). Examples of such measures are the Achenbach System of Empirically Based Assessment (ASEBA), the Conners Rating Scales - Revised (CRS-R), the Behavior Assessment System for Children 2nd Edition (BASC-2), and others (Ramsay et. al., 2002).

All sources of validity are important when evaluating the adequacy of clinical interpretations based on the data collected from informants, but construct validity is an especially crucial element in this context (Kane, 2013), comprising such aspects as factor structure, convergent and discriminant validity. Convergent validity refers to the agreement between different measures/methods that estimate the same construct(s). Discriminant validity captures the extent to which different constructs are distinctive from one another. Both these forms of validity are typically tested via the MRMM approach pioneered by Campbell & Fiske (1959), in which different assessment methods that capture the same trait(s) are expected to correlate highly with one another, but less strongly with measures that focus on different traits.

Different methodological or analytical innovations have been devised to test these principles (e.g., Hau, Wen & Cheng, 2005; Marsh, 1988; Marsh & Byrne, 1993). One such development is the use of confirmatory factor analysis (CFA) for generating the MTMM matrix. This particular form of CFA, CFA-MTMM, involves the specification of latent factors corresponding to both traits and methods. The latent factors capturing different methods for the same traits, and the latent factors comprising traits assessed via the same method are informative for the construct validity of the respective traits, respectively for a measure's discriminant validity and for the identification of potential method-effects. As important advantages of CFA-MTMM we mention the fact that it separates trait, method and error components while testing the assumptions of the underlying model (Eid et al., 2008), and that the analysis partitions the variance into true variance (trait or method) and error variance, thus correlating latent and not observed variables in the MTMM matrix.

During the past decade, the BASC-2 has emerged as one of the most popular multi-rater behavioral assessment systems in both research and clinical settings (Karr & Garcia-Barrera, 2016). Its items measure a wide array of constructs, tapping into both the clinical and the adaptive functioning area. The four-factor measurement architecture of the BASC-2 has been replicated across several empirical studies (e.g., Splett et al., 2017), and has been shown to be culturally invariant, with item bias (differential item functioning) occurring for a relatively low number of items (Dever, Raines, & Dowdy, 2016). A recent survey of school psychology test usage reported that the BASC Teacher Rating Scales (TRS) was the most frequently used measure in school psychology practice (Benson et al., 2019). Despite its popularity, empirical research regarding the measure's construct validity is generally scarce. Canivez et al., (2021) examined the latent factor structure of the TRS, providing some evidence supporting its construct validity. However, we did not identify any empirical investigations tackling the construct validity for the overall behavioral assessment system and for its individual components, such as the TRS, Parent Rating Scales (PRS) and Self Rating Scales (SRS). Additionally, previous empirical investigation tapping into its construct validity were conducted at the scale level, rather than at the item level, thus limiting our understanding regarding the relationships between items and latent factors among the system's various components.

### *The Present Study*

In this paper we conducted a CFA-MTMM in order to investigate the convergent and discriminant validity of one of the most frequently used assessment systems in school psychology practice (Benson et al., 2019), the BASC-2. We focused on two distinct samples (one of children and one of adolescents), that were each assessed with all the three age-corresponding forms (self, parent, and teacher) of the BASC-2.

## Method

### *Participants*

Sample 1 consists of 161 focal adolescents, among them 58 girls (36.02%), aged between 12 and 18 years ($M$ = 16.30, $SD$ = 1.74). These participants provided self-assessments and were also assessed by one of their parents (74.53% by mothers) and by one teacher. Sample 2 consists of 91 focal children, among them 60 girls (65.93%), aged between 8 and 12 years ($M$ = 10.25, $SD$ = 1.22). These participants provided self-assessments and were also assessed by one of their parents (81.32% by mothers) and by one teacher.

*Procedure*

Data was collected in Bucharest, the capital city of Romania, by sixteen school psychologists, who approached households based on a route sampling schema. If children in the targeted age range were present in the household, the parent and self-assessment forms were administered to the parent and child respectively. The parent was then asked to contact one of the teachers of the child and obtain his or her assessment. A total of 4000 households were approached in order to collect the 252 records in our two samples. Children up to 9-10 years only have one teacher in the Romanian educational system. Children above 9-10 years have several teachers; one of them is the class principal and this teacher provided the current assessment. The teacher assessments were handed by the teachers back to the parents in a closed envelope and were later collected by the researchers. The parents received a copy of the interpretative report for their child.

*Measures*

The BASC-2 (Reynolds & Kamphaus, 2004) is a system for the multidimensional assessment of behavior in children and adolescents, developed on a multimethod framework. For the current study data was collected using the Child (-C) and Adolescent (-A) versions of the BASC-2, collecting teacher (TRS), parent (PRS) and self-assessments (SRP). The present study used the Romanian version of the BASC-2, which was adapted to the Romanian language and culture (Reynolds et al., 2011) through a process that closely followed the International Guidelines on Test Adaptation of the International Test Commission (ITC, 2005).In some countries and cultures, the next form of this family of tests, namely the BASC-3 (Reynolds & Kamphaus, 2015), was already adapted and adopted – still we consider the usage of the BASC-2 in this context to be relevant on two accounts. First, we use the current data to illustrate not so much the validity of this particular test or form of a test, but rather in order to illustrate an approach regarding the internal validity of multi-rater systems in general. Second, a test is not necessarily obsolete because a new version of the test has been published by the test publisher – the International Test Commission's (ITC) Guidelines for Practitioner Use of Test Revisions, Obsolete Tests, and Test Disposal (International Test Commission, 2015) make this quite clear. Irrespective of the publication of the BASC-3, many countries and cultures still use the BASC-2, as these multi-rater systems are notoriously difficult to adapt culturally and especially to standardize.

*Analytical approach*

To estimate convergent and discriminant validity, we focused on those scales that were present in at least two of the three different-method forms for each age group (parent, teacher, or self-report). Scales that were included only in a single

form were excluded: Activities of daily living (present only in the parent forms), Learning Problems and Study Skills (present only in the teacher forms). A total number of 13 scales remained; these are all present in both the parent and teacher forms and 5 of them are also present in the self-report forms.

The convergent and discriminant validity of the BASC-2 was tested via confirmatory factorial analysis (CFA), following the general approach outlined by Kenny and Kashy (1992). The analyses were conducted with Mplus version 7 (Muthen & Muthen, 2008). The CFA-MTMM analyses were conducted at the item level, each item loading onto its corresponding trait or method dimension, respectively. To tackle the effects of potentially abnormality in the data, we used an MLR estimation. We generated a CFA-based multi-trait, multi-method latent factor correlation matrix, separately for the Child and Adolescent data.

## Results

Table 1 reports the scales included in the study. The CFA-MTMM correlation matrix is outlined in Tables 2 and 3, for the Child and Adolescent forms, respectively. A summary of the intercorrelations encountered across the various diagonals (Campbell, & Fiske, 1959) was included in Table 4. For both forms, the coefficients falling under the validity diagonal (mono-trait, hetero-method) have the highest median values, compared to the coefficients encountered in the monomethod block and those in the heteromethod-heterotrait triangles.

**Table 1.** The BASC-2 scales included in the study

| | Scale name | PRS-C and PRS-A | TRS-C and TRS-A | SRP-C and SRP-A |
|---|---|---|---|---|
| 1 | Hyperactivity | x | x | x |
| 2 | Aggression | x | x | - |
| 3 | Conduct Problems | x | x | - |
| 4 | Anxiety | x | x | x |
| 5 | Depression | x | x | x |
| 6 | Somatization | x | x | - |
| 7 | Attention Problems | x | x | x |
| 8 | Atypicality | x | x | x |
| 9 | Withdrawal | x | x | - |
| 10 | Adaptability | x | x | - |
| 11 | Social Skills | x | x | - |
| 12 | Leadership | x | x | - |
| 13 | Functional Communication | x | x | - |

*Note*: The Externalizing Problems Composite contains scales 1, 2, 3; the Internalizing Problems Composite contains scales 4, 5, 6; the Behavioral Symptoms Index contains scales 1, 2, 5, 7, 8, 9; the Adaptive Skills Composite contains scales 10, 11, 12, 13.

*Convergent validity (heteromethod-monotrait)*

The median correlation in the TRS-C and PRS-C block was $r = .34$. Overall, the correlations within this block tend to be moderate, being in line with the premises of the MTMM approach. The TRS-C and SRP-C overlapped in only five dimensions, and all displayed significant correlations, with a median correlation of $r = .20$. For the PRS-C and SRP-C block only four dimensions overlapped, and all of them displayed significant correlations, with the lowest correlation at $r = .13$ ($p < .01$). The median correlation for the TRS-A and PRS-A block was $r = .31$. Generally, the correlations observed within the validity diagonal were higher compared to those encountered in the other remaining blocks. All the six overlapping dimensions for the TRS-A and SRP-A block were significant, being small to moderate. For the PRS-A and SRP-A block all the convergent validities for the five dimensions were in the $r = .24$-$.29$ range.

*Discriminant validity within source (monomethod-heterotrait)*

The highest correlations in the PRS-C block were at $r = .13$ ($p < .05$), with most correlations being not significant and a median correlation in this block of .04. In the TRS-C block, the highest correlation emerged at $r = -.24$ ($p < .01$); 14 significant correlations were observed in this block out of the total of 89 correlations; the median correlation was $r = -.01$. Only one significant correlation was encountered within the SRP-C block, which had a median correlation of $r = .07$.

The highest correlation within the PRS-C block was $r = .13$ ($p < .05$), with most correlations being not significant; the median correlation in this block was .04. For the TRS-C block, only 3 out of 79 intercorrelations emerged as significant, and the median correlation was $r = .07$. Only one significant correlation was encountered in the SRP-C block ($r = .14$; $p < .05$), the median correlation was $r = .07$. The correlations observed in the SPR-C block were mostly not significant; the highest correlation was $r = .14$ ($p < .01$).

In the TRS-A block 32 traits correlated significantly with one another, representing more than one third of the total number of intercorrelations; the median correlation in the TRS-A mono-method block was $r = .09$. In the PRS-A block, 24 out of 79 dimensions had significant correlations, a pattern of intercorrelations similar to the one observed in the TRS-A block; the median correlation in the PRS-A mono-method block was $r = .05$. The intercorrelations within the SRP-A block had a median of $r = .07$; only 9 out of 26 correlations were significant.

*Discriminant validity between source (heteromethod-heterotrait)*

In the PRS-C block the median correlation was $r = .03$, with the largest correlations at $r = .13$ ($p < .05$) and only six out of 78 correlations flagged as

significant ($p < .05$). In the TRS-C block a total of 13 out of 78 correlations emerged as significant; the highest correlation was $r = .19$ ($p < .01$), and the median correlation in this block was $r = -.01$. Only 2 out of ten correlations were significant in the SPR-C block, the highest of them at $r = .14$ ($p < .01$); the median correlation in this block was $r = .08$. The highest correlation in the PRS-A block was $r = -.24$ ($p < .01$); 38 out of 78 correlations were significant and the median correlation in this block was $r = .09$. In the TRS-A block the median correlation was $r = .05$; the largest correlation was $r = .25$ ($p < .001$), and 31 out of 78 correlations were significant. The median correlation within the SRP-A block was $r = .12$, the highest correlation was $r = .35$ ($p < .001$) and only six out of the total of 15 correlations were not significant.

## Discussion

### *Summary of findings*

Our study enhances the current understanding regarding the construct validity of a behavioral assessment system by analyzing the BASC-2 through the lens of CFA-MTMM. Taken together, our results illustrate the method, and show that most of the individual scales in the various BASC-2 rating forms (parent, teacher, self-report) showed convergent and discriminant validity, both at the between and within-sources level.

Several specific conclusions related to the validity of the BASC-2 also emerged. First, the mid-sized correlations from the hetero-method mono-trait blocks suggest that the sources (parent, teacher, self-reports) complement each other in assessing the various constructs. The partial overlap between the three sources when assessing the same constructs indicates the necessity to consider all three perspectives when making clinical judgements or when drawing conclusions, cautioning practitioners against relying on single source data as evidence for clinical judgments. More specifically, considering the mid-sized associations between the same constructs measured by different informants, it is likely that data collected from each informant will reflect a relatively unique construct-relevant variance. Thus, data collected from multiple informants should result in more precise, accurate and valid clinical judgements and decisions. Precision should be higher because the relative degree of overlap between the different sources should translate into increased reliability or less noise in measurement. Validity should improve because each source also captures construct variance that is unique, in addition to variance that is shared with one or several of the other sources. Overall, assessing clinical and adaptive behaviors in children and adolescents via the three different sources may therefore become a common practice in school psychology settings. Second, the mostly non-significant correlations encountered in both the method blocks and the source blocks show that the scales are conceptually distinct from one another, having

a minimal degree of overlap. Third, overall, the scale correlations encountered throughout the three areas (heteromethod-monotrait, monomethod-heterotrait and heteromethod-heterotrait) suggest that the BASC-2 scales have relatively unique variances that are statistically distinguishable from one another. Fourth, relatively similar scale correlations emerged in the corresponding scales across the two forms (child and adolescent).

In order to draw conclusions with respect to our overarching objective, i.e., analyzing the relevance of the BASC-2 in guiding test-based interpretations and clinical judgements, we refer to the four conditions outlined by Benson et al. (2018): (1) test-based scores should provide a good representation of the target construct; (2) test-based scores should be conceptually distinct from one another; (3) test-based scores should be replicable across different methods and datasets; and (4) test-based scores should exhibit relatively unique variance, not overlapping with conceptually-similar constructs. Our dataset did not allow us to test whether the BASC-2 scores respect the first condition outlined by Benson et al. (2018). A few dimensions, such as Hyperactivity and Somatization displayed larger than expected correlations across the various blocks outlined by the MTMM approach, indicating a slightly larger degree of overlap between the contents measured by these dimensions and other traits, deviating from the second condition. However, our CFA-MTMM analysis suggests that BASC-2 test-scores meet the conditions outlined by Benson et al. (2018) for generating meaningful scale-derived interpretations.

By conducting the CFA-MTMM analysis at the item level we addressed a limitation that was identified in other empirical investigations as well (e.g., Canivez et al., 2021), especially in light of the fact that the BASC-2 and BASC-3 technical manuals report only scale-level CFA analyses. We did not identify any other studies that deployed the CFA-MTMM analysis framework on the BASC-2 or the recently revised version, BASC-3. Consequently, our paper expands our understanding regarding the relationships of methods and constructs in a multiple informant assessment system.

From a methodological point of view, we point out that the CFA approach to MTMM is underrepresented in the psychometric literature, despite its obvious advantages, such as distinguishing trait and method effects from measurement error variance or isolating trait or method effects by correlating latent traits or method variables. Our paper illustrates how MTMM analyses can be conducted in a CFA framework.

### *Limitations*

Caution must be taken when interpreting our conclusions as they were marked by several limitations. First, CFA-MTMM is a “data-hungry” technique typically requiring large sample sizes. However, considering the complexity of collecting multi-source data, our samples are rather small, and the results must be interpreted with caution. Second, our observations could be affected by the

convenience approach through which we sampled the participants: opportunity sampling can in no way ensure representativity or diversity in samples. Third, we did not collect any additional measure for tapping into the constructs measured by the BASC-2; this would have greatly enhanced our understanding regarding the complex construct-method inter-relationships, so it is a direction worth considering in future endeavors.

## Conclusion

Our data suggests that the BASC-2 is a useful tool for school psychologists, clinicians, teachers, and other practitioners in mental health. It can appropriately guide effective strategies and intervention plans, can be included with confidence in assessment and intervention services, and can be an important starting point for supplementary assessment, if needed.

## Author Note

We have no known conflict of interest to disclose.

## Implications

Our findings argue in favor of using data from multiple informants, in our case children, parents and teachers, for measuring various behavioral dimensions (both clinical and adaptive). These sources not only add to the measure's overall validity, but the sources complement each other, suggesting that the practice of collecting data from such multiple sources enhances the validity of multi-informant, multi-dimensions behavioral assessment systems.

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# THE ITALIAN VALIDATION OF THE BRIEF SELF-CONTROL SCALE: A PRELIMINARY ANALYSIS

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**Abstract**

The Brief Self-Control Scale (BSCS) developed by Tangney, Baumeister, and Boone (2004) is a widely used measure of trait self-control. The present study aimed to validate Italian version of the BSCS. 262 Italian university students completed BSCS along with measures of grit, impulsive behavior, self-esteem, resilience, and psychological distress. 143 of the first sample completed BSCS after three weeks again. Results indicated that the Italian version of the BSCS is one-dimensional as the original BSCS. Good internal consistency and test-retest stability were documented. Convergent and divergent validity of the construct was established with the association between BSCS and measures of grit and impulsive behavior. Furthermore, predictive validity assessment showed that BSCS positively predicted self-esteem and resilience, and negatively predicted psychological distress as expected. In conclusion, findings suggest that the Italian BSCS is a reliable and valid instrument assessing trait self-control in Italian speaking populations.

**Keywords:** Brief Self-Control Scale; Italian Adaptation; Trait Self-Control.

Trait self-control refers to one's capacity to override dominant responses in accordance with personal long-term goals (Baumeister & Heatherton, 1996). Exertion of self-control captures both action and inaction; engaging in goal-consistent behaviors, and also abstaining from goal-inconsistent behaviors and avoiding temptations (Hoyle & Davidson, 2016). For example, someone who has the intention to be more physically active faces impulses and temptations that are incompatible with reaching this goal (e.g., relaxing on the couch). These impulses and temptations have to be overcome by exerting self-control in terms of inhibiting these impulses (inaction) and to exercise nevertheless (action).

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Individual differences in self-control capacity and its relation to important life outcomes have attracted much attention in the literature. High trait self-control has been associated with better academic performance (Duckworth & Seligman, 2005; King & Gaerlan, 2014), better psychological adjustment, higher levels of well-being, life satisfaction, and self-esteem (Bowlin & Baer, 2012; Hoffmann et al., 2014; Tangney et al. 2004) and less impulse control problems (Bergen et al. 2012; Verstuyf et al., 2013). In longitudinal studies (Fergusson et al., 2013; Moffitt et al., 2011), it was reported that while controlling for gender, family socioeconomic status, and intelligence, high trait self-control in childhood was associated with higher educational degree, occupational prestige, income, and savings behaviour. Moreover, it predicted physical and mental health, lack of substance dependence and criminal convictions. On the contrary, low trait self-control in childhood was associated with starting smoking, school dropouts, unplanned pregnancies in teenage years, as well as poor mental and physical health, worse personal finances, and criminal convictions in adulthood. Overall, it is well-documented that trait self-control and major life outcomes across a variety of domains such as school, work, interpersonal functioning, well-being, and adjustment are associated where the higher the trait self-control, the better the life outcomes tend to be (de Ridder et al., 2012).

*Measurement of trait self-control*

In the literature, the most widely used measure of trait self-control has been the Brief Self-Control Scale (BSCS; Tangney et al., 2004). The measure was tailored according to the strength model of self-control (Baumeister et al.,1994) capturing thought, emotion, impulse, and performance control. Self-Control Scale (SCS) is a 36-item scale, and the short form of it, the Brief Self-Control Scale (BSCS) consists of 13 of these items. It is a one-dimensional self-report questionnaire, where items are rated on a 5-point scale, from 1 *not at all like me* to 5 *very much like me*. Some items are reverse coded (see Appendix A). One total score is computed for BSCS by summing items responses; higher scores indicate higher levels of trait self-control. The range of BSCS score is from 13 to 65. The psychometric properties of both SCS and BSCS were found satisfactory (Tangney et al., 2004). It was reported that BSCS have adequate internal reliability, alpha values reported were .83 and .85. Test-retest reliability with three-week interval was .87. Concordant with expectations, higher BSCS scores were associated with higher grade point average, less problems of binge eating and alcohol abuse, higher psychological adjustment, self-acceptance and self-esteem, better interpersonal relationships, more guilt feelings, and less shame feelings which were regarded as more beneficial emotional patterns.

BSCS has been adapted to German (Bertrams & Dickhäuser, 2009), Turkish (Nebioglu et al., 2012), French (Brevers et al., 2017), Russian (Gordeeva et al.,

2017), and SCS to Chinese (Unger et al., 2016) and Polish (Pilarska & Baumeister, 2018) so far. In the German adaptation (Bertrams & Dickhäuser, 2009) it was reported that BSCS proved to be one-dimensional, reliable and valid. In the Turkish adaptation (Nebioglu et al., 2012), BSCS was again reported to be reliable, and validity was supported in relation to measures of impulsiveness, negative body responses, anger management, and social skills. In this study however, two-factor structure was observed. French adaptation study (Brevers et al., 2017) also reported acceptable internal consistency, and showed test-retest stability. Exploratory factor analysis yielded one-factor as the original scale. Validity was supported with the negative association between BSCS and impulsive behaviour measure. Russian adaptation study (Gordeeva et al., 2017) also documented satisfactory reliability and reported that total composite score of the scale was more meaningful, supporting one-dimensional structure, and correlations between BSCS and positive outcome variables of self-esteem, perspective taking, and shame-proneness were reported.

*The current study*

The main aim of the present study was to validate the Italian version of the BSCS for both research and clinical purposes in Italian-speaking populations. It was aimed to provide a reliable and valid Italian measure on trait self-control in order to conduct research on such as goal-directed behaviors for life success (e.g., academic achievement) or health promotion (e.g., mental health, health behavior) in the Italian population.

We examined internal consistency, temporal stability, validity, and factor structure of the Italian BSCS. Exploratory factor analysis was carried out, Cronbach's alpha was employed for assessing internal consistency, and test-retest reliability with three-week interval was tested. Convergent validity was examined with the association between BSCS and grit consistent with the earlier theorizations and findings (Duckworth & Gross, 2014; Oriol et al., 2017), and divergent validity was examined with the association between BSCS and impulsivity as it was consistently documented to be negatively related (Brevers et al., 2017; Nebioglu et al., 2012). Predictive validity was tested with the relationship between BSCS and self-esteem, resilience, and general distress in parallel to the well-documented findings in the aforementioned literature (Bowlin & Baer, 2012; Fergusson et al., 2013; Hoffmann et al., 2014; Tangney et al. 2004).

It was expected to document one-factor structure as the original scale, and to demonstrate good psychometric properties with regard to reliability and validity. For the examination of validity, BSCS scores were expected to be negatively associated with impulsivity and positively associated with grit. Furthermore, BSCS scores were expected to positively predict self-esteem and resilience, and negatively predict psychological distress.

## Method

### *Participants and Procedure*

Participants were 262 University of Padova students recruited on voluntary basis. Participants ranged in age from 18 to 31 years ($M$ =22.87, $SD$ =2.27), 81.3% were female, 18.3% were male, and .4% were other. Test-retest subgroup of the sample who were enrolled in a psychology course was 143 in size, age range was 21-29 years ($M$ =22.76, $SD$ =1.47), and 86% were female and 14% were male.

Participants received an online link in which they were asked to fill out the demographic information form (including questions on age, gender, and academic status), the Italian version of the SCS followed by the standardized measures of impulsivity, general distress, resilience, grit, and self-esteem. A subgroup of participants was asked to fill out the SCS twice after a three-week interval.

The study received formal approval by the Ethics Committee for Psychological Research at University of Padova. This research was conducted in accordance with the Declaration of Helsinki.

### *Measures*

*The Italian Version of the Brief Self-Control Scale* was developed following the standard procedures in the psychology literature (Brislin, 1986). Firstly, the original version was translated from English to Italian by three researchers independently, and a common version was agreed upon. Secondly, a bilingual individual with comprehensive knowledge of the discipline of psychology back-translated the common Italian version to English. The back-translated version was nearly identical to the original one; few differences were resolved through discussion, and the final Italian version was adjusted according to the consensus.

*The Short Grit Scale* (Grit-S; Duckworth et al., 2009; Italian version by Sulla et al., 2018) is a 8-item scale that aims to measure trait level grit with the two subscales of perseverance of effort (e.g., "Setbacks don't discourage me") and consistency of interest (e.g. of a reversed item, "I often set a goal but later choose to pursue a different one"). Participants are asked to rate how much each of the items represents themselves on a 1 = *not like me at all* to 5 = *very much like me* -point scale. Higher scores correspond to higher level of grit. The psychometric properties of the Italian version were good; the subscales and the whole scale demonstrated sufficient to good internal consistency (Cronbach's alpha ranged from .60 to .83), two factor model was supported, and predictive validity in relation to career changes and educational attainment while controlling for conscientiousness was evidenced. In the present study, observed internal consistency value for the whole scale was .82, and .70 for the perseverance of effort subscale and .79 for the consistency of interest subscale.

*The Short Form of Impulsive Behavior Scale* (S-UPPS-P; Billieux et al., 2012; Italian version by D'Orta et al., 2015) is a 20-item questionnaire with five subscales; positive urgency (e.g. "When I am really excited, I tend not to think on the consequences of my actions"), negative urgency (e.g. "When I am upset I often act without thinking"), lack of perseverance (e.g. of a reversed item, "I am a productive person who always gets the job done"), lack of premeditation (e.g. of a reversed item, "I usually make up my mind through careful reasoning"), and sensation seeking (e.g., "I sometimes like doing things that are a bit frightening") that evaluates facets of impulsivity. Each item is rated on a 1 = *agree strongly* to 4 = *disagree strongly* -point scale. Higher scores indicate higher impulsive behavior tendency. The Italian version showed good psychometric properties; the subscales demonstrated good internal consistency (Cronbach's alpha ranged from .73 to .84), five factor model and construct validity was supported. In the present study, the observed internal consistency values for the subscales of positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking were .83, .75, .93, .88, and .81 respectively.

*The Depression Anxiety and Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995; Italian version by Bottesi et al., 2015) is a 21-item measure of general distress consisting of three subscales of depression (e.g., "I couldn't seem to experience any positive feeling at all"), anxiety (e.g., "I was aware of dryness of my month"), and stress (e.g., "I found it hard to wind down"). Participants are asked to rate to what extent each of the items applied to them considering the last week on a 0 = *did not apply to me at all* to 3 = *applied to me very much, or most of the time* -point scale. Higher total scores indicate higher general distress. The Italian version had good psychometric properties. The Cronbach's alpha coefficients of the three subscales and the whole scale in both community and clinical samples were good to excellent (ranged from .74 to .92), where the alpha values were the highest for the whole scale. Test-retest reliability was good and construct validity was established with large correlations to other measures of anxiety, depression, and stress, and further support was documented with regard to its use as a measure of general distress. The observed internal consistency value in our sample was .95 for the whole scale.

*The Resilience Scale for Adults* (RSA; Hjemdal et al., 2001; Italian version by Bonfiglio et al., 2016) is a 33-item measure of resilience protective factors with six subscales of perception of self (e.g., belief in myself), planned future (e.g., clear future goals), social competence (e.g., enjoy relations with other), structured style (e.g., organize my time), family cohesion (e.g., family do things together), and social resources (e.g., strong bonds with friends). Each item is rated on a 5-point scale anchored with opposing semantic answers. Higher scores indicate higher level of resilience. The Italian version showed good psychometric properties; the subscales demonstrated sufficient to good internal consistency (Cronbach's alpha ranged from

.66 to .87), six factor model was supported, test-retest reliability was adequate, and construct validity was documented with medium-to-large correlation coefficients. In our sample, internal consistency values for the subscales of perception of self, planned future, social competence, structured style, family cohesion, and social resources were .77, .81, .71, .85, .88, and .85 respectively.

*The Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965; Italian version by Prezza et al., 1997) is a 10-item (e.g., "On the whole, I am satisfied with myself") unidimensional measure of global self-esteem. Each item is rated on a 1= *strongly disagree* to 4 = *strongly agree*-point scale. Higher scores indicate higher levels of self-esteem. The Italian version of the scale demonstrated good internal consistency (Cronbach's alpha = .84) and 15-days test-retest reliability (r = .76). In our sample, observed internal consistency value was .91.

*Data analysis*

Statistical analyses were performed with the software Statistical Package for the Social Sciences (SPSS) version 27. Exploratory Factor Analysis was performed as one or two-factor structures have been documented earlier (see Lindner, Nagy, & Retelsdorf, 2015), we chose to adopt a more conservative approach and conduct an exploratory rather than confirmatory factor analysis. The number of factors identified was based on an examination of eigenvalues greater than one and on the scree plot. Internal consistency was assessed by Cronbach's α coefficient computation where $\alpha \geq .90$ = excellent; $.90 > \alpha \geq .80$ = good, and $.80 > \alpha \geq .70$ = acceptable (Cronbach, 1951). Relationship between BSCS and other related measures were examined with Pearson correlation coefficients.

## Results

*Descriptive statistics and factor structure*

Due to missing data in BSCS responses, 3 participants were excluded from the sample. The observed mean score of BSCS in the sample ($n$ = 259) was 44.93 with a standard deviation of 7.99, where the range of scores were from 21 to 60. The skewness and kurtosis were calculated for each of the 13 items. The results showed that the skewness ranged from -.86 to .06 and kurtosis from -1.00 to .22. There was no evidence of strong deviation from normality. Results from the PCA indicated one-factor solution (see Figure 1), and this factor explained 29.8% of the variance. Item-loadings ranged from .31 to .67 for Factor 1, which were higher than the factor loading cut-off of .30 (Kline, 2005).

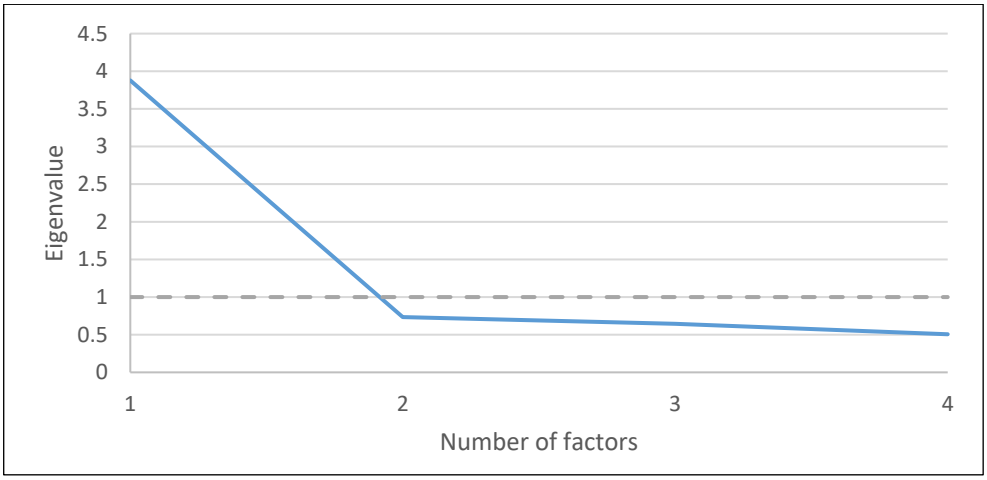


**Figure 1.** Scree plot

*Internal consistency and test-retest reliability*

Internal consistency analysis revealed a Cronbach's α coefficient of .83 indicating good internal consistency. For the subsample, who was re-administered BSCS after three weeks, Pearson correlation analysis showed a good test-retest reliability ($r$ = .84, $p$ < .001).

*Associations with demographic variables*

There was no significant difference in BSCS scores ($t(249)$ = -1.21, $p$ = .23) between male ($M$ = 42.68, $SD$ =7.92) and female participants ($M$ = 45.40, $SD$ = 7.95), and there was not a significant relationship between BSCS and age ($r$ = -.09; $p$ = .131).

*Validity*

Convergent validity examination revealed that BSCS was positively correlated with total Grit-S ($r$ = .73, $p$ < .001), and the two subscales perseverance of effort ($r$ = .67, $p$ < .001) and consistency of interest ($r$ = .62, $p$ < .001) significantly.

Divergent validity examination showed BSCS was negatively correlated with all S-UPPS-P subscales; positive urgency ($r$ = -.35, $p$ < .001), negative urgency ($r$ = -.31, $p$ < .001), lack of perseverance ($r$ = -.37, $p$ < .001), lack of premeditation ($r$ = -.33, $p$ < .001), and sensation seeking ($r$ = -.22, $p$ < .001) significantly.

Predictive validity examination yielded that BSCS negatively predicted DASS-21 ($\beta$ = -.45, $p$ < .001) significantly whereas it positively predicted all RSA subscales of perception of self ($\beta$ = .39, $p$ < .001), planned future ($\beta$ = .36, $p$ < .001), structured style ($\beta$ = .24, $p$ < .001), social competence ($\beta$ = .59, $p$ < .001), family

cohesion ($\beta$ = .36, $p$ < .001), and social resources ($\beta$ = .32, $p$ < .001) and RSES ($\beta$ = .84, $p$ < .001) significantly.

## Discussion

The present study aimed to provide the Italian version of the BSCS, and evaluate its' psychometric properties. With respect to the factor structure of the scale, consistent with the original BSCS, exploratory factor analysis revealed that the best factor solution is one factor model, in accordance with other validation studies (Bertrams & Dickhäuser, 2009; Brevers et al., 2017; Gordeeva et al., 2017). Fewer studies suggested two-factor resolution (e.g. Maloney et al., 2011; Nebioglu et al., 2012). However, it was argued that seemingly two factors were due to the presence of the regular and reverse-coded items (Pilarska & Baumeister, 2018). It was suggested that two-dimensional solution reflected the wording of the items being either positive or negative (Hankins, 2008), not the underlying facets.

The Italian BSCS showed very good reliability. Internal consistency and three-week temporal stability were both good. With regard to convergent validity, the Italian BSCS was positively correlated with grit, and with regard to divergent validity, it was negatively correlated with impulsive behavior as expected (Bergen et al. 2012; Verstuyf et al., 2013). Furthermore, BSCS positively predicted self-esteem and resilience, and negatively predicted psychological distress in line with the expectations (Bowlin & Baer, 2012; Hoffmann et al., 2014; Tangney et al. 2004) supporting predictive validity. These findings also provided support for the relationship between trait self-control and psychological well-being where higher level of trait self-control is associated with better psychological well-being.

Several shortcomings of the present study should be noted. The sample size was relatively small and, therefore, did not allow to test confirmatory factor analysis. Secondly, the sample consisted of university students, and most of the participants were females, which limit the generalizability of the results. Therefore, it is encouraged for future studies to test the Italian BSCS in larger and more representative samples and to conduct a cross-validation of the factor structure using confirmatory factor analysis. Furthermore, predictive validity assessment could be better examined with a longitudinal study design assessing trait self-control at baseline and e.g. psychological well-being, academic achievement or health status at a follow-up measurement.

In conclusion, despite the above-mentioned limitations, present study provides the Italian version of the BSCS demonstrating good reliability and validity. We believe that this tool will be useful for researchers investigating trait self-control in Italian speaking samples and for clinical purposes.

## Author note

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## Appendix A. The Italian BSCS

Per favore, utilizzando la scala di risposta fornita indichi quanto ciascuna delle seguenti affermazioni riflette il suo modo di essere generalmente.

| | | | Per nulla simile a me Moltissimo simile a me |
|---|---|---|---|
| | 1. | Sono bravo/a a resistere alle tentazioni. | 1--------2--------3--------4--------5 |
| (R) | 2. | Ho difficoltà a interrompere le cattive abitudini. | 1--------2--------3--------4--------5 |
| (R) | 3. | Sono pigro/a. | 1--------2--------3--------4--------5 |
| (R) | 4. | Dico cose inappropriate. | 1--------2--------3--------4--------5 |
| (R) | 5. | Se sono divertenti, faccio alcune cose che sono dannose per me. | 1--------2--------3--------4--------5 |
| | 6. | Rifiuto le cose che sono negative per me. | 1--------2--------3--------4--------5 |
| (R) | 7. | Vorrei avere più autodisciplina. | 1--------2--------3--------4--------5 |
| | 8. | Le persone potrebbero dire che ho un'auto-disciplina di ferro. | 1--------2--------3--------4--------5 |
| (R) | 9. | Piacere e divertimento qualche volta mi impediscono di portare a termine il lavoro. | 1--------2--------3--------4--------5 |
| (R) | 10. | Ho problemi a concentrarmi. | 1--------2--------3--------4--------5 |
| | 11. | Sono capace di lavorare in modo efficace verso obiettivi a lungo termine. | 1--------2--------3--------4--------5 |
| (R) | 12. | A volte non riesco a evitare di fare una cosa, anche se so che è sbagliata. | 1--------2--------3--------4--------5 |
| (R) | 13. | Spesso agisco senza pensare a tutte le alternative. | 1--------2--------3--------4--------5 |

Note. (R) refers to reverse coded items

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# PSYCHOMETRIC PROPRIETIES OF A ROMANIAN INVENTORY (ETPDUO) DESIGNED TO ASSESS PERSONALITY DISORDERS BASED ON THE DSM-5 AND THE ICD-10: EVIDENCE FOR RELIABILITY AND VALIDITY IN NONCLINICAL SAMPLES

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**Abstract**

The aim of the present research was to assess the psychometric proprieties of the ETPduo questionnaire (Romanian acronym for Evaluation of Personality Disorders), a new instrument designed to measure personality disorders based on two official classifying systems – the Diagnostic and Statistical Manual of Mental Disorders (fifth edition) and the International Classification of Diseases (tenth edition). In Study 1a ($N$ = 1,536) and 1b ($N$ = 267), we sought to evaluate the internal consistency and test-retest reliability of the ETPduo questionnaire, as well as the unidimensionality of the instrument's scales. Results showed that the scales have very good reliability and acceptable temporal stability. Confirmatory factor analyses generally indicated that the questionnaire's scales are unidimensional and very few poorly loading items were identified. In Study 2 ($N$ = 746), we aimed to assess the construct validity of the ETPduo questionnaire, by correlating the scores on the instrument with two other measures designed to assess normal and pathological personality traits. Results were mostly in line with our expectations. The two studies suggest that ETPduo is a reliable and valid measure of personality disorders. However, further validation of the instrument on a clinical sample is required.

**Keywords:** Personality Inventory for DSM-5; personality disorders; Diagnostic and Statistical Manual of Mental Disorders; International Classification of Diseases.

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Personality disorders (PDs) affect the lives of millions of people worldwide. Studies report relatively high rates of PDs in psychiatric outpatients (45% to 51% in the USA) (Beckwith et al., 2014) and in the general population across the Western world (Quirk et al., 2016). Recently, Winsper et al. (2020) conducted a meta-analysis of 46 studies (from 21 countries) found that the pooled prevalence of any personality disorder was 7.8%. If we take into account the co-occurrence of several PDs, undiagnosed cases and subclinical forms of PDs (mild forms), a substantial proportion of the population might be diagnosed with at least one PD or has to interact with people who have some (subclinical) form of PD.

A personality disorder is defined as a pattern of inner experience and behavior that is stable over time and markedly different from what is considered 'typical' in a given cultural context, causing significant distress or impairment for the individual (American Psychiatric Association [APA], 2013). According to the Diagnostic and Statistical Manual of Mental Disorders ([DSM-5]; APA, 2013), a PD is characterized by at least two of the following: (1) rigid, extreme, and distorted thinking patterns (cognitive domain), (2) problematic emotional responses (affective domain), (3) impulse control difficulties (behavior), and (4) significant interpersonal problems (interpersonal functioning domain). This set of features makes it difficult for people with PDs to properly function in everyday life, for instance – at work or in interpersonal contexts.

Almost a hundred years ago, Kurt Schneider (1923) introduced the first complete system that classified PDs. Schneider's proposed model described ten types of psychopathic personalities: hyperthymic, depressive, insecure (with two subtypes: sensitives and anankasts), fanatical, attention seeking, labile, explosive, affectionless, weak-willed, and asthenic. Schneider's initial contribution influenced subsequent diagnostic systems. With time, two official classifications of PDs were developed. Both the International Classification of Diseases (ICD) (maintained by the World Health Organization [WHO]) and the DSM (developed by the APA) include criteria for diagnosing PDs. Although the criteria by which PDs are defined in DSM-5 (APA, 2013) and ICD-10 (WHO, 1993) seem to differ, at a closer look one can observe that they are to a large extent similar. First, the aforementioned classification systems share five PDs, which were given identical names in both the ICD-10 and the DSM-5: paranoid PD, schizoid PD, histrionic PD, dependent PD, and borderline PD. Three conditions are named differently, but have a similar content: antisocial PD (DSM) vs. dissocial PD (ICD); avoidant PD (DSM) vs. anxious PD (ICD); obsessive-compulsive PD (DSM) vs. anankast PD (ICD). However, each of the two systems also contains three distinct PDs: DSM contains schizotypal PD and narcissistic PD, and ICD includes impulsive PD - along with borderline PD within the emotionally unstable PD.

Treating people with PDs is essential, as this mental health condition is linked to negative outcomes for both the patients themselves, as well as those around them. For instance, people with PDs are more likely to have interpersonal difficulties (e.g., Haliczer et al., 2020; Johnson et al., 2000; Overholser, 1996). Having a PD is also associated with being unemployed, having problems with colleagues and supervisors, as well as being unable to attain full productivity at work (Ettner et al., 2011; Hengartner et al., 2014; Lim et al., 2000). People with PDs are at a greater risk of divorce, having marital problems and lower levels of marital satisfaction (Disney et al., 2012; Kasalova et al., 2018; Lavner et al., 2015; South et al., 2008). They also report impaired physical health (Dokucu & Cloninger, 2019). Consequently, it is rather unsurprising that people with PDs generally have lower quality of life (Cramer et al., 2006; Ishak et al., 2013; Kavanagh et al., 2020).

A correct diagnosis is the first step towards providing treatment for people who have a PD. There are four common methods to assess personality disorders: the diagnostic interviews, rating instruments (administered by clinicians), self-report questionnaires, and other-report questionnaires (Furnham et al., 2014; Schotte, 2000). Among these, the most frequently used are the semi-structured interviews and the self-report inventories **(**Furnham et al., 2014; Schotte, 2000; Widiger & Boyd, 2009). In terms of complexity or the depth of the evaluation, three types of PD measures are available: multidimensional measures of multiple PDs (10 – 15 disorders measured by the same instrument), measures for one specific personality disorder (e.g., narcissistic PD, paranoid PD), or instruments designed to assess the subtypes of a specific personality disorder (e.g., communal and agentic narcissism). Furnham et al. (2014) examined extant instruments and concluded that they are numerous and can serve various purposes, from general screening to clinical diagnosis. These measures or methods also vary in terms of necessary time, as well as context (some are meant to be used in clinical practice, whereas others are more useful for counseling purposes).

In Romania, several questionnaires are currently used for the assessment of PDs. For example, the OMNI Personality Inventory (OMNI-IV) is a 375-item self-report questionnaire which was initially developed to measure both normal and abnormal personality traits (Loranger, 2001). It was translated into Romanian and validated on the Romanian population by Ciuca et al. (2016). Only 210 items were retained and the instrument can be used to assess ten personality disorders based on Axis II comprised by the fourth edition of the DSM (Ciuca et al., 2016). Another questionnaire used in Romania is the Dimensional Assessment of Personality Pathology Questionnaire – Basic Questionnaire (DAPP-BQ) (Livesley & Jackson, 2009). The DAPP-BQ questionnaire is not focused on the direct assessment of PDs. Rather, the instrument evaluates 18 clinically relevant personality traits. Some other tools for assessing various psychopathological traits are also available. For example, the Personality Inventory for DSM-5 (PID-5) (Krueger et al., 2012) has been recently translated and adapted into Romanian (Constantin et al., 2021) and could be used to

evaluate 25 maladaptive personality dimensions, in a quantitative manner, in contrast to the categorical approach of DSM model (Krueger & Hobbs, 2020).

The instruments presented above are consistent with the DSM (which is predominantly used in the United States of America) and not with the ICD, which is used in Romania and other European countries. Therefore, there is a need for an instrument that takes into consideration both perspectives and can be readily used by Romanian practitioners. Also, for practical purposes, a shorter scale (including fewer items) is called for. Consequently, we decided to develop the ETPduo questionnaire (Romanian acronym for Assessment of Personality Disorders Questionnaire), which provides researchers and practitioners with a psychological profile which is compatible with both the ICD-10 and the DSM-5. Moreover, it contains two additional scales which were designed for the assessment of depression and anxiety symptoms. Although anxiety and depression are not PDs, they are important indicators of one's degree of psychological dysfunction and are often associated with PDs (APA, 2013). Having practitioners' needs in mind, we sought to design an instrument that could provide them with a comprehensive report of their clients'/patients' mental health state. In the two studies described below, we assess the psychometric proprieties of this new instrument. The aim of Study 1a was to evaluate the internal consistency as well as to test the unidimensionality of the instrument's scales by means of confirmatory factor analyses (CFAs). In Study 2b, the test-retest reliability of the ETPduo questionnaire was evaluated. In Study 2, we aimed to assess the construct validity of the ETPduo questionnaire, by correlating the scores on the instrument with two other measures designed to assess normal and pathological personality traits. We compare our results with extant work (e.g., Widiger & Mullins-Sweatt, 2009) indicating that PDs can be described based on the five-factor model of personality. Furthermore, we evaluate our results against the Alternative Model of Personality Disorders (AMPD) put forward in the DSM-5 (APA, 2013). The expected relations are presented in Table 1.

**Table 1**. Personality disorders included in the DSM-5
from the perspective of normal and maladaptive personality traits

| Personality Disorder | Description from the perspective of the five-factor model of personality | Alternative Model of Personality Disorders |
|---|---|---|
| Paranoid | **High:** angry hostility<br>**Low:** warmth, gregariousness, actions, values, trust, straightforwardness, compliance, tender-mindedness | |
| Schizoid | **Low:** warmth, gregariousness, activity, excitement-seeking, positive emotionality, feelings, actions | |
| Schizotypal | **High:** anxiousness, self-consciousness, ideas<br>**Low:** warmth, gregariousness, positive emotionality, trust, order | cognitive and perceptual dysregulation, unusual beliefs and experiences, eccentricity, restricted affectivity, withdrawal, suspiciousness |

| Personality Disorder | Description from the perspective of the five-factor model of personality | Alternative Model of Personality Disorders |
|---|---|---|
| Antisocial | **High:** angry hostility, impulsivity, gregariousness, assertiveness, activity, excitement seeking, actions<br>**Low:** all facets of agreeableness, anxiousness, self-consciousness, vulnerability, dutifulness, self-discipline, deliberation | manipulativeness, callousness, deceitfulness, hostility, risk taking, impulsivity, irresponsibility |
| Borderline | **High:** all facets of neuroticism, feelings, actions<br>**Low:** trust, compliance, deliberation | emotional lability, anxiousness, separation insecurity, depressivity, impulsivity, risk taking, hostility |
| Histrionic | **High:** impulsivity, gregariousness, activity, excitement seeking, positive emotionality, fantasy, feelings, actions, trust<br>**Low:** self-consciousness, self-discipline, deliberation | |
| Narcissistic | **High:** angry hostility, assertiveness, excitement seeking, actions<br>**Low:** all facets of agreeableness, self-consciousness, warmth, feelings | grandiosity, attention seeking |
| Avoidant | **High:** anxiousness, self-consciousness, vulnerability, modesty<br>**Low:** gregariousness, assertiveness, excitement-seeking, actions | anxiousness, withdrawal, anhedonia, intimacy avoidance |
| Dependent | **High:** anxiousness, self-consciousness, vulnerability, warmth, trust, compliance, modesty<br>**Low:** assertiveness, competence | |
| Obsessive-compulsive | **High:** all facets of conscientiousness, anxiousness<br>**Low:** impulsivity, excitement seeking, feelings, actions, ideas, values | rigid perfectionism, perseveration, intimacy avoidance, restricted affectivity |

*Note.* Based on Widiger and Mullins-Sweatt (2009) and the APA (2013)

## Study 1a

### *Participants*

A number of 1,536 adults participated in the study (50.1 % women). They were aged between 18 and 74 years old, with a mean age of 36.25 (*SD* = 12.77). In terms of education, 4% of the participants completed primary or secondary lower education, 11.9% graduated from professional and technical education programs, 27.1% completed high-school, 6.1% attended post-secondary non-tertiary education, 26.8% had a Bachelor's degree, and 10.4% had a Master's degree or above. The rest of the participants (13.8%) did not report their education level.

*Instrument*

**The ETPduo Personality Inventory** is an instrument designed to assess personality disorders based on two competing models in diagnosis – the DSM-5, as well as ICD-10. The questionnaire was developed between 2016 and 2021. Three versions of the questionnaire (with varying number of items, item wordings etc.) were evaluated and refined before arriving at the final version, presented in this paper (Constantin, 2021a, b). For more information about the stages in the construction of the ETPduo questionnaire, please refer to the Supplementary material accompanying this article. The ETPduo questionnaire measures seven personality disorders included in both the DSM-5 and the ICD-10 (paranoid, schizoid, histrionic, dependent, borderline, antisocial/dissocial, avoidant/anxious, and obsessive-compulsive/ anankast PD), as well as two personality disorders that are only defined by the DSM-5 (narcissistic and schizotypal PD) or by the ICD-10 (impulsive PD). In addition, the inventory contains two additional scales, one for depression and one for anxiety. Examinees are asked to carefully read each of the statements and select the response that best describes them (*True* [2], *False* [0], or *?* [1] – if they cannot decide). A total score is computed on each scale, with possible scores ranging from 0 to 20.[*] The questionnaire is available on the PsihoProfile platform, following the link http://www.psihoprofile.ro/Content/Questionnaires/1/44/ChestionarETPv5_2020.pdf.

*Procedure*

For Studies 1a and 2, participants were recruited by psychologists and mental health professionals who use the PsihoProfile platform (http://www.psihoprofile.ro) to perform psychological assessments. These professionals recruited some of their own clients as participants in this research. To obtain a homogenous sample, only adults with no history of a mental health diagnosis were eligible to participate. Participants had two options: they could either (1) fill out only the ETPduo questionnaire or (2) fill out the ETPduo questionnaire, as well as the Big Five Plus and PID-5 questionnaires (used in Study 2). Those who agreed to take part in the study filled out the questionnaire(s) either on the computer or in a paper-and-pencil format. For those participants who opted for the paper-and-pencil format, the answer sheets were manually entered into the platform by the psychologist. Data collection started in September 2020 and ended one year later. We did not plan on plan on having a

[*] The ETPduo questionnaire assesses PDs as continuous dimensions, although the DSM-5/ICD-10 models are categorical. Similar to other questionnaires assessing PDs (e.g., OMNI-IV), the ETPduo inventory aims to evaluate one's tendencies towards PDs. The higher the score, the more accentuated one's predisposition towards that particular PD is. As there are no pure PDs but combinations of symptoms/tendencies towards different PDs, the dimensional approach was preferred to capture these tendencies/combinations. In a study which is in preparation, the ETPduo was administered to patients who received a PD diagnosis based on a clinical interview. The results of this study will allow us to establish cut-off scores for a categorical diagnosis.

specific sample size – instead, the final sample consisted of all eligible participants who filled out the questionnaire during this year. A total of 2,282 participants were recruited. Out of these, 1,536 participated in Study 1a (only having filled out the ETPduo questionnaire). The rest of them (746 participants) filled out all three questionnaires, and the resulting data were used in Study 2.

*Analytic strategy*

Analyses were performed with IBM SPSS Statistics 23.0 and R (Version 4.1.2; R Core Team, 2021). The lavaan package (Version 0.6.9; Rosseel, 2012) was used to conduct the CFAs. Seeing that the indicators are ordinal, we chose the WLSM estimator. The following indices were used to evaluate model fit: chi-square, the Root Mean Square Error of Approximation (RMSEA) with its associated 90% confidence interval (values close to or smaller than .06 are considered acceptable), the Tucker Lewis Index (TLI), the Comparative Fit Index (CFI) (both with values ≥ .95 reflecting good fit), and the Standardized Root Mean Square Residual (SRMR) (≤ .08) (Boateng et al., 2018).

*Results*

*Descriptive Statistics and Internal Consistency*

Descriptive statistics for each of the ETPduo scales are presented in Table 2. Except for the antisocial PD and anxiety scales, skewness and excess kurtosis values indicate that the distribution of the scores is roughly symmetrical, with tails that are close to those of a normal distribution. Antisocial PD is positively skewed, indicating that most scores fall toward the lower end of the scale and few participants have a tendency toward this PD. On the contrary, the scores on the Anxiety scale are negatively skewed, meaning that participants in our sample obtained relatively high scores on this scale.

**Table 2.** Descriptive statistics for the 13 scales included in the ETPduo inventory (Study 1)

| Scale | *M* | *SD* | Skewness | Excess kurtosis | Cronbach's alpha | Mean inter-item correlation coefficient |
|---|---|---|---|---|---|---|
| Paranoid | 6.50 | 5.61 | .629 | -.624 | .843 | .350 |
| Schizoid | 6.43 | 4.71 | .513 | -.532 | .739 | .220 |
| Schizotypal | 5.67 | 4.91 | .741 | -.289 | .792 | .280 |
| Antisocial | 3.80 | 4.03 | 1.388 | 1.768 | .768 | .260 |
| Borderline | 5.87 | 5.46 | .727 | -.524 | .850 | .360 |
| Histrionic | 6.56 | 4.81 | .611 | -.347 | .759 | .240 |
| Narcissistic | 7.50 | 4.22 | .393 | -.373 | .681 | .180 |
| Avoidant | 6.24 | 5.88 | .682 | -.742 | .872 | .400 |
| Dependent | 5.60 | 5.19 | .890 | -.170 | .824 | .330 |
| Obsessive-compulsive | 9.13 | 5.01 | .140 | -.857 | .759 | .230 |
| Impulsive | 6.24 | 4.78 | .557 | -.481 | .766 | .250 |

| Scale | *M* | *SD* | Skewness | Excess kurtosis | Cronbach's alpha | Mean inter-item correlation coefficient |
|---|---|---|---|---|---|---|
| Anxiety | 7.34 | 6.90 | .513 | -1.181 | .915 | .520 |
| Depression | 6.32 | 6.48 | .720 | -.775 | .905 | .490 |

In order to analyze the instrument's internal consistency, Cronbach's alphas, as well as the mean inter-item correlation coefficients, were calculated (see Table 2). Except for Narcissistic PD (.681), Cronbach's alpha values were above the conventional threshold (.70), ranging between .739 for Schizoid PD and .915 for the Anxiety scale. The analysis further indicated that the internal consistency of the narcissistic PD scale could not be improved by dropping any of the items. As expected, the lowest mean inter-item correlation coefficient was for the narcissistic PD scale (.180), whereas the largest was for anxiety (.520), suggesting that the items of the latter scale might be slightly redundant.

*Unidimensionality analyses*

CFAs were performed for each of the 13 scales separately, in order to test unidimensionality. Results are presented in Table 3. Acceptable fit was obtained for the majority of the scales, except for histrionic, narcissistic, and obsessive-compulsive PD scales. For the histrionic PD scale, we decided to drop items 106 and 118, because of their low factor loadings (standardized estimates = .238 and .318, respectively). Three items had to be removed from the narcissistic PD scale (101, 55, 44), because of unsatisfactory factor loadings (.163, .223, and .225, respectively). Finally, two items (i.e., 26, 116) were dropped from the obsessive-compulsive scale due to their low factor loadings (.171 and .308, respectively). The re-specification resulted in a better fit of the models, as can be seen in the Table 3.

**Table 3.** Confirmatory factor analysis results for the 13 scales included in the ETPduo

| Scale | Chi-square | *df* | *p* Chi-square | RMSEA (90% CI) | *p* RMSEA | TLI | CFI | SRMR |
|---|---|---|---|---|---|---|---|---|
| Paranoid | 171.20 | 34 | <.001 | .051 (.044; .059) | > .05 | .97 | .98 | .04 |
| Schizoid | 208.18 | 34 | <.001 | .058 (.050; .065) | .04 | .93 | .95 | .05 |
| Schizotypal | 91.70 | 34 | <.001 | .033 (.025; .042) | > .05 | .98 | .98 | .03 |
| Antisocial | 100.52 | 34 | <.001 | .036 (.028; .044) | > .05 | .96 | .97 | .04 |
| Borderline | 173.99 | 34 | <.001 | .052 (.044; .060) | > .05 | .97 | .98 | .04 |
| Histrionic | 253.27 | 34 | <.001 | .065 (.057; .072) | .001 | .92 | .94 | .05 |
| after re-specification (removing items 106, 118) | 113.91 | 19 | <.001 | .057 (.047; .067) | > .05 | .95 | .97 | .04 |
| Narcissistic | 324.53 | 34 | <.001 | .075 (.065; .082) | < .001 | .89 | .85 | .06 |
| after re-specification (removing items 101, 55, 44) | 85.14 | 13 | <.001 | .060 (.048; .073) | > .05 | .94 | .96 | .04 |
| Avoidant | 154.86 | 34 | <.001 | .048 (.041; .056) | > .05 | .98 | .98 | .04 |
| Dependent | 78.24 | 34 | <.001 | .029 (.021; .038) | > .05 | .99 | .99 | .03 |

| Scale | Chi-square | *df* | *p* Chi-square | RMSEA (90% CI) | *p* RMSEA | TLI | CFI | SRMR |
|---|---|---|---|---|---|---|---|---|
| Obsessive-compulsive | 297.67 | 34 | <.001 | .071 (.064; .079) | < .001 | .92 | .94 | .05 |
| after re-specification (removing items 26, 116) | 81.17 | 19 | <.001 | .046 (.036; .057) | > .05 | .98 | .97 | .03 |
| Impulsive | 188.85 | 34 | <.001 | .054 (.047; .062) | > .05 | .95 | .96 | .04 |
| Anxiety | 73.40 | 34 | <.001 | .027 (.019; .036) | > .05 | .99 | .99 | .02 |
| Depression | 88.82 | 34 | <.001 | .032 (.024; .041) | > .05 | .99 | .99 | .03 |

## Study 1b

### *Participants*

The initial sample consisted of 861 participants (55.1 % women), who filled out the ETPduo questionnaire during October or November 2021. Out of these, 267 (64% women) also completed the questionnaire after a period of at least 7 months (the retest took place in April and May 2022). Participants in the final sample were aged between 21 and 73 years ($M$ = 37.96, $SD$ = 12.24). Participants were recruited by Psychology undergraduates in exchange for course credit.

### *Analytic strategy*

Test-retest reliability was evaluated using intraclass correlation coefficients (ICCs) (model: two-way mixed effects; definition: absolute agreement, type: single measurement) (Koo & Li, 2016). According to Koo & Li (2016), ICC values < .50 are indicative of poor reliability, values between .50 and .75 reflect moderate levels of reliability, whereas good and excellent reliability is indicated by values over .75 or .90, respectively.

### *Results*

Table 4 presents the results obtained in Study 1b. Ranging between .531 for antisocial PD and .753 for anxiety, the ICC values indicate moderate and good levels of test-retest reliability. Moreover, ICC values for 10 out of the 13 scales were above .60.

**Table 4.** Test-retest reliability for the ETPduo questionnaire

| Scale | T1 *M (SD)* | T2 *M (SD)* | ICC (95% CI) |
|---|---|---|---|
| Paranoid | 8.38 (5.83) | 8.08 (5.77) | .674 (.603; .735) |
| Schizoid | 7.77 (4.37) | 7.56 (4.38) | .637 (.560; .703) |
| Schizotypal | 7.18 (4.47) | 6.73 (4.80) | .620 (.540; .689) |
| Antisocial | 4.67 (3.64) | 4.56 (3.70) | .531 (.436; .612) |
| Borderline | 7.12 (5.51) | 6.59 (5.33) | .719 (.655; .772) |
| Histrionic | 8.62 (4.22) | 8.30 (4.53) | .628 (.550; .696) |

| Scale | T1 *M (SD)* | T2 *M (SD)* | ICC (95% CI) |
|---|---|---|---|
| Narcissistic | 8.99 (4.07) | 8.84 (4.03) | .614 (.534; .684) |
| Avoidant | 8.04 (6.00) | 7.96 (5.99) | .734 (.674; .785) |
| Dependent | 6.15 (4.84) | 5.82 (4.95) | .696 (.628; .753) |
| Obsessive-compulsive | 11.92 (4.68) | 11.34 (4.91) | .593 (.510; .666) |
| Impulsive | 7.62 (4.23) | 7.30 (4.19) | .579 (.494; .654) |
| Anxiety | 8.78 (6.76) | 8.64 (6.84) | .753 (.696; .801) |
| Depression | 6.49 (6.16) | 6.35 (6.36) | .744 (.685; .793) |

*Discussion*

The results of Study 1 a&b suggest that the ETPduo questionnaire is a reliable instrument. Internal consistency values were very good for all scales, except for narcissism, for which Cronbach's alpha was nonetheless adequate. Test-retest reliability could only be described as moderate following Koo & Li's (2016) guidelines. However, when interpreting the ICC values, the reader should also take into consideration the amount of time that passed between the two measurements. Although lower, our results are still comparable to those obtained by Melley et al. (2002), who assessed the temporal stability of the Schedule for Nonadaptive and Adaptive Personality (SNAP). For a nine-month interval between the two screenings, the authors reported test-retest correlations coefficients ranging between .58 and .81. In a study conducted by Maruta et al. (2006), the authors report test-retest correlations coefficients ranging between .50 and .69 for the Japanese version of the DAPP-BQ (over a 3-week period). We therefore conclude that the ETPduo has adequate test-retest reliability. Higher ICC values might have been obtained if the interval between the two assessments had been smaller.

The 13 models that we tested through CFA, only three needed to be re-specified, by removing three weak items from the narcissistic PD scales, and two items from the histrionic and obsessive-compulsive PD scales, respectively. The items that had low factor loadings in the narcissistic PD scale seem to be more likely to evoke socially desirable responses (item 101: *I impress other people with the expensive, valuable goods that I own*; item 55: *Sometimes I am arrogant to those inferior to me*; item 44: *In order to get what I want, I make use of other people's enthusiasm and trust*). In fact, a frequency analysis indicated that a vast majority of the participants chose the *False* response option for items 101 and 55 (87.8% and 71.3%, respectively). Items that exhibited good factor loadings appear to be less affected by the social desirability bias (e.g., item 79: *Those who know me find me very interesting and attractive* – only 40.7% of the participants disagreed with this statement). Therefore, items 101, 55, and 44 should be revised in order to decrease respondents' tendency to present themselves in a better light. The two items that were removed in order to improve model fit for the histrionic PD scale were item 106 *(I like to surprise others with the eccentric, uncommon way I dress*) and item 118 (*I tend to be the life of the party*). Item 106 was initially included to capture the fact that the histrionic personality wishes to attract other people's attention, by doing

whatever it takes to be noticed (such as choosing eccentric pieces of clothing). However, it seems that item 106 is not a very good operationalization of the histrionic PD. This item could be revised to illustrate the tendency of the histrionic personality to dress provocatively or in a way which is inappropriately sexual for a given context. On the other hand, item 118 is a good description of the histrionic PD. It could be rephrased to emphasize the fact that the person strongly desires to be considered very funny or entertaining during social gatherings. Lastly, the analysis suggested that two items from the obsessive-compulsive PD should be reconsidered: item 26 (*People around me criticize me for being an overly conscientious person*) and item 116 (*I always plan my activities well*). Item 26 might be problematic because it makes reference to other people's perception of the respondent. Moreover, people have very different ways of defining conscientiousness. Therefore, this item should be rephrased to include a description of a specific behavior that is excessively scrupulous. Item 116 captures a completely adaptive behavior (planning one's activities) and should be reworded to indicate that the preparations are extremely meticulous and deviations from what was planned are considered unacceptable.

## Study 2

### *Participants*

The sample included 746 volunteers (56.2% women). They were aged between 18 and 73, with a mean age of 35.31 (*SD* = 11.64). Data about the education level was collected from the majority of our participants (86.3%). Out of these, 2.4% were primary or secondary lower education graduates (grades 1-8), 3.9% attended professional and technical education programs, 21.6% completed high school, 5.5% graduated from post-secondary non-tertiary education institutions, 30.3% had a Bachelor's degree, whereas 22.7% had a Master's degree or above.

### *Instruments*

Participants filled out the ETPduo questionnaire (described in detail in Study 1), as well as the Big Five Plus questionnaire (Constantin et al., 2010) and the Personality Inventory for DSM-5 (Krueger et al., 2012).

**The Big Five Plus questionnaire** (Constantin et al., 2010) is a self-report measure that can be used to assess the five broad personality traits described by the Big Five theory (i.e., neuroticism, extraversion, agreeableness, conscientiousness, and openness), as well as their subordinate facets (six facets per domain, 30 in total). The questionnaire consists of 240 dichotomous items, 48 for each of the five personality domains, and eight for each of the 30 subordinate dimensions. Participants are asked to choose one of the two statements that best describes them (e.g., *A quiet pace of life: (a) gets me bored; (b) makes me feel comfortable*). The

answer options were designed to be equivalent in terms of social desirability. The instrument was developed and validated on the Romanian population and was shown to have good internal consistency and test-retest reliability (Constantin et al., 2010).

**The Personality Inventory for DSM-5** (Krueger et al., 2012) is a self-report questionnaire that measures 25 maladaptive personality traits which are grouped into five higher order domains (i.e., negative affectivity, detachment, antagonism, disinhibition, and psychoticism) mirroring the Big Five personality traits. Participants are instructed to read each of the 220 items and to rate their response on a 4-point scale, where 0 = *Very false or Often false*; 4 = *Very true or Often true* (e.g., *I snap at people when they do little things that irritate me*). The questionnaire was shown to have a replicable factor structure, good convergent and discriminant validity, as well as internal consistency at both the trait and domain levels (Al-Dajani et al., 2016). The PID-5 was also recently translated into Romanian and validated on a Romanian community sample by Constantin et al. (2021).

*Results*

*Preliminary analyses*

Descriptive statistics and internal consistency coefficients for each of the three instruments used in Study 2 are presented in Tables 5, 6, and 7. Replicating the results of Study 1, very good internal consistency coefficients were obtained for all of the ETPduo scales, except for the narcissistic PD scale, which was however very close to the established threshold for what is considered an acceptable α coefficient. Very good internal consistencies were obtained on the Big Five domains, as can be seen in Table 6. However, some facets measured with Big Five Plus inventory (e.g., altruism, dutifulness, values, ideas) had problematic internal consistencies. The analyses showed that eliminating items would not have improved the scales' α. Therefore, we conducted all of the other analyses reported below using the original scales including all of the items. However, we will interpret results with caution, seeing that an instrument's reliability is a prerequisite for its validity. As presented in Table 7, the PID-5 demonstrated good internal consistency, with Cronbach's alphas ranging from .734 for restricted affectivity to .943 for eccentricity.

**Table 5.** Descriptive statistics and internal consistency coefficients for the ETPduo questionnaire in Study 2

| Scale | *M* | *SD* | Cronbach's alpha |
|---|---|---|---|
| Paranoid | 7.02 | 5.56 | .838 |
| Schizoid | 6.91 | 4.47 | .711 |
| Schizotypal | 6.14 | 4.92 | .790 |
| Antisocial | 4.72 | 4.04 | .743 |
| Borderline | 7.13 | 5.62 | .844 |
| Histrionic | 7.09 | 4.52 | .727 |

| Scale | *M* | *SD* | Cronbach's alpha |
|---|---|---|---|
| Narcissistic | 7.35 | 4.06 | .697 |
| Avoidant | 7.85 | 5.98 | .866 |
| Dependent | 6.74 | 5.50 | .835 |
| Obsessive-compulsive | 9.95 | 4.84 | .729 |
| Impulsive | 6.91 | 4.81 | .765 |
| Anxiety | 8.33 | 6.91 | .915 |
| Depression | 7.08 | 6.62 | .908 |

**Table 6.** Descriptive statistics and internal consistency coefficients for the Big Five Plus Inventory

| Big Five Plus scale | *M* | *SD* | Cronbach's alpha |
|---|---|---|---|
| **Neuroticism** | 22.04 | 10.94 | .925 |
| Anxiousness | 3.51 | 2.59 | .819 |
| Angry hostility | 3.81 | 2.71 | .852 |
| Depressiveness | 3.52 | 2.48 | .801 |
| Self-consciousness | 4.10 | 2.35 | .744 |
| Impulsivity | 3.49 | 2.19 | .689 |
| Vulnerability | 3.58 | 2.38 | .787 |
| **Extraversion** | 23.33 | 10.17 | .909 |
| Warmth | 4.44 | 2.46 | .780 |
| Gregariousness | 3.64 | 2.47 | .790 |
| Assertiveness | 3.78 | 2.27 | .719 |
| Activity | 4.24 | 2.17 | .666 |
| Excitement seeking | 3.16 | 2.42 | .789 |
| Positive emotion | 4.05 | 2.21 | .699 |
| **Agreeableness** | 29.50 | 7.10 | .808 |
| Trust | 4.44 | 2.24 | .700 |
| Straightforwardness | 5.62 | 1.94 | .654 |
| Altruism | 4.88 | 1.78 | .568 |
| Compliance | 4.89 | 2.11 | .687 |
| Modesty | 4.62 | 2.09 | .665 |
| Tender-mindedness | 5.03 | 2.09 | .690 |
| **Conscientiousness** | 27.88 | 8.29 | .858 |
| Competence | 4.36 | 2.24 | .721 |
| Order | 4.54 | 2.21 | .711 |
| Dutifulness | 5.22 | 1.95 | .632 |
| Achievement striving | 4.13 | 2.18 | .693 |
| Self-discipline | 4.54 | 2.27 | .719 |
| Deliberation | 5.08 | 2.12 | .699 |
| **Openness** | 20.65 | 7.41 | .826 |
| Fantasy | 2.71 | 2.13 | .710 |
| Aesthetics | 3.30 | 2.36 | .768 |
| Feelings | 4.11 | 2.14 | .673 |
| Actions | 3.00 | 2.29 | .749 |
| Ideas | 3.51 | 1.85 | .614 |
| Values | 4.00 | 1.70 | .503 |

**Table 7.** Descriptive statistics and internal consistency coefficients for the PID-5

| PID-5 scale | *M* | *SD* | Cronbach's alpha |
|---|---|---|---|
| Anhedonia | 8.13 | 5.48 | .856 |
| Anxiousness | 11.55 | 7.50 | .920 |
| Attention Seeking | 8.78 | 5.17 | .849 |
| Callousness | 6.21 | 6.39 | .865 |
| Deceitfulness | 6.28 | 5.46 | .850 |
| Depressivity | 9.87 | 9.82 | .942 |
| Distractibility | 8.73 | 7.07 | .929 |
| Eccentricity | 10.16 | 9.46 | .943 |
| Emotional Lability | 9.72 | 5.48 | .867 |
| Grandiosity | 5.57 | 3.81 | .777 |
| Hostility | 10.47 | 6.30 | .847 |
| Impulsivity | 6.01 | 4.12 | .824 |
| Intimacy Avoidance | 4.02 | 3.69 | .779 |
| Irresponsibility | 4.18 | 3.87 | .781 |
| Manipulativeness | 3.32 | 2.98 | .765 |
| Perceptual Dysregulation | 6.72 | 6.70 | .877 |
| Perseveration | 9.68 | 5.52 | .828 |
| Restricted Affectivity | 7.81 | 4.19 | .734 |
| Rigid Perfectionism | 12.78 | 6.67 | .834 |
| Risk Taking | 16.91 | 7.66 | .830 |
| Separation Insecurity | 7.99 | 5.27 | .853 |
| Submissiveness | 3.79 | 2.96 | .825 |
| Suspiciousness | 7.71 | 4.12 | .741 |
| Unusual Beliefs and Experiences | 4.59 | 4.70 | .824 |
| Withdrawal | 9.55 | 6.73 | .899 |

*Correlations among the Big Five traits and PDs measured with the ETPduo questionnaire*

In order to assess the construct validity of the newly developed instrument, we first correlated the results obtained on the ETPduo scale with the results on the Big Five plus questionnaire. The resulting correlation matrix is presented in Tables 8 (focusing on the PDs that are retained by the Alternative Model of Personality Disorders) and 9 (focusing on the rest of the PDs, as well as the depression and anxiety scales). Generally, correlations are small to moderate and in the expected direction. Only the obsessive-compulsive PD scale correlated weakly with all of the Big Five facets. The results indicate that, out of the five personality domains, neuroticism facets are the most strongly correlated with most of the PDs.

**Table 8.** Correlations among PDs assessed with the ETPduo questionnaire and Big Five personality domains and facets (part 1)

| Big Five Plus scale | Antisocial PD | Avoidant PD | Borderline PD | Narcissistic PD | Obsessive-compulsive PD | Schizotypal PD |
|---|---|---|---|---|---|---|
| **Neuroticism** | **.351** | **.715** | **.672** | -.177 | .274 | **.478** |
| Anxiousness | .216 | **.654** | **.585** | -.195 | .287 | **.423** |
| Angry hostility | **.394** | **.363** | **.477** | .019 | .227 | **.314** |
| Depressiveness | .292 | **.673** | **.633** | -.211 | .296 | **.488** |
| Self-consciousness | .126 | **.689** | **.450** | -.275 | .241 | **.326** |
| Impulsivity | **.401** | **.220** | **.384** | .140 | -.037 | .273 |
| Vulnerability | .130 | **.587** | **.448** | -.260 | .175 | .294 |
| **Extraversion** | .029 | **-.495** | -.222 | **.322** | -.171 | -.255 |
| Warmth | -.106 | **-.412** | -.207 | .169 | -.171 | -.271 |
| Gregariousness | -.011 | **-.383** | -.203 | .216 | -.176 | -.279 |
| Assertiveness | .137 | **-.374** | -.064 | .295 | -.052 | -.052 |
| Activity | -.043 | **-.335** | -.187 | .213 | .000 | -.199 |
| Excitement seeking | .175 | -.222 | -.026 | .297 | -.090 | .073 |
| Positive emotionality | -.024 | **-.434** | -.287 | .213 | -.248 | -.251 |
| **Agreeableness** | **-.302** | .047 | -.051 | -.221 | -.045 | -.227 |
| Trust | -.216 | -.307 | -.291 | .057 | -.274 | **.385** |
| Straightforwardness | **-.385** | -.249 | **-.315** | -.061 | -.052 | **-.318** |
| Altruism | -.189 | -.129 | -.102 | .003 | .035 | -.143 |
| Compliance | -.191 | .149 | .018 | -.252 | -.050 | -.122 |
| Modesty | -.039 | **.469** | .261 | **-.434** | .112 | .144 |
| Tender-mindedness | -.040 | .211 | .238 | -.068 | .095 | .038 |
| **Conscientiousness** | **-.410** | **-.391** | **-.406** | .097 | .162 | -.298 |
| Competence | -.254 | **-.647** | **-.553** | .240 | -.172 | **-.398** |
| Order | -.243 | -.078 | -.109 | -.045 | .238 | -.107 |
| Dutifulness | **-.357** | -.090 | -.180 | -.064 | .186 | -.165 |
| Achievement striving | -.139 | **-.345** | -.214 | **.305** | .060 | -.125 |
| Self-discipline | **-.335** | **-.329** | **-.369** | .044 | .103 | -.250 |
| Deliberation | -.248 | .028 | -.105 | -.131 | .223 | -.082 |
| **Openness** | .022 | -.133 | -.019 | .218 | -.179 | .108 |
| Fantasy | .243 | .266 | **.321** | .126 | -.026 | **.357** |
| Aesthetics | .004 | .053 | .099 | .106 | -.023 | .176 |
| Feelings | **-.338** | **-.535** | **-.496** | .160 | -.228 | **-.410** |
| Actions | .146 | -.166 | -.044 | .256 | -.138 | .069 |
| Ideas | -.025 | -.128 | -.207 | .093 | -.140 | .094 |
| Values | .042 | .048 | -.203 | -.005 | -.088 | .097 |

*Note*. All correlations larger than |.120| are significant at the < .001 level ($p < .001$). Correlations larger than |.300| are boldfaced.

**Table 9.** Correlations among PDs assessed with the ETPduo questionnaire and Big Five personality domains and facets (part 2)

| Big Five Plus scale | Paranoid PD | Schizoid PD | Histrionic PD | Dependent PD | Impulsive PD | Anxiety | Depression |
|---|---|---|---|---|---|---|---|
| **Neuroticism** | **.571** | **.379** | .228 | **.684** | **.627** | **.714** | **.707** |
| Anxiousness | **.513** | **.331** | .155 | **.630** | **.497** | **.693** | **.654** |
| Angry hostility | **.417** | .166 | **.352** | **.325** | **.535** | **.438** | **.397** |
| Depressiveness | **.558** | **.440** | .122 | **.681** | **.560** | **.711** | **.766** |
| Self-consciousness | **.409** | **.355** | -.065 | **.574** | **.377** | **.498** | **.521** |
| Impulsivity | .253 | .125 | **.400** | .256 | **.422** | .261 | .263 |
| Vulnerability | **.368** | .264 | .048 | **.571** | **.384** | **.554** | **.531** |
| **Extraversion** | -.298 | **-.428** | .284 | **-.411** | -.162 | **-.336** | **-.397** |
| Warmth | **-.326** | **-.465** | .155 | -.295 | -.215 | -.263 | **-.344** |
| Gregariousness | -.270 | **-.469** | **.221** | -.288 | -.163 | -.278 | **-.335** |
| Assertiveness | -.105 | -.210 | **.333** | **-.317** | .017 | -.163 | -.189 |
| Activity | -.197 | -.297 | .123 | **-.345** | -.160 | -.223 | **-.306** |
| Excitement seeking | -.052 | -.051 | .255 | -.223 | .043 | -.161 | -.148 |
| Positive emotionality | **-.348** | **-.364** | .143 | **-.335** | -.231 | **-.380** | **-.413** |
| **Agreeableness** | -.188 | -.275 | -.204 | .061 | -.172 | .004 | -.029 |
| Trust | **-.484** | **-.396** | -.092 | -.244 | **-.306** | **-.342** | **-.362** |
| Straightforwardness | **-.311** | -.295 | -.237 | -.279 | **-.367** | -.283 | -.296 |
| Altruism | -.126 | -.222 | -.080 | -.118 | -.160 | -.079 | -.132 |
| Compliance | -.062 | -.113 | -.192 | .170 | -.070 | .095 | .086 |
| Modesty | .222 | .221 | -.207 | **.458** | .169 | **.350** | **.401** |
| Tender-mindedness | .116 | -.153 | .098 | .198 | .122 | .261 | .187 |
| **Conscientiousness** | -.292 | -.294 | -.237 | **-.492** | **-.443** | **-.367** | **-.406** |
| Competence | **-.472** | **-.355** | -.120 | **-.668** | **-.480** | **-.614** | **-.614** |
| Order | -.065 | -.098 | -.149 | -.152 | -.171 | -.056 | -.089 |
| Dutifulness | -.128 | -.176 | -.222 | -.165 | -.233 | -.138 | -.148 |
| Achievement striving | -.140 | -.204 | .052 | **-.443** | -.224 | -.261 | **-.311** |
| Self-discipline | -.260 | -.258 | -.255 | **-.414** | **-.399** | **-.349** | **-.369** |
| Deliberation | -.034 | -.021 | -.220 | -.006 | -.173 | .012 | -.002 |
| **Openness** | -.069 | -.092 | .250 | -.124 | -.012 | -.149 | -.084 |
| Fantasy | .252 | .197 | **.310** | **.302** | **.321** | .250 | **.302** |
| Aesthetics | .053 | -.017 | .171 | .049 | .062 | .026 | .079 |
| Feelings | **-.438** | **-.471** | -.077 | **-.520** | **-.489** | **-.535** | **-.571** |
| Actions | -.051 | -.036 | .249 | -.197 | .025 | -.164 | -.139 |
| Ideas | -.080 | -.027 | .112 | -.114 | -.010 | -.097 | -.024 |
| Values | .018 | .046 | .103 | .058 | .051 | .000 | .076 |

*Note*. All correlations larger than |.120| are significant ($p < .001$). Correlations larger than |.300| are boldfaced.

*Correlations among maladaptive personality traits and PDs measured with the ETPduo questionnaire*

The associations among the 25 maladaptive personality traits assessed with the PID-5 and the six PDs included in the AMPD are presented in Table 10. Most correlation coefficients are positive and medium to large. With some exceptions (discussed below), all six PDs correlated positively and significantly with their respective trait specifiers. Table 11 presents the associations among PDs which are not included in the AMPD, as well as depression and anxiety, and the 25 maladaptive personality traits measured using PID-5. Results support the validity of the ETPduo questionnaire. For instance, in consonance with the prototypical description of this disorder, paranoid PD correlated strongly with suspiciousness and hostility. The schizoid PD was mainly associated with the facets of detachment, whereas the histrionic PD correlated most strongly with attention seeking. The dependent PD correlated strongly with the facets subordinated to negative affectivity (especially with depressivity and anxiousness), while there were large associations between the impulsive PD and hostility, irresponsibility, and impulsivity. Anxiety correlated most strongly with anxiousness, whereas there was a very large correlation between the ETPduo depression scale and PID-5 depressivity. Both anxiety and depression scales were strongly correlated with anhedonia and distractibility, as well as with emotional lability, perseveration, eccentricity, and perceptual dysregulation.

**Table 10.** Correlations among PDs assessed with the ETPduo questionnaire and maladaptive personality traits measured with the PID-5 (part 1)

| PID-5 scale | Antisocial PD | Avoidant PD | Borderline PD | Narcissistic PD | Obsessive-compulsive PD | Schizotypal PD |
|---|---|---|---|---|---|---|
| Anhedonia | .363 | **.593** | **.573** | -.108 | .252 | **.535** |
| Anxiousness | .356 | **.606** | **.669** | -.012 | .449 | **.561** |
| Attention Seeking | .379 | .108 | .330 | .475 | .177 | .297 |
| Callousness | **.595** | .211 | .335 | .237 | .102 | .434 |
| Deceitfulness | **.581** | .234 | .380 | .275 | .090 | .411 |
| Depressivity | .419 | **.630** | **.663** | -.054 | .277 | **.593** |
| Distractibility | .420 | **.643** | **.644** | -.028 | .228 | **.563** |
| Eccentricity | .497 | .467 | **.615** | .131 | .269 | **.728** |
| Emotional Lability | .392 | **.598** | **.692** | .045 | .394 | **.562** |
| Grandiosity | .327 | .049 | .208 | **.543** | .229 | .309 |
| Hostility | **.597** | .412 | **.587** | .145 | .315 | **.533** |
| Impulsivity | **.584** | .346 | **.541** | .098 | .135 | .439 |
| Intimacy Avoidance | .258 | .313 | .258 | .026 | .213 | .369 |
| Irresponsibility | **.557** | .478 | **.525** | .089 | .060 | .481 |
| Manipulativeness | **.521** | .092 | .294 | .384 | .072 | .375 |
| Perceptual Dysregulation | **.519** | **.519** | **.628** | .156 | .311 | **.668** |
| Perseveration | .445 | **.542** | **.604** | .109 | .440 | **.553** |
| Restricted Affectivity | .306 | .205 | .204 | .127 | .163 | .332 |
| Rigid Perfectionism | .235 | .265 | .337 | .231 | **.628** | .389 |

| PID-5 scale | Antisocial PD | Avoidant PD | Borderline PD | Narcissistic PD | Obsessive-compulsive PD | Schizotypal PD |
|---|---|---|---|---|---|---|
| Risk Taking | .381 | -.142 | .108 | .284 | -.058 | .207 |
| Separation Insecurity | .384 | .423 | **.597** | .126 | .300 | .363 |
| Submissiveness | .224 | **.564** | .469 | -.013 | .219 | .380 |
| Suspiciousness | .449 | .405 | .475 | .184 | .395 | **.580** |
| Unusual Beliefs and Experiences | .461 | .291 | .450 | .280 | .305 | **.631** |
| Withdrawal | .277 | **.549** | .386 | -.075 | .284 | .496 |

*Note.* All correlations larger than .120 are significant ($p < .001$). Large correlations (≥ .500) are boldfaced. Underlined correlation coefficients represent the traits proposed as a specifier for a certain PD in the AMPD.

**Table 11.** Correlations among PDs assessed with the ETPduo questionnaire and maladaptive personality traits measured with the PID-5 (part 2)

| PID-5 scale | Paranoid PD | Schizoid PD | Histrionic PD | Dependent PD | Impulsive PD | Anxiety | Depression |
|---|---|---|---|---|---|---|---|
| Anhedonia | **.563** | **.586** | .132 | **.636** | **.537** | **.619** | **.762** |
| Anxiousness | **.618** | .409 | .284 | **.650** | **.604** | **.791** | **.721** |
| Attention Seeking | .259 | .095 | **.621** | .138 | .333 | .213 | .159 |
| Callousness | .403 | .485 | .310 | .266 | .446 | .243 | .315 |
| Deceitfulness | .380 | .390 | .402 | .323 | .422 | .275 | .335 |
| Depressivity | **.608** | **.529** | .233 | **.727** | **.601** | **.649** | **.796** |
| Distractibility | **.566** | .495 | .297 | **.697** | **.599** | **.656** | **.717** |
| Eccentricity | **.575** | **.541** | .346 | **.529** | **.620** | **.557** | **.629** |
| Emotional Lability | **.583** | .378 | .365 | **.601** | **.626** | **.697** | **.652** |
| Grandiosity | .246 | .236 | .396 | .037 | .248 | .101 | .090 |
| Hostility | **.580** | .446 | .420 | .437 | **.671** | **.519** | **.529** |
| Impulsivity | .460 | .292 | .423 | .414 | **.628** | .435 | .451 |
| Intimacy Avoidance | .341 | **.506** | .029 | .302 | .290 | .256 | .360 |
| Irresponsibility | .455 | .454 | .339 | **.577** | **.543** | .457 | **.535** |
| Manipulativeness | .289 | .303 | .461 | .149 | .357 | .156 | .215 |
| Perceptual Dysregulation | **.624** | **.538** | .343 | **.584** | **.610** | **.606** | **.646** |
| Perseveration | **.563** | .497 | .301 | **.597** | **.588** | **.574** | **.601** |
| Restricted Affectivity | .304 | **.566** | .079 | .208 | .258 | .147 | .267 |
| Rigid Perfectionism | .384 | .313 | .223 | .234 | .327 | .333 | .295 |
| Risk Taking | .086 | .097 | .279 | -.090 | .204 | -.066 | -.018 |
| Separation Insecurity | .446 | .187 | .345 | **.531** | .491 | .483 | .453 |
| Submissiveness | .388 | .361 | .166 | **.554** | .405 | .440 | .493 |
| Suspiciousness | **.687** | .467 | .291 | .437 | .491 | .470 | .484 |
| Unusual Beliefs and Experiences | .486 | .408 | .338 | .354 | .461 | .410 | .428 |
| Withdrawal | .484 | **.682** | .003 | .489 | .392 | .442 | **.554** |

*Note.* All correlations larger than .120 are significant ($p < .001$). Large correlations (≥ .500) are boldfaced.

*Discussion*

The results presented above are generally in line with previous theoretical and empiric work; however, we notice that there are some deviations from our initial expectations, too. Antisocial PD was positively correlated with anxiousness, self-consciousness, and vulnerability (although the correlations were small), and was not correlated significantly with tender-mindedness, modesty, gregariousness, or activity, contrasting with the personality profile of this PD described by Widiger & Mullins-Sweatt (2009). However, according to the DSM-5 (2013), people with antisocial PD might also have associated anxiety and depression, which might explain the positive relations between antisocial PD, anxiousness, self-consciousness, and vulnerability in our study. Results showed that the avoidant PD was correlated with all the Big Five personality traits proposed by Widiger & Mullins-Sweatt. On the other hand, it also correlated strongly with other traits which were not specified by the two authors, such as depressiveness, competence, or feelings. Nonetheless, avoidant PD correlated with both depressiveness and competence in a meta-analysis conducted by Samuel & Widiger (2008). Moreover, in a study using an expert consensus approach to generate prototypical personality profiles for ten PDs, Lynam & Widiger (2001) report that the avoidant PD was described as being characterized by relatively high levels of depressiveness and low levels of competence. Moving on to the borderline PD, we notice that it was not correlated with compliance and actions, and was negatively correlated with feelings. In the meta-analysis conducted by Samuel & Widiger, results confirmed that borderline PD is negatively correlated with compliance and only very modestly correlated with feelings. Despite this discrepancy from past literature, we note that borderline PD was associated with high scores on anxiousness, angry hostility, depressiveness, and vulnerability, which were previously shown to be particularly characteristic of this PD (Furnham & Crump, 2014). Although it was negatively correlated with modesty and compliance, which is congruent with the prototypical description of this PD, narcissistic PD should have also been associated with low scores on all the other facets of agreeableness. We also expected a negative association between narcissistic PD and angry hostility based on the profile described by Widiger & Mullins-Sweatt's, as well as the meta-analysis of Samuel & Widiger. The obsessive-compulsive PD should have been positively correlated with all the facets of conscientiousness (Lynam & Widiger, 2001; Samuel & Widiger, 2004; Samuel & Widiger, 2008; Widiger & Costa, 2002). However, it was uncorrelated with achievement striving and negatively correlated with competence. The correlations with the other facets were rather small, too. On the other hand, data largely supported the hypothesized relations among normal personality traits and schizotypal, schizoid, and dependent PD. Although we did not find significant correlations between the schizotypal PD and ideas, or between the schizoid PD and actions, these results are in line with the meta-analysis of Samuel & Widiger. Based on the work of Widiger & Mullins-Sweatt, we would have expected the dependent

PD to be positively correlated with warmth and trust, but our results align with those reported in the meta-analysis conducted by Samuel & Widiger, where the authors found a negative (although negligible) correlation between these traits and the dependent PD. As expected, the paranoid PD was positively correlated with angry hostility and negatively associated with warmth, gregariousness, trust, and straightforwardness. However, it was not significantly correlated with compliance, actions, or values, and it was positively (although weakly) correlated with tender-mindedness. The meta-analysis of Samuel & Widiger revealed similar results for the actions and values facets, but indicated that the paranoid PD was indeed negatively correlated with compliance and tender-mindedness. We found a medium correlation between angry hostility and the histrionic PD, a trait which is not considered highly characteristic of this PD. On the other hand, histrionic PD was not associated with trust or feelings, but these results are in line with those reported by Samuel & Widiger (2008).

Looking at the correlations presented in Table 10, we note that there are very few discrepancies between the trait specifiers proposed in the AMPD and the results obtained in the present study. The antisocial PD was moderately or strongly correlated with the facets of psychoticism, which we would not have expected based on the AMPD. In fact, this was also true for the avoidant and borderline PDs. However, these results are in line with those of Watters et al. (2019), who report similar findings in their meta-analysis. The borderline PD was only weakly correlated with risk taking, a result which deviates from the profile proposed in the AMPD, but is in line with the meta-analysis of Watters et al. (2019). The obsessive-compulsive PD only modestly correlated with intimacy avoidance and restricted affectivity, and correlated more strongly with traits that are not specified in the AMPD, such as anxiousness and emotional lability (a result which is once again congruent with the meta-analysis of Watters et al.). Although no predictions were made about the relations between the 25 maladaptive personality traits and the five PDs not included in the alternative model, we note that the obtained correlations are plausible from a theoretical standpoint. The paranoid PD was strongly related to suspiciousness, hostility, and anxiousness (among others), the schizoid PD was correlated with withdrawal, restricted affectivity, and depressivity, the histrionic PD was associated with attention seeking and manipulativeness, whereas the dependent PD correlated strongly with the facets contained within the negative affectivity domain. These results are in line with the description of the PDs according to both the DSM-5 (APA, 2013) and the ICD-10 (WHO, 1993). Moreover, the associations between the impulsive PD and the 25 maladaptive traits are very similar to the correlations between the borderline PD and the PID-5 scales. Seeing that both PDs are subtypes of the emotionally unstable PD in the ICD-10, these similarities were to be expected.

Overall, we conclude that the ETPduo questionnaire has good construct validity. Most discrepancies were observed for the obsessive-compulsive and narcissistic PD scales. Although the obsessive-compulsive scale correlated strongly

with rigid perfectionism, it was only weakly related to the facets of conscientiousness. Similarly, we would have expected negative and larger correlations between narcissistic PD and the facets of agreeableness. These scales have also been shown to have problematic items in Study 1. Therefore, revising some of the items contained by these scales would likely result in improved factorial and construct validity.

## General discussion

The aim of the present studies was to assess the psychometric proprieties of a new instrument designed to measure 11 PDs described by the DSM-5 and the ICD-10, as well as anxiety and depression. Study 1 showed that the questionnaire has good internal consistency, test-retest reliability and factorial validity. The results were used to advance suggestions that could potentially be used to improve the psychometric proprieties of some of the scales (narcissistic PD, histrionic PD, and obsessive-compulsive PD). In Study 2, the nomological network of the instrument was evaluated. Findings suggest that the questionnaire has good construct validity, seeing that the hypothesized correlations among PDs measured with ETPduo and normal/maladaptive personality traits were largely supported by the data. The results for the obsessive-compulsive and narcissistic scales deviated more from what would have been expected based on previous literature, which suggests that these scales should be reexamined and revised in the future.

Despite the fact that these preliminary results suggest that the ETPduo questionnaire is a reliable and valid instrument, more empirical work is necessary before recommending it for clinical practice and some limitations of the present studies should be noted. First of all, the internal consistencies for some of the scales included in the Big Five inventory were below the conventional threshold. Therefore, these results should be interpreted with caution. Moreover, the present studies used convenience samples consisting of adults from the general population. Although the samples used in the present research were large enough and diverse (relatively equal numbers of men and women, diverse educational backgrounds, and a wide age range), the psychometric proprieties of the instrument should also be examined in a clinical sample. Moreover, the construct validity of the questionnaire needs to be further assessed by correlating the results obtained on the ETPduo questionnaire with results obtained on another instrument designed to evaluated PDs (such as the OMNI-IV). Last but not least, it must be noted that, in its present form, the ETPduo questionnaire cannot be used to identify persons who might fall into the Other Specified PD, Unspecified PD, or Not Otherwise Specified PD diagnoses. One of the limitations of the categorical model of PDs is its inadequate coverage, as many patients with PD symptomatology do not meet the criteria for any of the existing PD categories (Widiger & Trull, 2007). Some people who are adminstered the ETPduo assessment might not obtain extreme scores on any of the instrument's scales, despite

showing considerable inter- and intrapersonal impairment (as indicated by medium to large scores on a considerable number of scales). Such results might suggest that these persons might fall into the Not Otherwise Specified category. In a future revision of the ETPduo questionnaire, we plan on including an additional scale assessing global personality dysfunction. A total score on this scale might be computed by summing up items from all scales of the questionnaire (excluding items measuring depression and anxiety). We speculate that a high score on the global personality dysfunction scale in the absence of extreme scores on any of the specific PD scales might indicate that the person could have an accentuated tendency towards PD, which is not described by any of the existent categories. Empirical work is obviously needed to test this idea. Until other empirical studies address the issues presented above, the ETPduo questionnaire can still be used for research purposes by the Romanian authors who are interested in evaluating their participants' tendency towards certain PDs, as well as depression and anxiety.

## Authors note

**Conflicts of interest statement:** We have no conflict of interest to declare.

**Compliance of ethical standard statement:** The procedures performed in this study were in accordance with the standards of the institutional ethics committee and with APA ethical principles regarding research with human participants.

**Informed consent:** Informed consent was obtained from all participants included in the study.

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# IMPLICATIONS OF COGNITIVE IMPAIRMENT ON SEVERAL ASPECTS OF FUNCTIONALITY AND QUALITY OF LIFE IN MAJOR DEPRESSED PATIENTS

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**Abstract**

***Background:*** Depression is considered one of the main determinants of economic deficits by limiting the functionality of the patients. Our study aimed to longitudinally assess the implications of cognitive deficits on functionality and quality of life for patients with major depressive disorder, during an acute depressive episode and also during euthymia.

***Materials and methods:*** Our study included 65 patients diagnosed with recurrent major depressive disorder. The quality of life domains were tested during an acute episode and after 6 months of euthymia. For both phases, the results were correlated with 35 healthy controls.

***Results:*** Patients during an acute depressive episode who performed better at the evaluation of psychomotor speed reported higher levels of quality of life. For verbal memory and psychomotor speed, statistically significant correlations were identified with the level of functionality and the general living environment. During the euthymic phase, significant associations were identified between psychomotor speed and the global level of functionality. Also, memory and psychomotor coordination presented significant correlations with quality of life.

***Conclusions:*** Results from our study confirmed the relationship between cognitive functions and functionality of patients with depressive disorder and the predictive value of psychomotor speed for the quality of life domains during both phases.

**Keywords:** cognitive impairment, functionality, quality of life, major depression, euthymia.

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Clinical research shows that major depressive disorder is one of the primary causes of dysfunction reflected by decreased productivity or absence from work, altered interpersonal and social relationships, and deteriorated health status, being responsible in the end for the low quality of life (Demyttenaere, 2006; Rock et al., 2014; Szmulewicz et al., 2018). Also, depression involves high economical costs for the individual and the community (Reischies & Neu, 2000). Comparative studies identified a higher degree of dysfunction in depressive disorder compared to the level of functionality's impairment of other chronic pathologies such as asthma, arthritis, or hypertension (Evans et al., 2014; Reed et al., 2018).

Over the last years, cognitive impairment has become recognized as an important characteristic of Major Depressive Disorder, explained by the presence of deficits in inhibitory processes, inability to make decisions and a decrease of communication skills to a suboptimal level. Patients tend towards isolation, thus affecting the quality of life (Fennig et al., 2002; Lam et al., 2009; Lam et al., 2012; Păunescu & Micluția, 2015). These deficits have been shown to persist even after the remission of affective symptoms, making it difficult to reintegrate the patient into the workplace after an absence caused by a depressive episode (Wang et al., 2014). Numerous studies have attempted to explain the increased level of disability in depression by the presence of cognitive deficits, which can also contribute to decreased quality of life and can influence occupational status, but other studies suggest the severity of symptoms as an important determinant of dysfunction in depression (Gallagher et al., 2007; Martinez-Aran et al., 2007).

Because the relationship between cognitive deficits and global functionality in recurrent depressive disorder is complicated due to the heterogeneity of depressive symptoms, multiple cognitive domains, and different areas of psychosocial functionality, we assumed in the present study that cognitive dysfunction could be a mediator of psychosocial limitations. The study aimed to longitudinally assess the implications of cognitive deficits on functionality and quality of life for patients with major depressive disorder, during an acute episode at the first assessment, which was subsequently followed by a second assessment, in euthymia, at 6 months from baseline. We expect some correlations between different variables on depressed patients and on healthy controls, as the functionality and the domains of life quality for patients diagnosed with recurrent depressive disorder to be influenced by the presence of cognitive deficits during the acute depressive episode and also this relationship to manifest during the euthymic phase.

## Methods

### *Study Design*

This study included 65 depressed patients that were admitted to the Psychiatric Hospital from Cluj-Napoca for a depressive episode, each patient was identified during his first day of hospitalization by his chart. The duration of admission differed from patient to patient in relationship with the severity of the illness and the response to treatment, but after discharge, each patient was clinically assessed for the depressive symptoms on a monthly basis. The second cognitive evaluation was performed at 6 months since a patient meet the euthymic inclusion criteria. Also, 35 healthy control subjects who requested medical certificates over 6 months at the same hospital, were included in the study.

### *Participants*

Patients were of both genders, with ages between 18 and 60, with a minimum level of 8 years of education, who were currently experiencing a MDE (major depressive episode). Aiming to assess the longitudinal relationship between cognitive impairment and different life quality areas, all subjects were clinically and neurocognitively evaluated twice by the same evaluator, and the quality of life domains were tested during an acute depressive episode and after 6 months of euthymia. The inclusion criteria for depressive patients consisted of DSM-IV-TR and ICD-10 diagnosis of Major Depressive Disorder and Hamilton Depression Rating Scale (HAM-D) $\geq 8$. For euthymic patients, the inclusion criterium was established by a HAM-D score $\leq 7$. Subjects were excluded if they met the criteria for mental retardation, dementia, chronic alcoholism, or any other substance dependence, history of head trauma, or any current medical condition which could interfere with the level of cognitive performances. The patients' group was compared to 35 healthy control subjects who requested medical certificates over 6 months at the same Psychiatric hospital from Cluj-Napoca, who met the same exclusion criteria and matched by demographic characteristics. Before being admitted to the study all subjects had to give written informed consent. The study was approved by our university Ethics Committee.

### *Demographic and clinical data*

Sociodemographic data (age, gender, education level) and other clinical information were collected through the combination of a clinical interview and data from medical records. First, patients were clinically assessed upon admission for a major depressive episode and the diagnosis was made according to DSM IV-TR and ICD-10 diagnosis criteria for recurrent depressive disorder and a major depressive episode. Additional inclusion criteria consisted of a HAM-D score $\geq 8$. Absence of

any affective symptoms for six months and a HAM-D score ≤ 7 defined the remission state. In comparison with the outpatient population, all patients had more severe symptoms and episodes, because they were recruited while being hospitalized in an acute emergency ward.

*Instruments*

The cognitive domains were assessed with a battery of neuropsychological tests, called Brief Assessment of Cognition in Schizophrenia (BACS) (Clark et al., 2005) that was initially developed for schizophrenic patients in clinical trials. The scale has been shown to have a high degree of reliability, with a sensitivity in the evaluation of cognition similar to that of standard cognitive tests, in which the evaluation time is extended to 2 hours. As follows, the battery includes six different neurocognitive subtests for each specific cognitive domain:

Verbal memory – assessed with the List learning test (BACS), which analyzes the coding, organization, retention and then extraction of the newly presented information. The subject was read a list of 15 words at a rate of one word per second, and was asked to memorize as many of them as possible. The exam was repeated 5 times, and the final score corresponded to the number of words retained.

Working memory – evaluated by Digit sequencing test (BACS), from the short-term memory analyze, through a presentation to the subject series of numbers of increasing length and asked to repeat them starting with the shortest number and ending with the longest.

Attention and processing speed – was assessed with the Symbol coding test (BACS), at which subjects received a correspondence table between certain symbols with numbers from 1 to 9, they were asked to fill in the corresponding numbers next to a series of symbols as fast as they could within 90 seconds.

Verbal fluency- was evaluated by the Category instances test and controlled oral word association test (BACS), the subjects were asked to name in one minute as many words as possible, belonging to a given semantic category or words beginning with a certain letter.

Motor speed – was tested with the Token motor test (BACS), where patients were given 100 plastic chips and asked to place them in a stable container 8 cm high and 13 cm in diameter as fast as they could, within 60 seconds.

Executive functions – were assessed by the Tower of London (BACS), a test in which the patients specified the minimum number of moves by which the balls in one image could reach the same arrangement as in the other image.

Severity of depression was evaluated with the 17 items Hamilton scale (Hamilton, 1960) which is one of the most widely used clinician-administered depression assessment scale. It was designed to measure the effectiveness of antidepressant medication in clinical trials and became the gold standard measurement for depression (Alexpoulos et al., 2015). The internal consistency is 0.83, the accuracy of the results from one clinician to another is very high in terms

of the final score (0.80-0.98) and the accuracy of the retest is also very high (0.81) following the achievement by Janet Williams in 1988 of a Structured Interview Guide (Hamilton, 1960).

All four quality of life domains, such as physical health, mental health, social relationships, and general environment were evaluated with the WHOQOL – Bref and the functionality of each individual was assessed with GAF. The Global Functional Assessment Scale is a newer version of the Global Assessment Scale (GAS), published in DSM III-R in 1994. The scale provides an overall impression of the functionality based on a clinical judgment, being extremely useful when the clinical evolution of a patient must be evaluated in global terms, using a single measure. Psychological, social, and professional functioning is assessed, deterioration in functioning as a result of somatic complaints is not included. The maximum score is 100 and represents the healthy individual, and 1 represents the most affected individual. To calculate a GAF score, a single value will be chosen that best reflects the overall level of functioning of the individual. The application time of the scale is about 3 minutes. The WHOQOL – Bref is a shorter version that includes 26 items and 4 areas of evaluation. These are physical health, mental health, social relationships, and living environment, with a Cronbach's alpha coefficient ranging from 0.68 for social relationships to 0.82 for physical health. Therefore, this shorter version is a useful self-assessment scale with a high internal consistency, easily to be applied in a short time. This scale is validated on the population of Romania (Skevington et al., 2004; Taylor et al., 2004).

*Statistical analysis*

In the first part of the analysis, data were descriptively assessed, based on frequencies and ratios for the nominal variables and the most important descriptive statistics for the numerical ones. Means, medians, and standard deviations are provided for these variables through the article. To evaluate the relationship between cognitive performances and quality of life domains, correlation analysis was conducted (using Pearson's correlation coefficient), for both depressed and euthymic patients. Statistical significance was evaluated at the standard level of 5%. Statistical analysis was performed using IBM Statistical Package for Social Sciences 24 (SPPS) software, the Windows version.

## Results

*Clinical Characteristics*

Table 1 presents data for both groups, depressed patients and healthy controls, who were matched for demographic characteristics: gender, age, and level of education.

**Table 1.** Demographic and clinical characteristics for the depressed group (n = 65) and the control group (n = 35)

| Demographic and clinical aspects | Depressed patients (n = 65) mean/SD | Normal controls (n = 35) mean/SD |
|---|---|---|
| Age (in years) | 48.48 (SD = 10.484) | 41.20 (SD = 11.063) |
| | | Sex |
| 1. Male | n = 13 (20.00 %) | n = 8 (22.9 %) |
| 2. Female | n = 52 (80.00 %) | n = 27 (77.1 %) |
| Level of education (years) | 11.86 (SD = 3.115) | 11.55 (SD = 2.708) |
| 1. Gymnasium | n = 5 (7.7 %) | n = 2 (5.7 %) |
| 2. Vocational school | n = 6 (9.2 %) | n = 2 (5.7 %) |
| 3. High school | n = 34 (52.3 %) | n = 13 (37.1 %) |
| 4. University education | n = 20 (30.8 %) | n = 18 (51.4 %) |
| HAM-D scores (depression) | 23.20 (SD = 5.423) | – |
| HAM-D scores (euthymia) | 3.73 (SD = 1.387) | 0.74 (SD = 0.919) |

HAM-D Hamilton Depression Rating Scale, SD standard deviation

*Results obtained during the depression phase*

During a depressive episode, correlations between cognitive performances and different quality of life domains, including global functionality, physical health, mental health, social relationships, and general environment, were obtained using the Pearson correlation test. The results are presented in Table 2.

**Table 2**. Correlations of mean scores between the cognitive functions and the domains of the WHOQOL scale - Brief and GAF scale, during a depressive episode

| Cognitive function | Statistic Test | GAF | Physical health | Mental health | Social relationships | General environment |
|---|---|---|---|---|---|---|
| **List learning test** - try nr.1 | Pears. Correl. | .099 | .158 | .103 | .137 | .013 |
| | Sig.2-tailed | .432 | .210 | .416 | .277 | .921 |
| **List learning test** - try nr.2 | Pears. Correl. | .333** | .243 | .167 | .186 | .233 |
| | Sig.2-tailed | .007 | .051 | .184 | .137 | .061 |
| **List learning test** - try nr.3 | Pears. Correl. | .247* | .135 | .097 | .210 | .252* |
| | Sig.2-tailed | .047 | .283 | .442 | .093 | .043 |
| **List learning test** - try nr.4 | Pears. Correl. | .178 | .063 | .001 | .134 | .195 |
| | Sig.2-tailed | .155 | .615 | .996 | .288 | .119 |
| **List learning test** - try nr.5 | Pears. Correl. | .060 | .110 | -.004 | .187 | .236 |
| | Sig.2-tailed | .635 | .384 | .972 | .135 | .058 |
| **Sequencing test** | Pears. Correl. | .178 | -.009 | -.073 | .056 | .204 |
| | Sig.2-tailed | .155 | .946 | .562 | .660 | .103 |
| **Symbol coding** | Pears. Correl. | .051 | .118 | .063 | .153 | .110 |
| | Sig.2-tailed | .689 | .349 | .616 | .223 | .383 |
| **Category instances test** | Pears. Correl. | .160 | .145 | .038 | .213 | .170 |
| | Sig.2-tailed | .204 | .249 | .766 | .088 | .177 |
| **Controlled oral word association test-first try** | Pears. Correl. | .069 | -.017 | -.055 | .014 | -.009 |
| | Sig.2-tailed | .582 | .891 | .664 | .913 | .945 |
| | Pears. Correl. | .145 | .096 | .052 | .093 | .088 |

| Cognitive function | Statistic Test | GAF | Physical health | Mental health | Social relationships | General environment |
|---|---|---|---|---|---|---|
| **Controlled oral word association test** -second try | Sig.2-tailed | .250 | .449 | .678 | .462 | .486 |
| **Token motor test** -token left on the table | Pears. Correl. | -.264* | -.197 | -.212 | -.086 | -.286* |
| | Sig.2-tailed | .033 | .115 | .089 | .495 | .021 |
| **Token motor test** -total token in the recipient | Pears. Correl. | .287* | .181 | .198 | .069 | .276* |
| | Sig.2-tailed | .020 | .148 | .114 | .585 | .026 |
| **Token motor test** -token incorrectly put in recipient | Pears. Correl. | -.190 | -.138 | -.158 | .088 | -.193 |
| | Sig.2-tailed | .130 | .273 | .208 | .486 | .123 |
| **Token motor test** -token correctly put in recipient | Pears. Correl. | .242 | .194 | .202 | .152 | .249* |
| | Sig.2-tailed | .052 | .122 | .106 | .226 | .046 |
| **Tower of London** | Pears. Correl. | .022 | -.063 | .010 | -.083 | -.093 |
| | Sig.2-tailed | .860 | .619 | .934 | .511 | .463 |

Pears. Correl. – Pearson Correlation; Sig- significance, WHOQOL – Bref- World Health Organization Quality-of-Life Scale, GAF- Global Assessment of Functioning Scale, nr- number.

Statistically significant correlations ($p < .05$) were identified between the global level of functionality and the cognitive domains represented by verbal memory and psychomotor speed. In both cases, the Pearson correlation coefficients were positive.

For verbal memory, evaluated with the List learning test, statistically significant associations ($p < .05$) were identified with one of the quality of life domains. Pearson correlation coefficient = .252; $p < .05$, displayed a positive association between the third try of verbal memory testing and the general environment domain.

Psychomotor speed was statistically significantly correlated ($p < .05$) with the quality of life domain represented by the general living environment. For the Token motor test, the Pearson correlation coefficient was positive = .249 in the evaluation of tokens correctly placed in the recipient and negative = -.286 for the number of tokens left on the table.

The cognitive functions: working memory evaluated by the Sequencing test, attention and information processing speed assessed with symbol coding test, verbal fluency tested with category instances and controlled oral word association, and the executive functions assessed with Tower of London, were not correlated with any of the quality of life domains.

*Results obtained during the euthymic phase*

Within the euthymic phase, correlations between the cognitive scores and the domains of quality of life were obtained using the Pearson correlation test. The quality of life domains and the cognitive functions examined were identical to those

examined during the acute depressive episode, 6 months earlier. The results are presented in Table 3.

**Table 3.** Correlations of means scores between the cognitive functions and the domains of the WHOQOL scale - Brief and GAF scale, during an euthymic phase

| | | GAF | Physical health | Mental health | Social relationships | General environment |
|---|---|---|---|---|---|---|
| **List learning test - try nr.1** | Pears. Correl. | -.187 | -.211 | -.239 | -.364** | -.145 |
| | Sig. 2-tailed | .188 | .138 | .092 | .009 | .309 |
| **List learning test - try nr.2** | Pears. Correl. | -.105 | -.142 | -.141 | -.279* | -.020 |
| | Sig. 2-tailed | .461 | .321 | .324 | .048 | .890 |
| **List learning test - try nr.3** | Pears. Correl. | -.146 | -.341* | -.293* | -.468** | -.168 |
| | Sig. 2-tailed | .308 | .014 | .037 | .001 | .239 |
| **List learning test - try nr.4** | Pears. Correl. | -.252 | -.367** | -.379** | -.522** | -.241 |
| | Sig. 2-tailed | .074 | .008 | .006 | .000 | .089 |
| **List learning test - try nr.5** | Pears. Correl. | -.213 | -.265 | -.329* | -.428** | -.268 |
| | Sig. 2-tailed | .134 | .060 | .019 | .002 | .058 |
| **Sequencing test** | Pears. Correl. | -.090 | .323* | .173 | .082 | .263 |
| | Sig. 2-tailed | .531 | .021 | .226 | .566 | .062 |
| **Symbol coding** | Pears. Correl. | .097 | .074 | -.033 | .035 | .037 |
| | Sig. 2-tailed | .500 | .607 | .819 | .808 | .798 |
| **Category instances test** | Pears. Correl. | -.029 | -.115 | -.095 | -.197 | -.065 |
| | Sig. 2-tailed | .842 | .421 | .507 | .165 | .651 |
| **Controlled oral word association test-**first try | Pears. Correl. | .114 | .088 | -.040 | -.017 | .036 |
| | Sig. 2-tailed | .427 | .538 | .778 | .904 | .804 |
| **Controlled oral word association test-**second try | Pears. Correl. | .141 | .075 | -.012 | -.062 | .055 |
| | Sig. 2-tailed | .325 | .603 | .935 | .667 | .702 |
| **Token motor test -**token left on the table | Pears. Correl. | -.403** | -.287* | -.367** | -.224 | -.443** |
| | Sig. 2-tailed | .003 | .041 | .008 | .114 | .001 |
| **Token motor test -**total token in the recipient | Pears. Correl. | .403** | .287* | .367** | .224 | .443** |
| | Sig. 2-tailed | .003 | .041 | .008 | .114 | .001 |
| **Token motor test-** token incorrectly put in recipient | Pears. Correl. | -.302* | -.322* | -.431** | -.339* | -.331* |
| | Sig. 2-tailed | .031 | .021 | .002 | .015 | .018 |
| **Token motor test-** token correctly put in recipient | Pears. Correl. | .416** | .319* | .418** | .260 | .471** |
| | Sig. 2-tailed | .002 | .023 | .002 | .065 | .000 |
| **Tower of London** | Pears. Correl. | .111 | -.006 | .148 | .219 | .015 |
| | Sig. 2-tailed | .437 | .968 | .301 | .122 | .917 |

Pears. Correl. – Pearson Correlation; Sig- significance, WHOQOL – Bref- World Health Organization Quality-of-Life Scale, GAF- Global Assessment of Functioning Scale, nr- number.

Statistically significant associations ($p < .05$) were identified between the cognitive domain of psychomotor speed and the global level of functionality in

euthymic patients. For this association the Pearson coefficient was positive (Pearson coefficient = .416), so euthymic patients who performed well at the token motor test associated increased levels of functionality.

Euthymic patients who performed well at the psychomotor speed evaluation associated increased levels of functionality, as well as satisfaction in the areas of physical health, mental health, social relationships, and general environment. A higher level of quality in the field of physical health was obtained by the euthymic subjects who had good working memory.

For the Sequence test, a single statistically significant correlation with the physical health domain was identified. Pearson correlation coefficient was positive = .323, indicating that euthymic patients who managed to correctly reproduce an increased number of strings for the working memory evaluation reported a higher level of quality life in the field of physical health.

Correlation analyses showed that psychomotor speed was statistically significantly associated with all quality of life domains tested. Specifically, for the subtest total tokens put in the recipient of Token motor test, which evaluates the psychomotor speed, for all the statistically significant associations ($p < .05$) were identified positive Pearson coefficients, which showed that euthymic patients who had less psychomotor speed impairment reported higher levels of satisfaction and quality of life.

No significant statistical correlations were found between verbal fluency, executive functions or attention and information processing speed with any of the quality life domains.

## Discussions

Numerous reports have described the association between cognitive deficits and the influence they have on different areas of life satisfaction and quality of life (Druss et al., 2009; Maruff et al., 2009). The present study is based on a six months follow-up design; it is a naturalistic and longitudinal study, performed for a better understanding of the relationship dynamics between cognitive impairment and life quality in major depressed patients.

The results from the present study identified that depressed patients who perform better in areas of verbal memory and psychomotor speed associated higher levels of functionality ($p < 0.05$), showing that during an acute depressive episode the level of functionality is influenced by the presence of cognitive deficits. A similar result was obtained by another study, which concluded that the level of functional disability for patients having a depressive episode was strongly influenced by the presence of cognitive deficits, in domains such as psychomotor speed and verbal memory (Naismith et al., 2007).

Also, our data showed that, during the euthymic phase, functionality was influenced by the scores obtained on psychomotor speed evaluation, proving that this cognitive field has an important role for an optimal level of functionality. These findings are consistent with those reported by Jaeger et al., 2006, who identified strong correlations between attention, verbal memory, and psychomotor speed with the degree of functional disability during an acute depressive episode. Also, the scores obtained in testing psychomotor speed were predictive for the functional outcome on the subsequent examination at six months. A considerable enhancement was found in the level of functionality in those who showed improvement in cognitive deficits (Jaeger et al., 2006). On the other hand, Airaksinen et al., 2006, in a study that assessed the trajectory of episodic memory deficits and their correlation with the degree of functionality in depression, observed improvements in functionality although memory deficits were still present in the euthymic phase. It can be assumed that certain aspects of functionality appear to be dependent on the presence of affective symptoms and that functionality may improve while the depressive episode remits (Airaksinen et al., 2006).

Our results showed that patients during an acute depressive episode who perform better at the evaluation of psychomotor speed reported higher levels of quality of life for the general living environment domain. But no significant statistical correlations were found for the other cognitive functions tested, such as working memory, verbal fluency, executive functions, attention, or information processing speed, with any of the quality of life domains. These findings are not in line with those reported by McCall at al., which identified the field of social relationships as being significantly correlated with the scores obtained from the verbal memory test in a group of depressed subjects (Greer et al., 2013). Moreover, a study conducted by Greer et al., which also assessed the correlations between quality of life and cognition, using the CANTAB battery, obtained significant correlations between working memory and physical health, as well as between the field of social relations and executive functions (McCall & Dunn, 2003). Other research found, besides the correlation between psychomotor speed and general environment domain, other cognitive functions associated with quality of life areas (Naismith et al., 2007).

Among the cognitive functions that were evaluated in the current study during the euthymic phase, only memory and psychomotor coordination presented statistically significant correlations with the domains of quality of life at a level of statistical significance of 5%. Therefore, euthymic patients who performed better in the cognitive domain of working memory reported a better level of quality of life in the field of physical health. Comparing with other chronic somatic pathologies, such as migraine, obesity, diabetes, or pain, studies report even a higher level of impairment in the field of physical health for depression (Buist-Bouwman et al., 2008). Psychomotor speed was positively correlated with the quality of life, so a higher performance in this cognitive domain was associated with a higher level of quality of life. The results obtained in the study are similar to those described by

Shimizu et al., who concluded that although depressive symptoms remit, cognitive functioning can influence the quality of life, as he observed a significant association between verbal memory, psychomotor speed and the quality of life perceived by the subjects (Shimizu et al., 2013). Furthermore, the study conducted by Godard et al. identified significant correlations between the social domain of quality of life and cognitive functions represented by attention, psychomotor speed, and executive functions, in an euthymic patient group known with major depressive disorder (Godard et al., 2011).

## Limitations

Despite the fact that some results obtained are congruent with the data published in the literature, it is necessary to mention the limits of the presented study. An important aspect would be the relatively small size of some of the examined subgroups, that has implication on decreasing the statistical power of the study. A second limitation could be the fact that some of the questionnaires applied are self-assessment, so there is the possibility that participants could lie, disguise the aspects and symptoms assessed or simply respond according to expectations and not the actual reality. In current clinical practice there are often different clinical parameters that from one point of view can individualize the patient, but also can make it difficult to analyze in part, the influence of each of them on cognition or functionality, because they cannot be calculated with accuracy.

## Implication and future directions

One of the benefits of these results sustain the admission that cognitive impairment is present in depressed patients with different implications on functionality and quality of life and translate this knowledge in possible therapeutic interventions targeting the cognitive deficits. Recurrent depressive disorder is associated with an overall impairment of functionality and various areas of quality of life that the individual experiences, involving many areas such as general health, both physical and mental, decreased life satisfaction, interpersonal relationships, having the frequent consequence of losing a job, which determines a real disability. In connection with job related difficulties future studies should be designed to investigate the level of productivity, or absenteeism from work, regarding the associated cognitive deficits for major depressed patients.

## Conclusions

Following the results obtained in the present study, the relationship between cognitive functions and quality of life is confirmed for patients diagnosed with

recurrent depressive disorder. During an acute depressive episode, those who obtained better scores at the evaluation of verbal memory and psychomotor speed presented higher levels of functionality and quality of life for the general living environment. Euthymic patients who performed well at the psychomotor speed evaluation associated increased levels of functionality, as well as satisfaction in the areas of physical health, mental health, social relationships, and general environment. Also, a higher level of quality in the field of physical health was obtained by the euthymic subjects who had good working memory.

## Author Note

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# PSYCHOMETRICS PROPERTIES OF THE DAILY SPIRITUAL EXPERIENCES SCALE IN A ROMANIAN CLINICAL SAMPLE. A PILOT STUDY

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**Abstract**

***Background:*** In the last decades, there has been a growing interest in studying the effects of spirituality/religiosity on health. Many studies concluded that spirituality/religiosity has a beneficial effect on mental and physical health. To study these effects, validated instruments for measuring spirituality are needed. A good example of a largely used instrument is the Daily Spiritual Experiences Scale (DSES). The current study sought to examine the psychometric properties of Romanian version of DSES.

***Method:*** Exploratory Factor Analysis and Principal Components Analysis were used to confirm the construct validity of the scale. The internal consistency of the scale was determined using Cronbach's alpha.

***Results:*** 70 patients with a diagnosis of depression and 160 healthy volunteers were included in this cross-sectional study. Cronbach's alpha indicated excellent internal consistency of the scale. Principal Component Analysis indicated a two-component solution in both samples.

***Conclusions:*** Our study confirmed the validity and reliability of the Romanian version of DSES and it encourages its use in future studies of spirituality or studies regarding the influence of spirituality on depression.

**Keywords:** depression; spirituality; Daily Spiritual Experiences Scale; religiosity; psychometric properties.

The association between religiosity/spirituality and mental health has been studied for a long time. Starting with Durkheim (1951), researchers have found religious practices and beliefs to be protective factors, particularly against mental disorders. Although over the past decades many studies offered evidence that linked

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the benefits of religious practices or spirituality to mental health, additional work is needed. Many studies only focused on a small number of mental disorders (depression, anxiety, suicide risk, bipolar disorder).

Religiosity and spirituality are independent concepts, but are often studied together. Spirituality can manifest itself in the context of a religious system and religiosity involves spiritual experiences (Koening et al., 2012). Religiosity is defined as the extent to which the individual is engaged in a system of beliefs, practices, or rituals shared by a community and designed to facilitate the approach of the sacred or transcendent. Sullivan (1993) defines spirituality as a unique and individual trait that connects the person with the universe and those around him and does not necessarily include belief in a higher power.

Spirituality/religiosity has been associated with an increased quality of life and has a beneficial impact on both mental and psysical health (Lucchetti et al. 2013; Weber & Pargament, 2014). It can improve cognitive function, reduce stress level, anxiety and depression symptoms, lowers alcohol and other substances consumption, thus it buffers off the negative effects of many health conditions (Pargament 2013). Handbook of Religion and Health (Koening et al., 2001), which comprises a review of more than a thousand studies, showed that most of them found a beneficial influence of religiousity/spirituality on cardiovascular system, immunological function, stress level, anxiety and depression symptoms and is associated with higher levels of well-being, quality of life, greater social support and lower use of healthcare services.

In order to assess spirituality, reliable quantitative instruments are needed. One of the most used instruments in researching spirituality/religiosity is the Daily Spiritual Experiences Scale (DSES) developed by Lynn Underwood and Jeanne Teresi (Underwood & Teresi, 2002). The scale was intended to assess daily frequency of spiritual experiences and the interaction with the transcendent. Items measure spiritual experiences, not religious beliefs or behaviour. DSES is validated in many languages and can also be used in people with different religions or atheists.

Few studies about spirituality and mental health were conducted in Romania and used different scales to asses spirituality. We found only one study that used DSES to evaluate spirituality in trauma therapists (Neymer et al., 2016). This kind of studies in Romania are of great importance, considering the population's high level of religiosity and spirituality.

Wishing to contribute to the expansion of the knowledge in spiritual research, this study aims to evaluate the psychometric properties of the DSES, an internationally recognized instrument to measure the spiritual experiences, in a small clinical sample of depressed patients from a county hospital in Romania and to compare those results to a control group.

## Method

*Design and participants*

The present study is a case-control, cross-sectional study. Data were collected between March 2019 and June 2022.

The cases sample recruited patients with a diagnosis of depression admitted to a county Psychiatry Ward from Transylvania, with ages between 18-70, who were willing to cooperate and sign an informed consent.

For the control group we recruited volunteers using an online survey distributed on social media, due to the COVID-19 pandemic.

Sample size is important for factor analysis and adequate sample size is approximated based on a ratio of participants to variables of at least 10:1 (Yong & Pearce, 2013). Because a larger sample size can decrease the error in data (Yong & Pearce, 2013), at least 160 respondents are required to perform a factor analysis of the DSES (consisting of 16 items).

*Inclusion criteria:*

Patients with a diagnosis of depression (depressive episode, recurrent depressive disorder, bipolar disorder, current depressive episode) according to ICD-10 criteria, aged between 18 to 70, were included in the case group.

The control group included healthy volunteers, aged 18 to 70 years.

*Exclusion criteria:*

Patients with an age over 70 years, diagnosed with other psychiatric disorders (mental retardation, cognitive impairment, schizophrenia, delirium, delusional disorder, substance use disorder) or neurological disorders (neurodegenerative diseases, brain injury, stroke) or chronic terminal diseases were excluded from the case group.

Volunteers with a history of mental illness recruited in the control group were excluded from this study.

*Ethical Considerations*

The study was approved by the Iuliu Hatieganu University of Medicine and Pharmacy ethics committee. The objectives of the study were explained to participants before entering the study, and confidentiality was guaranteed. Subjects were assured that there were no risks associated with participation in this study and that they can withdraw from the study at any time. All participants gave their informed consent in order to participate in the study.

*Measures*

*Socio-demographics*

Data on age, gender, residence, religion affiliation, education level and marital status were collected using a demographic questionnaire.

*Daily Spiritual Experiences Scale (DSES)*

We obtained the license to use and Romanian version of the Daily Spiritual Experiences Scale from the author, Lynn Underwood (Underwood & Teresi, 2002). The conceptualization of the scale reflects an overlapping of spirituality and religiousness and contains theistic and non-theistic items. First 15 items of this scale are rated on a six-point Likert type scale, ranging from 1 ("Many times a day") to 6 ("Never or almost never") and one item has responses ranging from 1 ("As close as possible") to 4 ("Not at all"). We used reverse coding of the items, which means higher scores indicate a higher frequency of spiritual experiences. We chose to use only the first 15 items in order to maintain item consistency within inferential statistical analyses and to allow the most logical interpretation of scores, given the different scoring of item 16. In other studies the raw score of item 16 was adjusted but its 4-point Likert scoring was maintained for descriptive statistical reporting (Lace & Handal, 2017).

*Statistical analysis*

The collected data were analyzed using Statistical Package for the Social Sciences *(*SPSS*)* software, version 26, for Windows. Significance level of p was set at less than 0.05. Descriptive analysis was used to summarize categorical (number and frequency counts) and continuous variables (mean and standard deviation).

Kolmogorov–Smirnov test was performed to test data distribution.

Exploratory Factor Analysis (EFA) followed by principal components analysis (PCA) with varimax rotation were used to confirm the construct validity of the scale.

Cronbach's alpha is often used to evaluate the internal consistency of a scale and values of 0.70 or higher are considered acceptable. The internal consistency of DSES was determined using Cronbach's alpha (Lance et al., 2006).

To identify the relationship between individual items of the DSES and the total score, the Pearson correlation coefficient was used to determine the item-to-total score correlations (ITC). An ITC greater than 0.30 is considered acceptable.

## Results

In total, 70 patients who met the inclusion criteria were included in the case group. The mean ± SD age was 51.57 ± 13.88 (range 19-70) years. Half of the participants were men (n=35) and 51.4% came from urban area. The majority were orthodox (78.6%) and married (70%). Only 11.4% were Protestants and 10% were Catholics. Table 1 summarizes demographic characteristics of the sample.

**Table 1.** Socio-demographic characteristics

| Characteristics | Case n (%) | Control n (%) |
|---|---|---|
| Gender | | |
| Male | 35 (50) | 71 (44.4) |
| Female | 35 (50) | 89 (55.6) |
| Residence | | |
| Urban | 36 (51.4) | 127 (79.4) |
| Rural | 34 (48.6) | 33 (20.6) |
| Marital status | | |
| Married | 49 (70) | 91 (57) |
| Divorced | 7 (10) | 25 (15) |
| Widow | 5 (7.1) | 6 (4) |
| Single | 9 (12.9) | 38 (24) |
| Education | | |
| Primary | 17 (24.3) | 6 (3.8) |
| Secondary | 34 (48.6) | 27 (16.9) |
| University | 19 (27.1) | 127 (79.3) |
| Religion | | |
| Orthodox | 55 (78.6) | 120 (75.9) |
| Catholic | 7 (10) | 9 (5.7) |
| Protestant | 8 (11.4) | 12 (7.6) |
| Agnosticism | 0 (0) | 6 (3.8) |
| Atheism | 0 (0) | 11 (7.0) |

A total of 160 subjects, aged between 22 and 70 years, were included in the control group. The mean ± SD age of the sample was 48.29 ± 12.806 years. 55.6% of the respondents (N=89) were women and 44.4% (N=71) were men. The majority were Orthodox (75.9%) and came from urban area (79.4%). A summary of demographic characteristics of the control group can also be found in Table 1.

Cronbach's Alpha was 0.917 in the case group and 0.964 in the control group (Table 2).

**Table 2.** Reliability Statistics

| | Cronbach's Alpha | Number of Items |
|---|---|---|
| Cases group | 0.917 | 15 |
| Control group | 0.964 | 15 |

The PCA in the case group , with the criteria of eigenvalue greater than 1, resulted in a two factor solution explaining 63.076 % of the total variance. The eigenvalue of the first factor was 7.375 and of the second factor 2.087. The variances explained by the factors were, respectively, 49.164 % and 13.912 %. The factorial loadings of the items in the respective factors were all greater than 0.40. Of the 15 items, 8 had higher loadings in the first factor, with values ranging between 0.70 and 0.877. The second factor was composed of seven items with loadings from 0.576 to 0.80.

**Table 3.** Descriptive analysis and reliability of the Daily Spiritual Experience Scale items in the case group

| Items of DSES | N | Mean | Standard deviation | Corrected item-total correlation | Cronbach's alpha if item deleted |
|---|---|---|---|---|---|
| 1. God's presence | 70 | 4.29 | 1.342 | 0.666 | 0.91 |
| 2. Connection to all life | 70 | 3.87 | 1.382 | 0.496 | 0.916 |
| 3. Joy when connecting | 70 | 4.14 | 1.407 | 0.737 | 0.908 |
| 4. Strength in R/S | 70 | 4.46 | 1.369 | 0.784 | 0.906 |
| 5. Comfort in R/S | 70 | 4.44 | 1.358 | 0.77 | 0.907 |
| 6. Deep inner peace | 70 | 3.16 | 1.421 | 0.646 | 0.911 |
| 7. God for help | 70 | 4.77 | 1.241 | 0.67 | 0.91 |
| 8. Guided by God | 70 | 4.31 | 1.357 | 0.809 | 0.906 |
| 9. Love through others | 70 | 4 | 1.383 | 0.783 | 0.906 |
| 10. Love directly | 70 | 3.5 | 1.482 | 0.636 | 0.911 |
| 11. Touched by beauty | 70 | 3.66 | 1.443 | 0.475 | 0.917 |
| 12. Thankful for blessings | 70 | 4.54 | 1.151 | 0.667 | 0.911 |
| 13. Selfless caring | 70 | 3.71 | 1.353 | 0.255 | 0.923 |
| 14. Accept others | 70 | 3.7 | 1.255 | 0.369 | 0.919 |
| 15. Desires to be in union | 70 | 4.77 | 1.157 | 0.628 | 0.912 |

The PCA in the control group , with the criteria of eigenvalue greater than 1, also resulted in a two factor solution explaining 74.611 % of the total variance. The variance explained by the first factor was 67.224 % and of the second factor was 7.263 %. The eigenvalue of the first factor was 10.084 . The second factor had an eigenvalue of 1.090 . The factorial loadings of the items in the respective factors were all greater than 0.40. The first 12 items and item 15 loaded on the first factor, with values ranging between 0.653 and 0.919. Items 13 and 14 loaded on the second factor.

Descriptive analysis of the DSES items in the case group is presented in Table 3. The item with a lower mean compared to other items was item 6 ("I feel deep inner peace or harmony"). All items, except for item 13 (0.255), had ITC's of

0.30 or greater, ranged from 0.3 to 0.809, demonstrating satisfactory correlation with the total score of the scale.

In the control group, all items had ITC's of 0.30 or greater (ranged from 0.400 to 0.912), which demonstrates again a satisfactory correlation with the total score of the scale.

**Table 4.** Descriptive analysis and reliability of the DSES items in the control group

| Items of DSES | N | Mean | SD | Corrected item-total correlation | Cronbach's alpha if item deleted |
|---|---|---|---|---|---|
| 1. God's presence | 160 | 4.1 | 1.781 | 0.87 | 0.96 |
| 2. Connection to all life | 160 | 4.04 | 1.178 | 0.656 | 0.964 |
| 3. Joy when connecting | 160 | 3.34 | 1.554 | 0.854 | 0.961 |
| 4. Strength in R/S | 160 | 3.92 | 1.784 | 0.907 | 0.959 |
| 5. Comfort in R/S | 160 | 3.95 | 1.769 | 0.898 | 0.96 |
| 6. Deep inner peace | 160 | 4.29 | 1.394 | 0.705 | 0.963 |
| 7. God for help | 160 | 3.98 | 1.843 | 0.862 | 0.96 |
| 8. Guided by God | 160 | 3.88 | 1.808 | 0.912 | 0.959 |
| 9. Love through others | 160 | 3.96 | 1.78 | 0.888 | 0.96 |
| 10. Love directly | 160 | 3.67 | 1.835 | 0.821 | 0.961 |
| 11. Touched by beauty | 160 | 4.24 | 1.655 | 0.746 | 0.963 |
| 12. Thankful for blessings | 160 | 4.6 | 1.595 | 0.779 | 0.962 |
| 13. Selfless caring | 160 | 4.33 | 1.326 | 0.552 | 0.966 |
| 14. Accept others | 160 | 4.45 | 1.292 | 0.4 | 0.968 |
| 15. Desires to be in union | 160 | 4.07 | 1.802 | 0.875 | 0.96 |

## Discussions

The purpose of this study was to confirm as to whether DSES is a reliable and comprehensive scale for measuring daily spiritual experiences in both general population and depressed patients. To our knowledge, this is the first known study to evaluate the psychometric properties of DSES in Romanian population.

Range of mean score of the Romanian DSES items was similar with the original English version of DSES (Underwood & Teresi, 2002), and other studies (Rakošec et al., 2015; Kalkstein et al., 2009).

In their study, Underwood and Teresi (Underwood & Teresi, 2002) reported adequate distributions. In our study, Kolmogorov–Smirnov test showed normal distribution of the items.

The reliability of the DSES in both groups was confirmed by the high Cronbach's alpha value (0.917, respectively 0.964). The result of our study is comparable to those reported in other studies, in which the alpha coefficient was above 0.90 (Kalkstein & Tower, 2009; Ellison & Fan, 2008; Ng et al., 2009; Mayoral et al., 2010; McCauley et al., 2008; Saffari et al., 2017; Soósová & Mauer, 2021). Cronbach's alpha did not increase if particular items were removed from the scale, except for items 13 ("I feel a selfless caring for others.") and 14 ("I accept others

even when they do things I think are wrong"). This aspect was observed in both groups. The increase is not significant, which indicates good internal consistency of the DSES.

The DSES was designed as a unidimensional instrument but, in this study, exploratory factor analysis with varimax rotation generated a two-factor solution with eigenvalues greater than 1 in both groups. This result is different from those found in the majority of other studies. A two factor structure is reported in the original study of Underwood (Underwood & Teresi, 2002), in the Chinese validation study (Ng et al., 2009) and in a North American study (Kalkstein & Tower, 2009). These studies reported one dominant factor composed of 14 items and a second factor composed of two items (item 13, selfless caring for others and item 14, acceptance of others). A two-factor solution indicates the scale has two dimensions, called the "God" or "theistic" and the "non-theistic" or "self-transcendence" domains (Ellison & Fan, 2008; Kalkstein & Tower, 2009). However, the developer of the scale has reported that a single-factor solution is more common and that dividing the scale into two dimensions is not necessary or recommended (Underwood & Teresi, 2002). The two-factor solution found in this study can be explained by the cultural and religion affiliation differences between our sample and the samples from other studies.

In the initial validation study of DSES, although items 13 and 14 appeared to load onto a second factor, the authors chose to maintain them aggregated to the first factor, thus considering the scale as an unidimensional instrument. As in previous studies, items 13 and 14 also loaded in the second factor, an aspect found in both the control and case group. Items 13 ("I feel a selfless caring for others.") and 14 ("I accept others even when they do things that I think are wrong.") refer to the construct of "compassionate love", which includes the concepts of mercy and compassion (Underwood, 2006). A possible explanation as to why items 13 and 14 loaded separately onto another factor is that their underlying construct refers to interpersonal relationships, which are very important spiritual values in Orthodox Christianity (Georgadze et al., 2017). These items can be used separately in future studies to evaluate spiritually grounded motivations and selfless attitudes.

The findings of our study indicate that the DSES is a valid and reliable measure in both general population and clinically depressed patients and it can be used in future research regarding the influence of spirituality on depression.

This study has its limitations. The convenience sampling used for the control group is associated with a predominance of subjects with higher education, in comparison with the case group. The use of convenience recruitment may lead to limited generalizability of the results to the general population of Romanian Christians. Religious practices and spiritual experiences specific to Orthodox people can be accurately evaluated by the Romanian version of the scale, this phenomenon being reflected in this study.

## Conclusions

The results of this study confirm the validity and reliability of the Romanian DSES and promote the use of the DSES in future studies.

Although the exact mechanisms are still not entirely clear, spiritual values and experiences are increasingly recognized as important factors which promotes mental health. The Romanian DSES provides opportunity for enriching the knowledge about the spirituality in Romanian population in different aspects of life, and supports its use in future spirituality research. The specificity of Romanian spirituality is also preserved by the Romanian translation of the scale.

Future studies should determine whether our preliminary results can be replicated in other samples of Romanian patients or in general population. It would be recommended to test psychometric properties of the DSES in larger samples with diverse religious affiliation.

## Conflict of interest

The authors have no conflict of interest to disclose.

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