

Mindfulness training in VR for people with schizophrenia: A multi-case study

Virtual Reality (VR) is gaining popularity in treating various mental disorders, including psychotic ones. The effectiveness of **mindfulness-based interventions (MBI)** applied in psychotic patients has been confirmed in many studies, during which study participants declared less involvement in symptoms and a reduction in clinical symptoms of schizophrenia. Although some clinicians recommend far-reaching caution in applying mindfulness-based interventions to patients with schizophrenia, the results of the study reveal no adverse effects.

INTRODUCTION

Schizophrenia is one of the 25 leading causes of disability worldwide, and in Poland, it affects 385,000 people. Classical pharmacotherapy has limited results in treatment, sometimes leaving patients with years of exposure to psychotic and negative symptoms. Interventions based on third-wave techniques of cognitive-behavioral therapy, such as mindfulness, focused on symptom acceptance and coping with their presence, are promising directions of therapeutic approaches for patients resistant to antipsychotic drugs. Additionally, conducted in a VR environment, controllable and free of distractors, have the potential to support the recovery of people who have schizophrenia effectively.

OBJECTIVE

To evaluate the impact of MBI in VR (MBI-VR) interventions on the level of:

- psychopathological symptoms (PANSS-6),
- depressive symptoms (BDI, QIDS),
- stress (PSS-10),
- anxiety (BAI, STAI),
- cognitive functioning (ACE-III),

METHODOLOGY

Twenty-five patients with schizophrenia participated in training sessions on mindfulness in VR (MBI-VR) thrice a week for four weeks. One MBI-VR session lasted approximately 20 minutes. The subjects watched a 360 video while listening to instructions.

Questionnaire measurements were used at three-time points (T1, T2, T3), at 4-week intervals, and before and after each training session. The Reliable Change Indices (RCI) with 80% and 95% Confidence Intervals (CI) and Cohen's d-test for repeated measures were used to assess symptom severity changes in patients (the RCI is a statistic that measures changes in symptom severity in individuals, not in the patient group as a whole).

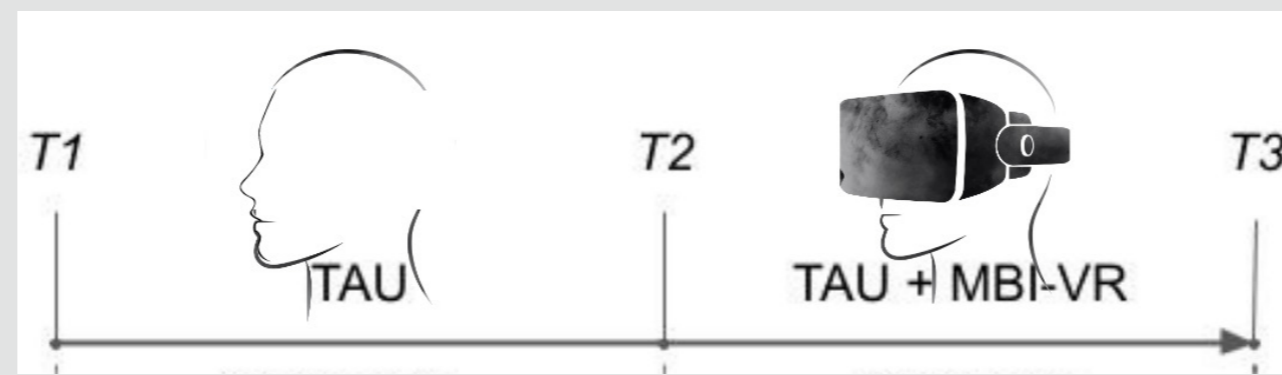


Table 1. Descriptive statistics at T1, T2, T3

Time Scale	T1		T2		T3	
	M	SD	M	SD	M	SD
ACE	89.6	7.8	91.0	7.7	93.1	5.6
PANSS	11.8	5.4	11.9	5.9	9.9	5.5
Pos	5.6	3.3	5.7	3.0	4.6	2.6
Neg	6.1	3.8	6.2	4.0	5.3	3.8
BDI	10.1	11.2	9.1	12.7	7.1	10.3
BAI	16.3	13.3	13.0	11.0	11.8	10.5
QIDS	7.0	6.1	6.0	6.2	5.2	5.3
STAI	21.4	11.8	18.5	10.6	17.8	12.6
PSS-10	15.7	6.5	14.1	6.3	14.1	6.4

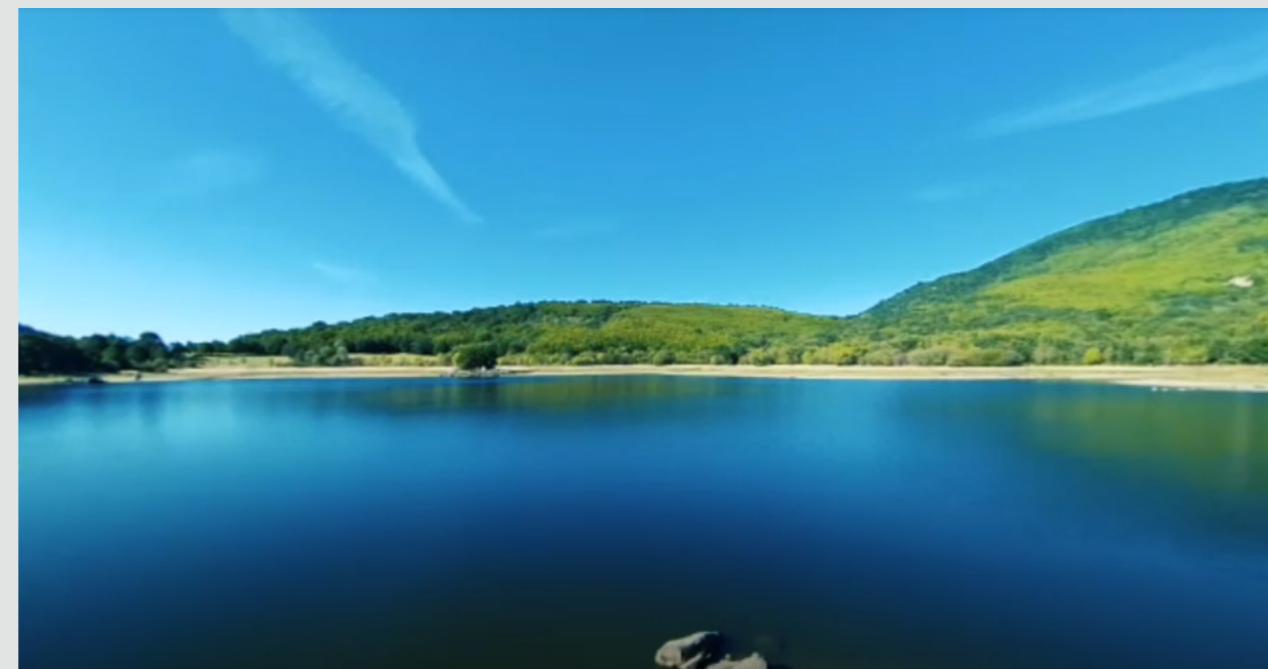
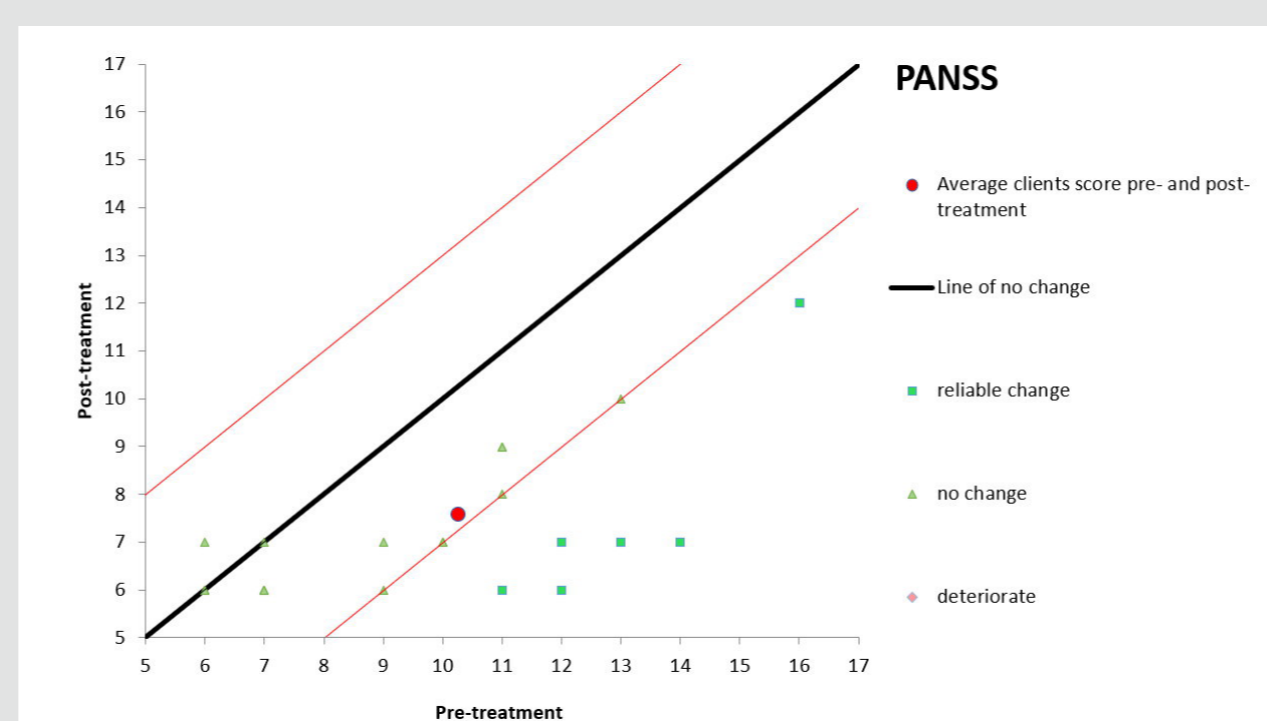


Table 2. Dynamics of effect sizes (Cohens d)

SCALE	T1-T2	T2-T3	T1-T3
ACE	.37	.51	.71
PANSS	.05	1.20	1.02
Pos.	.06	.50	.75
Neg.	.08	.65	.67
BDI	.15	.24	.41
BAI	.45	.16	.38
QIDS	.32	.20	.45
STAI	.66	.51	.71
PSS-10	.42	1.20	1.02

Figure 1. Reliable changes T3 vs. T1 in PANSS



RESULTS

The results show that MBI-VR produces positive effects (**Tab 1. and 2.**). Symptoms of minimal worsening are revealed in 1 patient in 1 of 3 factors at the 95% CI and 1-3 patients in 5 factors at the 80% CI. Positive effects appear in order in the areas of:

- general psychotic symptoms PANSS ($d=1.20$; 13 patients improved results 1 worsened at 80%CI; 10 vs. 0 at 95%CI) (**Fig. 1.**)
- negative psychotic symptoms ($d=0.65$; 5 vs. 0; 1 vs. 0),
- cognitive function ACE ($d=0.51$; 10 vs. 1; 2 vs. 0),
- positive psychotic symptoms ($d=0.50$; 4 vs. 0; 1 vs. 0),
- depression symptoms severity BDI ($d=0.24$; 7 vs. 0; 3 vs. 0),
- depression symptomatology QIDS ($d=0.20$; 5 vs. 0; 2 vs. 0),
- anxiety symptoms severity of BAI ($d=0.16$; 7 vs. 2; 6 vs. 1),
- anxiety state-trait STAI ($d=0.11$; 6 vs. 2; 4 vs. 1),
- perceived stress PSS-10 ($d=0.00$; 7 vs. 3; 6 vs. 1).

It should be emphasised that MBI-VR enhances the effects of TAU (**Table 1. and 2.**), but in some aspects there may be adverse effects. These effects may appear especially in anxiety STAI ($d=0.60$) and stress PSS-10 ($d=0.33$), where TAU produced significantly better outcomes than mindfulness ($d=0.11$ and $d=0.00$, respectively). Moreover, MBI-VR appears to have ambivalent influences on stress intensity PSS-10 and anxiety BAI/STAI (2-3 patients show worsening effects ver. 6-7 improving at 50% CI).

CONCLUSIONS

The research shows good feasibility and acceptability of the mindfulness intervention in VR in patients with schizophrenia. The results indicate potential benefits in alleviating symptoms of the disease, improvements in cognitive function, and emotion regulation. Such a result is consistent with the results of available meta-analyses that mindfulness-based interventions (without VR) associated with standard treatment improves overall symptomatology, level of functioning, and disease awareness. The possibility of adverse effects is also consistent with the other results, which lead people who begin practicing mindfulness may experience transient negative symptoms and emotions at first. This phenomenon is mainly due to gaining or deepening insight into oneself, which in the long term is salutogenic. It should be stressed that the results are particularly significant in that no such study has yet been published to our knowledge (the use of combining mindfulness with VR as a complementary therapy for patients with a schizophrenia spectrum diagnosis).

AUTHORS

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