VIRTUAL REALITY TECHNOLOGY (VRT) CAN OPTIMAZE THE PSYCHOLOGICAL WELLNESS AND COGNITIVE STATUS IN POST ACUTE STROKE? CONSIDERATIONS ABOUT A CASE-STUDY.

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Introduction

Post-stroke cognitive impairment occurs frequently in the patients with stroke, with a prevalence from 20% to 80%. Previous studies indicate that post-stroke anxiety is also common and persistent (1). The use of standard relaxation techniques in treating anxiety in patients undergoing post-stroke rehabilitation have showed some potential positive effects (2). In recent years, several publications have appeared on virtual reality (VR) in the treatment of anxiety disorders. However, a limited number of these studies targeted stress management and relaxation. Aim of this study is to evaluate the effects of a combined rehabilitative treatment using conventional relaxation and respiratory techniques, mediated by Virtual Reality Technology (VRT) with a specific rehabilitative environment - i.e. Bts Nirvana (see image n.1), in post stroke patient.

Case-study

A 58-year-old woman, affected by hemorrhagic stroke with a 13 years of education, underwent two different rehabilitation trainings: the first including the use of standard relaxation techniques in a usual setting face to face with therapist (standard approach); the second, with the same psychological approach in a semi-immersive virtual environment (combined approach).
We evaluated her cognitive and psychological status in two separate sessions, before and after the two different trainings, by using a proper psychometric battery, aimed to assess global cognition, attention process and to estimate the presence of mood alterations, anxiety and coping strategies. The principal vital parameters (such as oxygen and heart rate) were also monitored. Each rehabilitation program was articulated in 3 sessions/weekly for 2 months.

Results.

Compared the psychometric measures at T0-T1-T2-T3, *only at the end of the combined approach*, we observed a significant improvement in attention process and verbal memory, with a better stabilization of the cardiac frequency and a moderate reduction of anxiety symptoms; also it is relevant the optimization of the coping strategies in social support and positive attitude with a decrease of the voidance strategies (see table n.1).

Conclusion.

Relaxation and respiratory techniques in a Semi - Immersive Virtual Reality Environment, using proper and dedicated tool (such us Bts-Nirvana), may be an advanced system in improving attention process, coping strategies and reduction of anxiety symptoms in a post-stroke subject. In future research, the VRT - i.e. Bts Nirvana could be considered a promising tool to support the standard relaxation techniques.

Table n.1
Comparison of behavioral and psychometric measures at T0-T1-T2-T3; mean raw data are reported.

PSYCHOLOGICAL AND COGNITIVE STATUS			STANDARD APPROACH		COMBINED APPROACH	
Domain	*Psychometric Test*		T0	T1	T2	T3
Global Cognition	**MOca Test**		20/30	22/30	**22/30**	**26/30**
	Sub-items	Visuo-spatial / executive	4/5	5/5	5/5	5/5
		Naming	3/3	3/3	3/3	3/3
		Attention	**0/2**	**1/2**	**1/2**	**2/2**
		Attention	0/1	0/1	**0/1**	**1/1**
		Attention	2/3	2/3	2/3	2/3
		Language	2/2	2/2	2/2	2/2
		Abstraction	1/2	1/2	1/2	1/2
		Delayed Recall	2/5	2/5	**2/5**	**4/5**
		Orientation	6/6	6/6	6/6	6/6
Attention Process	**AM Test**		**31,50**	**33,50**	**30,50**	**49,50**
Anxiety	**HRS-A**		**20**	**18**	**21**	**15**
Depression symptoms	**HRS-D**		**13**	**11**	**15**	**9**
Coping Strategies	**Cope-NIV**		98	100	**94**	**106**
	Social support		15	15	**13**	**28**
	Voidance strategies		26	26	**26**	**15**
	Positive attitude		16	18	**14**	**22**
	Problem Solving		19	19	19	19
	Turning to religion		22	22	22	22

Image nr.1 *Relaxation and respiratory techniques in a Semi- Immersive Virtual Reality Environment using BTS Nirvana System.*

References

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