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VIRTUAL REALITY THERAPY UPON COGNITION AMONG SCHIZOPHRENIC CLIENTS

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ABSTRACT

Schizophrenia is a chronic mental illness with the symptoms of disordered thought, behavior, and emotions. The illness affects approximately 1% of the world's population and accounts for 1-2% of national health care costs in industrial countries. Cognition is impaired in most of the schizophrenic clients. This study was conducted to assess the effectiveness of virtual reality therapy upon cognition among schizophrenic clients. A study was conducted by using Pre Experimental research design at a selected private hospital, Chennai, South India with the Sample size of 35. Samples were chosen by using purposive sampling technique. Data were collected through an interview method by using Demographic Variable Proforma, Clinical Variable Proforma, and mini-mental status examination scale. Post-test cognition score of schizophrenic clients was higher (M=29.4, SD=1.76) than the pre-test cognition score (M=22.6, SD=1.48), which was statistically significant (*P<0.001). It can be attributed to the effectiveness of Virtual Reality Therapy on improving cognition. The above findings reveal that virtual reality therapy is effective in improving the cognition in schizophrenic clients.

Keywords— *Virtual reality therapy, Cognition, Schizophrenic clients*

1. INTRODUCTION

The term schizophrenia was coined in 1908 by the Swiss psychiatrist Eugene Bleuler. The word was derived from the Greek word skhizo (split) and phren (mind). Schizophrenia is defined as the disturbances in thinking are marked by alteration of concept formation, which may lead to misinterpretation of reality, Hallucination & delusion. The split occurred between the cognitive and emotional aspects of the personality, in schizophrenia (Townsend 2009)[1].

Individuals with schizophrenia show impairments in nearly every domain of cognition [2](Heinrich and Zackzanis, 1998). Researchers have shown that patients with schizophrenia tend to score in the lowest 5-10% of the general population on cognitive assessments (Keefe, Eesley, and Poe, 2007)[3]. Furthermore, at-risk and first-episode studies, representing individuals across the schizophrenia- spectrum, indicate that deficits are present at onset, and even prior to the onset of schizophrenia symptoms (Asarnow, 1999 & Ragland, 2003).[4]

Individuals with schizophrenia require long-term integrated treatment with pharmacological and other psychosocial interventions. The most effective treatment appears to be a combination of psychotropic medication and psychosocial therapy (Albus et al., 2006)[5]. Effective treatment requires multidisciplinary efforts including pharmacotherapy and various forms of psychosocial therapy and cognitive behavioral therapy.

Some of these include individual psychotherapy, group therapy, family therapy, social therapy, virtual reality therapy, and assertive communication training. Among these interventions virtual reality therapy is one of the recently added most effective intervention for schizophrenic clients, especially to improve the cognition level.

Virtual reality therapy is the simulation of physical presence in the real or imaginary world. The virtual reality therapy refers to immersive, interactive, multisensory, viewer-centered, censored, and projector viewed theatre environment which can be explored and interacted by a person. Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment.

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The virtual reality therapy is a commercially prepared artificial environment created by software and projected by capturing the user by the sensor. The user (participant) will be projected in the screen as a disease-free user. The person suspends the belief of presence of disease and accepts the virtual environment as real. When the brain is preoccupied with the virtual environment, it does not perceive other stimuli in the environment.

Virtual reality therapy is a good body-mind exercise. Exercise, in reality, affects many regions in the nervous system and sets on the pleasure chemicals such as serotonin and dopamine that makes the person feel calm, happy, peaceful and stress-free (Lee and Burdea, 2003).[6] Hence it helps in improving social skills, goal setting, decision making, self-esteem, and creative thoughts. In addition, a considerable effect of virtual reality therapy on cognition is also noted. Thus virtual reality therapy can be used as one of the mind-body exercises to improve cognition among patients with schizophrenia.

In virtual reality, since the person becomes part of this virtual world or is immersed within this therapeutic environment and whilst, they will be able to manipulate objects or perform a series of actions displayed on the screen. Thereby the person feels relief from his problems by permanently registering the positive effects in the brain (Lee and Burdea, 2003).[6]

Even though virtual reality therapy is found to be useful in improving the cognition, there is a paucity of research in this area, especially on schizophrenia and cognition. Therefore this study was undertaken by the investigator to assess the effectiveness of virtual reality therapy upon cognition among schizophrenic clients.

2. MATERIALS AND METHODS

A study was conducted by using Pre Experimental research design at the selected private hospital, Chennai with the Sample size of
35**.** Samples were chosen by using purposive sampling technique. Data were collected through an interview method by using pretested and predetermined tools such as Demographic Variables proforma (age, gender, educational status, source of income, monthly income, number of children, marital status, religion, type of family and duration of stay in old schizophrenia home), Clinical Variable Proforma, (any medical illness, duration of medical illness, history of taking medications for major illness, history of hospitalization, history of treatment-seeking behavior, history of smoking and alcoholism, physical activity, received any relaxation therapy), and Mini-mental status examination. Mini-mental status examination scale is a standardized tool to assess the cognition level developed by Folstein et al, (1975).[7] It consists of orientation, immediate recall, delayed verbal recall, attention, naming, repetition, stage command, adding, writing and copying etc. with the reliability score < 0.71. The total obtainable score is 0-30. The obtained score is interpreted as follows. Score 24–30 (above 75%) - normal, 18–23 (51-75%)- mild cognition impairment, 10-17 (25-50%) - moderate cognition impairment, 0-9 (below 25%) is severe cognition impairment.

After the initial introduction, the researcher obtained informed consent from the schizophrenic clients to participate in the study. By purposive sampling technique, 35 schizophrenic clients were selected. Demographic variables, Clinical variables, mini-mental status examination scale were administered to all the clients. The data collection was done for a period of 4 weeks on selected samples. Virtual reality therapy was administered to the participants for 5-7 minutes for each client for one week.

The virtual reality therapy is an artificial environment created by software and projected by capturing the user by the sensor. The investigator used the “Kinect Adventures” for the administration of virtual reality therapy in which the “Leak plug” was the selected module. The game type used was 20,000 Leaks, the player's avatar is in a glass cube underwater. Post-test was conducted after the one week of intervention.

3. RESULTS

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Table 1: Frequency and percentage distribution of demographic variables of schizophrenic clients (N = 35)

Demographic variables	f	%
Age (in years)		
30 – 60	34	97
Above 60	1	3
Gender		
Male	27	77
Female	8	23
Educational Status		
Graduates	11	31
Up to Higher Secondary	25	69
Marital status		
Married	6	17
Un married	25	71
Separated/divorce	2	6
Widow/widower	2	6
Monthly family income		
Up to 25000	6	17
Above 20000	29	83
Religion		
Hindu	29	83
Muslim	4	11
Christian	2	6

It can be noted in the table: 1 that, majority of the participants were aged between 30-60 years (97%), males (77%), unmarried (71%), Hindus (91%), studied up to higher secondary (69%), with no monthly family income more than 20000 (83%).

Figure 1 shows that a significant percentage of clients stays in the hospital for more than 6 years (23%).

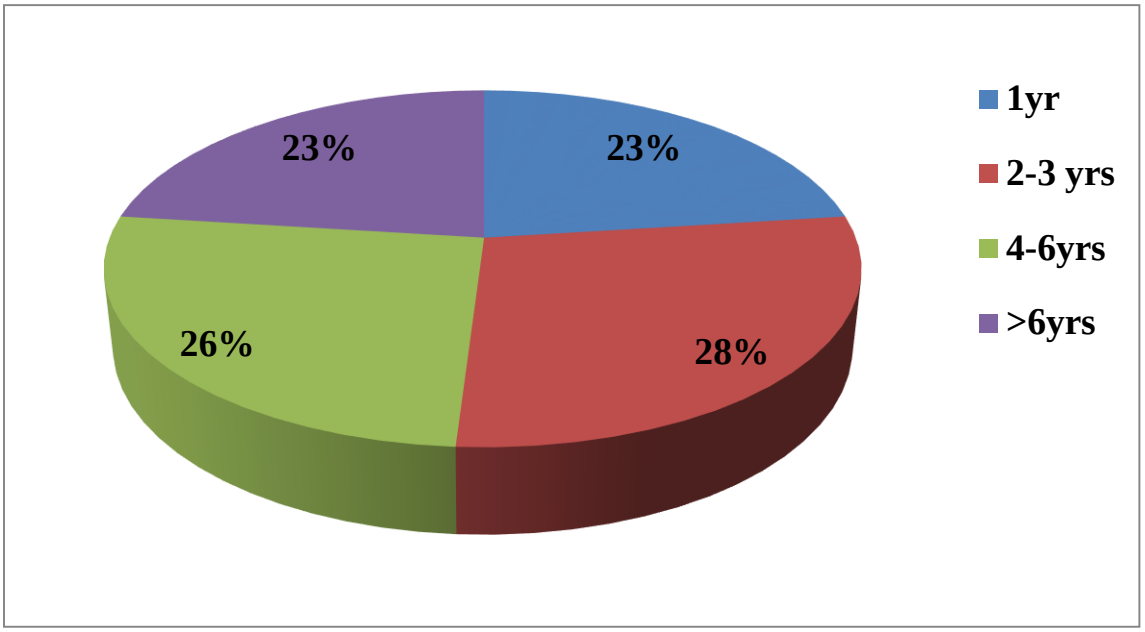

Fig 1: Duration of stay of schizophrenic clients at schizophrenic home

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Table 2: Frequency and Percentage Distribution of Clinical Variables in schizophrenic clients (N = 35)

Clinical variables	f	%
Any medical illness Diabetes mellitus Hyper tension Arthritis Respiratory problem Others (specify)	4 1 2 2 -	11 3 6 6 -
Duration of medical illness < 1 year 1- 5 year 6- 10 year 10 year NIL	2 2 1 - 3 0	6 6 3 - 8 6
No of times hospitalized within last five years Nil 1-2 yrs > 3 yrs	28 1 2	80 14 16
History of smoking Smoker Non – smoker	8 27	23 77
History of alcoholism Non-alcoholic Regular drinker Social drinker	32 - 3	91 - 9
If yes, type of relaxation therapy underwent Progressive muscle relaxation Yogasana meditatio n NIL	1 8 6 20	3 23 17 57

It can be inferred from the table: 2 that, most of the schizophrenic clients in the group seeks medical facilities for their illness (97%), the most common medical problem was diabetes mellitus (11%), with a duration of 1- 5 years (6%), the history of hospitalization was nil among the clients (80%), most of them were non-smokers (77%), and Non-alcoholics (91%).

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Table 3: Comparison of mean and standard deviation of cognition in schizophrenic clients before and after virtual reality therapy (N = 35)

Group	Mean	SD	t - value
Before therapy	22.6	1.48	25*
After therapy	29.4	1.76	

***P<0.001**

The data in the table 3 shows that the score of cognition in schizophrenic clients was less in pre-test (M = 22.6, SD = 1.48) than in the post-test scores (M=29.4, SD=1.76). The difference was statistically proven to be significant at P<0.001. Thus null hypothesis H01 (There will be no significant difference in cognitive level in Schizophrenic clients before and after providing virtual reality therapy) was rejected.

4. DISCUSSION

The study was conducted to assess the effectiveness of virtual reality therapy upon cognition among schizophrenic clients. The results show that the score of cognition in schizophrenic clients was less in pre-test (M = 22.6, SD = 1.48) which was improved in the post-test (M=29.4, SD=1.76). The difference was statistically proven to be Significant at P<0.001, thus null hypothesis H01 (There will be no significant difference in cognitive level in Schizophrenic clients before and after providing virtual reality therapy). The improvement in the cognition after the therapy can be attributed to Virtual reality therapy, for the clinical treatment of psychological disorder. Various other studies have also demonstrated the effectiveness of virtual reality therapy on various other psychological problems such as anxiety disorders, post-traumatic stress disorder. This also supports the statement of Da Costa (2004),[8] that virtual reality application has also been developed to clinically rehabilitate a degradation of cognitive function resulting from schizophrenia).

The use of virtual reality therapy is an interactive immersive computer environment allows one of the key variables in understanding psychosis, social environment to be controlled providing an exciting application to research and treatment. A computer generated an image a display system presented the sensory information and a tracker feedback the user's position and orientation in order to update the image. The elements combined to substitute sense data from the natural world with sense data about an imaginary world that changed in response to the user's action. The results are a sense of presence in an interactive 3-dimensional virtual world.

It is well-known fact that, cognitive impairment profoundly limits the work functioning of clients. Impaired cognitive functioning predicts poor outcomes in clients receiving rehabilitation (Hurford, 2014).[9] The improvement of the cognition after the therapy in this study can be attributed to virtual reality therapy. Thus this therapy is used as an assessment or intervention for the clinical treatment of psychological disorder.

Examining the design and engineering of computer games technology may lead to some useful suggestion about how to design the therapeutic intervention to engage and motivate the clients. Hence virtual reality therapy can be used to assess, rehabilitate and improve cognitive skills for the clients suffering from mental illness as well as for the normal population to improve their psychological well-being. Virtual Reality Therapy medicine helps to improve the coordination between the mind and body and improve the cognition. Virtual Reality Therapy program will test an individual think quickly and act even quicker thus improving the cognition

5. CONCLUSION

This study has thrown light on the importance of the role of the nurses in identifying the impairment of cognition in schizophrenic clients and the effectiveness of virtual reality therapy to improve their cognition. Therefore the nurses can be instrumental in administering virtual reality therapy to improve their cognition by which their functional ability, quality of living and independent living can also be improved.

6. REFERENCES

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