EFFECTIVENESS OF VIRTUAL REALITY THERAPY UPON INSOMNIA
AMONG SCHIZOPHRENIC CLIENTS

BY
S.SHILPA JABEEN

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING
OCTOBER 2016
EFFECTIVENESS OF VIRTUAL REALITY THERAPY UPON INSOMNIA AMONG SCHIZOPHRENIC CLIENTS

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MASTER OF SCIENCE IN NURSING

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DECLARATION

I hereby declare that the present dissertation entitled “A Pre Experimental Study to Assess The Effectiveness of Virtual Reality Therapy upon insomnia among Schizophrenic Clients” is the outcome of the original research work undertaken and carried out by me, under the guidance of Dr. Latha Venkatesan, M.Sc (N), Ph.D (N), Principal, Apollo College of Nursing and Dr. Vijayalakshmi. K M.Sc (N) M.A. (Psy), MBA, Ph.D (N) Head of Mental Health Nursing Department, Apollo College of Nursing, Chennai.

I also declare that the material of this has not found in any way, the basis for the award of any degree or diploma in this university or any other universities.

M.SC (N) II Year Student
ACKNOWLEDGEMENT

I thank the **God Almighty** for being with me and guiding me throughout my Endeavour and showering his Profuse blessings in each and every step to complete the dissertation.

I proudly and honestly express my sincere gratitude to our esteemed leader **Dr. Latha Venkatesan, M.Sc (N), M.Phil (N), M.B.A, Ph.D(N), Principal, Apollo college of Nursing** for her tremendous help, continuous support, valuable suggestion and tireless motivation to carry out my study successfully.

I also extend my thanks to **Prof. Lizy Sonia. A, M.Sc. (N), (Ph.D.,) Vice principal and H.O.D of Medical Surgical Department, Apollo College of Nursing** for her unbroken support, elegant direction, throughout my study.

I owe my special thanks to the clinical guide, Research coordinator and head of the Mental Health Nursing Department **Dr. Vijaylakshmi. K, M.Sc (N) M.A. (Psy), M.B.A, Ph.D (N)** for her valuable suggestions, efficient guidance, tenacious help profound support throughout the study and the success of this work is credited to her.

I am thankful to **Prof. Nesa Sathy Satchi, M.Sc (N), Ph.D (N) course coordinator and professor, pediatric Nursing Department, Apollo College of Nursing**, for her uninterrupted support, guidance and encouragement.

I would like to thank **Mrs.Anuradha .C, M.Sc (N), M.Sc.(Psy). Reader, Department of Psychiatric Nursing, Mrs. Stella Mary.I, M.Sc (N), Reader, Department**
of psychiatric Nursing and Mrs. Priya.S, M.Sc(N), M.Sc (Psy) Lecturer, Department of Psychiatric Nursing, for their guidance and profound support throughout the study.

With the special word of reference, I thank all the experts for validating my tool and offering worthy suggestions to make it effective.

A note of thanks to the Librarians at Apollo College of Nursing and The Tamilnadu Dr. M.G.R. Medical University, for their help in providing needed reference materials which we required.

I thank all the participants of my study for their wonderful participation and cooperation without whom I could not have completed my study. My special gratitude to Mr. Kannan R, Universe Internet Centre, in helping me to proceed with my paper materials.

I don’t think I can find proper words to express my gratitude towards my grandmother. With the special word of greetings, I thank her for the encouragement and blessing from the beginning of my life that made it possible for me to reach this stage. I would fail in my duty if I forget to thank my parents Mr. R.Sundararaj and Mrs. S. Christy, Mr. S. Alwin my lovable brother and Ms. S. Kiruba my wonderful sister, for their motivation and all my classmates for their support in all times of ups and downs, their prayer, their blessings and their help rendered to me in completing my study successfully.
SYNOPSIS

Statement Of The Problem

A pre experimental study to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients at selected home for schizophrenic clients, Chennai.

Objectives of the study

1. To assess the level of insomnia among schizophrenic clients before and after virtual reality therapy.
2. To assess the effectiveness of virtual reality therapy by comparing the level of insomnia among schizophrenic clients before and after virtual reality therapy.
3. To determine the level of satisfaction in schizophrenic clients regarding Virtual Reality Therapy.
4. To find out the association between selected variables and level of insomnia among schizophrenic clients before and after Virtual Reality Therapy.

The study was carried out upon 30 schizophrenic clients Chennai. Tools such as Demographic variable proforma, Clinical variable proforma, Insomnia severity index and Rating scale on level of satisfaction of virtual reality therapy were used by the researcher to collect the data. The validity was obtained from various experts and reliability of the tool was cronbach’s alpha r = 0.78. The main study was conducted after the pilot study.

The level of insomnia was assessed before and after virtual reality therapy using insomnia severity index in the group of schizophrenic clients. Virtual reality therapy
was administered every day morning 5 – 7 minutes for the period of two weeks for each schizophrenic clients. After two weeks, the level of insomnia was assessed by using insomnia severity index among the schizophrenic clients. Then the level of satisfaction on virtual reality therapy was also assessed by using satisfactory scale. The data obtained were analysed using Descriptive and Inferential statistics.

**Major Findings of the Study**

The study results that a majority of the schizophrenic patients were aged between 31-40 years (90%), female (73.3%), un married (66.6%), Hindus (90%), with >20,000 monthly incomes (66.6%).

This study indicates that majority of the schizophrenic clients did not have any medical illness (83.3%), most of their onset of illness is between 20-30 yrs of age (50%), duration of hospitalization is 2-3 yrs (43.3%) and did not practice any relaxation therapy (66.6%).

The study indicates that all of them had moderate clinical insomnia before virtual Reality therapy, whereas after virtual reality therapy, none of them (0%) had significant insomnia. These results can be attributed to the effectiveness of virtual reality therapy. Hence the null hypothesis H0₁ was rejected.

The insomnia score in schizophrenic clients, before the therapy was high (M= 18.3, SD = 4.18) and after therapy, it found to be less (M = 3.03, SD = 2.68), which is statistically proven to be significant (P<0.001). Hence, the null hypothesis H₀₁ was rejected. The reduction in the insomnia after the therapy can be attributed to the
Virtual reality therapy. Therefore, it can be used as an effective intervention for the clinical treatment of psychological disorder.

The researcher found that, the majority of the schizophrenic clients were highly satisfied (86%) with virtual reality therapy.

It is found that there was no significant association between the level of insomnia and the selected variables of the schizophrenic patients. Hence the null hypothesis was retained.

**Recommendations**

- The study could be conducted on larger samples for better generalization.
- The study could be replicated in other setting like the community and hospitals etc.
- A time series design can be conducted with an interval of 2, 4 and 6 months to assess the long term effects of virtual reality therapy upon insomnia.
- A study can be conducted to assess the effectiveness of virtual reality therapy on psychological wellbeing and quality of life among the schizophrenic clients.
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CHAPTER I
INTRODUCTION

Background of the Study

“If you lie down, you will not be afraid; when you lie down, your sleep will be sweet”

-Solomon

Schizophrenia is the most severe form of chronic mental disorder requiring long term treatment. The term schizophrenia was coined in 1908 by the Swiss psychiatrist Eugene Bleuler. The word is derived from the Greek words schizo (split) and phren (mind). Schizophrenia is defined as the disturbances in thinking marked by alteration of concept formation, which may lead to misinterpretation of reality, hallucination & delusion. Bleuler explained split occurred between the cognitive and emotional aspects of the personality, in schizophrenia (Townsend, 2009).

Schizophrenia is a mental illness that is typified by debilitating symptoms of disordered thought, behaviour, and emotions. The illness affects approximately 1% of the world’s population and accounts for 1-2% of national healthcare costs in industrial countries (Stone and Faraone, 1999).

Individuals with schizophrenia require long term integrated treatment with pharmacological and other interventions. Some of these include individual psychotherapy, group therapy, family therapy, social therapy and assertive community treatment. Along with these interventions, virtual reality therapy has been the recently added as the most effective intervention for schizophrenic clients, especially to improve
the sleep pattern level. The most effective treatment appears to be a combination of psychotropic medication and psychosocial therapy (Albus, 2006).

Insomnia is also a major issue for the schizophrenic clients and most of the health problems originate from insomnia. Reaction of persons to insomnia has several manifestations. Schizophrenic patients often face a loss of identity. Insomnia is due to a result of a minor problem but since the reflexes are slower, the individual often does not know how to handle it. Insomnia is a relative term and depends on the condition of the person.

Thus it is important for the mental health professionals to take measures for improving the quality of sleep among schizophrenic clients for which there are various psychosocial interventions such as music therapy, yoga, meditation, virtual reality therapy etc., (Hirshkowitz, 2004).

Virtual reality therapy is one of the important interventions which helps the Schizophrenic clients to improve their sleep pattern. The use of virtual reality therapy is an interactive immersive computer environment that helps one of the key variables in understanding psychosis and social environment to be controlled providing exciting application to research and treatment. A computer generated an image a display system presents the sensory information and a tracker feedback is for the user’s position and orientation in order to update the image. The elements are combined to generate sense data from the natural world with sense data about an imaginary world that change in response to the user’s action. The results are a sense of presence in an interactive 3dimensional virtual world (Friedman, 2005).
The virtual reality therapy helps improvement of the co-ordination between mind and body. Exercise in reality affects many regions in the nervous system and sets on the pleasure chemicals such as serotonin and dopamine that induce calmness, happiness and a sense of liberty in patients. The benefits of virtual reality therapy include stimulation of sleep, improvement in memory, concentration and motor activity. It also improves sleep during nights (Eilig, 2003).

**Need For the Study**

Schizophrenia is the most severe form of chronic mental disorder, requiring long term treatment. Of all the mental illness that cause suffering in society is schizophrenia as the worst. Schizophrenia probably is responsible for larger hospitalization, greater chaos in family life, more exorbitant costs to individuals and governments and more fears than any other. In view of the enormous threat to life and happiness and as an unsolved puzzle, it has probably been studied more than any other mental disorder (Townsend, 2010).

Schizophrenia is perhaps the most enigmatic and tragic disease to be handled by psychiatrists and perhaps also the most devastating. It is one of the leading causes of disability among young adults. Schizophrenia is a severe psychiatric disorder affecting 1% of the population. It is characterized by multiplicity of symptoms arising from all domains of mental functioning, e.g. language, emotion, motor activity, and perception (Anderson, 2003).

Insomnia is the most common symptom in Schizophrenic clients, but undertreated. Its prevalence is variable and depends on the type and severity of the episode. Insomnia
observed in the Schizophrenic clients is often similar what is observed in other mentally ill clients, but can be masked and difficult to recognize, particularly, in distinguishing late onset insomnia and early one too. Better and more meaningful discrimination between them appears necessary according to therapeutic response and prognosis. Risk of dementia after insomnia seems to be related with type of insomnia episode and with the treatment efficacy (Clemet, 2008).

Hofstetter (2003), stated that clients suffering from insomnia tend to have functional impairment and need significant health care services. Failure to recognize and treat insomnia in later life can lead to increased need for health care usage, and mortality associated with both medical illness and physical problems.

Complementary and psychosocial interventions used for insomnia are widespread with variations in patterns of use. A series of systematic reviews provide a summary of current evidence for acupuncture, aromatherapy, massage, homeopathy, meditation, reflexology, herbal medicine, yoga, several dietary supplements, relaxation techniques and virtual reality therapy which help improvement in the sleep pattern. The quantity and quality of individual studies vary widely, but research interest in complementary therapies is increasing. Major questions are still to be answered with respect to the effectiveness and appropriate role of these therapies in the management of insomnia.

Virtual reality therapy is one of the important psychosocial interventions which play an important role in the attention, concentration and psychomotor skill development by engaging the patient in the virtual reality to recognize their physical
presence before the behavioral performance. Virtual reality therapy had a great role in
improving the sleep in insomnia clients (Allen, 2002).

Kinetic adventure compact disc is one of the virtual reality therapy games which
can be administered to Schizophrenic clients as it helps to reduce stress, depression,
anxiety and improves cognition and sleep level. It is a 2010 sports video game for the
Xbox 360, which utilizes a kinetic motion camera and is included as a pack in the game
with a device. It was officially introduced at the 2010 electronic entertainment expo in
Los Angeles. The game is a collection of five adventures and sports mini games and
was developed by a good science studio, a subsidiary of Microsoft game studios.

Kinetic adventure game package is one of the most effective virtual reality
therapy games which include various games like 20,000 leaks, river rush, reflex ridge,
space pop. Among them 20,000 leaks games are the most effective sleep pattern for
schizophrenic clients. In 20,000 Leaks, the player's avatar is in a glass cube underwater.
The player positions his or her limbs and head to plug cracks as crabs, fish, and bosses
such as sharks and swordfish cause cracks and holes in the cube. As difficulty increases,
up to five leaks must be plugged at a time to earn Adventure pins. Each game consists
of three waves, which end with expiry of indicated time or when all leaks are plugged.
Extra time left over at the end of each wave is added to the Adventure pin total
(Butlers, 2009).

This game allows the client to think well and motivates interest to gain more
points than other clients among the group. It triggers active participation and
competitive attention. This helps the schizophrenic clients in improving their sleep
pattern. Thus despite the presence of various therapies useful in reducing insomnia, virtual reality therapy is found to be useful for improving the attention, concentration and body, mind co-ordination among patients, however there is paucity of research in this area, especially on insomnia among schizophrenic clients. Hence the investigator has undertaken this study for assessing the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients.

**Statement of the problem**

A pre-experimental study to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients at selected home for schizophrenic clients, Chennai.

**Objectives of the study**

1. To assess the level of insomnia among schizophrenic clients before and after virtual reality therapy.
2. To assess the effectiveness of virtual reality therapy by comparing the level of insomnia among schizophrenic clients before and after virtual reality therapy.
3. To determine the level of satisfaction in schizophrenic clients regarding Virtual Reality Therapy.
4. To find out the association between selected variables and level of insomnia among schizophrenic clients before and after Virtual Reality Therapy.
Conceptual Definitions and Operational Definitions

Effectiveness

The degree to which objectives are achieved and to the extent to which targeted problems are solved (Oxford dictionary). In this study, effectiveness refers to the significant improvement in sleep pattern level after providing virtual reality therapy in schizophrenic clients as evidenced by improvement in the sleep pattern as measured by insomnia severity index.

Virtual Reality Therapy

Virtual Reality Therapy is also known as virtual reality immersion therapy. It uses specially programmed computers, visual immersion devices and artificially created environments to give the patient a simulated experience. In this study, the participants become a part of virtual world or in a therapeutic environment involved for performing a series of actions displayed on the screen and there by the person experiences a realistic situation. This intervention is made by appropriate movements made for the individual depending upon the task, designed in reality. It is administered for 5-7 minutes every day for 6 consecutive days for each client individually.

Insomnia

Insomnia is a sleep disorder in which there is an inability to fall asleep or to stay asleep as long as desired (Oxford dictionary). In this study, Insomnia refers to sleep pattern disturbance which is expressed through verbal and non-verbal responses by the
patients describing the inability to fall asleep with frequent interruption between sleep and no satisfaction of sleep as measured by Insomnia severity index.

**Schizophrenic clients**

A group of persons suffering from mental illness characterized by specific psychological symptoms leading to disorganization of the personality of an individual. The symptoms interfere mainly with the patient's thinking, emotions and behavior as a whole and diagnosed as schizophrenia by the psychiatrist.

**Satisfaction**

It is a feeling of gratification attained or achieved by clients. In this study it refers to gratification attained by or achieved by clients with virtual reality therapy as measured by satisfaction scale of virtual reality therapy developed by researcher.

**Assumptions**

- Schizophrenia is one of the devastating mental illnesses.
- Insomnia is very common in schizophrenic clients.
- Due to alteration in the sleep pattern there is an impaired role of functions in the schools, jobs and families in schizophrenic clients.
- A majority of the beds in mental hospitals and psychiatric wards in general hospital are occupied by schizophrenic clients.
Null Hypothesis

$Ho_1$ There will be no significant difference in the level of insomnia among Schizophrenic clients before and after administration of virtual reality therapy.

$Ho_2$ There will be no significant association between selected variables and level of insomnia among Schizophrenic clients before and after the virtual reality therapy.

Delimitations

- Data collection was limited to 4 weeks only.
- Study participants were confined to schizophrenic clients who are admitted in the selected home.

Conceptual frame work of the study

(Peplau’s Interpersonal Mode, 1952)

A framework is a group of concepts and set of propositions that spell out the relationship between them. Their overall purpose is to make scientific findings meaningful and generalized.

The conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to the body of nursing knowledge.

The conceptual framework deals with the inter-related concepts that are assembled together in some rational schemes by virtue of their relevance to a common theme (Polit and Beck, 2012).
The present study aims at describing the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients at a selected schizophrenic home. The conceptual framework of the study is based on “Peplau’s Interpersonal Model” (1952). According to Hildegard Peplau, "the goals of nursing are currently in transition, its major concern fifty years ago had to do with getting sick people well, today, nursing is more concerned with ways for helping people to stay well". The model views of nursing are in two ways. Firstly, nursing is educative. Secondly, nursing is therapeutic. With these two functions combined, they allow nurses and clients to develop skills for problem solving. This process of education and therapeutic interactions occurs only within the relationship of the nurse and the client. This interpersonal relationship between the nurse investigator and the schizophrenic clients has four clearly discernible phases. Therapeutic interaction occurs only within the relationship of the nurse and the client. This interpersonal relationship between the nurse investigator and the schizophrenic clients has four clearly discernible phases. These phases are orientation, identification, exploitation and resolution. Each of these phases are seen as being interlocking and requiring overlapping roles and functions as the nurse and the schizophrenic clients learn to work together to resolve difficulties in relation to health problems.

**Orientation**

The schizophrenic clients and the nurse investigator come together as strangers meeting for the first time. During this phase, the development of trust and empowerment of the schizophrenic clients were primary considerations. The nurse investigator encouraged the schizophrenic clients to participate in identifying the need for virtual reality therapy in sleep management and allowed them to be an active
participant in virtual reality therapy. By asking for and receiving help, the schizophrenic clients felt more at ease expressing their need for sleep management knowing that the nurse investigator will take care of those needs. With the completion of orientation, the relationship entered the next phase.

**Identification**

The schizophrenic clients in partnership with the nurse investigator were able to identify the problems of insomnia that require working on within the relationship. The schizophrenic clients responded selectively to a nurse investigator who offered the improvement of sleep pattern by providing virtual reality therapy needed by the schizophrenic clients. Both the nurse investigator and the schizophrenic clients clarified each other's perceptions and expectations, which affected the ability of both to identify problems and offered the necessary solutions. When clarity of perceptions and expectations was achieved, the schizophrenic clients learned to make use of the nurse Investigator-Patient relationship. Once identification has occurred, the relationship enters the next phase.

**Exploitation**

The schizophrenic clients took full advantage of the virtual reality therapy. The degree to which reduction in the level of insomnia was achieved by providing virtual reality therapy was used on the basis of the needs and the interest of the schizophrenic clients. From this sense of self-determination, schizophrenic clients developed an inner strength that allowed them to face new challenges. As the relationship passed through
all of the mentioned phases and the needs of the schizophrenic clients were met, the relationship passed on to closure or the phase of resolution.

**Resolution**

It occurs when the needs of sleep pattern see improvement through virtual reality therapy are met. It implied the gradual freedom from identification with the nurse investigator and the generation and strengthening of ability to stand more or less alone.
Fig. 1 Conceptual Framework based on Peplau's Interpersonal Model (1952)
Projected Outcome

This study is useful for improving the sleep pattern level by providing virtual reality among schizophrenic clients. In turn, it helps them to reduce the level of insomnia and express their views in a clear, affirmative way. It helps in building an effective improvement of sleep which indirectly influences the prognosis and reduce the relapse rate. There are several other benefits of virtual reality such as it helps in cognition, body mind co-ordination, to develop empathy, it relaxes the mind and to build healthy relationship.

Summary

This chapter has dealt with the background, need for the study, and statement of the problem, objectives, operational definitions, assumptions, null hypotheses, delimitations and conceptual framework and projected outcome of the study.
Organization of the Report

Further aspects of the study are presented in the following five chapters.

In Chapter – II : Review of literature.

In Chapter – III : Research methodology-which includes research approach, research design, setting, population, sample and sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

In Chapter – IV : Analysis and interpretation of data.

In Chapter – V : Discussion.

In Chapter – VI : Summary, conclusion, implications and recommendations.
CHAPTER II

REVIEW OF LITERATURE

A literature review involves the systematic identification, location, scrutiny and summary of written materials that contain information on the research problems (Polit, 2010).

The task of reviewing literature involves the identification, selection, critical analysis and reporting of existing information on the topic of the interest. This chapter will deal with a review of published studies, unpublished research studies and from related material for the present study. The review will help the researcher in building the foundation of the study.

- Prevalence of schizophrenia.
- Studies on insomnia among schizophrenic clients.
- Literature on virtual reality therapy.
- Literature related to virtual reality therapy upon insomnia among schizophrenic clients.

Prevalence of schizophrenia

A Global study was conducted by Saha et al,(2000), which included 132 core studies, 21 studies reported point prevalence, 34 studies reported period prevalence, and 24 reported lifetime prevalence. The median prevalence of schizophrenia was 4.6/1,000 for point prevalence, 3.3/1,000 for period prevalence, 4.0 for life time prevalence, and 7.2 for life time morbid risk. There were no significant differences between males and females, nor between urban, rural, and
mixed sites, although migrants and homeless people had higher rates of schizophrenia and, not surprisingly, developing countries had lower prevalence rates (the lower prevalence of schizophrenia in developing countries has been previously documented). Other studies show migrants having higher than expected rates of schizophrenia, definite variations in the definitions of migrants in these studies which have suffered from a series of other methodological problems.

A study was conducted by Bhugra, (2004). The study findings indicate for clinicians, clearly that lifetime prevalence is 4.0/1,000 and not 1%, as reported in the Diagnostic and statistical manual of mental disorder. fourth edition, and other text books. The study also challenges the widely held view that schizophrenia is much more common in women than in men. Bhugra’s finding that schizophrenia was just as common in women has clear implications for developing services, since it means that not only must we develop and provide culturally appropriate services but also services that are gender sensitive (as the number of cases in women are higher than expected, gender becomes a more important factor).

According to WHO, Schizophrenia creates enormous burden for individuals who suffer from them, for their careers, for mental health services, and for society at large. People with schizophrenia always endured very poor social outcomes, including 80% unemployment rates. The risk of committing suicide is 5%, going up to 13% showing moderate to severe suicidal behavior.
Studies on insomnia among schizophrenic clients

Many patients with schizophrenia reported chronically disturbed sleep pattern. Independent of the phase of illness, sleep disturbance documented by polysomnography includes difficulties in falling asleep, awakening too early and being unable to go back to sleep, a preference for being awake during the evening, reduced deep or slow wave sleep (the most restorative stage of sleep), and short REM latencies. (karuo, 1996)

According to American Sleep Disorders association, many schizophrenic clients annually reported that they regularly have trouble sleeping at least a few nights a week. As a result, many are still so tired when they get up in the morning that they fall asleep while commuting to work or doze off on the job. American Sleep Disorders Association conducted a study and found 17% Schizophrenic clients sometimes falling asleep at their workplace. Further, 31% of clients in the 18 – 34 age admitted they had at one time or another fallen asleep at work (Bhugra, 2004).

Literature on virtual reality therapy

In the science-fiction thriller The Matrix, the heroes are "plugged in" to a virtual world. While their bodies rested in reclining chairs, their minds fought martial-arts battles, dodged bullets and drove motorcycles in an elaborately constructed software program. This cardinal virtue of virtual reality is to give users the sense that they are "somewhere else"--can be of great value in a medical setting. Researchers are finding that some of the best applications of the software
focus on therapy rather than entertainment. In essence, virtual reality can ease
pain, both physical and psychological. (Hoffman, 2004)

Eventually, more sophisticated equipments and design features that
increasingly approximate the virtual reality three-dimensional emersion
environments may be added in a stepwise fashion for creating more realistic
interactions of the virtual reality psychotherapeutic environment even when
affordable. However, alternatives are available, and the creative investigator may
build upon existing, available, and affordable technology to develop simple virtual
reality systems (Malbos, 2007)

In virtual reality training endeavor, elements of the empirically supported
and multifaceted Systematic Treatment Selection model were chosen as training
criteria and incorporated into virtual reality training system designed by the
researcher to demonstrate both its feasibility and practicality. This article outlines
initial endeavor in the development of a virtual reality system for training in
psychotherapy and summarizes Systematic Treatment Selection training-relevant
research findings. Future directions for the applications of virtual reality
technology to both training and treatment are provided (Riva, 2005).

Rose (2005), has noted that virtual reality applications for cognitive
rehabilitation face challenges as in 90s. In 1962, the US Patent Office awarded a
patent to Morton Heilig for what he called a sensorama Simulator (Heilig). This
device could provide the illusion of an alternate reality to one to four users by
presenting them with visual, olfactory, auditory and tactile stimulation.
Virtual reality can be used as an assessment or intervention instrument for the clinical treatment of psychological disorders. Studies have been conducted which focused on cognitive behavioral therapy for the rehabilitation of anxiety disorders such as fear of heights (acrophobia), fear of flying, fear of open spaces (agoraphobia) and social phobia. Other applications involve the rehabilitation of anxiety disorders such as Post Traumatic Stress Disorders (Costa, 2004).

Virtual reality applications have also been developed for clinical rehabilitation of degradation of cognitive functioning, resulting from a range of diseases including Alzheimer’s, schizophrenia or conditions such as autism. A functional overlap exists in many of these applications in that they can aim to achieve similar goals such as training with activities of daily life which support more independent living, enhancing cognitive performance and improving social skills. Each of these mini games requires the player to complete simple cognitive tasks, such as reading aloud and performing arithmetic calculations (Parsons, 2002).

Rahman (2011) has conducted a study on the effectiveness of Virtual Reality for Motor Rehabilitation of Neurological Disorder. He has discussed the rationale, criteria of application, limits of the available procedures and the effects of VR in the rehabilitation of patients with stroke and those with cerebral palsy (CP). Seventeen published articles from 1/1/2002 to 1/05/2010 have been reviewed. The studies completed to date support the efficacy of application of VR in the treatment of patients after stroke and CP patients. The duration of the rehabilitation effects after discontinuing VR training is crucial.
Miyahira (2012) has conducted a study for assessing the effectiveness of Virtual reality exposure therapy for PTSD (Post traumatic Stress disorders) in returning war fighters. The current study was a randomized controlled clinical trial designed to assess the effectiveness of a novel intervention for treating combat-related PTSD in returning Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) war fighters. A cognitive behavior treatment approach augmented with virtual reality exposure therapy (VRE) was developed, and administered for 10 treatment sessions over 5 weeks. Comparisons with a control group receiving minimal attention (MA) for 5 weeks revealed significant reduction in the VRE group in the avoidance/numbing symptoms on the Clinician Administered PTSD Scale (CAPS). The VRE group also had significant reductions in guilt at post-treatment compared to the control group.

Malbos (2013) has conducted a study on virtual reality in the treatment of mental disorders. The study depicts the utility of virtual reality therapy for assessment and therapy through various clinical studies carried out on subjects exhibiting diverse mental disorders. Despite clinical experiments set on a larger scale, extended follow-up and studies about factors influencing presence are needed, while virtual reality exposure represents an efficacious, confidential, affordable, flexible, interactive therapeutic method whose application will progressively get widened in the field of mental health. Virtual reality and interactive video gaming are innovative therapy approaches in the field of stroke rehabilitation. The impact on secondary outcomes including activities of daily living was also assessed.
A study was done to investigate the effectiveness of the virtual walking training program using a real-world video recording on walking balance and spatiotemporal gait parameters in patients with chronic stroke. Fourteen patients with chronic stroke were randomly assigned to either the experimental group (n = 7) or the control group (n = 7). The subjects in both groups underwent a standard rehabilitation program; In addition, the experimental group participated in the virtual walking training program using a real-world video recording for 30 minutes a day for 6 wks. Walking balance was measured using the Berg Balance Scale (BBS) and the Timed Up and Go test. Gait performance was measured using an electrical walkway system. In walking balance, greater improvement on the Berg Balance Scale and the Timed Up and Go test was observed in the experimental group compared with the control group at P < 0.05. This study demonstrated the positive effects of the virtual walking training program using a real-world video recording on gait performance (Cho, 2013).

Daniela (2012) has conducted a study to find out the relationship between interactive media and stress. It has gained wide interest in the mental health area. This study found that interactive experiences help people manage their stress. By combining different techniques, which may produce more significant outcomes than single-strategy programs, a stress management protocol was developed for increasing self awareness, to control and relax oneself, induce positive emotions, and reduce negative emotions. Stress management protocol was tested in a controlled study comparing three interactive experiences (virtual reality [VR], video and audio). Results showed efficacy of all the three interactive experiences in inducing positive emotions and integrating different approaches to manage
stress. In particular, VR showed better improvements related to the psycho-physiological changes.

A randomized and quasi-randomized controlled trials was conducted by Laver in 2012. The trial compared virtual reality with an alternative or no intervention was included in the review. The Cochrane Stroke Group Trials Register, the Cochrane Central Register of Controlled Trials, electronic databases, trial registers, reference lists, Dissertation Abstracts, conference proceedings, contacted key researchers and virtual reality manufacturers were investigated. Nineteen studies with a total of 565 participants were included in the review. Virtual reality was found to be significantly more effective than conventional therapy in improving upper limb function (standardized mean difference of 0.53 and 95% confidence intervals (0.25 to 0.81)) based on seven studies, and activities of daily routine based on three studies. No statistically significant effects were found for grip strength (based on two studies) or gait speed (based on three studies). The findings shown that Virtual reality therapy appears to be a promising approach.

Powers (2013) has conducted a study to assess the effectiveness of virtual reality technology upon patients with social anxiety. The operation is limited to pre-programmed avatars that cannot be controlled to interact and converse with the patient in real time. The current technology allows the operator to directly control the avatar (including speaking) during VR conversations. Using an incomplete repeated measures (VR vs. in vivo conversation) design and random starting order with rotation counterbalancing, participants (N = 26) provided
ratings of fear and presence during both VR and in vivo conversations. Results showed that VR conversation successfully elevating fear ratings relative to baseline (d = 2.29). Participants also rated their fear higher during VR conversation than during in vivo conversation (d = 0.85). However, in vivo conversation, it was rated as more realistic than VR conversation (d = 0.74). No participant dropped out and all of them completed both VR and in vivo conversations. Overall, the data suggest that the novel technology allowing real time interaction/conversation in VR may prove useful for the treatment of social anxiety in future studies.

Rothbaum (2007) has conducted a study on virtual reality exposure therapy and standard (in vivo) exposure therapy in the treatment of fear of flying. This controlled clinical trial tested virtual reality exposure therapy for the fear of flying, a relatively new and innovative way to do exposure therapy, and compared it to standard (in vivo) exposure therapy and a wait list control with a 6- and 12-month follow-up. Twenty-three wait list participants completed randomly assigned treatment following the waiting period. The Treatment consisted of 4 sessions of anxiety management training followed either by exposure to a virtual airplane or an actual airplane at the airport conducted over 6 weeks. Results indicate virtual exposure therapy as superior to wait list on all measures, including willingness to fly on the post treatment flight (76% for virtual exposure therapy and standard exposure therapy; 20% for WL).

Alsina (2007) conducted a study on the validity of virtual reality as a method of exposure in the treatment of test anxiety. Twenty-one students agreed
to take part, 11 with high test anxiety and 10 with low test anxiety. The virtual environments were prepared in chronological order: the student’s home, then the metro, and finally the corridor and lecture hall where the examination was held. The results showed that the high-test-anxiety group presented higher levels of anxiety and depression than the low-test-anxiety group during exposure to the virtual environments. This study shows the ability of virtual reality to provoke emotional responses in students with high test anxiety.

Jaye (2006) has conducted a study on the efficacy of virtual reality exposure therapy to treat driving phobia. A comprehensive search of literature has identified 13 studies that were included in the final analyses. Consistent with the prediction the primary random effects, analysis showed a large mean effect size for VRET compared to control conditions, Cohen's d = 1.1. This finding was consistent across secondary outcome categories as well. Also, as expected in vivo, treatment was not significantly more effective than VRET.

Anderson (2005) has conducted a study on cognitive behavioral therapy for public speaking anxiety using virtual reality for exposure. This study used an open clinical trial to test a cognitive-behavioral treatment for public-speaking anxiety that utilized virtual reality as a tool for exposure therapy. Treatment was completed by participants meeting the Diagnostic and Statistical Manual of Mental Disorders DSM-IV criteria for social phobia, or panic disorder with agoraphobia in which public speaking was the predominantly feared stimulus. The Treatment consisted of eight individual therapy sessions, including four sessions of anxiety management training and four sessions of exposure therapy using a
virtual audience, according to a standardized treatment manual. Participants completed standardized self-report questionnaires assessing public-speaking anxiety at pre-treatment, post-treatment, and a 3-month follow-up. Results showed 32 decreases on all self-report measures of public-speaking anxiety from pre- to post treatment, which were maintained at follow-up.

Schneider (2004) has conducted a cross over study to explore the use of virtual reality as a distraction intervention for relieving symptom distress in women receiving chemotherapy for breast cancer. The study was conducted in the outpatient clinic of Midwestern comprehensive cancer center. This study was conducted in 20 women 18-55 years of age. Using a crossover design, 20 subjects served as their own controls. One pretest and two post-test measures were employed for two matched chemotherapy treatments, and randomly assigned to receive the virtual reality distraction intervention during a chemotherapy treatment and received no distraction intervention (control condition) during an alternate chemotherapy treatment. Finding show significant decreases in symptom distress and fatigue occurring immediately following chemotherapy treatments when women used the virtual reality intervention.

Schneider (2003) has conducted a study on the effects of a virtual reality distraction intervention on chemotherapy-related symptom distress levels in 16 women aged 50 and above. A cross-over design was used with a head mounted display (Sony PC Glasstron PLM - S700) encompassing images and block competing stimuli during chemotherapy infusions. The Symptom Distress Scale (SDS), Revised Piper Fatigue Scale (PFS), and the State Anxiety Inventory (SAI)
were used for measuring symptom distress. Participants were randomly assigned to receive the VR distraction intervention during one chemotherapy treatment and received no distraction intervention (control condition) during an alternate chemotherapy treatment. Analysis using paired t-tests demonstrated a significant decrease in the SAI (p = 0.10) scores immediately following chemotherapy treatments when participants used VR. Evaluation of the intervention indicated feeling of women that the head mounted device was easy to use, they experienced no cyber sickness, and 100% would use VR again.

**Literature related to virtual reality therapy upon insomnia among schizophrenic clients**

Virtual reality therapy has thus become a mainstream psychiatric treatment for sleep disorders and is finding increasing use in the treatment of other cognitive disorders associated with various medical conditions such as addiction, depression and anxiety.

A study was conducted by Friedman, 2005. The findings also support applications of virtual reality-based therapy for insomnia, acrophobia, gloss phobia, and substance abuse. Virtual reality therapy has proved successful in normalization of sleep disorder over in 70% of the patients, it has now become a standard accepted treatment by the Anxiety and Depression Association of America. The use of "Virtual reality therapy” interventions empowers people.

The simulation technology of virtual reality lends itself to mastery oriented treatment rather than coping with threats, phobia’s manage progressively more threatening aspects in a computer generated environment. The range of
applications can be extended by enhancing the reality and interactivity so that actions elicit reactions from the environments in which individuals immerse themselves”.

Virtual reality therapy aims at modifying negative thoughts, beliefs, emotions, sleep pattern and behavior using a number of techniques. It is assumed that when negative thoughts are replaced by virtual reality therapy, schizophrenic patients become more realistic and reasonable in his / her perceptions virtual reality therapy also aids in learning self - motivation may also generate changes, such as increased physical activity, mind deviation, relaxation of mind, increased control over life and a renewed outlook on pain. These physiological and mental changes will holistically improve health and reduce insomnia. However, the Investigator could not find much study on virtual reality therapy upon insomnia (Bongar, 2000).

A study was conducted in two phases, survey and quasi experimental approaches which were used in phase I and phase II respectively. The sample size of the study was 130 for phase I and 60 for phase II, (30 in the control group and 30 in the experimental group) respectively. Purposive sampling technique was used for selecting the samples. Quasi experimental research design was adopted. Most of them had moderate insomnia (70%, 76.67%) in the control and the experimental groups of elderly population before virtual reality therapy. However, in the experimental group, after virtual reality therapy, none of them had clinically significant insomnia (100%) whereas in the control group, after virtual reality
therapy, nearly half of the elderly population had clinical insomnia (moderate severity - 60%) (Jeyanthi, 2014).

Virtual reality therapy helps schizophrenic clients to have positive perception. It can improve their mental health by helping the management of negative emotions such as fear, anger, worry and promotes courage, cheerfulness and sleep. When the insomnia will significantly get reduced, it also improves the psychological wellbeing and quality of life. Thus, regular practice of virtual reality therapy will be quite effective in not only overcoming insomnia among the schizophrenic clients but also helping them in promoting mental health. Virtual reality therapy is commonly used for describing various relaxation techniques that help the practitioner to control life force. Virtual reality therapy has been reported to be beneficial in treating a range of insomnia related disorders (Beutler, 2000).

Thus, the conclusion is that virtual reality therapy helps in reduction of insomnia level in the schizophrenic clients. This might prove to be a useful adjunct to medications and at times may even act as the only form of treatment. The findings would have a significant impact in our socio cultural context as people in rural areas are mostly poor and lack necessary medical care and our indigenous method of virtual reality therapy will be effective in the treatment of various mental and physical distresses. However, the Investigator could not find many studies on virtual reality therapy upon insomnia.
Summary

This chapter has dealt with the review of literature related to the problem stated. It helped the researcher to understand the impact of the problem under study. Literature also enabled the investigator to design the study, develop the tool, plan the data collection procedure and to analyze the data. All the sources of review of literature, cited in these chapter are primary sources.
CHAPTER III

RESEARCH METHODOLOGY

The methodology of the research study is defined as the way the information is gathered for answering the research question or to analyze the research problem. The present study was conducted for assessing the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients, at selected schizophrenic home in Chennai. This chapter deals with different steps undertaken by the investigator of this study. It involves research approach, the setting, and population sample, sampling technique, selection of tool, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

Research Approach

Research approach is the most significant part of any research. The appropriate choice of the research approach depends on the purpose of the research study which is undertaken. An experimental approach was used in this study for accomplishing the objective of the study, as the researcher wanted to assess the effectiveness of virtual reality therapy on insomnia.
Research Design

The research design is the planned structure and strategy of investigation of answering research question. It is the overall plan or blueprint to the researchers to select carry out the study (Polit, 2004).

The research design used in this study was pre - experimental research design.

A one group pre-test, post-test pre experimental research design, was adopted for conducting the study. In this study, the investigator administered a pre-test for the selected schizophrenic clients and virtual reality therapy was administered to the same group of clients. The post test was conducted later. The effect of virtual reality therapy on insomnia was assessed at the end.

The research design is represented diagrammatically as follows

\[ O_1 \times O_2 \]

\( O_1 \) – Pretest of insomnia among the schizophrenic clients.

\( X \) – Virtual reality therapy

\( O_2 \) – Post test of insomnia among the schizophrenic clients.
Interventional protocol

Virtual Reality Therapy

- In this study, the participants became a part of virtual world or in a therapeutic environment involved in performing a series of actions displayed on the screen and the person experienced the realistic situation. Thereby this intervention was performed by appropriate movements made by the individual depending upon the task, designed in the reality.
- It was administered for 5-7 minutes every day in the Morning for 6 consecutive days for each client.

Variables

An abstract concept when defined in terms that can measure is called a variable. Variables are characteristics that vary among the subjects being studied.

Independent variable

It is variable hypothesized to outcome variable of interest. In this study, the independent variable was virtual reality therapy.

Dependent variable

It is the variable hypothesized to be dependent on or to be caused by another variable. In this study dependent variable was insomnia.
Research Setting

Settings are the most specific places where data collection takes place. The study was conducted in Dr. Peter Fernandez’s Home for Schizophrenia, Mugalivakkam, Chennai. It is located about 5 Kms from Porur bus stand. It is a 80 bedded home, with 30 beds for females and 50 for males. They have a daily schedule of activities starting from Morning Prayer, breakfast, therapy session followed by lunch and a period of rest and watching television, dinner, and bedtime. The Home is managed by a psychiatrist, 2 social workers, 3 nurses and some administrative staff.

Population

Population is the entire aggregation of cases which meet the designated set of criteria (polit and Beck 2012). The target population is the group of people that the researcher aims to study and to whom the study findings were generalized.

In this study, the target population comprises of all the schizophrenic clients who satisfy the inclusion criteria. The accessible population is the list of population that the researcher finds in the study area. The accessible population who satisfy the inclusion criteria at Doctor peter Fernandez’s home for schizophrenia, Mugalivakkam, Chennai.
Sample

The sample consists of the subset of units that comprise the population (Polit & Beck, 2012). Here it comprised 30 schizophrenic clients who met the inclusion criteria at Doctor Peter Fernandez’s home for schizophrenia, Mugalivakkam, Chennai.

Sample size

The sample size for present study was 30. The decision on the sample size was based on the feasibility and the availability of the sample.

Sampling Technique

Sampling is the process of selecting a portion of population to represent the entire population (Polit & Beck 2012). In this study, the researcher used selection of participants based on personal judgment. Thus researcher used purposive sampling technique based on the inclusion criteria of the study.
Sampling Criteria

Inclusion Criteria

- The Study included the schizophrenic clients who were admitted in the Home for schizophrenia.
- Clients who were taking treatment in the homes for schizophrenia for more than six months.
- Clients who were able to speak & read English or Tamil.
Identification of the setting

Identification of 30 samples from setting through purposive Sampling technique

Pre test using tools such as demographic variable, clinical variable, insomnia severity index scale

Administration of virtual reality therapy to schizophrenic clients

Post test using tools such as insomnia severity index scale, level of satisfaction

Analysis and interpretation by descriptive and inferential statistics

Conclusion

Fig 2. Schematic representation of research design
Exclusion criteria

- Clients with acute or severe psychotic symptoms
- Clients who were not willing to participate in the study
- Clients with visual and hearing problems

Selection and Development of Study Instruments

The study aims at evaluating the effectiveness of virtual reality therapy upon the level of insomnia among schizophrenic clients. The data collection instruments were developed and chosen through an extensive review of literature in consultation with experts and with the opinion of the faculty members. The instruments used in the study were:

- Demographic variable Proforma.
- Clinical variable proforma.
- Insomnia severity index scale.
- Rating scale on the level of satisfaction after virtual reality therapy.

Demographic variable proforma of schizophrenic clients

The demographic variables proforma was used for collecting the base line details such as age, occupational status, type of family, family income, marital status, number of children and duration of stay. The investigator collected the data by interviewing the clients.
Clinical variable proforma of schizophrenic clients

This was used for assessing the clinical variables such as diagnosis, duration of illness, history of previous hospitalization, source of help availed, family history of mental illness, onset of mental illness and treatment of mental illness. The investigator collected the data by interviewing the clients and referring to the case sheet of the clients.

Insomnia severity index scale

This is a standardized tool for assessing the insomnia level developed by Charles M. Morin. It consists of 7 items on patterns of sleeping. It is a 5-point rating scale, with 5 points ranging from none, mild, moderate, severe and very severe and scores ranged from 0 to 4 respectively. Individual item scores were added to obtain the total insomnia score. Total obtainable score ranges from 0 to 28. Higher scores indicate severe insomnia.

Score interpretation

0 – 7 = No clinically significant insomnia
8 – 14 = sub threshold insomnia
15 – 21 = clinical insomnia (moderate severity)
22 – 28 = clinical insomnia (severe)
Rating scale on the level of satisfaction of virtual reality therapy in the experimental group of schizophrenic clients

This was developed by the investigator for assessing the satisfaction of virtual reality therapy among schizophrenic clients. This scale consists of 12 items on the satisfaction of the study participants regarding the various aspects of virtual reality therapy, rated on a four-point scale with the score – Highly Satisfied – 4, Satisfied – 3, Dissatisfied – 2, Highly Dissatisfied – 1. The scale was used for assessing various aspects of virtual reality therapy such as explanation given about the virtual reality therapy, the researcher’s approach to the clients, time, duration, understand ability and usefulness, involvement of the participants and arrangements made during the program me. Thus the total obtainable score is 12-48. The obtained score is converted into percentage and is interpreted as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>76 – 100</td>
<td>Highly Satisfied</td>
</tr>
<tr>
<td>51 – 75</td>
<td>Satisfied</td>
</tr>
<tr>
<td>25 – 50</td>
<td>Dissatisfied</td>
</tr>
<tr>
<td>Below 25</td>
<td>Highly Dissatisfied</td>
</tr>
</tbody>
</table>

Validity

The content validity refers to the degree to which the item on an instrument adequately represents the universe of the content (Polit & Beck, 2012).
Insomnia severity index scales are standardized instrument. The other Proforma and scales were certified and validated by six experts.

**Reliability**

Reliability refers to the accuracy and consistency of the measuring tool (Polit & Beck 2012). Insomnia severity index scale is a standardized tool developed by Dr. Charles M. Morin. Reliability of the tool was Cronbach’s alpha $r = 0.78$, determined by using split half technique, which indicates that the tool is highly reliable.

**Pilot study**

Pilot study was a miniature of some part of actual study, in which the instrument was administrated to the subjects drawn from the population. It was a small scale version done in preparation for the major study, (Polit & Beck, 2012). The purpose was to find out the feasibility and practicability of the study design. A pilot study was conducted on six schizophrenic clients and the conduct of the study was found feasible.

The pilot study was conducted among 6 schizophrenic clients in Dr. Peter Fernandez home, Mugalivakam. Formal permission was obtained from the authorities for the pilot study. Five subjects were chosen by purposive sampling technique. The therapy was administered for all the selected clients individually one by one for a duration of 5-7 minutes for each client. The clients were assisted by the researcher during the sessions. The level of insomnia was assessed by using
the predetermined tools. The level of satisfaction on virtual reality therapy was assessed later using the rating scale for the group.

**Protection of human rights**

- The study was conducted after obtaining the approval of ethical committee, Apollo Hospitals Chennai.
- The study was conducted after obtaining permission from the Principal, Apollo College of Nursing, H.O.D psychiatric department, the concerned authority of the Doctor Peter Fernandez home for schizophrenia, Mugalivakam, Chennai.
- The Written consent was obtained from the clients and confidentiality was maintained throughout the study.

**Data collection procedure**

Data collection is the gathering of information needed for the researcher to address the research problem. Data collection was done by the researcher for a period of 4 weeks. The researcher identified the clients who met the inclusion criteria and selected 30 clients in the setting for the study through purposive sampling technique. After initial introduction, the researcher obtained consent from the clients to participate in the study. An assurance was given regarding confidentiality before the data collection procedure. The data was collected by using predetermined and pretested tools such as demographic variable proforma,
clinical variable proforma, clinical insomnia scale by interview method using structured questionnaire.

Virtual reality therapy was administered after the pretest. The therapy was administered for all the clients individually one by one for a duration of 5 – 7 minutes for each client for 1 week. The clients were assisted by the researcher during the sessions. Then the level of satisfaction on regarding virtual reality therapy was assessed by using the satisfaction rating scale. Posttest was conducted after one week of the intervention.

Plan for data analysis

Data analysis is the systematic organization and synthesis of research data and testing of null hypothesis by using the obtained data (Polit&Beck 2012). Data was analyzed by using appropriate descriptive and inferential statistics.

Descriptive statistics such as mean, median, frequency, standard deviation and the percentage were used for describing the demographic variables, clinic variables and the level of insomnia in the group of schizophrenic clients. Inferential statistics like paired ‘t’ test was used to assess the effectiveness of virtual reality therapy upon insomnia by comparing the pre and posttest mean score of insomnia. Chi square test was used to assess the association between insomnia and the selected variables of schizophrenic clients
Summary

This chapter dealt with research approach, research design, setting, population and sample, sampling technique, sampling criteria, selection and development of study instruments, reliability, pilot study, data collection procedure, plan for data analysis and Budget.
CHAPTER IV
ANALYSIS AND INTERPRETATION

Analysis is defined as the method of organizing data in such a way that the research question can be answered. Interpretation is the process of the results and of examining the simplification of findings with a broader context (Polit, 2008).

This chapter deals with the analysis and interpretation including both descriptive and inferential statistics. Statistics is the field of study concerned with the techniques and method of collection of data, classification and summarizing, interpretation, drawing inferences, testing of hypothesis, making recommendations (Mahajan, 2010).

The data analysis was done as per the objective and hypothesis of the study. The data were entered into the master coding sheet and the analysis of the study was made. Descriptive and inferential statistics was used by the investigator for analysis. Tabulation and interpretation of the data was done using descriptive and inferential statistics.

Organization of the Findings

The findings of the study were organized and presented under the following headings.

- Frequency and Percentage Distribution of Demographic Variables of Schizophrenic clients. (Table: 1)
- Frequency and Percentage Distribution of Clinical Variables in schizophrenic Clients (Table: 2).
- Frequency and Percentage Distribution of Level of insomnia in schizophrenic clients Before and After Virtual Reality Therapy (Table: 3).
- Comparison of Mean and Standard Deviation of insomnia in schizophrenic clients before and After Virtual Reality Therapy(Table:4).
- Using Wilcoxon signed ranks test of insomnia among schizophrenic clients before and after virtual reality therapy (Table:5)
- Frequency and Percentage of level satisfaction on administration of Virtual Reality Therapy in schizophrenic clients(Table: 6).
- Association between the selected variables and the level of insomnia in the schizophrenic clients before and after virtual reality therapy (Table:7).
Table: 1

Frequency and Percentage Distribution of Demographic Variables of Schizophrenic Clients.  

$N = 30$

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>N</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (in years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 30 yrs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>31 - 40 yrs</td>
<td>27</td>
<td>90</td>
</tr>
<tr>
<td>41 – 50 yrs</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>&gt;50 yrs</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Un married</td>
<td>20</td>
<td>66.6</td>
</tr>
<tr>
<td>Separated / divorce</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>Widow /widower</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Monthly income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 10,000</td>
<td>5</td>
<td>16.6</td>
</tr>
<tr>
<td>10,001 – 16,000</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>16,001 – 20,000</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Above 20000</td>
<td>20</td>
<td>66.6</td>
</tr>
<tr>
<td>Not known</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>27</td>
<td>90</td>
</tr>
<tr>
<td>Muslim</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Christian</td>
<td>2</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Table: 1 shows a majority of clients were aged between 31-40 years (90%), females (73.3%), un married (66.6%), Hindus (90%), with >20,000 monthly incomes (66.6%).
Fig. 3. Percentage distribution of gender of Schizophrenic Clients
**Table : 2**  
Frequency and Percentage Distribution of Clinical Variables in schizophrenic clients

\[ N = 30 \]

<table>
<thead>
<tr>
<th>Clinical variable</th>
<th>n</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Any medical illness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Hyper tension</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Arthritis</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Respiratory problem</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Others (specify)</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>nil</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td><strong>Duration of medical illness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>1 - 5 year</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>6- 10 year</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>10 year</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NIL</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td><strong>Onset of illness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 20 yrs</td>
<td>11</td>
<td>36.6</td>
</tr>
<tr>
<td>20-30 yrs</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Above 30 yrs</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Duration of hospitalization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1 yrs</td>
<td>5</td>
<td>16.6</td>
</tr>
<tr>
<td>2-3 yrs</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td>4-5 yrs</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>&gt;5 yrs</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

Table : 2, helps the inference that most of the schizophrenic clients did not have any medical illness (83.3%), half of their onset of illness is between 20-30 yrs of age (50%), duration of hospitalization is 2-3 yrs (43.3%) and did not practice any relaxation therapy (66.6%).
Fig. 4 Percentage distribution of Schizophrenic clients received relaxation training
Table 3

Frequency and Percentage Distribution of Level of insomnia in schizophrenic clients Before and After Virtual Reality Therapy.

<table>
<thead>
<tr>
<th>Level of insomnia</th>
<th>Before therapy</th>
<th>After therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>p</td>
</tr>
<tr>
<td>No clinical significant insomnia</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sub threshold insomnia</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clinical insomnia (moderate)</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Clinical insomnia (Severe  )</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3 indicates that moderate clinical insomnia among all clients before virtual Reality therapy, whereas after virtual reality therapy, none of them (0%) had significant insomnia. These results can be attributed to the Effectiveness of virtual reality therapy.
<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>t - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test (Before therapy)</td>
<td>18.3</td>
<td>4.18</td>
<td>4.45***</td>
</tr>
<tr>
<td>Post test (After therapy)</td>
<td>3.03</td>
<td>2.68</td>
<td></td>
</tr>
</tbody>
</table>

*** p < 0.001

There was significant difference in insomnia score between pretest (M= 18.3, SD= 4.18) and posttest (M= 3.03, SD= 2.68) which was significant (p < 0.001). Insomnia score was less in posttest than pretest.
Table: 5

Comparison of insomnia score between pre-test and post-test among schizophrenic clients (using Wilcoxon signed ranks test)

<table>
<thead>
<tr>
<th>Group</th>
<th>Median</th>
<th>Obtained Range</th>
<th>Wilcoxon test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>18</td>
<td>15-21</td>
<td>-4.791</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Post-test</td>
<td>2</td>
<td>0-7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use of Wilcoxon signed ranks test, a statistical significant difference between pretest and posttest of insomnia score (p<0.001) is seen.
Table: 6

Frequency and Percentage of level satisfaction on administration of Virtual Reality Therapy in schizophrenic clients.

N = 30

<table>
<thead>
<tr>
<th>Level of Satisfaction</th>
<th>Highly Satisfied</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
<th>Highly Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>p</td>
<td>n</td>
<td>p</td>
</tr>
<tr>
<td>Overall Satisfaction</td>
<td>26</td>
<td>86</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Related to therapy</td>
<td>25</td>
<td>83</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Outcome of virtual reality therapy</td>
<td>26</td>
<td>86</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Related to researcher</td>
<td>26</td>
<td>86</td>
<td>4</td>
<td>13</td>
</tr>
</tbody>
</table>

Table: 6 helps inference that most of the schizophrenic clients were highly satisfied (86%) with all the aspects of virtual reality therapy.
Table: 7

Association between the selected variables and the level of insomnia in the schizophrenic clients before and after virtual reality therapy.

(N=30)

<table>
<thead>
<tr>
<th>Selected variables</th>
<th>Before Therapy</th>
<th></th>
<th></th>
<th>After Therapy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upto Mean</td>
<td>Above Mean</td>
<td>χ²</td>
<td>Upto Mean</td>
<td>Above Mean</td>
</tr>
<tr>
<td><strong>Age (in years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 35</td>
<td>10</td>
<td>3</td>
<td>0.2</td>
<td>(df=1)</td>
<td>0.6</td>
</tr>
<tr>
<td>Above 35</td>
<td>8</td>
<td>9</td>
<td>0.06</td>
<td>(df=1)</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>4</td>
<td>0.26</td>
<td>(df=1)</td>
<td>0.42</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>8</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Educational status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to higher secondary</td>
<td>13</td>
<td>6</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.69</td>
</tr>
<tr>
<td>Graduate and Above</td>
<td>5</td>
<td>6</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Duration of hospital stay</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3 years</td>
<td>9</td>
<td>9</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.69</td>
</tr>
<tr>
<td>&gt;3 years</td>
<td>9</td>
<td>3</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Any medical illness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>4</td>
<td>1</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.75</td>
</tr>
<tr>
<td>Absent</td>
<td>14</td>
<td>11</td>
<td>0.25</td>
<td>(df=1)</td>
<td>0.75</td>
</tr>
</tbody>
</table>

# = yates corrected test, χ² = Chi Square

Table: 7 helps inference that there is no significant association between the selected variables and the level of insomnia in the schizophrenic clients. Hence the null hypothesis H₀ was retained.
Summary

This chapter has dealt with the analysis and the interpretation of data obtained by the researcher. The analysis showed improvement in the level of insomnia in the schizophrenic clients after administration of virtual reality therapy, when compared to the before administration of the therapy. This implied that virtual reality therapy has the effect on insomnia.
CHAPTER V

DISCUSSION

This study was carried out upon 30 schizophrenic clients, Chennai. The level of insomnia was assessed before virtual reality therapy using insomnia severity index scale in the group of schizophrenic clients. Virtual reality therapy was administered every day morning 5 – 7 minutes for the period of two weeks for each schizophrenic clients. After two weeks, the level of insomnia was assessed by using insomnia severity index scale among the schizophrenic clients. Then the level of satisfaction on virtual reality therapy was assessed by using satisfaction scale developed by the investigator.

The discussion is presented under the following headings

- Demographic variables of schizophrenia
- Clinical variables of schizophrenic clients
- Level of insomnia among schizophrenic clients
- Effectiveness of virtual reality therapy on insomnia
- Level of satisfaction of virtual reality therapy
- Association between the selected variables and level of insomnia among schizophrenic clients

Demographic variables of schizophrenia

The study results show that, a majority of them were between 31-40 years (90%), females (73.3%), un married (66.6%), Hindus (90%), with >20,000 monthly income (66.6%).
Clinical variables of schizophrenic clients

This study indicates the absence of any medical illness in a majority of the schizophrenic clients (83.3%), most of their onset of illness is in patients between 20-30 of age (50%), duration of hospitalization was 2-3 yrs (43.3%) and did not practice any relaxation therapy (66.6%).

The first objective of the study was to assess the level of insomnia among schizophrenic clients before and after virtual reality therapy.

The study indicates the presence of clinical insomnia in all of them. Moderate clinical insomnia before administration of virtual Reality therapy, whereas, after virtual reality therapy, none of them (0%) had significant insomnia. These results can be attributed to the effectiveness of the virtual reality therapy. Hence the null hypothesis $H_0$ was rejected.

Consistent findings reported by American sleep disorders association, show many schizophrenic clients annually report that they regularly have trouble in sleeping at least a few nights a week. As a result, many are still so tired when they get up in the morning that they fall asleep while commuting to work or doze off on the job. American Sleep Disorders Association conducted a study and found that 17% Schizophrenic clients sometimes fell asleep at their workplace. Further, 31% of clients in the 18 – 34 age admitted they had at one time or another fallen asleep at work (Bhugra, 2004).
The second objective of the study was to assess the effectiveness of virtual reality therapy by comparing the level of insomnia among schizophrenic clients before and after virtual reality therapy.

The corresponding null hypothesis was ‘There will be no significant difference in the level of insomnia among Schizophrenic clients before and after administration of virtual reality therapy.

The insomnia score in schizophrenic clients, before the therapy was high (M= 18.3, SD = 4.18) and after therapy, it found to be much less (M = 3.03, SD = 2.68), which is statistically proven to be significant at P<0.001. Hence, the null hypothesis H01 was rejected. The reduction in insomnia after the therapy can be attributed to the Virtual reality therapy. Therefore, it can be used as an effective intervention as a part of clinical treatment of psychological disorder, to improve quality of sleep among patients.

These findings are consistent with a study conducted by Jayanthi (2013) to assess the effectiveness of virtual reality therapy upon insomnia among old age people. She reported that virtual reality therapy was effective in reducing insomnia among old age people. Studies by the researcher have also demonstrated the effectiveness of virtual reality therapy on various other psychological problems such as anxiety disorders, posttraumatic stress disorder. This supports the statement that virtual reality application has been developed also for clinically rehabilitation of a degradation of insomnia resulting from schizophrenia. Examining the design and engineering of computer games technology may lead to some useful suggestions about how to design the therapeutic intervention to engage and motivate the clients. Virtual reality therapy can be used for assessment
and rehabilitation and improvement in the level of sleep pattern for the clients suffering from mental illness as well as for normal population to improve their psychological wellbeing.

**The third objective of the study was to determine the level of satisfaction in schizophrenic clients regarding Virtual Reality Therapy.**

Satisfaction arises from a person, when a therapy is balanced between the choice of the study and professional responsibility. A high level of effectiveness can be obtained when the participants are satisfied with the various components of any intervention such as the method of administration, approach of the researcher, easiness, feasibility etc.

The researcher found satisfaction among a majority of the schizophrenic clients (86%) with virtual reality therapy. These findings indicated effectiveness of administration of virtual reality therapy in improving the sleep pattern level in schizophrenic clients, due to being, cost effective and harmless. Many of the schizophrenic clients reported high level of satisfaction. So the nurses were instrumental in administering virtual reality therapy to the schizophrenic clients without any restriction and helped to improve the sleep pattern in the schizophrenic clients, thereby improving even the quality of life. The study findings have thrown light on the fact that sleep impairment in schizophrenic clients could be reduced through an effective psychosocial intervention like virtual reality therapy. It is an intervention using technology for presenting the user with interactive virtual or mixed reality environment.
The fourth objective of the study to find out the association between selected variables and level of insomnia among schizophrenic clients before and after Virtual Reality Therapy.

Corresponding hypothesis was $H_0$ "There will be no significant association between selected variables and level of insomnia among Schizophrenic clients before and after the virtual reality therapy'.

Chi – square test was used to find out the association between selected variables and the level of insomnia. It is found that there was no significant association between the level of insomnia and the selected variables of the schizophrenic patients. Hence the null hypothesis was retained.

Lack of association in this study may be due to small sample size and homogenous nature of samples with respect to the nature of illness and treatment variables. Various studies increasing in number have found that sleep impairment profoundly limits the work functioning in persons with schizophrenia. Impaired sleep pattern predicts worse employment outcomes in clients going through rehabilitation.

A study was conducted by Friedman, 2005, it also supports application of virtual reality-based therapy for insomnia, acrophobia, gloss phobia, and substance abuse. Virtual reality therapy was proved successful in normalization of over 70% among persons suffering from sleep disorder and that has now become a standard accepted treatment by the Anxiety and Depression Association of America. Hence "Virtual reality therapy” interventions can be effectively used in treatment of psychological problems and insomnia.
Summary

This chapter dealt with the objectives of the study, major findings of the demographic and clinical variable of schizophrenic clients with insomnia among schizophrenic clients before and after administration virtual reality therapy, Mean and Standard Deviation of insomnia level before and after virtual reality therapy, association between the selected demographic and clinical variable and level of insomnia of the schizophrenic clients and the level of satisfaction of the virtual reality therapy.
CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATION ANDRECOMMENDATION

Summary

The aim of the study is to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients at selected home for schizophrenic clients, Chennai.

Objectives of the study

1. To assess the level of insomnia among schizophrenic clients before and after virtual reality therapy.
2. To assess the effectiveness of virtual reality therapy by comparing the level of insomnia among schizophrenic clients before and after virtual reality therapy.
3. To determine the level of satisfaction in schizophrenic clients regarding Virtual Reality Therapy.
4. To find out the association between selected variables and level of insomnia among schizophrenic clients before and after Virtual Reality Therapy.
Null Hypothesis

The null hypothesis stated are:

H01 There will be no significant difference in the level of insomnia among Schizophrenic clients before and after administration of virtual reality therapy.

H02 There will be no significant association between selected variables and level of insomnia among Schizophrenic clients before and after the virtual reality therapy.

Major findings of the study

Demographic variables of schizophrenia

The study results show that, a majority of the schizophrenic patients were aged between 31-40 years (90%), females (73.3%), un married (66.6%), Hindus (90%), with >20,000 monthly incomes (66.6%).

Clinical variables of schizophrenic clients

This study indicates the absence of any medical illness in a majority of the schizophrenic clients (83.3%), most of their onset of illness is in between 20-30 yrs of age (50%), duration of hospitalization is 2-3 yrs (43.3%) and did not practice any relaxation therapy (66.6%).

Level of insomnia among schizophrenic clients

The study indicates the presence of moderate clinical insomnia among all of them before administration of the virtual Reality therapy, whereas after virtual
reality therapy, none of them (0%) had any significant insomnia. These results can be attributed to the Effectiveness of virtual reality therapy. Hence the null hypothesis H01 was rejected.

**Effectiveness of virtual reality therapy on insomnia**

The insomnia score in schizophrenic clients, before the therapy was high (M= 18.3, SD = 4.18) and after therapy, it found to be less (M = 3.03, SD = 2.68), which is statistically proven to be significant P<0.001. Hence, the null hypothesis H01 was rejected. The reduction in the insomnia after the therapy can be attributed to the Virtual reality therapy. Therefore, it can be used as an effective intervention for the clinical treatment of psychological disorder.

**Level of satisfaction of virtual reality therapy**

The researcher found satisfaction among a majority of the schizophrenic clients (86%) with virtual reality therapy.

**Association between the selected variables and level of insomnia among schizophrenic clients**

No significant association was noticed between the level of insomnia and the selected variables of the schizophrenic patients. Hence the null hypothesis was retained.
Conclusion

The finding of the study reveal insomnia as one of the common problems faced by the schizophrenic clients. It may be due to various factors such as neurotransmitter imbalance, increasing nuclear family system and inadequate time to take care of them. Virtual reality therapy is a non-pharmacological psychosocial intervention for the treatment of insomnia, which can be practiced by schizophrenic clients to improve quality of sleep.

Implications

Based on the findings of the study, the researcher recommends the implications on Nursing practice, nursing education, nursing administration, Nursing research.
Nursing practice

It was identified during interview from selected schizophrenic homes, Chennai that many schizophrenic clients complain of insomnia. But basically it is being neglected by the women and health professionals unless it is severe. Psychiatric nurses play a vital role in meeting the biological needs of the patients, including the need for sleep. Since a, majority of the schizophrenic patients experience insomnia, nurses can plan and practice psycho social interventions including virtual reality therapy to improve the quality of sleep among schizophrenic patients.

Nursing education

There is need to incorporate the major findings in nursing curricula at all levels in order to equip students well to address insomnia and its problem with changing health care trends, nursing education must emphasize primary care approach focusing on prevention than cure. Students can be motivated to conduct mass awareness programs on insomnia and its management among mentally ill patients. So nursing students at all levels should be taught about the problems faced by the people with insomnia, and available complimentary therapy including virtual reality therapy to deal with their problems including insomnia.

Nursing administration

In today’s technological advance and the ever growing challenges in the care needs, the nurse administrator has the highest responsibility in providing the psychiatric nurse with substantive continuing education opportunities in the alternative therapies for insomnia. This will enable the nurses to cultivate and
update her knowledge, and manage schizophrenic clients with insomnia problem. The nurse administrator should take initiative and organize continuing education programs on management of insomnia with supportive care like virtual reality therapy for nursing personnel in the hospital and in the community setting with modern technological visual aids to gain adequate knowledge regarding non pharmacological ways of reducing insomnia severity.

The nurse administrator should take adequate steps with the growing bodies in formulating policies and protocol to emphasize on nursing care of schizophrenic clients with insomnia, and plan for man power, money, material methods and time to conduct the programs. The nurse administrator should organize and provide opportunities for the psychiatric nurses to attend training programs on psychosocial intervention including virtual reality therapy.

**Nursing research**

As a result of growing demand, there is a heightened urgency to expand the evidence base to support their use. There is a need for extensive and intensive research in this area for generating a more specific data base and to identify the benefits of therapies and provide much needed information for the consumers and providers. It opens a big avenue for research on innovative, alternative methods for reducing the severity of insomnia. Further research needs to be conducted for helping schizophrenic clients with insomnia to come out from their health problems. The Professional and student nurses could conduct further studies on the impact of various alternative methods for treating insomnia and also for avoiding the use of sleeping pills and its side effects.
Recommendations

The researcher recommends the following studies in the field of nursing research

- The study could be conducted on larger samples for better generalization.
- The study could be replicated in other settings like the community and hospitals etc.
- A time series design can be conducted with an interval of 2, 4 and 6 months to assess the long term effects of virtual reality therapy upon insomnia.
- A study can be conducted to assess the effectiveness of virtual reality therapy on quality of life among the schizophrenic clients.

Limitations

- The study findings cannot be generalized due to sample size being small.
- Random sampling was not possible due to practical difficulties.
- True experimental research could not be conducted due to unavailability of the patients and practical difficulties.
REFERENCES


APPENDIX I

LETTER SEEKING PERMISSION TO CONDUCT STUDY

To

Dr. Peter Fernandez
Dr. Fernandez Home for Schizophrenia
Sabari Nagar Extension
Mugalivakkam,
Chennai.

Respected Sir,

Sub.: To request permission for research study – Reg

Greetings! As part of the curriculum requirement our 2nd year M.Sc. (N) student Ms. Shilpa Jabeen S has selected the following title for her Research Study.

“A pre experimental study to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients.”

So I kindly request your good selves to permit her to conduct study in your esteemed hospital.

Thanking you,

Dr. LATHA VENKATESAN
PRINCIPAL

Dr. M. PETER FERNANDEZ
M.D., D.P.M., T.D.D., FIPS
Professor Emeritus (Psychiatry)
# 3, Sabari Nagar Ext.,
Mugalivakkam, Chennai-600 126.
APPENDIX II

ETHICAL COMMITTEE CLEARANCE LETTER

Institutional Ethics Committee - Clinical Studies
Reg. No.: ECR/37/Inst/TN/2013

7 July 2015

To,
Ms. Shilpa Jabeen S.,
First year, M.Sc (Nursing),
Department of Mental Health Nursing,
Apollo College of Nursing, Chennai.

Ref: A pre experimental study to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients.

Sub: Approval of the above referenced project and its related documents.

Dear Ms. Shilpa,

The Institutional Ethics Committee-Clinical Studies has received the following document submitted by you related to the conduct of the above-referenced study -

- Project Proposal
- Informed Consent Form

The Institutional Ethics Committee-Clinical Studies reviewed (through expedited review) and discussed the project proposal documents submitted by you at a specially convened meeting held on 7 July 2015.

The following members were present at the meeting held on 7 July 2015 at 2:00pm at Apollo Hospitals Educational Research Foundation, Conference Hall, Room No: 15, 2nd Floor, Krishnadeep Chambers, Wallace Garden, Chennai:

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Designation</th>
<th>Affiliation</th>
<th>Position in the committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Rema Menon</td>
<td>F</td>
<td>Blood Bank Officer</td>
<td>Apollo Hospitals, Chennai</td>
<td>Member Secretary (Clinician)</td>
</tr>
<tr>
<td>Dr. Pradeep Kumar</td>
<td>M</td>
<td>Clinical Pharmacist</td>
<td>Apollo Hospitals, Chennai</td>
<td>Member (Pharmacologist)</td>
</tr>
<tr>
<td>Dr. Rama Narasimhan</td>
<td>F</td>
<td>Senior Consultant-Internal Medicine</td>
<td>Apollo Hospitals, Chennai</td>
<td>SIRC Member (Clinician)</td>
</tr>
<tr>
<td>Dr. Sivagnanasundaram</td>
<td>M</td>
<td>Senior Consultant</td>
<td>Madras High</td>
<td>SIRC - Member</td>
</tr>
</tbody>
</table>

Apollo Hospitals Enterprise Limited,
21, Greaves Lane, Off Greaves Road, Chennai - 600 006, India. T: +91 44 2829 5045 / 6641 Fax: +91 44-2829 4449
Email: ecapollochennai@gmail.com
<table>
<thead>
<tr>
<th>Endocrinology</th>
<th>Court, Chennai</th>
<th>(Clinician)</th>
</tr>
</thead>
</table>

The Institutional Ethics Committee-Clinical Studies reviewed the proposal, its methodology and design of the study. The proposed thesis work is approved in its present proposal without any modifications.

The Institutional Ethics Committee-Clinical Studies review and approval of the report is only to meet their academic requirement and will not amount to any approval of the conclusion / recommendations as conclusive, deserving adoption and implementations, in any form, in any health care institution.

The Institutional Ethics Committee-Clinical Studies is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

Regards,

Dr. Rema Menon,
Member Secretary,
Institutional Ethics Committee-Clinical Studies,
Apollo Hospitals, Chennai.

Date: 7/1/2015

---

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE CLINICAL STUDIES
APOLLO HOSPITALS, AHEL
CHENNAI, TAMILNADU.
APPENDIX III

LETTER SEEKING PERMISSION TO USE THE TOOL

From
S. Shilpa Jabeen
M.Sc (N) II year
Apollo College of Nursing

To
The Principal
Dr. Latha Venkatesan,
Apollo College of Nursing

Through proper channel

Sub: Request for opinion and suggestion of experts for establishing content validity of Research tool.

Respected Madam

Greetings! As per the Curriculum Requirement the following research title is selected for the study.

“A Pre Experimental Study to Assess the Effectiveness of Virtual Reality therapy upon Insomnia among Schizophrenic Clients at Selected Schizophrenic home, Chennai”. I will highly privilege to have your valuable suggestions with regard to the establishment of content validity of Research tool. So I request you to validate my research tool and give suggestion about the tool.

Thanking you

Place: 
Date:

Yours sincerely
S. Shilpa Jabeen
APPENDIX IV

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the Research tool and interventional programme of Ms S. Shilpa Jabeen, M.Sc. (N) II year students who is undertaking research study.

“A Pre Experimental Study to Assess the Effectiveness of Virtual Reality therapy upon Insomnia among Schizophrenic Clients at Selected Schizophrenic home, Chennai”.

Signature of expert

Name and Designation
APPENDIX V

LIST OF EXPERTS FOR CONTENT VALIDITY

1. Dr. Latha Venkatesan, M.Sc (N), M.Phil. (N), Ph.D.(N),
   Principal and Professor in Maternity Nursing,
   Apollo College of Nursing,
   Chennai- 600 095

2. Dr. Lizy Sonia. A, M.Sc.(N),
   Vice Principal and Professor in Medical Surgical Nursing,
   Apollo College of Nursing,
   Chennai-600 095

3. Dr. Frenandez
   MD, DPM, FIPS
   Chief, Psycholab

4. Mrs. Anuradha.C. M.Sc.(N), M.Sc. (Psy)
   Associate professor,
   Department of Mental Health Nursing
   Apollo College of Nursing,
   Chennai- 600 095.

5. Mrs. Stella Mary. I, M,sc (N)
   Reader
   Department of Mental Health Nursing,
   Apollo College of Nursing
APPENDIX VI

RESEARCH PARTICIPANTS CONSENT FORM

Dear participants,

I am M.Sc (N) 1 year student of Apollo College of Nursing. As a part of my study, a research study on “A Pre Experimental Study to Assess the Effectiveness of Virtual Reality therapy upon Insomnia among Schizophrenic Clients at Selected Schizophrenic home, Chennai”. The findings of the study will be helpful in reducing the insomnia in Schizophrenic clients.

I hereby seek your consent and cooperation to participate in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I …………………………………………………………Hereby consent to participate and undergo the study.

Place:  

Signature of the participant

Date:
APPENDIX VII

CERTIFICATE OF TRAINING IN VIRTUAL REALITY THERAPY

Medical Advance Research Foundation
(Public Charitable Trust)
Recipient: Science Popularisation Award, Government of Tamil Nadu 2001 - 2002

Managing Trustee:
Dr. M. KUMARESAN, M.S. (E.N.T.) D.L.O.
Member, Pulitzer Society, USA
President, Madras - India Regional Chapter of the Acoustical
Society of America
Secretary, Acoustical Foundation Education and Charitable Trust
Director, International Research Institute for the Deaf
RECIPIENT OF NATIONAL AND STATE GOVERNMENT AWARDS
Managing Director, Bharath Institute of Para-Medical Sciences
Chairman, Bharath Community College.

Office:
SIVA E.N.T. HOSPITAL
No.159, Avai Shanmugam Salai,
Royapuram, Chennai - 600 014,
Tamil Nadu, India.
Phone: 2881 6809
E-mail: kumaresan@doctor.com
Cell: 98410 55774
Research:
Virtual Reality Medicine

Date:

Certificate Of Virtual Reality Therapy Completion

This is to certify Miss. S. Shilpa jabeen, MSc.Nursing II year has successfully completed the
Training for Virtual Reality Therapy. Aim, Target People, Methodology, outcome Conducted
from 07/05/2015 to 09/05/2015

[Signature]
APPENDIX VIII

PERMISSION FOR USING   INSOMNIA SEVERITY INDEX SCALE

Dear Mr. Charles Morin,

With due respect, I, Ms. Shilpa Jabeen, MSc Nursing II year would like to state that, as a part of my curriculum requirement, I am planning to do a research entitled “An experimental study to assess the effectiveness of virtual reality therapy upon insomnia among schizophrenic clients at selected home for schizophrenic clients, Chennai.” For the same, I would like to use the Insomnia severity index Scale as one of my tool (for academic purpose only). Please consider my request and grant me permission for the same.

Thanking you.
APPENDIX IX
CERTIFICATE FOR ENGLISH EDITING

TOWHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation entitled “A Pre Experimental Study to assess The Effectiveness of Virtual Reality Therapy upon Insomnia Among Schizophrenic Clients at Selected Home for Schizophrenic Clients, Chennai” by S. Shilpa Jabeen, II year M.Sc. Nursing student of Apollo College of Nursing, was edited for English Language appropriateness.

Prof. J.L. NARASIMHAN
New No.8, Second Main Road,
Block B - F1, Krishna Nagar,
Chromepet, Chennai-600 044.
Cell : 94446 64720
e-mail : profjin@yahoo.com

Signature
APPENDIX X
CERTIFICATE FOR TAMIL EDITING

CERTIFICATE FOR TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This to certify that the dissertation, “A Pre Experimental Study To Assess The Effectiveness Of Virtual Reality Therapy Upon Insomnia Among Schizophrenic Clients At Selected Home For Schizophrenic Clients, Chennai.” by Ms. S. Shilpa Jabeen, M.Sc Nursing II year student, was edited for Tamil language appropriateness.
### APPENDIX XI

**PLAGIARISM ORIGINALITY REPORT**

<table>
<thead>
<tr>
<th>Plagiarism Detector - Originality Report</th>
</tr>
</thead>
</table>

Originality report details:

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</table>

**Important Hint:** To understand what exactly is meant by any report value - you can click, “Help image”. It will navigate you to the most detailed explanation at our web site.

**Plagiarism Detection Chart:**

- **Referenced (4.00%)**
- **Linked (0.00%)**
- **Plagiarism (0.00%)**
- **Original (96.00%)**

**Referenced 4% / Linked 0%**

**Original - 96% / 0% - Plagiarism**
**APPENDIX XII**

**DEMOGRAPHIC VARIABLES PROFORMA FOR SCHIZOPHRENIC CLIENTS**

**Purpose**

This proforma is used to measure the demographic variable such as age, sex, marital status, education, occupation, monthly income, type of family;

It is designed to assess the social and family details of the Schizophrenic clients

**Instructions**

Kindly read the following questions. Put a tick mark against the answers or fill in the blanks at the space provided. Please describe your responses. Freely and frankly. The details will be kept confidential and used for research purposes only.

1. **Age in years**
   - 1.1 20 - 30 yrs
   - 1.2 31 - 40 yrs
   - 1.3 41 - 50 yrs
   - 1.4 >50 yrs

2. **Gender**
   - 2.1 Male
   - 2.2 Female

3. **Educational status**
   - 3.1 Illiterate
   - 3.2 Primary education
   - 3.3 Secondary education
   - 3.4 Higher secondary education
   - 3.5 Graduate and above
### 4. Marital status

<table>
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<tr>
<th>Status</th>
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<tbody>
<tr>
<td>Married</td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td></td>
</tr>
<tr>
<td>Widow/widower</td>
<td></td>
</tr>
<tr>
<td>Separated/divorced</td>
<td></td>
</tr>
</tbody>
</table>

### 5. Monthly income in Rs.

<table>
<thead>
<tr>
<th>Income Range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10,000</td>
<td></td>
</tr>
<tr>
<td>11,000–15,000</td>
<td></td>
</tr>
<tr>
<td>16,000–20,000</td>
<td></td>
</tr>
<tr>
<td>&gt; 21,000</td>
<td></td>
</tr>
<tr>
<td>Not known</td>
<td></td>
</tr>
</tbody>
</table>

### 6. Religion

<table>
<thead>
<tr>
<th>Religion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX XIII
CLINICAL VARIABLE PROFORMA

Purpose

This proforma is used to assess the clinical variables such as medical illness, duration of medical illness, onset of illness, Duration of hospitalization and treatment seeking behavior.

Instructions

Kindly read the following questions put a tick mark against the answers or fill in the blanks at the space provided. Please describe your responses freely and frankly. The detail will be kept confidential and used for research purposes only

1. History of any Medical Illness

1.1 Diabetes mellitus

1.2 Hypertension

1.3 Arthritis

1.4 Respiratory problems

1.5 Others [specify]

1.6 Nil

2. Duration Medical Illness

2.1 <1 year

2.2 1 - 5 year

2.3 6 – 10 years

2.4 > 10 years

2.5 Nil

3. Onset of illness

3.1 Age in years
4. Duration of hospitalization

4.1 0-1 yr

4.2 2-3 yrs

4.3 4-5 yrs

4.4 > 5 yrs

5. Have you received any training or information on relaxation training before

5.1 yes

5.2 no
APPENDIX XIV

INSOMNIA SEVERITY INDEX

Purpose

The insomnia severity index has seven questions. The seven answers will be added up to get a total score. This is used to assess the severity of insomnia.

Instructions

For each question, please circle the number that best describes your answer. Please rate the current severity of your sleep problems.

1. Difficulty in falling asleep?

None Mild Moderate Severe Very Severe

0 1 2 3 4

2. Difficulty in staying asleep?

None Mild Moderate Severe Very Severe

0 1 2 3 4

3. Problem in waking up too early?

None Mild Moderate Severe Very Severe

0 1 2 3 4

4. How satisfied/dissatisfied are you with your current sleep pattern?

Very satisfied Satisfied Moderately satisfied Dissatisfied Very Dissatisfied

0 1 2 3 4

5. To what extent do you consider your sleep problems to interfere with your daily functioning (e.g., daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc.)?

Not at all interfering/A Little interfering/Somewhat interfering/Much Interfering/Very much

0 1 2 3 4
6. How noticeable to others do you think your sleeping problem is in terms of impairing the quality of your life?

Not At All satisfied/A little satisfied/Somewhat satisfied/ Much satisfied/ Very much satisfied

0 1 2 3 4

7. How worried/distressed are you about your current sleep problem?

Not At All worried/A Little worried/Somewhat worried/Much worried/ Very Much worried

0 1 2 3 4

Guidelines for scoring /interpretation:

By adding the scores of all seven items (questions 1+ 2 + 3 + 4 + 5 + 6 + 7) = ............ total score

Total score categories.

0 – 7 = No clinically significant insomnia

8 – 14 = sub threshold insomnia

15 – 21 = clinical insomnia (moderate severity)

22 – 28 = clinical insomnia (severe)
## BLUE PRINT ON THE LEVEL OF SATISFACTION OF VIRTUAL REALITY THERAPY

<table>
<thead>
<tr>
<th>S.No</th>
<th>Content</th>
<th>Item No</th>
<th>Total No of items</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Virtual reality Therapy</td>
<td>1,2,3,4</td>
<td>4</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Outcome of virtual reality</td>
<td>5,6,7,8</td>
<td>4</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>therapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Researcher’s approach</td>
<td>9,10,11,12</td>
<td>4</td>
<td>--</td>
</tr>
</tbody>
</table>
APPENDIX XV

RATING SCALE ON LEVEL OF SATISFACTION REGARDING VIRTUAL REALITY THERAPY IN SCHIZOPHRENIC CLIENTS

Purpose

This rating scale is used to assess the level of satisfaction of the participants regarding virtual reality therapy.

Instructions

Please keep your frank responses to the questions given below. The information will be kept confidentially and will be used for research purpose only.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Item</th>
<th>Highly satisfied</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
<th>Highly Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel more comfortable about virtual reality therapy</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Duration of virtual reality therapy is sufficient for me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I like to do it regularly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>It improves myself image</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I experienced decrease in mental stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>My mind is relaxed after virtual reality therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>It improves my inner feelings and peace of mind</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>Description</td>
<td>Percentage</td>
<td>Level of satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
<td>-----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 36</td>
<td>I am able to cope up with sleep pattern effectively</td>
<td>&lt; 76-100%</td>
<td>Highly satisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-35</td>
<td>The researcher explained clearly about the intervention</td>
<td>50-75</td>
<td>Satisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-22</td>
<td>The researcher cleared all the doubts I had about intervention</td>
<td>25-49</td>
<td>Dissatisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-10</td>
<td>The researcher is present throughout the procedure</td>
<td>1-24</td>
<td>Highly Dissatisfied</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LEVEL OF SATISFACTION

8  I am able to cope up with sleep pattern effectively
9  The researcher explained clearly about the intervention
10 The researcher cleared all the doubts I had about intervention
11 I am satisfied with the manner of demonstration
12 The researcher is present throughout the procedure
மகாதல்கள் காலக்குறிகள்

மகாதல்கள் பாராளுமன்றம், சேவையகத்தால், பொருள்கள், சேவையக முற்புகையில், கூட்டு மகள் பேச்சுக்கு மகாதல்கள் காலக்குறிகளை அடிப்படையில் வழங்குவதுபோராக்கம் இருப்பது. தன்னால் மகாதல்கள் குறுக்கு கூட்டு மகள் பேச்சுக்கு மகாதல்களை குறித்து விளக்கத்தை மதிக்கக்கூட்ட நோக்கமாகும்.

நிர்வகிக்கப்படும்

மகாதல்கள் பிரித்தானிய விளக்கக் குறிக்கு பாதையுடையதாக, பெரும்பாலான அதிகம் அமைந்த பொருள்களில் பாதையுடையதாக விளக்கம் உள்ளது (v) பாதையுடையது. அமைந்த பொருள்கள் விளக்கத்தை விளக்கவும் மகாதல் விளக்கத்தை விளக்கவும் மகாதல் விளக்கத்தை விளக்கவும் மகாதல் விளக்கத்தை விளக்கவும் அடிப்படை மகாதல்களை சாத்திக்கப்பட்டிருக்கின்றது அல்லது ஏனென மறுபாக்கத்தை.
4. முறை
   அ) இணை
   ஆ) பின்னணி
   இ) தொடர்கள்

5. சிற்றுருக்கின் வகை
   அ) அலகுகள்
   ஆ) அலக்குகள்
   இ) கல்லாளை சுருக்கம் அல்லது கல்லாளை சுருக்கம்

6. மத்தியுருக்கின்
   அ) 10000 ரூபாய் மத்தியுரு
   ஆ) ரூ.11,000-15,000
   இ) ரூ.16,000-20,000
   எ) ரூ.>21,000
   உ) ஒருபாகியான

xxxiii
1. என்னுடனும் சொந்தத்தூராயாக புத்துருக்குநர்

<p>| | |</p>
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</tr>
<tr>
<td>1.2</td>
<td>குன்று அம்ச செய்யும்</td>
</tr>
<tr>
<td>1.3</td>
<td>கையார் விளக்கம்</td>
</tr>
<tr>
<td>1.4</td>
<td>துளி பற்றிய பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>1.5</td>
<td>ப்பேக</td>
</tr>
<tr>
<td>1.6</td>
<td>தூளை திறக்கும்</td>
</tr>
</tbody>
</table>

2. குறைவான கூடம் என்னுடனும் கூல்லூராயாக புத்தரனும்?

<p>| | |</p>
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</thead>
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<td>1 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>2.2</td>
<td>1-5 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>2.3</td>
<td>6-10 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>2.4</td>
<td>10 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>2.5</td>
<td>தூளை திறக்கும்</td>
</tr>
</tbody>
</table>

3. சன்னாராயான என்னுடனும் கூல்லூராயாக புத்தராயாக போன்று?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>முழுவதும் பிள்ளை செய்யும்</td>
</tr>
</tbody>
</table>

4. குறைவான கூடம் என்னுடனும் கூல்லூராயாக போன்று புத்தராயாக?

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<tr>
<td>4.1</td>
<td>0-1 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>4.2</td>
<td>2-3 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>4.3</td>
<td>4-5 என்பதில் பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>4.4</td>
<td>5 என்பதில் பிள்ளை செய்யும்</td>
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</table>

5. என்னுடனும் குச்சை என்னுடனும் கூழாயான என்னுடனும் லூராயாக புத்தராயாக?

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<tbody>
<tr>
<td>5.1</td>
<td>பிள்ளை செய்யும்</td>
</tr>
<tr>
<td>5.2</td>
<td>தூளை திறக்கும்</td>
</tr>
</tbody>
</table>


## குழந்தைகளின் குழந்தைக் கூட்டாட்டத்தின் தேவை

குழந்தைகளின் குழந்தைக் கூட்டாட்டத்தின் தேவை குழந்தைகளுக்கு துணைப்பாட்டாக. குழந்தைகளின் செயல்பாடுகளை வளர்ச்சிப்பாட்டுக்காக மேலும் குழந்தைகளின் தேவைகளைப் பார்வையிட்டு தான் குழந்தைகளின் குழந்தைக் கூட்டாட்டத்தின் தேவைகளை அறிய வேண்டும்.

### ஆண்டுதொகை

நேரடியாக விளக்கத்திலும், குழந்தைகளுக்கு எண் மற்றும் தேவைகளின் வளர்ச்சிக்கான மாற்றங்களை தரும்படிக்கொள்ளும். குழந்தைகளின் பிறவுக்கான குழந்தைகளின் குழந்தைக் கூட்டாட்டத்தின் தேவையை அறிவிக்கும்.

<table>
<thead>
<tr>
<th>உயர்வு ஏற்றுமதி</th>
<th>பிறப்பு ஏற்றுமதி</th>
<th>நேரடி அல்லது பிறப்பு ஏற்றுமதியறிவு</th>
<th>பிறப்பு ஏற்றுமதி மற்றும் பிறப்பு ஏற்றுமதியறிவு</th>
<th>பிறப்பு ஏற்றுமதி மற்றும் பிறப்பு ஏற்றுமதியறிவு</th>
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</table>

2. குழந்தைகளின் முதல் செயல்பாடு

<table>
<thead>
<tr>
<th>உயர்வு ஏற்றுமதி</th>
<th>பிறப்பு ஏற்றுமதி</th>
<th>நேரடி அல்லது பிறப்பு ஏற்றுமதியறிவு</th>
<th>பிறப்பு ஏற்றுமதி மற்றும் பிறப்பு ஏற்றுமதியறிவு</th>
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3. குழந்தைகளின் முதல் செயல்பாடு பிறப்பு ஏற்றுமதியறிவு

<table>
<thead>
<tr>
<th>உயர்வு ஏற்றும.mat</th>
<th>பிறப்பு ஏற்றும.mat</th>
<th>நேரடி அல்லது பிறப்பு ஏற்றும.matயறிவு</th>
<th>பிறப்பு ஏற்றும.mat மற்றும் பிறப்பு ஏற்றும.matயறிவு</th>
<th>பிறப்பு ஏற்றும.mat மற்றும் பிறப்பு ஏற்றும.matயறிவு</th>
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4. குழந்தைகளின் முதல் செயல்பாடு பிறப்பு ஏற்றும.matயறிவு 

<table>
<thead>
<tr>
<th>உயர்வு ஏற்றும.mat</th>
<th>பிறப்பு ஏற்றும.mat</th>
<th>நேரடி அல்லது பிறப்பு ஏற்றும.matயறிவு</th>
<th>பிறப்பு ஏற்றும.mat மற்றும் பிறப்பு ஏற்றும.matயறிவு</th>
<th>பிறப்பு ஏற்றும.mat மற்றும் பிறப்பு ஏற்றும.matயறிவு</th>
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<td>5</td>
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</table>
5. காலத்திற்குரியான விழாவின் நூற்றாண்டு சாதாரண முயற்சிகளின் கால அரசாங்க அமெக்கேசியன் உரையாட்டு விளைவுகள் காலத்திற்குரிய குருக்களின் காலாவधி எப்போது விளைவுகள், பாரம்பரிய, கிராமச்சாட்டு விழாக்காண்பாடுகள் செய்யப் போது, கூட்டம், கிராமச்சாட்டு போட்டிகள், பாரம்பரிய, கிராமச்சாட்டு போட்டி

<table>
<thead>
<tr>
<th>கெட்டாண்டம்</th>
<th>குருக்களின் பெரும்</th>
<th>முதல் குருக்களின் பெரும்</th>
<th>முதல் குருக்களின் பெரும்</th>
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<tr>
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<td>1</td>
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</table>

6. காலத்திற்குரிய முயற்சிகள் விழாவின் புத்தாண்டு பாரம்பரிய அமெக்கேசியன் உரையாட்டு விளைவுகள்

<table>
<thead>
<tr>
<th>கெட்டாண்டம்</th>
<th>குருக்களின் பெரும்</th>
<th>முதல் குருக்களின் பெரும்</th>
<th>முதல் குருக்களின் பெரும்</th>
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<tr>
<td>0</td>
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</tbody>
</table>

7. காலத்திற்குரிய விழா புத்தாண்டு முயற்சிகள் விழாவின் நூற்றாண்டு / பாரம்பரிய காலம்

<table>
<thead>
<tr>
<th>கெட்டாண்டம்</th>
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<th>முதல் குருக்களின் பெரும்</th>
<th>முதல் குருக்களின் பெரும்</th>
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<tbody>
<tr>
<td>0</td>
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</table>

பாரம்பரிய காலம், அரசாங்க காலம், வணிகம் காலம்

1+2+3+4+5+6+7 கெட்டாண்ட விழாவின் விளைவுகள்

0-7 = பாரம்பரிய காலம், வணிகம் காலம் அல்லது காலம் பாரம்பரிய காலம்
8-14 = காலம், வணிகம், காலம், வணிகம்
15-21 = பாரம்பரிய காலம், பாரம்பரிய காலம் (ுருக்கடா குறிப்பிட்டும்)
22-28 = பாரம்பரிய காலம், பாரம்பரிய காலம் (அதிக விளைவு)


<table>
<thead>
<tr>
<th>எண்</th>
<th>நூற்றாண்டு</th>
<th>நூற்றாண்டின் கணிகை</th>
<th>முதல் வரலாற்று</th>
<th>கிளைத் தரவு</th>
<th>ஆணத் தரவு</th>
<th>மூலம் அலைத்து தரவு</th>
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<tbody>
<tr>
<td>1.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் மூலம் பெற்றுத்த்தும் பிரிவுகள்</td>
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<td>2.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் நூற்றாண்டு பெற்றுத்த்தும் பிரிவுகள்</td>
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<td>3.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>4.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>5.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள் (அத்தொடரு) கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>6.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>7.</td>
<td>நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள் (அத்தொடரு) கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>8.</td>
<td>கிளையுடமாக நூற்றாண்டு பெற்றுத்த்தும் கிளையுடமாக நூற்றாண்டு பிரிவுகள்</td>
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<td>தமிழ்நாடு செயலாளர் பந்து முடிக்கும் வகைகள் நிறைந்து அறிக்கை</td>
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<td>9.</td>
<td>அருப்பநிலைப் பார்வையில் மூழ்கும் வகை நிறைந்து அறிக்கை</td>
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<td>அருப்பநிலைப் பார்வையில் மூழ்கும் வகை நிறைந்து அறிக்கை</td>
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<td>11.</td>
<td>தினசரியான பார்வை வழியாயிய விளையாட்டுகள்</td>
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<td>12.</td>
<td>தினசரியில் பார்வையில் அருப்பநிலைப் பார்வையில் விளையாட்டு</td>
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APPENDIX XVI

CONTENT ON VIRTUAL REALITY THERAPY

TOPIC - VIRTUAL REALITY THERAPY

GROUP - SCHIZOPHRENIC CLIENTS

PLACE - DR. PETER FERNANDEZ HOME FOR SCHIZOPHRENIA

DURATION - 4 WEEKS

METHOD OF TEACHING - LECTURE CUM DISCUSSION

MEDIA OF TEACHING - DEMONSTRATION

EDUCATOR - II YEAR MSC (N) STUDENT, APOLLO COLLEGE OF NURSING, CHENNAI
GENERAL OBJECTIVE

The schizophrenic clients will gain adequate knowledge and practical skill on virtual reality therapy to improve the sleep pattern.

SPECIFIC OBJECTIVES:

AT THE END OF THE SESSION STUDY PARTICIPANTS ARE ABLE TO

- Introduce the virtual reality therapy
- Define the virtual reality therapy
- State the uses of virtual reality therapy
- Illustrate the advantages of virtual reality therapy
- justify the need for virtual reality therapy upon insomnia among schizophrenic
<table>
<thead>
<tr>
<th>SPECIFIC OBJECTIVES</th>
<th>CONTENT</th>
<th>LEARNING ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduces virtual reality therapy</td>
<td><strong>Introduction:</strong> Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. Virtual reality has been proposed as a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. This method appears to have several advantages over standard exposure therapy. Virtual is artificial and reality is what we experience. The field of Virtual reality is growing rapidly due to recent advances in artificial intelligence and computer graphics. It has been believed that artificial intelligence can help to improve human health and longevity. Virtual reality was invented by Morton H. Eilig in 1956. Virtual reality was introduced in medicine by Dr. Ralph Larson in the year 1990. He introduced virtual reality in medicine to treat his own fear of height (Acrophobia). At present virtual reality is being used as part of treatment. Prof.V.S.Ramachandran from the university of California is noted for his use of virtual reality and the neuro imaging – mirror neurons.</td>
<td>Lecture cum discussion and Listening</td>
</tr>
<tr>
<td>Define virtual reality therapy</td>
<td>Lecture cum discussion and Listening</td>
<td></td>
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<tr>
<td>--------------------------------</td>
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<tr>
<td><strong>DEFINITION:</strong> Virtual reality is a form of technology which creates computer generated worlds or immersive environment, which people can interact with it. Virtual is artificial and reality is what we experience. So, the term virtual reality basically means “Near Reality” Virtual reality treatment refers to immersive, interactive, multisensory, viewer-centered, sensor, projector viewed theatre environment which can be explored and interacted with by a person. 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. Virtual reality therapy is the simulation of physical presence in the real or imaginary world. Seeing the world through different eyes. Imagine being taken to a place - a virtual reality, Where there's relief from pain. You sleep soundly and your fears and inhibitions are momentarily taken away and the best part is There are no drugs or medication required.</td>
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## AIMS OF VIRTUAL REALITY THERAPY
- To promote and protect peoples help throughout their lives.
- To reduce the incidence of major diseases and injuries and to alleviate the suffering.

## USES OF VIRTUAL REALITY THERAPY;
The virtual reality therapy is often used to help patients face and overcome insomnia. This can be done in a monitored, controlled, sensored, projector viewed theatre environment, tailored to the needs of each individual patient. It permanently registers positive effects in the brain.

Rehabilitative programs for:
- vertigo,
- tinnitus,
- vocal injuries,
- stress,
- headache,
- dementia,
- Parkinson’s disease
- Dementia
- Schizophrenia
- Insomnia,
Illustrate the advantages of virtual reality therapy.

- Sinusitis,
- Vertigo,
- Voice care
- Stuttering,
- Behaviour Problems,
- Contractures.

ADVANTAGES OF VIRTUAL REALITY THERAPY:
- Prevention of chronic diseases
- Distraction of pain
- Improves coping mechanism
- Modulation of the effects of stimuli perceived by the brain

NEED FOR VIRTUAL REALITY THERAPY UPON INSOMNIA AMONG SCHIZOPHRENIC CLIENTS:

SCHIZOPHRENIA: Schizophrenia is a psychotic condition characterized by a disturbance in thinking, emotions, volitions and faculties in the presence of clear consciousness, which usually leads to social withdrawal and insomnia. Insomnia is inevitable nowadays; insomnia affects the physical, mental and social wellbeing of a person. Imagination in this sense, not being limited to the acquisition of exact knowledge by the requirements of practical necessity, is, up to a certain point, free from objective restraints. The ability to imagine...
<table>
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<th>Justify the need for virtual reality therapy upon insomnia among schizophrenic</th>
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<td>one's self in another person's place is very important to social relations and understanding. Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. Makes physical therapy interactive for insomnia &amp; Medical condition.</td>
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<td>A variety of signs and symptoms with insomnia. Some people with insomnia may complain of difficulty falling asleep or waking up frequently during the night. The problem may begin with stress. Then, as you begin to associate the bed with your inability to sleep, the problem may become chronic. Most often daytime symptoms will bring people to seek medical attention. Daytime problems caused by insomnia include the following: Poor concentration and focus Difficulty with memory Impaired motor coordination (being uncoordinated) Irritability and impaired social interaction Motor vehicle accidents because of fatigued, sleep-deprived drivers People may worsen these daytime symptoms by their own attempts to treat the symptoms.</td>
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<td>The virtual reality therapy helps to improve the co-ordination between mind and body. Exercise in reality affects many regions in the</td>
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Demonstrate virtual reality therapy

Virtual reality therapy demonstrates the effects of virtual reality therapy on the nervous system and sets on the pleasure chemicals such as serotonin and dopamine that makes the person feel calm, happy and free. The benefits of virtual reality therapy include stimulation of sleep, improvement in memory, concentration, and motor activity. It also improves sleep during night time.

**VIRTUAL REALITY PLAY STATION** Virtual reality is an artificial environment created by software and projected by capturing the user by sensor. The user will be projected in the screen as a disease-free user. The person suspends the belief of presence of disease and accepts the real environment. When the brain is preoccupied with virtual environment, it does not perceive other stimuli as effective as it otherwise good. This mechanism in turn, greatly lessens the sensation of real disease of the patient. The Virtual Reality replicates real life situation. Even though it may look like a game, but what we are doing is giving a very scientific prescription to rehabilitate yourself. The real-time behaviors motions are captured by the sensor plug into the presentation media for creating rehabilitation applications.

**Game types** 20,000 Leaks plug In 20,000 Leaks, the player's avatar is in a glass cube underwater. The player positions his or her limbs and

| Lecture cum discussion and Listening |

xlvi
Describe the benefits of virtual reality therapy

head to plug cracks as crabs, fish, and bosses such as sharks and swordfish cause cracks and holes in the cube. As difficulty increases, up to five leaks must be plugged at a time to earn Adventure pins. Each game consists of three waves, which end when time expires or when all leaks are plugged. Extra time left over at the end of each wave is added to the Adventure pin total. This game makes the client to think more and motivates interest to gain more points than other clients among them. This makes them to participate actively and attentively in competitive way. Which helps the client to improve their sleep pattern.

**BENEFITS OF VIRTUAL REALITY THERAPY**

- Virtual reality stimulates sleep
- Improve memory
- Improve concentration
- Reduce insomnia
- Improve sleep during night time
- Improve language skills
- Improve creative thought
- Improve cognitive skills
- Improve decision making
- Improves self-esteem
- Lose weight

Lecture cum discussion and Listening
Increases Creative thoughts
- Good Physical Exercises

CONCLUSION
Virtual reality is a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. It stimulates the physical presence in real or imaginary world. More specially designed environments with user friendly atmosphere can be created which allow for broader virtual reality usage in treatment and research.
APPENDIX XVI
DATA CODE SHEET

DEMOGRAPHIC VARIABLES

1. Age In Years
   1.1 20-30 Yrs
   1.2 31-40 Yrs
   1.3 41-50 Yrs
   1.4 >50 Yrs

2. Sex
   2.1 Male
   2.2 Female

3. Educational Status
   3.1 Illiterate
   3.2 Primary Education
   3.3 Secondary Education
   3.4 Higher Secondary Education
   3.5 Graduate and Above

4. Marital Status
   4.1 Married
   4.2 Un Married
   4.3 Widow/Widower
   4.4 Separated/Divorced

5. Monthly Income in Rs.
   5.1 <10,000
   5.2 11,000-15,000
   5.3 16,000-20,000
   5.4 >21,000
   5.5 Not Known

6. Religion
   6.1 Hindu
   6.2 Muslim
   6.3 Christian
CLINICAL VARIABLES

1. Any Medical Illness
   1.1 Diabetes Mellitus
   1.2 Hypertension
   1.3 Arthritis
   1.4 Respiratory Problem
   1.5 Others [Specify]
   1.6 Nil

2. Duration of Medical Illness
   2.1 <1 Year
   2.2 1-5 Year
   2.3 6-10 Years
   2.4 >10 Years
   2.5 Nil

3. Duration of Hospitalization
   3.1 0-1 Yr
   3.2 2-3 Yrs
   3.3 4-5 Yrs
   3.4 > 5 Yrs

4. Received Any Relaxation Training Before
   4.1 Yes
   4.2 No
### APPENDIX XVII
### MASTER CODE SHEET

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