EFFECTIVENESS OF VISUAL IMAGES MNEMONIC TRAINING ON MEMORY AMONG ALZHEIMER'S DISEASE PATIENTS AT ALZHEIMER'S AND RELATED DISORDERS SOCIETY OF INDIA, COCHIN, KERALA.

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF AWARD OF

MASTER OF SCIENCE IN NURSING

PSYCHIATRIC NURSING

BY

30109041

DHANVANTRI COLLEGE OF NURSING

Ganapathypuram, No: 1 Ranganoor Road,

Pallakapalayam (PO), Namakkal (Dt)-6737303.

APRIL – 2012

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BY

30109041

Research advisor: _____

Professor. A. Arvin Babu, M.Sc (N), Ph.D (N),
Principal,
Dhanvantri College of Nursing,
Pallakkapalayam (PO), Namakkal (Dt).

Clinical speciality advisor: _____

Professor. A. Arvin Babu, M.Sc (N), Ph.D (N),
HOD, Psychiatric Nursing,
Dhanvantri College of Nursing,
Pallakkapalayam (PO), Namakkal (Dt).

A dissertation submitted in partial fulfillment of the requirement for the Degree of Master of Science in Nursing from The Tamilnadu Dr. M.G.R Medical University, Chennai.

APRIL – 2012

CERTIFIED THAT THIS IS THE BONAFIED WORK OF

30109041

AT DHANVANTRI COLLEGE OF NURSING

A DESSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI.

EXAMINERS,

1. ……..

2. ……..

Appendix-IV

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the tool of **Mr. Basil V. Kuriakose** II year M.Sc. Nursing student of Dhanvantri College of Nursing, Pallakapalayam Namakkal (Dt), who is undertaking the dissertation work on **"Effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients at Alzheimer's And Related Disorders Society of India Cochin, Kerala".**

Signature of the Expert

Place:

Data:

Name & designation

APPENDIX-V

INFORMED CONSENT

Namaskkaram, I am 30109041 M.sc (N) II year student, studying in Dhanvantri College of Nursing, Pallakapalayam. As a part of my curriculum, I need to do the dissertation. From this study I will not harm you. Whatever information collected that should be in confidential. So I request you to kindly co-operate with me.

Section A: Include selected Demographic variables.

Section B: Visual Mnemonic Rating Scale-Alzheimer's Disease (VMRS-AD)

APPENDIX-VI

TOOLS FOR RESEARCH

SECTION- A

DEMOGRAPHIC DATA

It consists of characteristics of Alzheimer's disease patient such as

1. Age in years

   a. 55-60yr

   b. 61-66yr

   c. 67-72yr

   d. Above 72

2. Gender

   a. Male

   b. Female

3. Family history of dementia

   a. Yes

   b. No

4. History of illness

    a. >1 yr

    b. 1-2 yr

    c. 2-3 yr

    d. 3-4 yr

5. H/o medications

    a. Yes

    b. No

SECTION- B: VISUAL MNEMONIC RATING SCALE –ALZHEIMER'S DISEASE (VMRS-AD)

Structured observation rating scale consist of 15 items and each item projected to Alzheimer's disease patient in the form of pictures this tool is rates the level of memory through these researchers observation.

Significant Photos	**Immediate response (4)**	**Delayed response (15-59seconds) (3)**	**Confused response (2)**	**No response (1)**
Eye				
Ear				
Nose				
Mouth				
Hands				
Legs				
Tooth brush and tooth paste				
Wash basin				
Bathroom				
Toilet				
Phone number				
Address				
House name				
post office				
Taluk				
District				

Scoring procedure of memory based on the percentage of scores

Mild memory disturbance	41-60
Moderate memory disturbance	21-40
Severe memory disturbance	1-20

APPENDIX-VII

VISUAL IMAGES MNEMONIC TRAINING

INTRODUCTION

The use of visual and other sensory imagery is the foundation of all memory. We remember new information by associating it with information we already know and can recall. If that information is in the form of concrete imagery it is remembered almost automatically. Ninety percent of all memory tasks consist of tying one bit of information to or with another bit of information (a fact and its referent). This could be a name and a face, an historical event and a date, a word and its meaning, etc. Visual mnemonics are a type of mnemonic that work by associating an image with characters or objects whose name sounds like the item that has to be memorized. This treatment is helpful for remembering the past experience in an interesting way with less strain

GOAL

The goal is to improve the level of memory among Alzheimer's disease patients.

PROCEDURE

Visual images mnemonic training refers to repeated visual representation of related subjects such as figures of Body parts, Address, and significant places which are displayed in the chart for the duration of 30-40 minutes per day for 10 days.

NURSES RESPONSIBILITY

Assess the level of memory disturbance in the Alzheimer's disease patients.

Assess the interest of the patient towards visual images mnemonic training.

Arrange proper environment for teaching and learning.

Record the procedure in the nurse's record.

APPENDIX – VIII

LIST OF EXPERTS

1. Mr.ANANDKUMAR, MBBS, DPM

Psychiatrist

Government head quarters hospital, Erode.

2. Mrs. MEERA SARAVANAN M.sc (N)

Professor,

PSG College (Nursing),

Coimbatore.

3. Mrs. PRATHIBHA M.A, M.S, M.Phil,

Psychologist.

4. Mr. N. SENTHIL KUMAR, MA (psychology)

Clinical psychologist,

Government head quarters hospital, Erode.

5. Mr.DHANAPAL,

Statistician,

Dhanvantri College of Nursing, Pallakkapalayam, Namakkal.(Dt.)

APPENDIX –IX

PHOTOGRAPHS

Photograph showing visual images mnemonic training application by the investigator

ABSTRACT

- **Background:** Alzheimer’s disease is usually gradual, and it is slowly progressive. Problems of memory, particularly for recent events (short-term memory) are common early in the course of Alzheimer's disease. Visual images mnemonic training is helpful for remembering the past experience in an interesting way with less strain. **Objectives:** To assess the effectiveness of visual images mnemonic training on memory among Alzheimer’s disease patients. **Design:** pre experimental design where one group pretest and post test design. **Setting:** Alzheimer’s And Related Disorders Society of India (ARDSI) Cochin, Kerala **Sample size:** 30 Alzheimer’s disease patients **sampling technique:** Purposive sampling technique. **Methods:** 30 Alzheimer’s disease patients receive visual images mnemonic training with the duration of 30 -40 minutes for 10 days. Pre test was done by using visual images mnemonic rating scale - Alzheimer’s disease for memory assessment .Post test was done by immediately from the first day after the visual images mnemonic training, followed that every day before and after visual images mnemonic training posttest was conducted for 10 days. Mean value of 19 post test score were considered as one post test value. **Results:** From the findings of the study it can be concluded that Highest were in the age group of 66-72 years, were females,

had family history of dementia, in between 2-3 years duration of illness and history of dementia. The paired‘t’ values was10, when it was high. The difference in the mean percentage was 11%. It seems the visual images mnemonic training on memory among Alzheimer’s disease patients was effective. Chi-square value shows no significant association between demographic variables and post score of memory among Alzheimer’s disease patients. **Conclusion**. The visual images mnemonic training was effective on memory among Alzheimer’s disease patients. But mild difference in effectiveness was found in address when compare to body parts and significant places.

ACKNOWLEDGEMENT

Thank you for being there when I needed you the most

Thank you for helping me through all those tough times in life

Completing any work is never been a one man show, because it is a team work. The victory of this study would not have been attained without the help, guidance and contribution of the teachers, friends, well wishers and others. I wish to thank them all.

I praise and thank **God Almighty** for his blessings, grace and mercy throughout the study.

I dedicate this work to my lovely **Father, Mother** and my lovable **Sister, Brother-in-law,** who wanted me to shine as a star in every aspect.

I immensely grateful to **Prof. Dr. N. Ganapathy, MBBS. MD, DA, FCCP, DCCM (Cardio), MCAM.** Chairman of Dhanvantri College of Nursing, Pallakapalayam, who made me what I am now, who has given inspiration, amenable constant and tremendous encouragement.

One looks back with appreciation to the brilliant teacher, but with gratitude to those who touched our human feelings. It is my privilege to owe my sincere thanks to **Prof. Mr. A. Arvinbabu** M.Sc (N), Ph.D (N), Principal and HOD,

psychiatric Nursing, Dhanvantri College of Nursing, for his goodness, support and valuable guidance to render this study.

It gives great pleasure to thank with deep sense of gratitude and respect to **Mrs. Padmavathi Msc Nursing** Ph.D (N), **Associate professor,** Dhanvantri College of Nursing, Pallakapalayam for her inspiration, guidance, encouragements and for showing personal interest and sincerity to move this study in a successful way.

I extended my thanks to teaching staff in my department **Ms.Sampoornam, M.sc.(N), Lecturer Dhanvantri College of Nursing**, for her valuable contributions, guidance, time-to-time suggestions and crystallized the study.

Investigator owe her sincere thanks to her teaching mentors **Mrs. Jayadeepa, Associate Professors, and Mrs. Amudha Associate professsor** for their guidance, encouragement and support to completion of this study inspite of their busy schedule.

I deeply indebted and grateful to **Prof . Dhanapal, statistician** who had given me this knowledge over statistics without whom this project is not possible.

I immensely grateful and express my thanks to the panel of experts namely**, Mr.N Senthilkumar, M.A, (PSYCHOLOGY) Mrs Pratibha (PSYCHOLOGY), Mr.Anandkumar MBBS Psychiatrist, Mrs.Meera**

Saravanan Msc, (Nursing) Mental health Nursing, Mr. Dhanapal for their valuable suggestions and guidance of validating the tool for this research.

.I wish to extend my gratitude and thanks to librarians **Mrs. Radha , Ms. Vimala** Dhanvantri College of Nursing , Pallakapalayam for their kind co-orporation and support for the completion of the study.

I extend my sincere thanks to all **Teaching and Non Teaching** staffs of Dhanvantri College of Nursing for their co-operation and valuable contribution.

I extend my sincere thanks to **Mr. Babu Varghese Project officer** and all staffs of ARDSI COCHIN, KERALA.

I am greatly gratitude to **MR.SENTHILKUMAR (D. Nsg) (STAFF NURSE), MRS. KAVITHA (social worker),** for their valuable support.

I convey my heart full gratitude to **Circle of Friends** for their constant help and encouragement.

May lord abundantly bless each and every one of their who helped me directly and indirectly.

I am indebted to all the Alzheimer's disease patients who participated in this study without their help and co-operation.

Above all my success to the **Lord Almighty**

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CHAPTER-I

INTRODUCTION

"Memory is a way of holding on to the things you love, the things you are, and the things you never want to lose."

Old age is the most unexpected of all the things that can happen to a man, (**Leon Trotsky, 2008).**

Ageing is a journey or maturation or odyssey the process of ageing classically depicted as one of the constant and inexorable decline often reaching a peak of bodily function efficiency around the end of second decade of life. Ageing is an important part of all human societies reflecting the biological changes that occur, but also reflecting cultural and societal conventions, (**Linda, 2005).**

In India it has been reported that at present there are 77 million elderly person and the number is expected to be 177 million in the next two and half decades. An increasing number of older persons are falling prey to geriatric diseases such as rheumatism, arthritis, osteoporosis, dementia, cardiac complications and mental depression, (**Soneja, 2002).**

India was home to more than 75 million people older than sixty years in 2001. This age group, which was 7.5% of the population, is expected to grow

dramatically in the coming decades. Analysis of the census data shows marked variations in the rate of demographic aging within India ranging from 10.5% in Kerala to 4% in Dadra and Nagar Haveli. Other regions with elderly population above 8% include Himachal Pradesh(9%),Punjab (9%),Maharashtra (8.7%), Tamil Nadu (8.8%), Orissa (8.3%), Goa (8.3%), and Pondicherry (8.3%). The demand for services will soon be evident in such places and will make the task of meeting the needs for the older people more challenging and urgent there is a growing realization that the care of older people with disabilities makes enormous demands on their careers. Terms like dementia and Alzheimer's disease are now better understood**, (ARDSI, 2001).**

Population of elderly persons is growing at a faster rate due to the demographic transition that is occurring in India, particularly in Kerala. The number of elderly was about 56 million in 1991. The projected figures for the years 2003 and 2025 are 70 million and 177 million respectively. Kerala is one of the states in which the demographic transition is most marked. The elderly population is growing at about two times faster than the total population. It has reached 3 million (9.5 %) by 2001.The review of the literature of studies done in the field of dementia care services revealed a variety of factors on the prevalence

of the Dementia and services availed by the population of Cochin Corporation, (**Shaji P, 2001).**

Dementia is defined as a syndrome of acquired, persistent intellectual impairment with compromised function in multiple spheres of mental activity, such as memory, language, visuospatial skills, emotion or personality and cognition, (**Wise&Gray, 1994).**

The estimated global dementia prevalence in people aged over 60 is approximate 3.9% with regional prevalence being 1.6% in Africa, 3.9% in Eastern Europe, 4.0% in China, 4.6% in Latin America, 5.4% in Western Europe, and 6.4% in North America, (**Ziegler-Graham 2008).**

According to WHO report 0.379% of people worldwide had dementia, and that the prevalence would increase to 0.441% in 2015 and to 0.556% in 2030. Another study estimated that in 2006, 0.40% of the world population (range 0.17–0.89%; absolute number 26.6 million, range 11.4–59.4 million) were afflicted by AD, and that the prevalence rate would triple and the absolute number would quadruple by 2050, **(WHO 2005).**

An estimated four million people nationwide have been diagnosed with AD. Alzheimer's disease is most common in individuals who are over 65; however, it can also occur in people much younger. The incidence of dementia increases rapidly beyond age 65. In 1998, the percentage of

older persons with moderate or severe memory impairment ranged from about 4 percent among people aged 65-69 to about 36 percent among people aged 85 or older. AD is the ninth leading cause of death among those aged 65 and older. Cost for an individual with AD is estimated at $174,000, **(Alzheimer's Association, 2001).**

The Alzheimer's disease (AD) has been fueled by the increased prevalence of AD in our aging population: AD currently affects approximately 10% of the population aged 65 years and older (four million people) and almost 50% of the people aged 85 and older. For persons with AD who receive at-home care, the mean cost of care provided by outside caregivers is about $12,500 per year; and the mean cost of care is $42,000 for persons with AD who live in nursing homes. Overall, approximately $100 billion per year is spent in the United States for care of persons with AD, **(Johonson B, 2000).**

The United Nations estimate that the number of people suffering from age-related neuro degeneration, particularly from AD, will exponentially increase from 25.5 million in 2000 to an estimated 114 million in 2050. The global annual incidence of dementia is estimated to be around 7.5 per 1000 population. The risk of AD grows exponentially with age, doubling approximately every 5–6 years. The largest increase in absolute numbers of old persons will occur in developing countries; it almost triples from 249 million in 2000 to an estimated 690 million in 2030. The developing regions' share of the worldwide aging population will

increase from 59 to 71%. Most people with dementia live in developing countries (60% in 2001). Rates of increase are not uniform; numbers in developed countries are estimated to double between 2001 and 2040, but by more than 300% in India, China, and their south Asian and western Pacific neighbors. The global trend in the phenomenon of population aging has dramatic consequences for public health, healthcare financing, and delivery systems in the word and, especially in developing countries, **(Qiu et. Al;2007).**

The cause(s) of Alzheimer's disease is (are) not known. The strongest data supporting the amyloid cascade hypothesis comes from the study of early-onset inherited (genetic) Alzheimer's disease. Mutations associated with Alzheimer's disease have been found in about half of the patients with early-onset disease. The mutation leads to excess production in the brain of a specific form of a small protein fragment called ABeta (Aβ). Alzheimer's disease include high blood pressure (hypertension), coronary artery disease, diabetes, and possibly elevated blood cholesterol. Individuals who have completed less than eight years of education also have an increased risk for Alzheimer's disease. All patients with Down syndrome will develop the brain changes of Alzheimer's disease by 40 years of age, **(Jay W Marks, 2011).**

The main risk factor for Alzheimer's disease is increased age. As a population ages, the frequency of Alzheimer's disease continues to increase. Ten percent of people over 65 years of age and 50% of those over 85 years of age have

Alzheimer's disease. Unless new treatments are developed to decrease the likelihood of developing Alzheimer's disease, the number of individuals with Alzheimer's disease in the United States is expected to be 14 million by the year 2050, (**Mary .W, 2001).**

There are also genetic risk factors for Alzheimer's disease. Most patients develop Alzheimer's disease after age 70. However, 2%-5% of patients develop the disease in the fourth or fifth decade of life (40s or 50s). At least half of these early onset patients have inherited gene mutations associated with their Alzheimer's disease. Moreover, the children of a patient with early onset Alzheimer's disease who has one of these gene mutations has a 50% risk of developing Alzheimer's disease, (**Wilson R, 2000).**

Memory problems occurring in Alzheimer's disease like frequent word finding pauses, substitutions, gets lost in familiar places and takes excessive time o return home ,notable decline in memory for recent events and ability to converse ,loss of interest in social activities may behave in socially inappropriate ways, **(Robert D, 2007).**

The symptoms of Alzheimer's disease are usually gradual, and it is slowly progressive. Problems of memory, particularly for recent events (short-term memory) are common early in the course of Alzheimer's disease. Mild personality changes, such as less spontaneity, apathy, and a tendency to withdraw from social

interactions, may occur early in the illness. As the disease progresses, problems in abstract thinking and in other intellectual functions develop. The person may begin to have trouble with figures when working on bills, with understanding what is being read, or with organizing the day's work. Further disturbances in behavior and appearance may also be seen at this point, such as agitation, irritability, quarrelsomeness, and a diminishing ability to dress appropriately. Eventually, patients may wander, be unable to engage in conversation, erratic in mood, uncooperative, and lose bladder and bowel control. In late stages of the disease, persons may become totally incapable of caring for themselves, **(Sharon M. Arkin, 2000).**

The common symptoms of Alzheimer's disease warning signs are, Memory loss, Difficulty performing familiar tasks ,Problems with language ,Disorientation to time and place, Poor or decreased judgment, Problems with abstract thinking ,Misplacing things ,Changes in mood or behavior ,Changes in personality ,Loss of initiative**, (Belleza F.S, 1999).**

AD patients might make better use of external memory aids if they were systematically taught how to use them. For maximum impact on activities of daily living, memory training for AD patients should emphasize prospective memory skills, that is, remembering to do things in the future**, (The American Journal of Alzheimer's Care and Related Disorders & Research, 2003)**

The use of visual and other sensory imagery is the foundation of all memory. We remember new information by associating it with information we already know and can recall. If that information is in the form of concrete imagery it is remembered almost automatically. Ninety percent of all memory tasks consist of tying one bit of information to or with another bit of information (a fact and its referent). This could be a name and a face, an historical event and a date, a word and its meaning, etc. After forming pictures to represent these abstracts we must tie them together so they can be recalled, (**Dr.MilesR.Jones,1986).**

Visual mnemonics are a type of mnemonic that work by associating an image with characters or objects whose name sounds like the item that has to be memorized. This treatment is helpful for remembering the past experience in an interesting way with less strain, (**Dennis R, 2000).**

NEED FOR STUDY

Gerontology the study of ageing has become new field of specialization. Gerontologists divide the aged into 3 groups. The young old (60-70years), old (75-85years) and very old individuals (85 and above), (**Robert N Buttler, 2002).**

The graying population is one of the most significant characteristics of the 20^{th} century and the first quarter of the 21^{st} century known as the “age of ageing “. Along with the world population , Indian elderly are also ageing in old age ageing

is a lifelong activity – from birth we grow older through infancy to childhood to adolescence to adulthood and onwards. The term ‘old’ is often associated with alteration in individuals biological, psychological and health capabilities and changes in social roles. People aged 60 years and over are also considered as person in the “third age**”, (Mohan Pai, 2002).**

“India is home to over 76.6 million people over the age of 60. According to data available with the health ministry the country has 76,622,321 persons aged 60 and above with nearly 14 percent of the elderly population Uttar Pradesh tops the chart with 11.6 million elderly. Maharashtra follows with 8.45million senior citizens. West Bengal has 5.7 million; Bihar and Tamil Nadu have 5.5 million senior citizens each. Delhi is home to 719,650 citizens above the age of 60. At the other end of the spectrum are places like Lakshadweep (3,729), Daman and Diu, Pondicherry and Dadre and Nagar Haveli with about 8,000 elderly each, (**Indian health news, 2007).**

In the last decades 20th century expectancy has increased by 20 years to the present average of 66years. During the same period, the ratio of the world population of citizens over 60 years of age has changed from 1 among 5, the current global population of senior citizens is 580million, around 60 percent, reside in the developing countries. By 2020, the world is expected to have around 1 billion senior citizens. In India, life expectancy of an average citizen was just 23 years in 1901, which could only add 9 year till in1951 to become 32 years. In

1981, the average normal life expectancy reached 52 years, which went up to 62 years in 1996.by the year 2020, life expectancy of the country is poised to reach 70 years. At present we have a population of around 77 million senior citizens, (**Kamal nishanth, 2009**).

Population of elderly persons is growing at a faster rate due to the demographic transition that is occurring in India, particularly in Kerala. The number of elderly was about 56 million in 1991. The projected figures for the years 2003 and 2025 are 70 million and 177 million respectively. Kerala is one of the states in which the demographic transition is most marked. The elderly population is growing at about two times faster than the total population. It has reached 3 million (9.5 %) by 2001, (**Dr. Shaji, 2007).**

Worldwide elderly people led the world health organization list of new cases of mental illness compared to 93 per 10,000 suffer from mental illness compared to 93 per 10,000 for those aged 45-64 in the next younger group, **(WHO, 2005).**

(Kawas.C, 2007), conducted the study on "estimate age-specific incidence rates of AD in the Baltimore Longitudinal Study of Aging (BLSA)". Subjects are 1236 participants (802 men, 434 women) in the BLSA with longitudinal follow-up between January 1985 and May 1998. The authors diagnosed 155 cases of dementia, of which 114 (74%) were AD. Incidence rates of AD increased with age from an estimated 0.08% per year (95% CI 0.00 to 0.43) in the 60 to 65 age group

to an estimated 6.48% per year (95% CI 5.01 to 8.38) in the 85+ age group for men and women combined. The doubling time of incidence rates was estimated to be approximately 4.4 years and the median time of conversion from mild cognitive impairment to diagnosis of AD was estimated to be 4.4 years. There was a trend for women to have higher incidence rates than men and for fewer years of education to be associated with higher incidence rates; however, these effects were not significant.

Estimates from 2005 suggest a global dementia prevalence of 24.3 million, with 4.6 million new cases of dementia every year. The number of people affected will double every 20 years to 81.1 million by 2040 Developing countries like India, China will be among the countries worst hit by Alzheimer's disease in the next decade, according to global experts "It is estimated that there are currently about 18 million people worldwide with Alzheimer's disease,". "In India, prevalence of dementia is 33.6 per 1000 Alzheimer's disease was the most common type (54 per cent), followed by vascular dementia (39 per cent) The percentage of 60+ persons in the total population has seen a steady rise from 5.1 percent in 1901 to 6.8 per cent in 1991. It is expected to reach 8.9 per cent in 2016. Projections beyond 2016**, (Dr.Sailesh Mishra, 2007).**

In 2006 the worldwide prevalence of Alzheimer's disease was 26.6 million. By 2050, prevalence will quadruple by which time 1 in 85 persons worldwide will be living with the disease. We estimate about 43% of prevalent cases need a high

level of care equivalent to that of a nursing home. If interventions could delay both disease onset and progression by a modest 1 year, there would be nearly 9.2 million fewer cases of disease in 2050 with nearly all the decline attributable to decreases in persons needing high level of care, (**Elizabeth Johnson, 2007**).

Women have a higher risk of becoming mentally frail and/or developing dementia than men, especially at very old ages In 2006, there were 26.6 million cases of Alzheimer's disease in the world (range 11.4-59.4). We predict that by the year 2050 the worldwide prevalence of Alzheimer's will grow fourfold to 106.8 million (range 47.2-221.2).Shows the geographic distribution of the burden of disease. We estimate that 48% of the worldwide cases are in Asia and that percentage will grow to 59% by 2050. The prevalence rates at ages 65, 75 and 85 were 0.9%, 4.2% and 14.7% respectively the age-specific prevalence rate by stage of disease from which one can calculate the percent of cases with late stage disease. Overall, we estimate about 11.6 (43%) of the 26.6 million worldwide cases living today have late stage disease shows the growth in the prevalence of Alzheimer's disease cases through 2050 by stage of disease and by gender. We estimate that about 62% of worldwide cases are female reflecting the lower background mortality rates among women, **(Roberson E, Mucke L, 2006).**

India is estimated to have 59.7 million elderly people (65+ years in age) in the year 2010, rising to 86.5 million in 2020 and 124.5 million in 2030 (World Population Prospects: Population database, The 2008 Revision: United Nations

Population Division) Aging is the main risk factor for dementia and thus the number of elderly people suffering from dementia in India will rise in tandem with rising elderly population. Initial epidemiological studies in India suggested low estimates for the prevalence of dementia and Alzheimer's disease (AD), with some showing about one-third of the prevalence .compared to the United States and other developed countries, (**Alzheimer's Disease International, 2009).**

In studies conducted in rural and urban communities in Tamil Nadu, a neighboring state to Kerala, vascular dementia constituted 27% and 26% respectively of the total dementia cases. It has been observed that there is a regional variation in the relative proportion of Alzheimer's disease and vascular dementia. The relative proportion of Alzheimer's disease in the Indian studies ranged from 41% to 65% and the proportion of vascular dementia ranged from 22% to 58%, (**Rajkumar M, 2001**).

There was high incidence of dementia in Chalakudy with 6 per cent, while in most other places the numbers indicated around 3 per cent. It was also found that more women were affected by dementia, he said. A similar study was done around two years ago in some of the wards of the Kochi Corporation area, which had revealed a similar conclusion. At that time, it was found that 53 per cent of dementia cases were because of Alzheimer's disease, (**Dr. Shaji, 2007).**

People with Mild Cognitive Impairment (MCI) appear to develop Alzheimer's disease (AD) at a rate of 10-15% a year. Difficulty with self-care

usually develops over time. For example, without help, some people with dementia may not pay much attention to personal hygiene .Since most new treatments for dementia focus upon slowing the progression of AD, it is critical to test with a screen in primary care at an early stage for the markers of future cognitive decline & the need for intensive diagnostic evaluation, (**Jane B. Tornatore, 2006).**

Cognitive intervention (CI) could even reverse the progress of AD. The general conclusion from the recent studies was that mild AD patients could learn new information and maintain it for a considerable time and that CI should be designed for specific type of memory problems, should not produce memory load to the patients, and provide the appropriate cues for both encoding and recall processes, (**Bäckman, 1996).**

A meta analysis study of cognitive training programs in Alzheimer's disease indicates medium effect sizes for learning, memory, executive functioning, activities of daily living, general cognitive problems, though small effects in visual learning and motor speed , **(Sitzer, 2006).**

(Sagar et. Al; 2006), Examined remote memory in patients with mild to moderateAD, using recall and recognition tests of public events. They found a gradient of deficits in the recall of past public events (remote events being less affected than recent events), and the severity of the memory deficit was related to the severity of dementia

(**Belleza F.S, 2010),** reported that the Ten warning signs of Alzheimer's disease are Memory loss, Difficulty performing familiar tasks , Problems with language , Disorientation to time and place, Poor or decreased judgment , Problems with abstract thinking, Misplacing things, Changes in mood or behavior, Changes in personality and Loss of initiative

(Ben Schmand W, 2004), Association between Memory Complaints and Incident Alzheimer's Disease in Elderly People With Normal Baseline Cognition In the community-based Amsterdam Study of the Elderly, a sample of 3,778 non demented persons, 65 to 84 years old, was selected and divided into two cognitive categories: normal (Mini-Mental State scores of 26–30) and borderline and impaired (Mini-Mental State scores less than 26). At baseline, the presence or absence of memory complaints was assessed. At follow-up, incident cases of Alzheimer's disease were diagnosed in a two-step procedure. After an average of 3.2 years, 2,169 persons were reevaluated, of whom 77 had incident Alzheimer's disease. Multivariate logistic regression analyses showed that memory complaints were associated with incident Alzheimer's disease in subjects with normal baseline cognition but not in subjects with impaired baseline cognition. The findings of this study suggest that memory complaints are a relatively strong

predictor of incident Alzheimer's disease in older persons in whom cognitive impairment is not yet apparent.

(**McCarty D, 2007)**, Two studies were conducted on a face--name mnemonic containing several components: a prominent facial feature; a concrete, high imagery transformation of the person's name (e.g., "Bryant" became "bride ant"); and an interactive visual image of these two components. In the first experiment subjects were given one of six strategies for learning face--name associations; the strategies differed with respect to which of the three or combination of the three components were incorporated. Results indicated that all three components of the face--name mnemonic were essential for its effectiveness. The second experiment showed that the cue effectiveness of a facial feature decreased with the frequency of its usage and varied directly with the feature's distinctiveness among all faces in the list.

Two experiments were conducted to determine the efficacy of visual imagery as a memory aid for Alzheimer's disease patients. The first experiment showed Alzheimer's disease patients to have equally poor memory for both visual as well as verbal material. Verbal cues presented to aid both learning and retrieval efforts proved to have some beneficial effects on the memory of the Alzheimer's disease patients. The second experiment showed that, when provided with both a visual prompt that is similar to the to-be-remembered material, as well as a verbal cue to direct learning and retrieval processes, Alzheimer's patients' recognition and

memory approached that of healthy older adults. It was suggested that contextual cues to guide and restrict processing during both learning and retrieval efforts may be used to improve the memory of healthy older adults as well as patients with Alzheimer's disease**, (Mark Byrd**, **2001).**

Three studies used visual imagery—based mnemonic techniques as memory stimulation programs in dementia. The study involved 14 patients with AD in a didactic visual-imagery training group, 11 patients with AD in a problem-solving group, and 10 patients with AD in a waiting-list control group. The patients were randomly assigned to the treatment and waiting-list control groups. The training was carried out in dyads, in seven 90-minute sessions. The visual imagery tasks consisted of forming mental images of words that subjects had to remember. The problem-solving tasks consisted of learning how to take practical steps to manage day-to-day problems caused by the memory loss. Recall and recognition tasks of 15 items were used to assess memory at baseline and at the end of the training sessions, along with the Memory and Behavior Problems Checklist, to assess the impact of the training on everyday functioning capacity, **(Zarit et. al;2003).**

AD is the most common form of dementia, accounting for over 50% of all dementia and affecting more than 26 million people worldwide. Since the 1980s, the pace of research into the nature of AD has greatly accelerated, and investigators currently believe that it will become possible to treat or prevent AD,

which is a major socioeconomic concern in all developed countries of the world. Mild cognitive impairment (MCI) is a relatively recent term used to describe people who have some memory problems, but do not actually have dementia. It remains widely used technique for the treatment of memory impairment in Alzheimer's disease patients. So the investigator felt a need for conducting a study to assess the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients at ARDSI Cochin Kerala".

STATEMENT OF PROBLEM

"Effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients at Alzheimer's And Related Disorders Society of India Cochin, Kerala"

OBJECTIVES

- To assess the level of memory among Alzheimer's disease patients before and after visual images mnemonic training.
- To determine the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients.
- To find out the association between post test scores on memory among Alzheimer's disease patients with their selected demographic variables.

OPERATIONAL DEFINITIONS

Effectiveness

It refers to improvement in memory among Alzheimer's disease patient as determined by significant difference in pre and post test scores.

Visual images mnemonics training

It refers to repeated visual representation of related subjects such as figures of body parts, photos, phone numbers and letters, and significant places which are displayed in the chart for the duration of 30-40 minutes per day for 10 days.

Memory

It refers to ability of Alzheimer's disease patients ability to perceive, remember, recollect and respond to the immediate experience of the visual representation

Alzheimer's disease patient

Patient with mild and moderate level of memory impairment

HYPOTHESES

H_1: There is a significant difference in memory among Alzheimer's disease patients before and after visual images mnemonic training

H_2: There is a significant effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients

H_3: There is a significant association between post test memory scores among Alzheimer's disease patients with their selected demographic variables.

DELIMITATION

The study was delimited to,

- Assess the effectiveness of visual images mnemonic training
- Mild and moderate level of memory
- Alzheimer's disease patients
- Alzheimer's disease patients at Alzheimer's And Related Disorders Society of India, COCHIN,KERALA

CONCEPTUAL FRAMEWORK

This study is based on Jean Watson's Philosophy and science of caring (1979) which could be relevant to the effectiveness of Visual images mnemonic training on memory among Alzheimer's disease patients. Jean Watson's Philosophy of Nursing model focuses on the **ten primary curative factors**.

According to Jean Watson's Philosophy and science of caring model the client to be a valued person in and of him or herself to be cared for, respected, nurtured, understood and assisted. In this study the person is the Alzheimer's disease patient. The basic core structure is improving memory.

1. The formation of a humanistic- altruistic system of values

Begins developmentally at an early age with values shared with the parents. Mediated through one's own life experiences, the learning one gains and exposure to the humanities. Is perceived as necessary to the nurse's own maturation which then promotes altruistic behavior towards others.

2. Faith-hope

Is essential to both the curative and the curative processes. When modern science has nothing further to offer the person, the nurse can continue to use faith-hope to provide a sense of well-being through beliefs which are meaningful to the individual.

3. Cultivation of sensitivity to one's self and to others

Explores the need of the nurse to begin to feel an emotion as it presents itself. Development of one's own feeling is needed to interact genuinely and sensitively with others. Striving to become sensitive, makes the nurse more authentic, which encourages self-growth and self-actualization, in both the nurse and those with whom the nurse interacts. The nurses promote health and higher level functioning only when they form person to person relationship.

4. Establishing a helping-trust relationship

Strongest tool is the mode of communication, which establishes rapport and caring.Characteristics needed to in the helping-trust relationship are:Congruence,Empathy,Warmth.Communication includes verbal, nonverbal and listening in a manner which connotes empathetic understanding.

In this study researcher made a helping trust relationship with the Alzheimer's disease patients for improving memory by using visual images mnemonic training.

5. The expression of feelings, both positive and negative

"Feelings alter thoughts and behavior, and they need to be considered and allowed for in a caring relationship". Awareness of the feelings helps to understand the behavior it engenders.

6. The systematic use of the scientific problem-solving method for decision making

The scientific problem- solving method is the only method that allows for control and prediction, and that permits self-correction. The science of caring should not be always neutral and objective.

7.Promotion of interpersonal teaching-learning

The caring nurse must focus on the learning process as much as the teaching process. Understanding the person's perception of the situation assist the nurse to prepare a cognitive plan.

In this study the researcher implemented the visual images mnemonic training on memory among Alzheimer's disease patients with the duration of 30 -40 minutes for 10 days. Expected outcomes are immediate and delayed responses, unexpected outcomes are confused and no responses.

8. Provision for a supportive, protective and /or corrective mental, physical, socio-cultural and spiritual environment

Watson divides these into external and internal variables, which the nurse manipulates in order to provide support and protection for the person's mental and physical well-being. The external and internal environments are

interdependent.Nurse must provide comfort, privacy and safety as a part of this carative factor.

9. Assistance with the gratification of human needs

It is based on a hierarchy of need similar to that of the Maslow's. Each need is equally important for quality nursing care and the promotion of optimal health.

All the needs deserve to be attended to and valued.

Watson's ordering of needs

Lower order needs (biophysical needs)

- The need for food and fluid
- The need for elimination
- The need for ventilation

Lower order needs (psychophysical needs)

- The need for activity-inactivity
- The need for sexuality

Higher order needs (psychosocial needs)

- The need for achievement
- The need for affiliation

- Higher order need (intrapersonal-interpersonal need)
- The need for self-actualization

10. Allowance for existential-phenomenological forces

Phenomenology is a way of understanding people from the way things appear to them, from their frame of reference. Existential psychology is the study of human existence using phenomenological analysis. This factor helps the nurse to reconcile and mediate the incongruity of viewing the person holistically while at the same time attending to the hierarchical ordering of needs. Thus the nurse assists the person to find the strength or courage to confront life or death.

CHAPTER-II

REVIEW OF LITERATURE

The review of literature is a broad, comprehensive, in depth, systematic and critical review of scholarly publication, unpublished scholarly print materials, and audiovisual materials and personal communication, **(Polit and hungler, 2005).**

A review of literature is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection, critical analysis and written description of existing information on a topic, **(Polit and hungler, 2003).**

The review of literature in this study is organized and divided into four under the following headings.

1. Studies related to visual images mnemonic training on memory.
2. Studies related to memory among Alzheimer's disease
3. Studies related to alternative therapies on memory Alzheimer's disease
4. Studies related to visual images mnemonic training on memory among Alzheimer's disease

1. STUDIES RELATED TO VISUAL IMAGES MNEMONIC TRAINING ON MEMORY

Pot vinmj (2011), Conducted a prospective study to investigate the PM rehabilitation programme based on visual imagery techniques expected to strengthen the cue-action association was developed. Ten moderate to severe chronic TBI patients learned to create a mental image representing the association between a prospective cue and an intended action within progressively more complex and naturalistic PM tasks. We hypothesized that compared to TBI patients (n□=□20) who received a short session of education (control condition), TBI patients in the rehabilitation group would exhibit a greater improvement on the event-based than on the time-based condition of a PM ecological task. Revealed of this programme was similarly beneficial for both conditions. TBI patients in the rehabilitation group and their relatives also reported less everyday PM failures following the programme, which suggests generalisation. The PM improvement appears to be specific since results on cognitive control tasks remained similar. Visual imagery techniques appear to improve PM functioning by strengthening the memory trace of the intentions and inducing an automatic recall of the intention.

Jerome A. Y(2009), Conducted a study to investigate the impact of pretraining on the long-term effect of an imagery-based mnemonic in persons with age-associated memory impairment (AAMI). Eighty-two participants were

randomly assigned to one of six groups: (1) verbal judgment pretraining plus mnemonic training, (2) visual imagery elaboration pretraining plus mnemonic training, (3) relaxation pretraining plus mnemonic training, (4) nonspecific pretraining plus mnemonic training, (5) nonspecific training, and (6) wait list. Participants receiving the three specific pretraining techniques along with mnemonic training (Groups I to 3) recalled more than those receiving nonspecific pretraining with mnemonic training (Group 4) or nonspecific pretraining without mnemonics (Group 5). Participants receiving mnemonic training (Groups 1 to 4) did not differ from non mnemonic controls (Group 5) at 6 months. Concluded that specific pretraining strategies can help maintain beneficial effects of imagery-based mnemonics over time.

Robin L. West (2006), Conducted a study to examine the effectiveness of videotaped memory training for mature adults, two groups of middle-aged and older adults were given imagery training that included videotaped presentation of interactive imagery for object location recall and linking items on a list, and the image-name match method for name recall. The training group performed significantly better than the waiting list on the initial post-test, and the two groups were comparable after both groups had received training. Evidence for both maintenance and generalization was found. Videotaped presentation of imagery training is effective for mature

adults as a self-paced at-home intervention, and has cost-saving advantages over the predominant training methodology.

Carrier C (1983), Conducted a study to examine the self-generated imagery techniques of gifted children would be superior to supplied (experimenter-provided) visuals in facilitating recall and recognition on a memory task. 27 high-potential students in Grades 4 to 6 were divided into three treatment groups to investigate the effects of rote repetition, self-generated visualization, and supplied visuals on the memorization of concrete noun-word pairs. Perhaps because even gifted children do not know how to construct good visual images without training and practice, our hypothesis was not supported. The supplied visual condition produced significantly better results than did either of the other treatment conditions, implying that the utilization of appropriate techniques helps gifted children learn certain memory tasks. One wonders if effective instruction in the development of self-generated mnemonic techniques might not be of greater benefit to young learners of such tasks.

2. STUDIES RELATED TO MEMORY AMONG ALZHEIMER'S DISEASE PATIENTS

Tomaz C (**2011),** Conducted a study to examine emotional content affects processes supporting working memory in Alzheimer disease (AD) patients. Assessed 22 AD patients and 40 elderly controls (EC) with a delayed matching and non-matching to sample task (DMST/DNMST), and a spatial-delayed recognition span task (SRST; unique/varied) using emotional stimuli.AD patients showed decreased performance on both tasks compared with EC. With regard to the valence of the stimuli, we did not observe significant performance differences between groups in the DMST/DNMST. However, both groups remembered a larger number of negative than positive or neutral pictures on unique SRST. The results indicate that AD patients show a relative preservation of working memory for emotional information, particularly for negative stimuli.

Gilleen J (2011), Conducted a study to determine the better relationship between premorbid personality and awareness by using improved methodology. Moreover, the study aims to contrast the strength of the relationship of premorbid personality and awareness with that of cognitive factors. Awareness of illness, symptoms, mnemonic and behavioural impairments, and treatment compliance were measured in 27 patients with mild-to-moderate Alzheimer's disease (AD)

diagnosed by standard criteria for probable AD. Participant premorbid personality was measured using average retrospective Neuroticism-Extroversion-Openness Inventory (NEO-FFI) scores from two informants. Correlations were performed to examine the relationship between awareness and personality dimensions, as well as measures of cognitive style, neuropsychological function, mood, carer burden, and sociodemographic factors. There was little relationship between awareness and personality scores, but modest associations between awareness and mood, age, and age of onset of first symptoms. Awareness of memory was related to memory functioning. Increased career burden was present with lack of awareness of cognitive-behavioral deficits but there were only few and weak associations between awareness and measures of cognitive functioning. There was little support for an association between previous personality and awareness in dementia. High level of career burden was associated specifically with lack of awareness of cognitive-behavioral deficits not deficits in ADL, whereas lower awareness of ADL and not cognitive-behavioral deficits was associated with age. Awareness of memory appeared to be a met memory capacity. Mood and age rather than personality and cognition are stronger predictors of awareness in early Alzheimer's disease.

Chan M (2011), Conducted a study to determine the mild cognitive impairment (MCI) represents a continuum of cognitive and functional deficits. Clinical data of 164 subjects with no dementia (ND, n = 52), uncertain dementia (n

= 69), and mild probable Alzheimer's disease (AD, n = 43) were assessed. Uncertain dementia patients were divided as pre-MCI (n = 11), early amnestic MCI (e-aMCI, n = 15) and late amnestic MCI (l-aMCI, n = 15). Cognitive assessments [Chinese Mini-Mental State Examination (CMMSE) and a validated neuropsychological battery], functional assessments (Lawton's scale for instrumental activities of daily living) and neuroimaging (ischemic lesions and medial temporal lobe atrophy) were reviewed. ND, aMCI and mild AD subjects demonstrated a significant trend for worsening performance for all cognitive and functional measures (ANOVA, $p < 0.05$). Pre-MCI subjects performed significantly better than aMCI subjects in all verbal memory domains ($p < 0.001$), while l-aMCI had worse functional performance ($p = 0.007$), a trend towards greater depressive symptoms ($p = 0.05$) and higher medial temporal lobe atrophy scores ($p = 0.06$). l-aMCI subjects were more likely than either pre-MCI or e-aMCI to progress to dementia over a mean follow-up period of 2.5 years (46.7 vs. 9.1 and 20.0%, respectively).

Georgina Stewart (2010), Conducted a study to investigate the patients with Alzheimer's disease (AD) were able to alter their awareness of memory deficits after exposure to a memory task. Thirty normal older adults and 23 mild AD patients participated in the study. Anosognosia was assessed using discrepancies between self- and informant-evaluations of cognitive and functional performance. Participants estimated their performance on the Verbal Paired

Associates task at different points in time (before, immediately after the task and after a 1-h delay). AD patients were generally less able to judge their memory abilities than healthy older adults, and tended to overestimate their task performance beforehand. Their prediction accuracy increased immediately after the task, but after a 1-h delay, they again misjudged their abilities at pretesting accuracy levels. Self-career discrepancy scores of awareness of deficits in memory and other areas correlated significantly with memory tests but not with other neuropsychological tasks in the assessment, and larger discrepancy scores were associated with poorer performance.AD patients can monitor task performance online, but are unable to maintain awareness of their deficits over time. Loss of awareness of memory deficits (or of any other deficits) in early stage AD may indicate damage to a system which updates a personal knowledge base with recent information. Failure to retain this information impedes abstraction from episodic to semantic memory.

Prodan C.I (2010), Conducted a study to investigate the association between coated-platelet production in amnestic MCI and rate of progression to AD. Coated-platelet levels were assayed in 74 patients with amnestic MCI who were subsequently followed longitudinally for up to 36 months in an outpatient dementia clinic. Levels are reported as percent of cells converted into coated-platelets. Subjects were categorized into tertiles of coated-platelet levels. The distributions of time to progression to AD were estimated for each tertile using cumulative incidence curves and compared statistically using a log-rank test. Cox

proportional hazards regression was used to adjust for potential confounders. The 24-month cumulative incidence of progression to AD was different among tertiles: 4% for the first tertile (lowest coated-platelet levels), 13% for the second tertile, and 37% for the third tertile (overall log-rank test, $p = 0.02$). The hazard rate of progression to AD for patients in the highest coated-platelet tertile was 5.1 times that for patients in the lowest tertile ($p = 0.04$), whereas the hazard rate for the middle tertile was similar to that for the lowest tertile (hazard rate ratio = 1.5,$p = 0.7$). Elevated coated-platelet levels in patients with amnestic MCI are associated with increased risk for progression to AD.

John C. Morris (2009), Conducted a longitudinal cohort study of cognitively normal older adults assessed with positron emission tomography (PET) to determine the mean cortical binding potential for PiB and followed up with annual clinical and cognitive assessments for progression to very mild dementia of the Alzheimer type (DAT).The Alzheimer's Disease Research Center, Washington University, St Louis, Missouri.One hundred fifty-nine participants with a mean age of 71.5 years with a Clinical Dementia Rating (CDR) of 0 on a PET PiB scan at baseline.Progression from CDR 0 to CDR 0.5 status (very mild dementia).Twenty-three participants progressed to CDR 0.5 at follow-up assessment (range, 1-5 assessments after PET PiB). Of these, 9 also were diagnosed with DAT. Higher mean cortical binding potential values for PiB (hazard ratio, 4.85; 95% confidence interval, 1.22-19.01; $P = .02$) and age (hazard ratio, 1.14; 95% confidence interval, 1.02-1.28; $P = .03$) predicted progression to

CDR 0.5 DAT. The CDR 0.5 DAT group showed decline in 3 cognitive domains (episodic memory, semantic memory, and visuospatial performance) and had volume loss in the parahippocampal gyrus (includes entorhinal cortex) compared with individuals who remained at CDR 0. Preclinical AD as detected by PET PiB is not benign, as it is associated with progression to symptomatic AD.

Edward Helmes (2009), Conducted a study to examine the cognitive changes in Alzheimer's disease In addition to memory impairment; deficits in other cognitive processes are common in the advanced stages of Alzheimer's disease (AD). The diagnosis of AD does not consider the relative prevalence of deficits in cognitive areas other than memory. Report on the prevalence of aphasia, apraxia, and other cognitive changes in individuals from a large representative sample of elderly Canadians. The proportion of these symptoms and the relevant neuropsychological test performance were compared in a group of 749 people over 65 years in age with AD and a control group of 563 people without cognitive impairment. Agnosia was less common in both groups than were deficits in complex visuomotor tasks, abstract thinking. aphasia, and constructional defects. The occurrence of all symptoms increased, and levels of performance on relevant neuropsychological tests decreased, with severity of Alzheimer disease. The tests did not, distinguish between possible and probable AD. These diagnostic groups showed similar levels of performance, which suggests that this distinction is not clinically meaningful.

Yoneda. H (2009), Conducted a study to determine the role of the medial temporal structures in memory impairment caused by Alzheimer's disease. Using high resolution MRI and a semiautomated image analysis technique, volumes of the medial temporal structures (amygdaloid complex, hippocampal formation, subiculum, and parahippocampal gyrus) were measured, and correlations between atrophy of each structure and memory dysfunction in patients with Alzheimer's disease were examined.Patients with Alzheimer's disease showed poor performance on verbal and non-verbal memory tests, and MRI volumetry showed a significant volume reduction of the medial temporal lobe structures. Volumes of the amygdaloid complex and of the subiculum correlated with memory performance. Stepwise regression analyses disclosed that the volume of the right amygdaloid complex specifically predicted visual memory function and to some extent verbal memory function, and that the volume of the left subiculum specifically predicted verbal memory function. Atrophy of the hippocampus did not predict severity of memory impairment.The presence of perihippocampal damage involving the amygdala proper, its surrounding cortex, and the subiculum further increased the severity of memory impairment attributable to hippocampal damage in Alzheimer's disease

Eric Grandmaison (2003), Conducted a study to investigate the effectiveness of a Critical Review of Memory Stimulation Programs in Alzheimer's disease. The memory stimulation programs used in the treatment of

Alzheimer's disease (AD) and review their efficacy. Visual imagery, errorless learning, dyadic approaches, spaced retrieval techniques, encoding specificity with cognitive support at retrieval, and external memory aids were the memory stimulation programs used alone or in combination in AD. Preliminary evidence suggests that the errorless learning, spaced retrieval, and vanishing cues techniques and the dyadic approach, used alone or in combination, are efficacious in stimulating memory in patients with AD. Early and accurate clinical diagnosis of dementias as well as knowledge about the cognitive mechanisms involved, especially the memory systems, have greatly developed over the past 25 years the growing emphasis on early detection and diagnosis of dementia highlights the need for effective psychological interventions for people in the early stages of AD. Even in the mild phase of dementia, these individuals have significant episodic memory impairments: the encoding and retrieval capacities, as measured with the free and cued recall, as well as recognition paradigms, are the most impaired functions of episodic memory early in the AD course. In paper review the efficacy of cognitive interventions for enhancing memory functions in the mild to moderate stages of AD. The paper has two parts. In the first part, we present descriptions, as well as the theoretical basis, of the various stimulation strategies or programs that have been studied in patients with Alzheimer's disease. In the second part, we review the evidence on the efficacy of these programs with the AD population.

John C. Morris (2001), A prospective clinical and psychometric study was conducted among Alzheimer Disease patients in the community setup with an age

group upto95 years. The objective is to examine MCI in early-stage AD on the basis of natural history and neuropathology. Neuropathology examinations were performed on participants who had undergone autopsy at AD research center. All participants enrolled between July 1990 and June 1997 with Clinical Dementia Rating (CDR) scores of 0 (cognitively healthy; n = 177; mean age, 78.9 years) or 0.5 (equivalent to MCI; n = 277; mean age, 76.9 years). Based on the degree of clinical confidence that MCI represented dementia of the Alzheimer type (DAT), 3 subgroups of individuals with CDR scores of 0.5 were identified: CDR 0.5/DAT, CDR 0.5/incipient DAT, and CDR 0.5/uncertain dementia. Progression to the stage of CDR 1, which characterizes mild definite DAT. Survival analysis showed that 100% of CDR 0.5/DAT participants progressed to greater dementia severity over a 9.5-year period. At 5 years, rates of progression to a score of CDR 1 (or greater) for DAT were 60.5% (95% confidence interval [CI], 50.2%-70.8%) for the CDR 0.5/DAT group, 35.7% (95% CI, 21.0%-50.3%) for the CDR 0.5/incipient DAT group, 19.9% (95% CI, 8.0%-31.8%) for the CDR 0.5/uncertain dementia group, and 6.8% (95% CI, 2.2%-11.3%) for CDR 0/controls. Progression to greater dementia severity correlated with degree of cognitive impairment at baseline. Twenty-four of the 25 participants with scores of CDR 0.5 had a neuropathologic dementing disorder, which was AD in 21 (84%). Individuals currently characterized as having MCI progress steadily to greater stages of dementia severity at rates dependent on the level of cognitive impairment at

entry and they almost always have the neuropathology features of AD. MCI generally represents early-stage AD.

3. STUDIES RELATED TO ALTERNATIVE THERAPIES ON MEMORY ALZHEIMER'S DISEASE

Wilson.CA (**2011),** Conducted a study to examine the acute effects of dimebolin, a potential Alzheimer's disease treatment, on working memory in rhesus monkeys.Dimebolin (latrepirdine), a compound with multiple potential drug targets, is being evaluated in clinical trials for the treatment of Alzheimer's disease (AD) and preliminary results suggest it can slow the disease process. Here we assessed the acute effect of dimebolin on components of working memory in non-human primates, young adult (11-17 years old) and aged (20-31 years old) rhesus macaques.The effects of dimebolin (3.9-118 μg kg(-1)) on working memory, as measured by performance on delayed matching-to-sample (DMTS), were examined in the normal young adult monkeys and aged adult monkeys. All the monkeys studied were proficient in the performance of a computer-assisted DMTS task. In a subsequent experiment in the same subjects, dimebolin was administered 15 min before a cognitively-impairing dose (20 μg kg(-1)) of scopolamine. In both the young adult and aged monkeys, dimebolin significantly increased the DMTS task accuracies. In young adults, the task enhancement was associated with long (retention/retrieval) delay trials, and a

protracted enhancement was observed for sessions run 24 h post administration of a single dose. Dimebolin did not significantly attenuate the scopolamine-induced impairment. In the aged monkeys, dimebolin significantly improved the reduced task accuracies associated with long delay intervals.Here we demonstrated that dimebolin is able to improve components of working memory in monkeys and to induce a protracted

Kashani.MS (2011), Conducted a study to examine the Aqueous extract of lavender (Lavandula angustifolia) improves the spatial performance of a rat model of Alzheimer's disease. Male Wister rats were first divided into control and AD groups. Rat model of AD was established by intracerebroventricular injection of 10 μg Aβ1-42 20 d prior to administration of the lavender extract. Rats in both groups were then introduced to 2 stages of task learning (with an interval of 20 d) in Morris water maze, each followed by one probe test. After the first stage of spatial learning, control and AD animals received different doses (50, 100 and 200 mg/kg) of the lavender extract. In the first stage of experiment, the latency to locate the hidden platform in AD group was significantly higher than that in control group. In the second stage of experiment, control and AD rats that received distilled water (vehicle) showed similar performance, indicating that the maze navigation itself could improve the spatial learning of AD animals. Besides, in the second stage of experiment, control and AD rats that received lavender extract administration at different doses (50, 100, and 200 mg/ kg) spent less time locating

the platform (except for the AD rats with 50 mg/kg extract treatment), as compared with their counterparts with vehicle treatment, respectively. Lavender extract significantly improved the performance of control and AD rats in the probe test, only at the dose of 200 mg/kg, as compared with their counterparts with vehicle treatment. Concluded that the lavender extracts can effectively reverse spatial learning deficits in AD rats.

Wang Z (2010), Conducted a study to observe the effect of Naoling decoction on hippocamal histomorphology and the expression of amyloid precursor protein (APP) in CA3 region in rats with Alzheimer's disease (AD), and to explore the therapeutically and the potential mechanism. Forty SD rats were divided into 5 groups: a normal group, a sham-operated group, an AD group, a Naoling decoction group, and a Naofukang group. Alzheimer's disease model was established by Abeta1-42 injected into the hippocamal in the rats. The faculty of learning and memory was evaluated by Morris water maze. The changes of cell morphology were detected by HE staining. Expression of APP in CA3 region was measured with immunohistochemical staining. Morris water maze experiment showed that the escape latency of hidden platform in the AD group were delayed significantly ($P<0.05$) and the average times of passing was decreased ($P<0.05$). In the hippocampal CA3 field of the AD rats, HE staining and immunohistochemical test showed that pyramidal cells disturbed, neurons decreased significantly and expression of APP protein increased ($P<0.05$). Naoling decoction treatment

improved pyramidal cellular disorders and decreased APP expression. Naoling decoction can distinctly improve the learning and memory ability, and decrease the expression of APP in the AD model rats, suggesting that Naoling decoction can be used for the treatment of AD in rats.

Simmons-Stern NR (2010), Conducted a study to examine the effect of music at encoding on the subsequent recognition of associated verbal information. Lyrics of unfamiliar children's songs were presented bimodal at encoding, and visual stimuli were accompanied by either a sung or a spoken recording. Patients with AD demonstrated better recognition accuracy for the song lyrics than the spoken lyrics, while healthy older adults showed no significant difference between the two conditions. We propose two possible explanations for these findings: first, that the brain areas sub serving music processing may be preferentially spared by AD, allowing a more holistic encoding that facilitates recognition, and second, that music heightens arousal in patients with AD, allowing better attention and improved memory.

Zhang P (2010), Conducted a study to effects of electroacupuncture on expression of Abeta positive cells of the hippocampus and SOD activity in rats with streptozocin-Alzheimer's disease.Sixty Wistar rats were randomly divided into a normal group, a normal saline group, a model group, a western medication group and an electroacupuncture group, 12 rats in each group. The AD rat model was established by injecting Streptozocin (STZ) into lateral cerebral ventricle,

except the rats in the normal saline group injecting Normal Saline with the same dose and in normal group with no injection. The western medication group was treated with intragastric administration of Memantine, and in the electroacupuncture group, the electroacupuncture was given at "Baihui" (GV 20), "Dazhui" (CV 14), "Taixi" (KI 3), "Shenshu" (BL 23), "Zusanli" (ST 36), once each day, 7 days for a course, and lasted for 4 courses. The other three groups were fed in routine way and without any treatment. The learning and memory ability was assessed by Morris water maze and the expression of Abeta positive cells of the hippocampus and superoxide dismutase (SOD) activity were determined by immunohistochemistry and visible spectrophotometer colorimetry.Compared with the normal group and the normal saline group, the Abeta protein expression was significantly increased in the model group (both $P < 0.01$), and the SOD activity was obviously decreased (both $P < 0.01$). After treatment, as compared with the model group, the Abeta protein expression was significantly declined (both $P < 0.01$), and the SOD activity was obviously increased (both $P < 0.01$) in the electroacupuncture group and western medication group. Electro acupuncture treatment can reduce the Abeta protein expression and increase the SOD activity of the hippocampus so as to enhance learning and memory ability in the AD rats.

Wattanathorn.J (2010), Conducted a study to determine the effect of alcoholic extract of Bacopa monnieri on cognitive function and neurodegeneration in animal

model of Alzheimer's disease induced by ethylcholine aziridinium ion (AF64A).Male Wistar rats were orally given the alcoholic extract of Bacopa monnieri at doses of 20, 40 and 80 mg/kg BW through a feeding needle for a period of 2 weeks before and 1 week after the intra cerebroventricular administration of AF64A bilaterally. Rats were tested for spatial memory using Morris water maze test and the density of neurons and cholinergic neurons was determined using histological techniques 7 days after AF64A administration. Bacopa monnieri extract enhanced the escape latency time ($p<.01$) in Morris water maze test. The reduction of neurons and cholinergic neuron densities were also mitigated. These findings suggest that Bacopa monnieri is a potential cognitive enhancer and neuro protectant against Alzheimer's disease.

Ahmed.T (2009), Conducted a study to the curcuminoids possess acetylcholinesterase (AChE) inhibitory and memory enhancing activities. The in-vitro and ex-vivo models of AChE inhibitory activity were used along with Morris water maze test to study the effect on memory in rats. Curcuminoids inhibited AChE in the in-vitro assay with IC(50) value of 19.67, bisdemethoxycurcumin 16.84, demethoxycurcumin 33.14 and curcumin 67.69 microM. In the ex-vivo AChE assay, curcuminoids and its individual components except curcumin showed dose-dependent (3-10 mg/kg) inhibition in frontal cortex and hippocampus. When studied for their effect on memory at a fixed dose (10 mg/kg), all compounds showed significant ($p<0.001$) and comparable effect in

scopolamine-induced amnesia. These data indicate that curcuminoids and all individual components except curcumin possess pronounced AChE inhibitory activity. Curcumin was relatively weak in the in-vitro assay and without effect in the ex-vivo AChE model, while equally effective in memory enhancing effect, suggestive of additional mechanism(s) involved. Thus curcuminoids mixture might possess better therapeutic profile than curcumin for its medicinal use in AD.

Carlson MC (2009), Conducted a randomized double-blind, placebo-controlled clinical trial trial study on Ginkgo biloba for preventing cognitive decline in older adults. The herbal product Ginkgo biloba is taken frequently with the intention of improving cognitive health in aging. However, evidence from adequately powered clinical trials is lacking regarding its effect on long-term cognitive functioning. The Ginkgo Evaluation of Memory (GEM) study, a randomized, double-blind, placebo-controlled clinical trial of 3069 community-dwelling participants aged 72 to 96 years, conducted in 6 academic medical centers in the United States between 2000 and 2008, with a median follow-up of 6.1 years. Twice-daily dose of 120-mg extract of G. biloba (n = 1545) or identical-appearing placebo (n = 1524).Rates of change over time in the Modified Mini-Mental State Examination (3MSE), in the cognitive subscale of the Alzheimer Disease Assessment Scale (ADAS-Cog), and in neuropsychological domains of attention,memory,visual-spatial construction, language, and executive functions, based on sums of z scores of individual tests. Annual rates of decline in z scores did not differ between G. biloba and placebo groups in any domains,

including memory(0.043; 95% confidence interval [CI], 0.034-0.051 vs 0.041; 95% CI, 0.032-0.050), attention (0.043; 95% CI, 0.037-0.050 vs 0.048; 95% CI, 0.041-0.054), visuospatial abilities (0.107; 95% CI, 0.097-0.117 vs 0.118; 95% CI, 0.108-0.128), language (0.045; 95% CI, 0.037-0.054 vs 0.041; 95% CI, 0.033-0.048), and executive functions (0.092; 95% CI, 0.086-0.099 vs 0.089; 95% CI, 0.082-0.096). For the 3MSE and ADAS-Cog, rates of change varied by baseline cognitive status (mild cognitive impairment), but there were no differences in rates of change between treatment groups (for 3MSE, P = .71; for ADAS-Cog, P = .97). There was no significant effect modification of treatment on rate of decline by age, sex, race, education, APOE*E4 allele, or baseline mild cognitive impairment (P > .05).Compared with placebo, the use of G. biloba, 120 mg twice daily, did not result in less cognitive decline in older adults with normal cognition or with mild cognitive impairment.

Lee ST (2008), Conducted a study to investigated the clinical efficacy of Panax ginseng in the cognitive performance of AD patients in an open-label study. Consecutive AD patients were randomly assigned to the ginseng (n=58) or the control group (n=39), and the ginseng group was treated with Panax ginseng powder (4.5 g/d) for 12 weeks. Cognitive performances were monitored using the mini-mental state examination (MMSE) and Alzheimer disease assessment scale (ADAS) during 12 weeks of the ginseng treatment and at 12 weeks after the ginseng discontinuation. MMSE and ADAS scales showed no baseline difference

between the groups. After ginseng treatment, the cognitive subscale of ADAS and the MMSE score began to show improvements and continued up to 12 weeks (P=0.029 and P=0.009 vs. baseline, respectively). After discontinuing ginseng, the improved ADAS and MMSE scores decreased to the levels of the control group. These results suggest that Panax ginseng is clinically effective in the cognitive performance of AD patients.

Sundstrøm M (2004), Conducted a study to examine the emotional memory (EM) of objects with self-reference in Alzheimer's disease (AD) can be modeled with binomial logistic regression in a free recall and an object recognition test to predict EM enhancement. Twenty patients with AD and twenty healthy controls were studied. Six objects (three presented as gifts) were shown to each participant. Ten minutes later, a free recall and a recognition test were applied. The recognition test had target-objects mixed with six similar distracter objects. Participants were asked to name any object in the recall test and identify each object in the recognition test as known or unknown.The total of gift objects recalled in AD patients (41.6%) was larger than neutral objects (13.3%) and a significant EM recall effect for gifts was found (Wilcoxon: $p < .003$). EM was not found for recognition in AD patients due to a ceiling effect. Healthy older adults scored overall higher in recall and recognition but showed no EM enhancement due to a ceiling effect. A logistic regression showed that likelihood of emotional recall memory can be modeled as a function

of MMSE score ($p < .014$) and object status ($p < .0001$) as gift or non-gift. Recall memory was improved in AD patients for emotional objects indicating that EM in mild to moderate AD although impaired can be provoked with strong emotional load. The logistic regression model suggests that EM decrease with the progression of AD rather than disrupts and may be a useful tool for evaluating magnitude of emotional load.

4. STUDIES RELATED TO VISUAL IMAGES MNEMONIC TRAINING ON MEMORY AMONG ALZHEIMER'S DISEASE

Hill RD (2011), Conducted a study to examine the visual imagery mnemonic training in a patient with primary degenerative dementia. A visual-imagery mnemonic was used as a memory training aid for a 66-year-old patient with primary degenerative dementia. Length of retention time was used as the primary outcome measure. The application of the mnemonic procedure extended the length of retention time for name-face recall from baseline. Performance gains were sustained at one month. Visual imagery Mnemonic Training in a Patient With Primary Degenerative Dementia

Borg C (2010), Conducted a study to investigate the Visual imagery processing and knowledge of famous names in patients in the early stages

Alzheimer's disease and MCI., in patients in the early stages of Alzheimer's disease (AD) and in the prodromal stage of AD, so-called Mild Cognitive Impairment (MCI). Fifteen patients with AD (MMSE > or = 23), 15 patients with amnestic MCI (a-MCI) and 15 normal controls (NC) performed a famous names test designed to evaluate the semantic and distinctive physical features knowledge of famous persons. Indicated that patients with AD and a-MCI generated significantly less physical features and semantic biographical knowledge about famous persons than did normal control participants. Additionally, significant differences were observed between a-MCI and AD patients in all tasks. The present findings confirm recent studies reporting semantic memory impairment in MCI. Moreover, the current findings show that mental imagery is lowered in a-MCI and AD and is likely related to the early semantic impairment.

Tippett LJ (2003), Conducted a study to Visual images and face processing in mild-to-moderate Alzheimer's disease: from segmentation to imagination. First, they have been shown to be sensitive to impairments of perception and imagery caused by other neurological conditions. Second, they test specific stages of visual perception and cognition in a reasonably selective manner. These stages were (in their normal order of occurrence during perception): the segmentation of different local points of the visual field into regions belonging to distinct objects; the representation of the shapes of these segmented regions in the image; the construction of more abstract shape

representations that possess constancy over changes in size, location, orientation or illumination (assessed separately for faces and objects); the use of these perceived shape representations to access stored shape representations; and the access of lexical semantic representations from these high-level visual representations. Additional tasks tested the top-down activation of earlier visual representations from the semantic level in visual mental imagery. Our findings indicate small, but in most cases reliable, impairments in visual perception, which are independent of degree of cognitive decline. Deficits in basic shape processing influenced performance on some higher level visual tasks, but did not contribute to poor performance on face processing, or to the profound deficit on object naming. The latter of these is related to semantic-lexical impairment.

Clare.**L (2002),** Conducted a study on Relearning face-name associations in early Alzheimer's disease. The present study extends these findings in a controlled trial. Twelve participants meeting criteria for probable AD, with Mini-Mental State Examination scores of 18 or above, were trained in face-name associations using an errorless learning paradigm. Training produced a significant group improvement in recall of trained, but not control, items. Gains were largely maintained 6 months later, in the absence of practice. There were differences in individual response to intervention. Results did not differ according to medication status, and the intervention had no adverse effects on self-reported

well-being, but participants who were more aware of their memory difficulties achieved better outcomes.

Flicker C (1987), Conducted a study A visual recognition memory test for the assessment of cognitive function in aging and dementia.Young, non-demented elderly, and elderly demented subjects were administered a computerized visual recognition memory task. In the task, subjects were instructed to point out the new object from a group of objects whose number was progressively incremented. The test was subject-paced and made use of face-valid stimulus materials; it is closely comparable to tests developed for memory assessment in non-human primates that are sensitive to the effects of hippocampal ablation. The present task was found to elicit significant differences in performance between young and non-demented aged subjects, between the non-demented and demented elderly, and between demented subjects in the early and more advanced stages of senile dementia of the Alzheimer type (SDAT). In a discriminant analysis, the visual recognition memory test scores correctly classified 72.6% of the aged subjects and early SDAT patients. No significant difference in task performance was found between SDAT patients and demented patients with a significant cerebrovascular etiological component. Thus, although the task does not appear to be suitable for diagnostic purposes it would be useful for the assessment of treatment effects upon age-related cognitive dysfunction.

CHAPTER-III

RESEARCH METHODOLOGY

Research methodology is a significant part of any study, which enables the researcher to project the research undertaken. Research methodology is the systemic way to carry out an academic study, **(Abdullah, 2004)**

This chapter includes research approach, research design, variables, setting of the study, population, sample, sample size, sampling technique, developing and description of the tool, reliability of the tool, and method of data collection procedure and plan for data analysis and interpretation of the data.

RESEARCH APPROACH

The selection of research is a basic procedure for the conduction of research study**, (B.T.Basvanthappa, 2007)**.

The research approach used in the study is an applied form of research to find out how well a program, intervention, is effective. In this study, the effectiveness of visual images mnemonic training on memory was evaluated. Therefore on quantitative evaluation research approach is essential to test the effectiveness of the intervention.

RESEARCH DESIGN

Polit and Beck (2004) research design is the overall plan for addressing a research question including specification for enhancing the study integrity.

The design used for the present study was pre experimental design where one group pretest and post test design was selected to evaluate the effectiveness of visual images mnemonic training on level of memory among Alzheimer's disease patients

Tab 3.1 Diagrammatic presentation of research design

Purposively selected Alzheimer's Patients	**Pre test**	**Intervention**	**Post test**
Experimental group	O_1	X	O_2

The symbol used are,

O_1: Pre test on level of memory among Alzheimer's disease patients

X: Visual images mnemonic training

O_2 : Post test on level of memory among Alzheimer's disease patients

SETTING OF THE STUDY

Research settings are the set of surroundings in a research where the collection of data is to be taken, **(B.T.Basvanthappa, 2007)**

The study was conducted at Alzheimer's And Related Disorders Society Of India (ARDSI) Cochin, Kerala . Which is a nongovernmental organization for Alzheimer's disease patients. It is located 300 km away from Dhanvantri College of Nursing, Erode. It is 50 bedded day care center. An average admissions of 20-25 patients/day.

VARIABLES

Variables are characters that can have more than value. The categories of variables discussed in the present study are,

Independent Variables

The variable that is believed to care or influence the behavior and ideas **(Polit and hungler, 1999)**

In this study the independent variable refers to visual images mnemonic training

Dependent Variables

The dependent variable is the researcher is interested in understanding, explaining, and proceeding (**Polit and hungler, 1999**)

In this study the dependent variable refers to memory.

POPULATION

The population is all elements (individuals, objectives, events or substances) that meet certain criteria for inclusion in a study, **(Polit and Beck, 2008).**

Populations for the present study were Alzheimer's disease patients**.**

SAMPLE

The sample is the population selected to participate in a research study**, (Polit and Beck 2008),**

The sample for the present study was Alzheimer's disease patients admitted at (ARDSI) Alzheimer's And Related Disorders Society Of India, Cochin, KERALA.

SAMPLE SIZE

Sample size is normally decided by nature of the study, nature of population, type of sampling technique, total variables statistical test adopted for data analysis sensitivity of the measures and attrition**, (Polit and Hungler, 2002).**

In this present study the total sample size was 30 Alzheimer's disease patients.

SAMPLING TECHNIQUE

Sampling refers to the process of selecting the population to represent the entire population, (**Polit and Beck 2004)**

Purposive sampling technique was used for the present study all Alzheimer's disease patients admitted in ARDSI, Cochin, Kerala, with mid and moderate level of memory, present during the period of data collection were selected as sample.

Purposive sampling is a judgment sampling that involves selection by the researcher of certain subject of element to include in a study. It is one of the non-probability sampling techniques, where the subjects are selected with the investigators judgment, (**Burn's 1997)**

CRITERIA FOR SAMPLE SELECTION

The Alzheimer's disease patients,

- Both gender
- Age group of 55 years and above
- Who are having mild and moderate level of memory
- Who are willing to participate in the study
- Who speak and understand Malayalam
- Who are present during the time of data collection

EXCLUSION CRITERIA

- Difficulty in vision and speaking & hearing
- Irregular visit more than one day

DEVELOPMENT OF TOOL

There are two sections of a tool were used: They are

SECTION A: It consists of demographics of Alzheimer's disease patient such as

- Age
- Gender
- Family history of dementia
- Duration of illness
- H/o medications

SECTION B: (VMRS-AD) Visual Mnemonic Rating Scale –Alzheimer's Disease Scale

It is a structured observation rating scale used to assess the memory of Alzheimer's Disease and consist of 15 items namely Eye, Ear ,Nose, ,Mouth, Hands, Legs, Tooth Brush And Tooth Paste, Bathroom, Wash Basin, Toilet, Phone Number, Address, House Name, Post Office, Taluk, District. It is a 4 point rating scale, rate 1 was given to no response, 2 was given to confused response, 3 will be

given to Delayed response (15-59seconds), and 4 was given to Immediate response.

Scoring procedure

Based on the percentage of scores, the memory level were categorized as "mild", "moderate" and "severe".

TAB 3.1 SCORING PROCEDURE OF MEMORY BASED ON THE PERCENTAGE OF SCORES

Level of memory disturbance	**Actual score**	**Percentage (%)**
Mild	41-60	68-100
Moderate	21-40	34-67
Severe	1-20	7-33

Validity

The content validity of the demographic variables and Visual Mnemonic Rating Scale –Alzheimer's disease was validated in consultation with guide and experts. The experts are in mental health nurse specialist, psychiatrist,

psychologist and statistician. The tool was modified according to the suggestion and recommendation of the experts.(**Annexure VII)**

Reliability

The reliability of Visual Mnemonic Rating Scale –Alzheimer's Disease was tested by implementing the tool on four Alzheimer's disease patients at Alzheimer's and related disorders society Cochin, KERALA which is same the sample area. Test retest method was used to check the reliability of the tool and the tool was found to be reliable, (r'=0.9).

METHOD OF DATA COLLECTION PROCEDURE

Data collection is the gathering of information needed to address the research problem. The word "data" means information that is systematically collected in the course of a study**, (Polit and Hungler, 2001)**

Talbot, (1995) refers data collection as gathering of information from the sampling units. The researcher plan typically specifies procedures for actual collection of data. The researcher must be sure that enough material is available to complete the study that the participants are informed that the schedules do not conflict.

Permission from the Concerned Authority

Prior to collection of data, permission was obtained from the project officer of ARDSI, COCHIN, KERALA.

Period of Data Collection

The investigator collected the data from Alzheimer's disease patients for the period of 1 month from 12.08.2011 to 08.08.2011

Pre test

Pre test conducted on Alzheimer's disease patients in the ARDSI, COCHIN, KERALA by using Visual Mnemonic Rating Scale –Alzheimer's Disease scale to assess the level of memory. In a day average of 8-9 patients were assessed. The time for assessment varied from 30 -40 minutes.

Implementation of Visual Images Mnemonic Training

Immediately after pre-test the visual images mnemonic training was implemented to the Alzheimer's disease patients with the duration of 30 -40 minutes for 10 days.

Posttest

Post test was conducted by using Visual Mnemonic Rating Scale – Alzheimer's disease scale to assess the memory among Alzheimer's disease patients. Post test was done immediately from the first day after the visual images mnemonic training, followed that every day before and after visual images mnemonic training posttest was conducted for 10 days. Mean value of 19 post test score were considered as one post test value.

PLAN FOR DATA ANALYSIS

- Level of memory among Alzheimer's disease patients before and after visual images mnemonic training was analyzed by using frequency and percentage distribution.
- Effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients was analyzed by using paired t test, mean, standard deviation and mean percentage.
- Association between posttest scores on memory among Alzheimer's disease patients with their demographic variables was analyzed by using chi-square test.

SUMMARY

Pre experimental pre and post test only design was carried on 30 Alzheimer's disease patients admitted at Alzheimer's and related disorders society Cochin, Kerala by using purposive sampling technique. Visual mnemonic rating scale –Alzheimer's disease scale was used to assess the memory Function among Alzheimer's disease patients. The data were collected after obtaining the permission from concerned authority of the day care center . Data were planned to analysis by using descriptive and inferential statistic and to be presented in the form of tables, graphs and figures.

CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested, **(Polit and Hungler, 2003)**

Analyses enable the researcher to reduce, summarize, organize, evaluate, interpret and communicate numerical information. (**Polit and Hungler, 2003)**

This chapter deals with the analysis and interpretation of data collected from 30 Alzheimer's disease patients by using purposive sampling from Alzheimer's and related disorders society Cochin, KERALA, to assess the effectiveness of visual images mnemonic training on memory

The data were coded and analyzed as per objectives of the study under the following headings.

SECTION A : Description of Alzheimer's disease patients according to their demographic variables

SECTION B: Assess the memory among Alzheimer's disease patients in experimental group before and after visual images mnemonic training.

- Frequency and percentage distribution of the pre test and posttest score of level of memory among Alzheimer's disease patients.

SECTIONC: Assess the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients.

- Paired't' test value of pretest and posttest scores of level of memory among Alzheimer's disease patients.
- Area wise comparison of mean, standard deviation and mean percentage of pretest and posttest scores of level of memory among Alzheimer's disease patients.

SECTION D: Find out the association between the post test scores on memory among Alzheimer's disease patients with their demographic variables.

- Chi-square value of association between the posttests scores on memory among Alzheimer's disease patients with their demographic variables.

SECTION – A: DESCRIPTION OF PATIENTS ACCORDING TO THEIR DEMOGRAPHIC CHARACTERISTICS

Table: 4.1 Frequency and percentage distribution of samples according to their demographic variables. (N = 30)

Sl.N0:	Demographic Variables	Frequency(n)	Percentage (%)
1	**Age in year**		
	a. 55-60years	5	17
	b. 61-66years	10	33
	b. 67-72years	15	50
	c. > 72years	-	-
2	**Gender**		
	a. Male	12	40
	b. Female	18	60
3	**Family history of dementia**		
	a. Present	17	57
	b. Absent	13	43
4	**Durationof illness**		
	a. <1year	7	23
	b. 1-2 year	9	30
	c. 2-3 year	11	37
	d. 3-4 year	3	10
5	**Historyof medication**	25	83
	a. Present	5	17
	b. Absent		

Distribution of samples according to their age group depicts that, most (50%) of the patients were in the age group of 67-72 years. However 33% of patients were in the age group of 61-66 years and only 17% of patients were in the age group of 55-60years.

Gender wise distribution of sample shows that, most (60%) of the Alzheimer's disease patient were females and only 40% of patient were males. It concludes that females are most affected more than males. Women have a significantly higher risk of developing the disease than do men, **(**Richard W, 2002)

Distribution of samples according to their family history of dementia shows that highest percentage (57%) of patients had family history of dementia, and (43%) of patients had no family history of dementia

Distribution of samples according to their duration of illness shows that highest percentage (37%) of patients were in between 2-3 years duration of illness. However 30% of patients had 1-2years duration of illness, 23% of patients had <1years of illness and only 10% of patients had 3-4 years duration of illness

Distribution of samples according to their history of medication reveals that most (83%) of them had history of medication and only 17% of them were no history of medication.

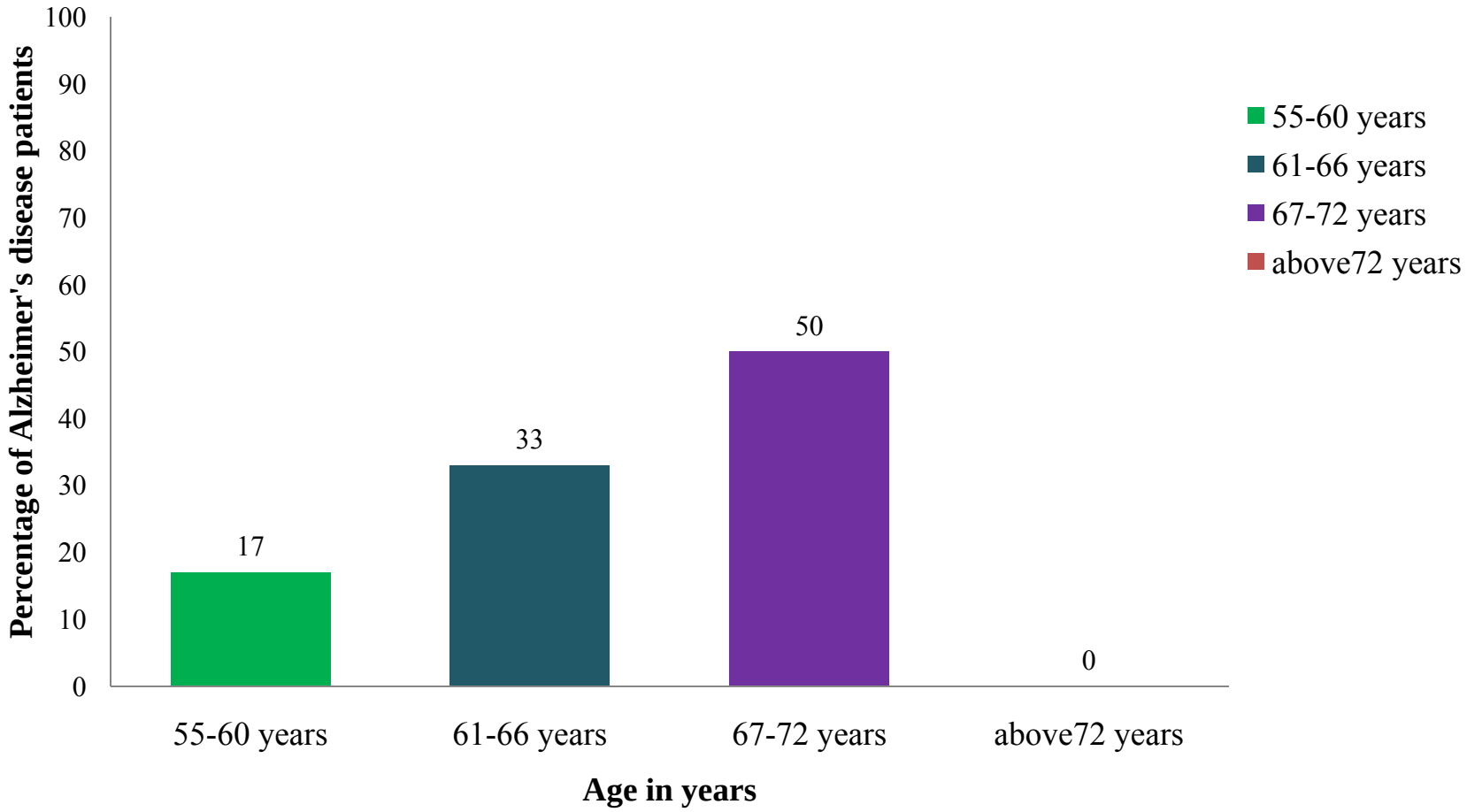

Fig.4.1: Bar diagram showing the percentage distribution of Alzheimer's disease patients according to their Age group

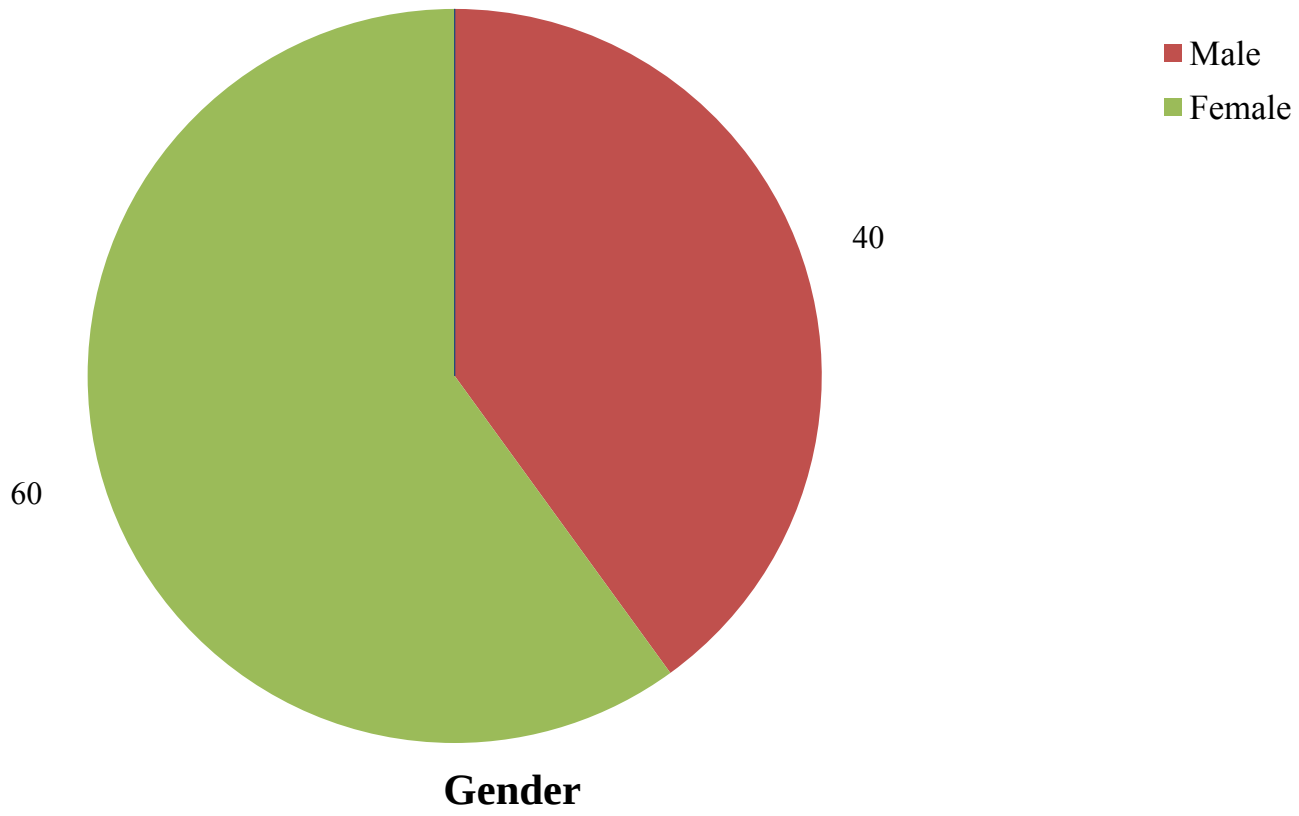

Fig 4.2: Pie diagram showing percentage distribution of Alzheimer's disease patients according to their Gender

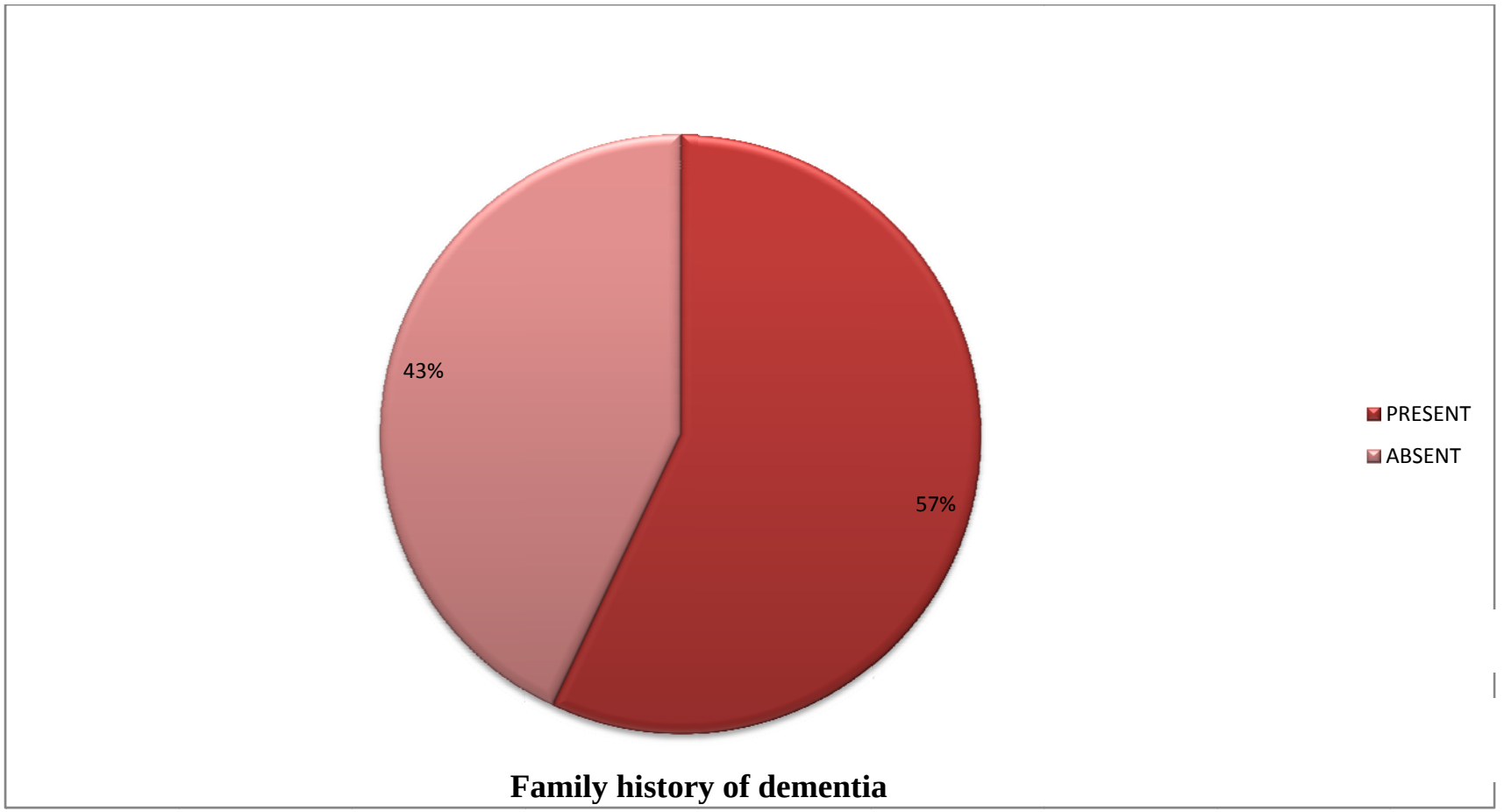

Figure 4.3: Pie diagram showing percentage distribution of Alzheimer's disease patients according to their family history of dementia

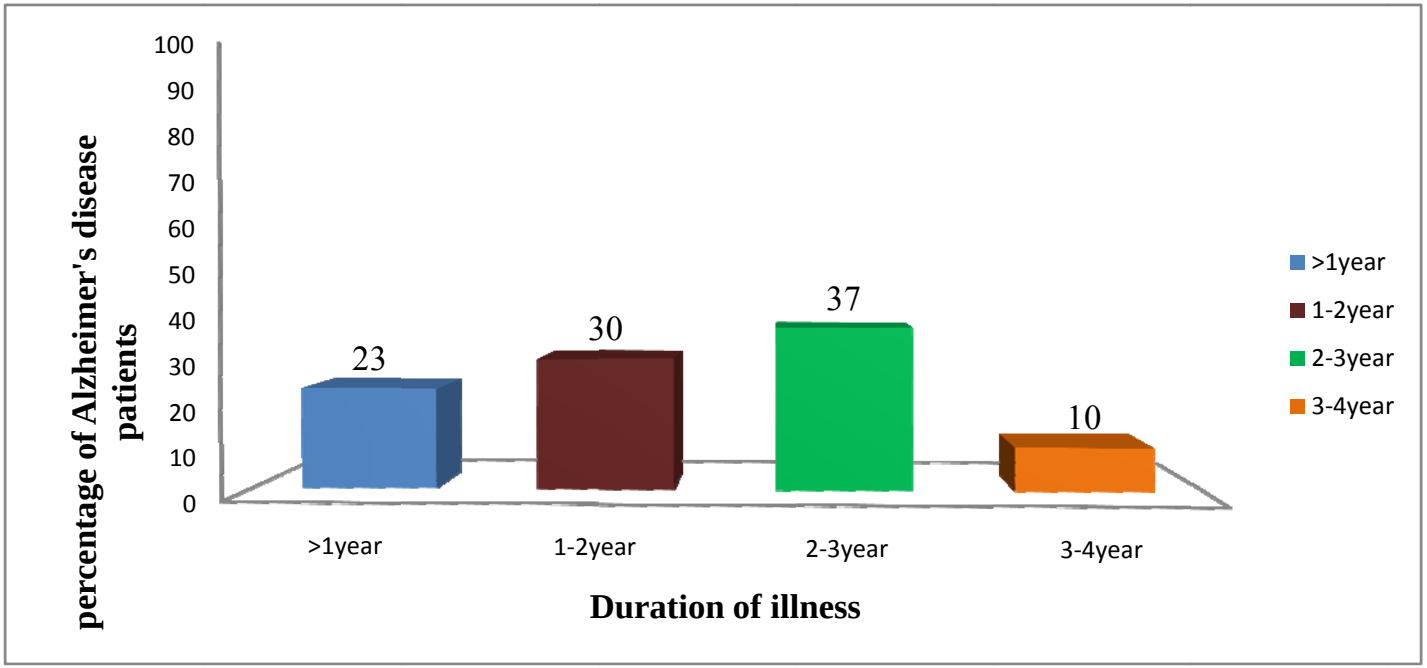

Figure 4.4: Bar diagram showing percentage distribution of Alzheimer's disease patients according to their Duration of illness

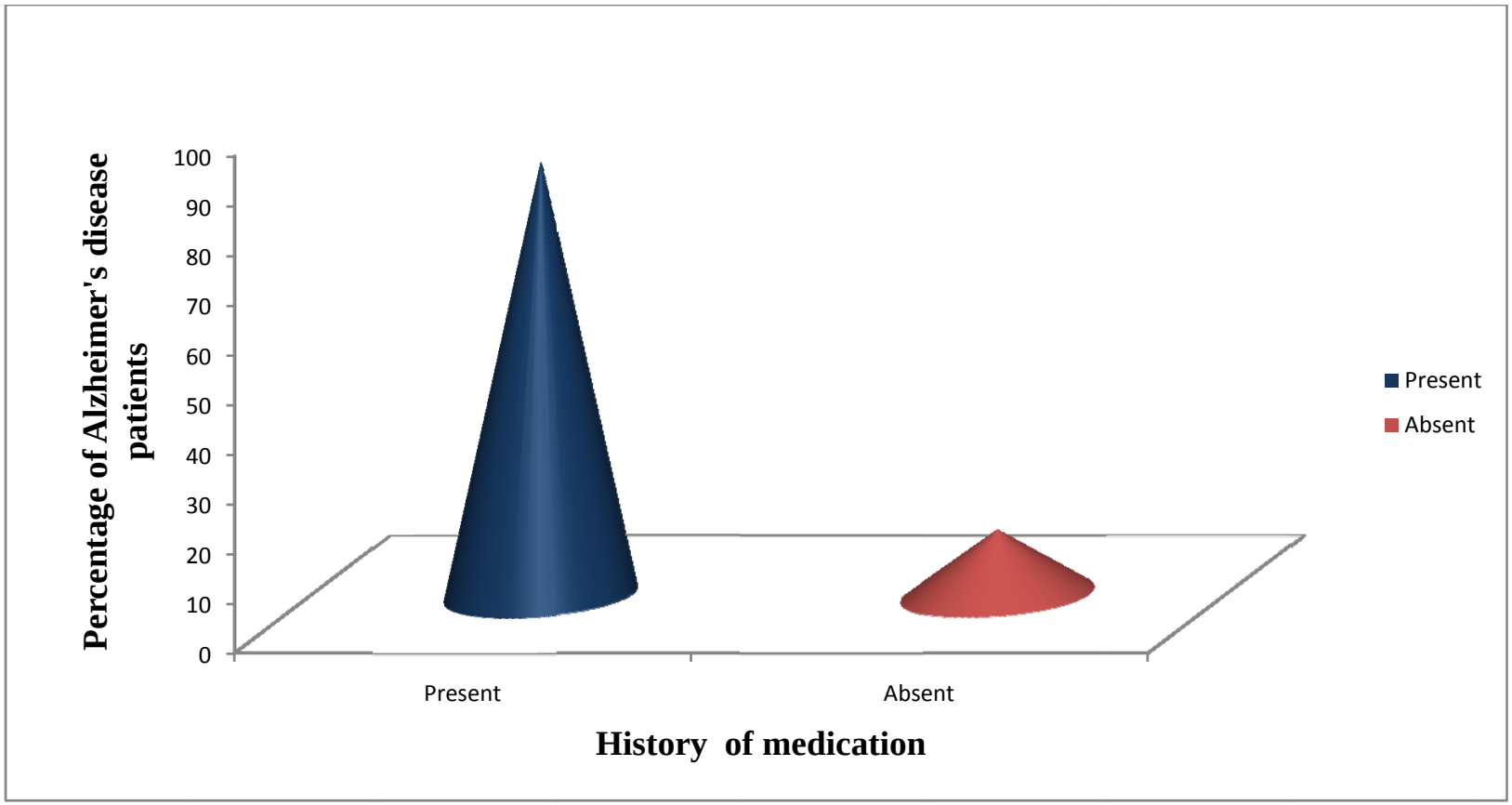

Figure 4.5: Cone diagram showing percentage distribution of Alzheimer's disease patients according to their History of medication.

SECTION-B: **ASSESS THE MEMORY AMONG ALZHEIMER'S DISEASE PATIENTS BEFORE AND AFTER VISUAL IMAGES MNEMONIC TRAINING**

Table: 4.2 Frequency and percentage distribution of the pre test and posttest scores of level of memory among Alzheimer's disease patients

(N=30)

Level of Memory disturbance	**Alzheimer's disease patients**			
	Pretest scores		**Posttest scores**	
	Frequency(n)	**Percentage (%)**	**Frequency(n)**	**Percentage (%)**
Mild	**14**	**47**	**22**	**73**
Moderate	**16**	**53**	**8**	**27**
Severe	**0**	**-**	**0**	**-**

Frequency and percentage distribution of pretest and posttest scores of memory among Alzheimer's disease patients depicts that, in pretest 47% of patients were mild level of memory disturbance and only 53% were moderate level of memory disturbances whereas in post test 73 % of patients were in mild

level of memory disturbance and 27% of patients with moderate level of memory disturbance. It seems that visual images mnemonic training on memory was effective among Alzheimer's disease patients.

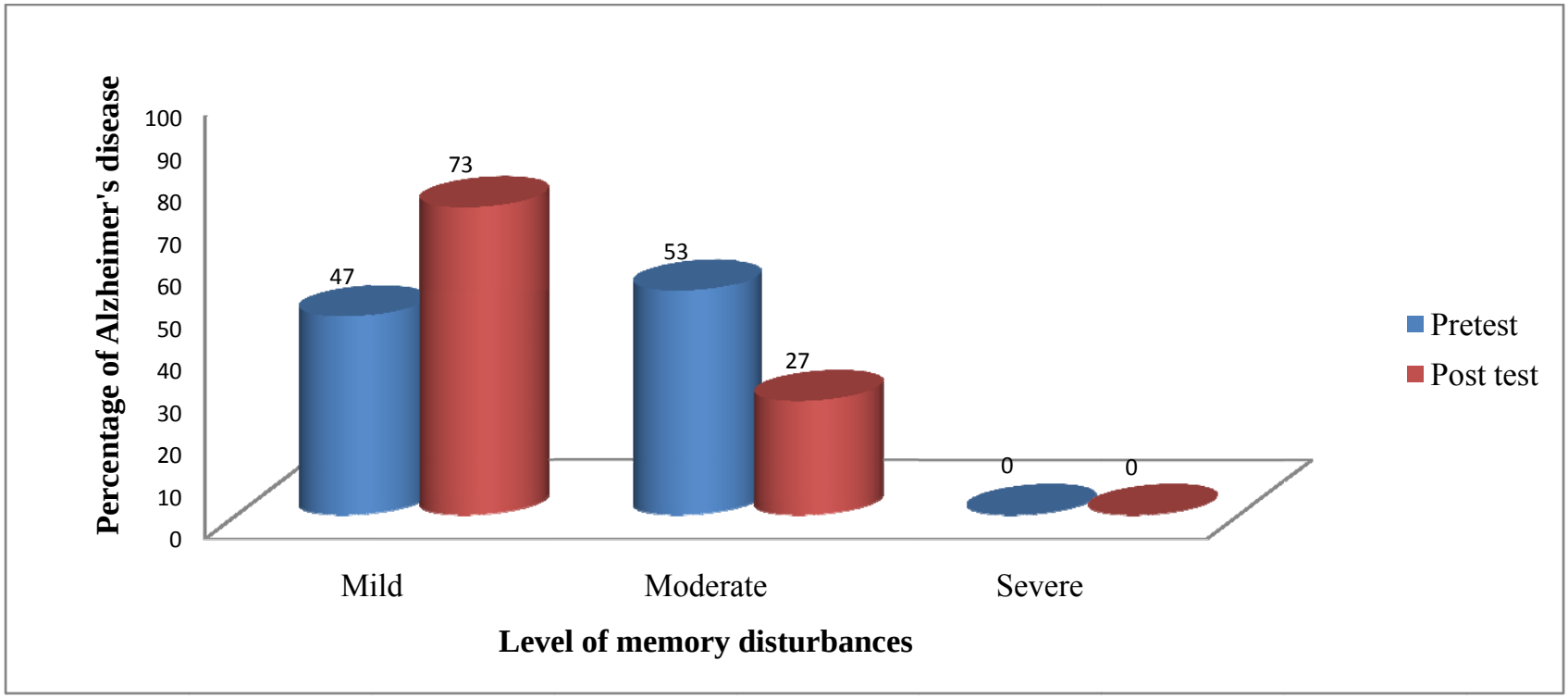

Figure 4.6: Cylinder diagram showing frequency and percentage comparison of pretest and post test scores of memory among Alzheimer's disease patients

SECTION C: ASSESS THE EFFECTIVENESS OF VISUAL IMAGES MNEMONIC TRAINING ON MEMORY AMONG ALZHEIMER'S DISEASE PATIENTS

Table 4.3: Paired' test value of Alzheimer's disease patients pre and post test scores of memory.

(N=30)

Alzheimer's disease patients	Paired t' value	Table value	Level of significance
Body parts	7.07	2.05	**p < 0.05 significant**
Significant places	5.12	2.05	**p < 0.05 significant**
Address	9.69	2.05	**p < 0.05 significant**
Total	10	2.05	**p < 0.05 significant**

Df-29 Table value- 2.05 p < 0.05 significant

Paired't' test was calculated to analyze the difference in pre and post test Scores on memory among Alzheimer's disease patients. The paired't' value was 10, when compared to table values (2.05) it was high. It seems that there is significance effectiveness visual images mnemonic training on memory among Alzheimer's disease patients.

Table 4.4 Comparison of mean, standard deviation and mean percentage of pretest and posttest scores of level of memory among Alzheimer's disease patients.

(N=30)

Areas of memory disturbance	**Max scores**	**Alzheimer's disease patients**						**Difference in mean %**
		Pre test			**Post test**			
		Mean	**SD**	**Mean %**	**Mean**	**SD**	**Mean %**	
Body parts	24	17.1	2.5	71	19.2	2.7	80	9
Significant places	16	11.1	1.6	69	12.7	1.9	79	10
Address	20	12.3	2.3	62	15.5	2.8	78	16
Total	**60**	**40.5**	**4.6**	**68**	**47.4**	**6.4**	**79**	**11**

Comparison of mean, SD, and mean percentage of memory among Alzheimer's disease patients pre and post test scores depicts that, In pre test the highest mean score was (17.1 ± 2.5) which is 71% where as in post test the mean score was (19.2 ± 2.7) which is 80 %. It is showing the difference of 9%. In pre test lowest mean score was (12.3 ± 2.3) which is 62% where as in post test the mean score was (15.5 ± 2.8) which is 78 %. It is showing the difference of 16%.

Similarly the overall mean score was (40.5± 4.6) which is 68% where as in post test the mean score was (47.4± 6.4) which is 79%. It is showing the difference of 11%. It seems the visual images mnemonic training on memory among Alzheimer's disease patients was effective. It graphically represented on fig 4. 7

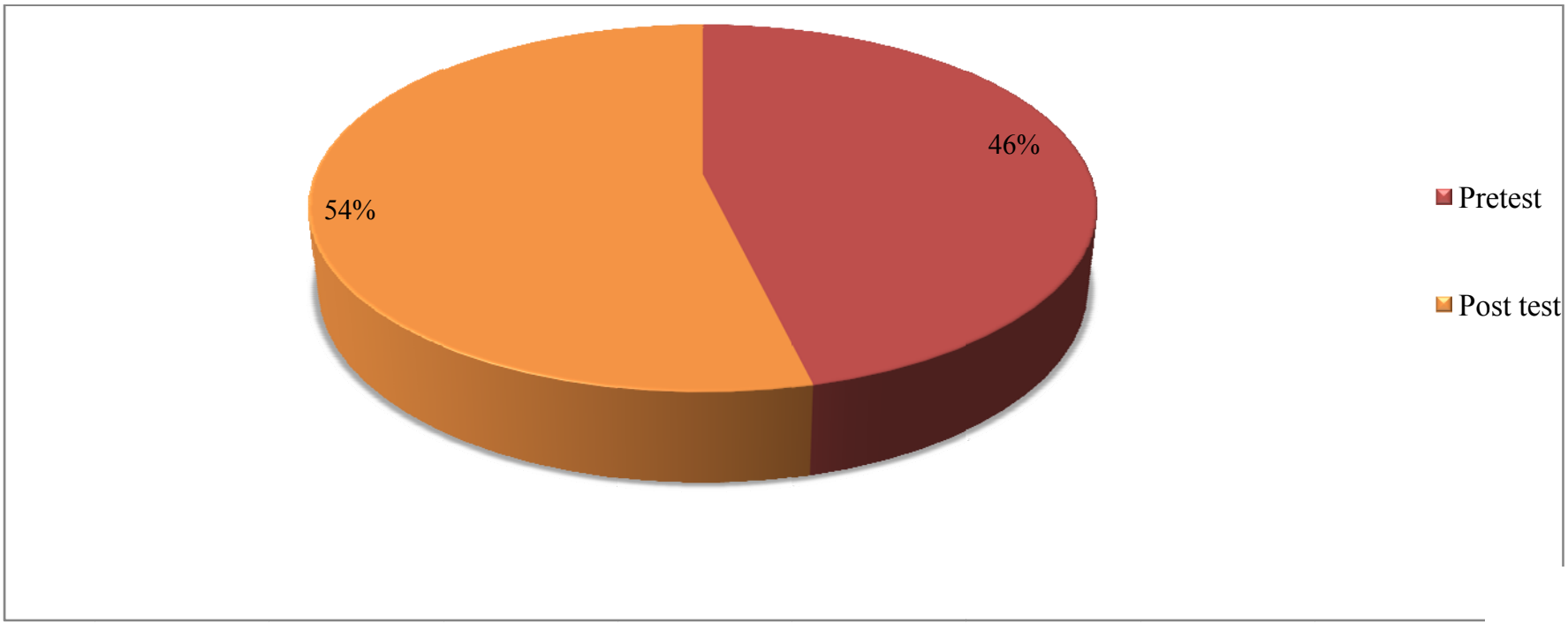

Figure 4.7: Pie diagram showing the mean percentage of pretest and post test scores of memory among Alzheimer's disease patients

SECTION-D: FIND OUT THE ASSOCIATION BETWEEN THE POST TEST SCORES ON MEMORY AMONG ALZHEIMER'S DISEASE PATIENTS WITH THEIR DEMOGRAPHIC VARIABLES

Table 4.5 Chi-square value of association between the posttests scores on memory among Alzheimer's disease patients with their demographic variables. (N=30)

Demographic variables	DF	X^2	TV	Level of significance
Age	3	6.14	7.82	**P<0.05Not significant**
Sex	1	1.01	3.84	**P<0.05Not significant**
Family history of dementia	1	2.1	3.84	**P<0.05Not significant**
Duration of illness	3	1.52	7.82	**P<0.05Not significant**
History of medication	1	0.92	3.84	**P<0.05Not significant**

Chi square was calculated to find out the association between the post test scores of memory among Alzheimer's disease patients patients with their demographic variables (Age, Gender, Family history of dementia, Duration of illness, History of medication). Hence it can be interpreted that there is no significant association between post test scores of memory among Alzheimer's disease patients with demographic variables. Hence it was only by chance not the true difference. It seems that visual images mnemonic training was effective among all Alzheimer's disease patients irrespective of their demographic variables.

SUMMARY

This chapter deals with analysis and interpretation of data collected to evaluate the effectiveness of visual images mnemonic training. The findings revealed that, the pretest mean score was (40.16±4.7) which is 68%, which is where as in post test mean score was (47.93±6.40) which is 79 %. It shows the difference of 11%. It indicates visual images mnemonic training on memory was effective among Alzheimer's disease patients. The paired't' test value showed that, there was significant difference in Alzheimer's disease patients regarding visual images mnemonic training on memory and chi square test showed no association between the demographic variables and post test scores of memory Alzheimer's disease patients.

CHAPTER – V

DISCUSSION

This chapter deals with the discussion which was based on the findings obtained from the statistical analysis and its relation to the objectives of the study, the theoretical frame work and the related literature.

A study was to assess the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients at (ARDSI) Alzheimer's and related disorders society of India. The following were the objectives of this study.

Objectives of the study were

- ★ To assess the level of memory among Alzheimer's disease patients before and after visual images mnemonic training
- ★ To determine the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients
- ★ To find out the association between post test scores on memory among Alzheimer's disease patients with their selected demographic variables

Objective 1

To assess the level of memory among Alzheimer's disease patients before and after visual images mnemonic training

- In pretest 47% of patients were mild level of memory disturbance and only 53% were moderate level of memory disturbances
- In post test 73 % of patients were in mild level of memory disturbance and 27% of patients with moderate level of memory disturbance.
- It seems that visual images mnemonic training on memory was effective among Alzheimer's disease patients.

Hypotheses 1: There is a significant level of pretest and posttest scores difference in memory among Alzheimer's disease patients before and after visual images mnemonic training. So this hypothesis is accepted.

Objectives II

To determine the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients.

1. **Paired't' test value of Alzheimer's disease pre and post test scores of memory.**

    - The paired t' test score for Address was 9.69 when compared to table value (2.05) it was high.

2. Mean, Standard Deviation And Mean Percentage Of Pre And Post Test Scores Memory Of Alzheimer's Disease Patient

In pre test

- In Address the Mean, SD was 12.3 ± 2.3 and mean percentage was 62%
- In Body parts the Mean, SD was 17.1 ± 2.5 and mean percentage was 71 %.
- In Significant places the Mean, SD was 11.1±1.6 and mean percentage was 69%.

In post test

- In Address the Mean, SD was 15.5±2.8 and mean percentage was 78%.
- In Body parts the Mean, SD was 19.2 ± 2.7 and mean percentage was 80%.
- In Significant places the Mean, SD was 12.7±1.9 and mean percentage was 79%.

Mean difference are

- In Address the difference in mean percentage was 16%.
- In Body parts the difference in mean percentage was 9%.
- In Significant places the difference in mean percentage was 10%.
- The overall mean score was 40.5± 4.6 which is 68% where as in post test the mean score was 47.4± 6.4 which is 79%.

- It is showing the difference of 11%. It seems the visual images mnemonic training on memory among Alzheimer's disease patients was effective.

Hypotheses II: There is a significant effectiveness of Visual Images Mnemonic Training on memory among Alzheimer's disease patients. So this hypothesis is accepted.

Objectives III

To find Out the Association between the Post Test Scores Of Memory among Alzheimer's disease Patients with Their Demographic Variables.

Chi square value shows that there is no significant association between posttest scores of memory among Alzheimer's disease patients with their demographic variables like Age, Gender, Family history of dementia, duration of illness and history of medication.

Hypotheses III

There is no significant association between post test scores of memory among Alzheimer's disease patients with their demographic variables. So this hypothesis was rejected.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS, AND RECOMMENDATION

This chapter deals with the summary of the study, its findings, conclusion and the implications for nursing administration, nursing practice, nursing education and nursing research. This study has been started with a few limitations and ends with suggestions and recommendations for research in future.

SUMMARY

Visual images mnemonic training were designed to improve the level of memory. The investigator studied the statement “A study to assess the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients at (ARDSI) Alzheimer’s and related disorders society of India, Cochin, Kerala

The objectives of the study are,

- ⋆ To assess the level of memory among Alzheimer's disease patients before and after visual images mnemonic training
- ⋆ To determine the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients
- ⋆ To find out the association between post test scores on memory among Alzheimer's disease patients with their selected demographic variables

Hypotheses

Researchers formulated and tested the following research hypothesis,

H_1: There is a significant level of pretest and posttest scores difference in memory among Alzheimer's disease patients before and after visual images mnemonic training.

H_2: There is a significant effectiveness of Visual Images Mnemonic Training on memory among Alzheimer's disease patients.

H_3: There is no significant association between post test scores of memory among Alzheimer's disease patients with their demographic variables.

The review of literature on related studies helped the integrations to design the methodology, conceptual frame work and find out the tool. The literature review was done for the present study and presented under the following heading.

a. Studies related to visual images mnemonic training on memory.

b. Studies related to memory among Alzheimer's disease

c. Studies related to alternative therapies on memory Alzheimer's disease

d. Studies related to visual images mnemonic training on memory among Alzheimer's disease

The investigator developed**.** The research design adopted for the study was pre experimental study. Setting chosen to conduct the study was at (ARDSI) Alzheimer's and related disorders society of India, Cochin, Kerala

In this study the sample is Alzheimer's disease patients. The sample size was 30. In this purposive sampling technique was (VMRS-AD) Visual Mnemonic Rating Scale –Alzheimer 's disease to assess visual images mnemonic training.

The reliability of respiratory function assessment scale was tested by implementing the tool on four Alzheimer's disease patients at Alzheimer's and related disorders society Cochin, KERALA which is on the same sample area.

Test retest method was used to check the reliability. The tool was found to be reliable (r'=0.9).

The main study was conducted at (ARDSI) Alzheimer's and related disorders society of India, Cochin, Kerala. The samples were selected by using purposive sampling method among those who fulfill the sampling criteria. Visual images mnemonic training was given for ten days. Data were gathered through (VMRS-AD) Visual Mnemonic Rating Scale –Alzheimer's disease. The data gathered are analyzed by descriptive and inferential statistical method and interpretation is made based on the objectives of the study.

Findings

The major findings of the study were presented under the following headings.

1. Finding related to Demographic variables of Alzheimer's disease patients.
2. Finding related to frequency and percentage distribution of pretest and posttest scores on level of memory
3. Finding related to effectiveness of Visual Images Mnemonic Training on memory among Alzheimer's disease patients.
4. Finding related to comparison of Mean, Standard deviation, and Mean percentage of pretest and post test scores.

5. Finding related to the association between post test scores of memory among Alzheimer's disease patients with their selected demographic variables.

1. Finding related to Demographic variables of Alzheimer's disease patients.

- Most of (50%) them were in the age group of 67-72 years.
- Most of (60%) them were females.
- Most of (57%) them had family history of dementia
- Highest percentage (37%) patients were in between 2-3 years duration of illness.
- Majority (83%) of them had history of medication

2. Finding related to frequency and percentage distribution of pretest and posttest scores on level of memory

- In pretest 47% of patients were mild level of memory disturbance and only 53% were moderate level of memory disturbances
- In post test 73 % of patients were in mild level of memory disturbance and 27% of patients with moderate level of memory disturbance.

- It seems that visual images mnemonic training on memory was effective among Alzheimer's disease patients.

3**. Finding related to assess the effectiveness of visual images mnemonic training on memory among Alzheimer's disease patients.**

Paired't' test was calculated to analyze the difference in Alzheimer's disease patients pretest and posttest memory. The paired 't'values were,

- Body parts was 20.2
- Significant places was 17.86
- Address was 9.69
- The paired't' value was 10, when compared to table values (2.05) it was high.

4. **Area wise comparison of Mean, Standard deviation, and Mean percentage of Alzheimer's disease patients pre and post test scores.**

- In the areas of significant places the pretest Mean and SD score was (11.1±1.6) which is 69% where as in posttest mean score was (12.7±1.9) which is 79% .It was showing the difference of 10%.
- In pre test the highest Mean and SD score was (17.1 ± 2.5) which is 71% where as in post test the mean score was (19.2 ± 2.7) which is 80 %. It is showing the difference of 9%.

- In pre test lowest Mean and SD score was (12.3 ± 2.3) which is 62% where as in post test the mean score was (15.5 ± 2.8) which is 78 %. It is showing the difference of 16%.
- The overall Mean score and SD was (40.5± 4.6) which is 68% where as in post test the mean score was (47.4± 6.4) which is 79%. It is showing the difference of 11%. It seems the visual images mnemonic training on memory among Alzheimer's disease patients was effective

5. **Finding related to the association between post test scores of memory among Alzheimer's disease patients with their demographic variables.**

Chi square was calculated to find out the association between the post test scores of experimental group with their demographic variables

- Chi square value for age in years was 6.14 ($p>0.05$).
- Chi square value for gender was 1.01, ($p>0.05$).
- Chi square value for family history of dementia was 2.1, ($p>0.05$).
- Chi square value for duration of illness was 1.52 ($p>0.05$).
- Chi square value for history of medication was 0.92 ($p>0.05$).

CONCLUSION

From the findings of the study it can be concluded that

- Highest were in the age group of 66-72 years.

- Most of them were females
- Most of them had family history of dementia,
- Majority of them in between 2-3 years duration of illness and history of dementia.
- The visual images mnemonic training was highly effective on memory with areas of address among Alzheimer's disease patients.
- There was no significant association between posttest test scores with their demographic variables like Age, Gender, Family History of Dementia, Duration of Illness and History of Medication.

IMPLICATIONS

The findings of the study have implication in nursing service, nursing administration, nursing education and nursing research.

Nursing service

- This mnemonic training can be used by the Nursing professionals who are working in the hospital for further reinforcing their practice.
- This mnemonic training can be used to demonstrate to the care givers of the patients.
- This mnemonic training can be used in the community for improvement of memory.
- This mnemonic training can be used in different types of memory disorders.

Nursing Education

Nurse educator should educate the student Nurses to improve their knowledge and practice regarding the effective management of Alzheimer's disease patients with memory disturbances and motivate them to practice.

Nursing Research

The study may be issued for further reference and for further research studies can be done as replication to standardize the Visual Images Mnemonic Training

Nursing administration

- Nurse educator should educate nursing professionals to follow this technique and find out the effectiveness.
- Administrator staff should understand the need of Alzheimer's disease patients.
- The researchers educate the family members to follow this technique for improvement of memory.

RECOMMENDATIONS

Based on the finding of the study the following recommendations have been made for further study.

- A study can conduct with large samples to generalize the findings.
- A similar study can be conducted at different settings (old age home, Mentally challenged schools)
- A similar study can be conducted with control group.
- A comparative study can be conducted to see the effectiveness of electro acupuncture and visual images mnemonic training.

SUMMARY

This chapter was dealt with the summary of the study, major findings, conclusions, implications of the study in the nursing, and recommendation for future.

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