A SURVEY ON KNOWLEDGE REGARDING ALZHEIMER'S DISEASE AMONG UNIVERSITY STUDENTS IN DHAKA CITY

A THESIS PAPER SUBMITTED TO THE DEPARTMENT OF PHARMACY, EAST WEST UNIVERSITY BANGLADESH IN PARTIAL FULLFILLMENT OF THE REQUIRMENTS FOR THE DEGREE OF BACHELOR OF PHARMACY (B.PHARM)

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DECLARATION BY THE RESEARCH CANDIDATE

I, Nurun Nahar Tania, ID: 2013-3-70-045, hereby declare that the thesis, entitled **"A SURVEY ON KNOWLEDGE REGARDING ALZHEIMER'S DISEASE AMONG UNIVERSITY STUDENTS IN DHAKA CITY"**, Submitted to the Department of Pharmacy, East West University Bangladesh, in the partial fulfillment of the requirements for the Degree of Bachelor of Pharmacy (B.Pharm) is a genuine and authentic research work carried out by me. The contents of the thesis, in full or in parts, have not been submitted to any other institute or university.

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CERTIFICATION BY THE SUPERVISOR

This is to certify that the thesis, entitled **"A SURVEY ON KNOWLEDGE REGARDING ALZHEIMER'S DISEASE AMONG UNIVERSITY STUDENTS IN DHAKA CITY",** is a research work done by **Nurun Nahar Tania (ID: 2013-3-70-045)**, in the partial fulfillment of the requirements for the Degree of Bachelor of Pharmacy under my supervision.

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ACKNOWLEDGEMENT

DEDICATION

This research paper is dedicated to my beloved parents,

Honorable faculties &loving friends.

ABSTRACT

Alzheimer disease is one of the most common mental disorder among the people in worldwide. The main objective of the study was to find out the level of knowledge related to AD including risk factors, sign and symptoms, concern about getting AD, Stages of AD and treatment regarding AD among students of different levels. In this study, total number of participant participated was four hundred and eleven. Among them majority of the students are graduate. Though majority of them are graduate one third portion don't know even the term. And the rest two third portion don't have clear idea about this.About 86.39% don't have any idea about the stage of AD. It was seen that among all the symptom most of students had selected memory loss (13.51%), confusion with place and people (12.19%), difficulty planning or solving problems (11.63%).Among all the symptom most of students had selected traumatic brain injury, Age, Stress and Genetics. 29.24% strongly agree about the chances of getting AD, 35.59% somewhat agree, 25.42% neither agree nor disagree. The participants relation with affected person maximum is not a first degree relative 87.5%.Most of them think that there are no specific treatment of AD but if the patient pass busy time with brain related works it can be a protective factor.Overall finding suggests that the knowledge about risk factors, protective factors and sign and symptom among mass people concerning AD was relatively poor and need to improve. So some steps should be taken with the help of professionals to make them aware of this mental disorder.

Keywords: Alzheimer's disease, stages of Alzheimer's, traumatic brain injury.

LIST OF CONTENTS

Chapter Three: RESULT & STATISTICAL ANALYSIS	**31-51**

Chapter One
INTRODUCTION

1.1What is Alzheimer's Disease?

According to the Center for Disease Control, Alzheimer's disease is a common cause of dementia causing as many as 50 to 70% of all dementia cases. In fact, Alzheimer's is a very specific form of dementia. Symptoms of Alzheimer's include impaired thought, impaired speech, and confusion. Doctors use a variety of screenings to determine the cause of dementia including blood tests, mental status evaluations and brain scans.

Figure 1.1: An affected women of AD

More than five million Americans are believed to have Alzheimer's, two-thirds of them are women. Geri Taylor, 72, is one of them. (Michael Kirby Smith for The New York Times)

1.2 Dementia and Alzheimer's disease

Dementia is an umbrella term for a set of symptoms including impaired thinking and memory. It is a term that is often associated with the cognitive decline of aging. However, issues other than Alzheimer's can cause dementia. Other common causes of dementia are Huntington's Disease, Parkinson's Disease and Creutzfeldt-Jakob disease.(Evans, D.1989)

1.3 Incidence of Alzheimer's

It is found that the number of Americans living with Alzheimer's disease is growing fast. An estimated 5.5 million Americans of all ages have Alzheimer's disease**.**

Of the estimated 5.5 million Americans living with Alzheimer's dementia in 2017, an estimated 5.3 million are age 65 and older and approximately 200,000 individuals are under age 65 and have younger-onset Alzheimer's.

- One in 10 people age 65 and older (10 percent) has Alzheimer's dementia.

- Almost two-thirds of Americans with Alzheimer's are women.

- African-Americans are about twice as likely to have Alzheimer's or other dementias as older whites.

- Hispanics are about one and one-half times as likely to have Alzheimer's or other dementias as older whites.

Because of the increasing number of people age 65 and older in the United States, particularly the oldest-old, the number of new cases of Alzheimer's and other dementias is projected to soar. Today, someone in the United States develops Alzheimer's dementia every 66 seconds. (Kivipelto, M.2001)

1.4 Progression of Alzheimer's

Every person with Alzheimer's disease experiences the disease differently, but patients tend to experience a similar trajectory from the beginning of the illness to its merciful end. The precise number of stages is somewhat arbitrary. Some experts use a simple three-phase model (early, moderate and end), while others have found a granular breakdown to be a more useful aid to understanding the progression of the illness.

Stage 1: Preclinical Alzheimer's or no impairment

During this stage, Alzheimer's disease is not detectable and no memory problems or other symptoms of dementia are evident. Someone in this stage is fully independent. They may not even know they have the disease.

Stage 2: Very mild decline or normal forgetfulness

The senior may notice minor memory problems or lose things around the house, although not to the point where the memory loss can easily be distinguished from normal age related memory loss. The person will still do well on memory tests and the disease is unlikely to be detected by physicians or loved ones.

Symptoms at stage 2 won't interfere with work or social activities. Memory troubles are still very mild and may not be apparent to friends and family.

Stage 3: Mild Decline

At this stage, the friends and family members of the senior may begin to notice memory and cognitive problems. Performance on memory and cognitive tests are affected and physicians will be able to detect impaired cognitive function.

Patients in stage 3 will have difficulty in many areas including:

- finding the right word during conversations
- remembering names of new acquaintances
- planning and organizing

People with stage three Alzheimer's may also frequently lose personal possessions. Other examples of stage 3 signs include:

- getting lost even when traveling a familiar route
- finding it hard to remember the right words or names
- being unable to remember what you just read
- not remembering new names or people
- misplacing or losing a valuable object
- decreasing concentration during testing

Your doctor or clinician may also have to conduct a more intense interview than usual to discover cases of memory loss.

At this stage, someone with Alzheimer's may need counselling, especially if they have complex job responsibilities. They may experience mild to moderate anxiety and denial.

Stage 4: Mild Alzheimer's or moderate decline

In stage four of Alzheimer's disease clear cut symptoms of Alzheimer's disease are apparent. Patients with stage four Alzheimer's disease:

- Have difficulty with simple arithmetic

- May forget details about their life histories

- Have poor short term memory (may not recall what they ate for breakfast, for example)

- Inability to manage finance and pay bills

Stage 5: Moderately Severe Decline

During the fifth stage of Alzheimer's, patients begin to need help with many day to day activities. People in stage five of the disease may experience:

- Significant confusion

- Inability to recall simple details about themselves such as their own phone number

- Difficulty dressing appropriately

On the other hand, patients in stage five maintain a modicum of functionality. They typically can still bathe and toilet independently. They also usually still know their family members and some detail about their personal histories, especially their childhood and youth. They'll need assistance with daily tasks and can no longer live independently. Personal hygiene and eating won't be an issue yet, but they may have trouble picking the right clothing for the weather or taking care of finances.

Stage 6: Severe Decline

Patients with the sixth stage of Alzheimer's disease need constant supervision and frequently require professional care. Symptoms include:

- Confusion or unawareness of environment and surroundings

- Major personality changes and potential behavior problems

- The need for assistance with activities of daily living such as toileting and bathing

- Inability to recognize faces except closest friends and relatives

- Inability to remember most details of personal history

- Loss of bowel and bladder control

Assistance with personal care, from daily tasks to hygiene, is necessary by this stage. They may also start to sleep more during the day and wander at night.

Stages 7: Very Severe Decline

Stage seven is the final stage of Alzheimer's disease. Because Alzheimer's disease is a terminal illness, patients in stage seven are nearing death. In stage seven of the disease, patients lose ability to respond to their environment or communicate. While they may still be able to utter words and phrases, they have no insight into their condition and need assistance with all activities of daily living. In the final stages of the illness, patients may lose their ability to swallow.

At this stage, the individual's ability to respond to the environment is lost. They'll need help with almost all their daily tasks, including eating or moving. Some people will become immobile during this stage. The most frequent cause of death in someone with stage 7 Alzheimer's is pneumonia. (Kivipelto, M. 2001)

1.5 Causes or risk factor of Alzheimer

Scientists believe that for most people, Alzheimer's disease is caused by a combination of genetic, lifestyle and environmental factors that affect the brain over time. Less than 5 percent of the time, Alzheimer's is caused by specific genetic changes that virtually guarantee a person will develop the disease.

Those who have a parent, brother, sister or child with Alzheimer's are more likely to develop the disease. The risk increases if more than one family member has the illness. When diseases tend to run in families, either heredity (genetics) or environmental factors, or both, may play a role. High cholesterol level high blood pressure, diabetes, smoking and obesity are the major modifiable risk factors for cardiovascular diseases, including heart disease and stroke. The risk factors for cardiovascular disease represent risk factors for both Alzheimer's disease and vascular dementia.

Familial Alzheimer's disease (FAD) is a rare form of Alzheimer's that is entirely passed down through family, being inherited from a parent. FAD accounts for between 2-3% of all cases of Alzheimer's and usually has a much earlier onset than other types of Alzheimer's, with symptoms developing in their 30s or 40s. (Aevarsson, O. and Skoog, I, 1996).

1.6 What Can Lead to Alzheimer's Disease?

There are a few things that may make people more likely to get Alzheimer's. So far, research has linked the disease with:

1. Age which risk for Alzheimer's goes up as someone getting older. For most people, it starts going up after age 65.

2. Gender is a factor where Women get the disease more often than men.

3. Family history is a important thing as People who have a parent or sibling with Alzheimer's are more likely to get it themselves.

4. Down syndrome . It's not clear why, but people with this disorder often get Alzheimer's disease in their 30s and 40s.

5. Some studies have shown a link between Alzheimer's disease and a major head injury.

6.Other factors. High cholesterol levels and high blood pressure may also raise your risk.

Blood pressure is the measurement
of force applied to artery walls

✿ADAM.
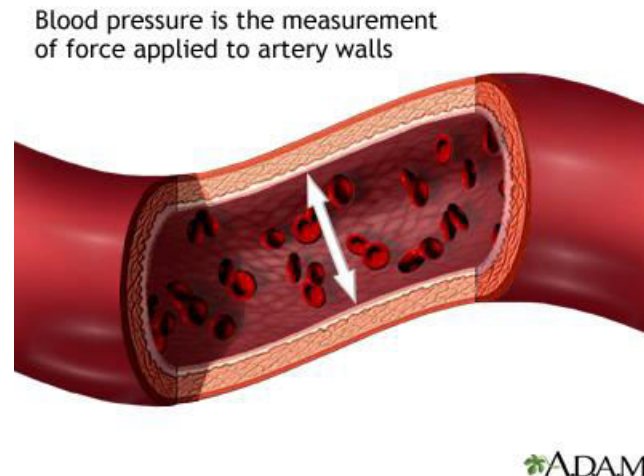
Figure: Blood vesel

Researchers don't know exactly what causes Alzheimer's disease. There are probably a lot of things that are behind it. But as scientists have learned more about the condition, they've found clues about where symptoms come from and who's at risk. (Aevarsson, O. and Skoog, I. 1996).

The Brain and Alzheimer's Disease

There are three brain abnormalities that are the hallmarks of the Alzheimer's disease process:

- Plaques. A protein called beta-amyloid accumulates and forms sticky clumps of amyloid plaque between nerve cells (neurons). High levels of beta amyloid are associated with reduced levels of the neurotransmitter acetylcholine. (Neurotransmitters are chemical messengers in the brain.) Acetylcholine is part of the cholinergic system, which is essential for memory and learning and is progressively destroyed in Alzheimer's disease.

- Tangles. Neurofibrillary tangles are the damaged remains of macrotubules, the support structure that allows the flow of nutrients through the neurons. A key feature of these tangled fibers is an abnormal form of the tau protein, which in its normal version helps maintain healthy neurons.

- Loss of nerve cell connections. The tangles and plaques cause neurons to lose their connection to one another and die off. As the neurons die, brain tissue shrinks (atrophies).
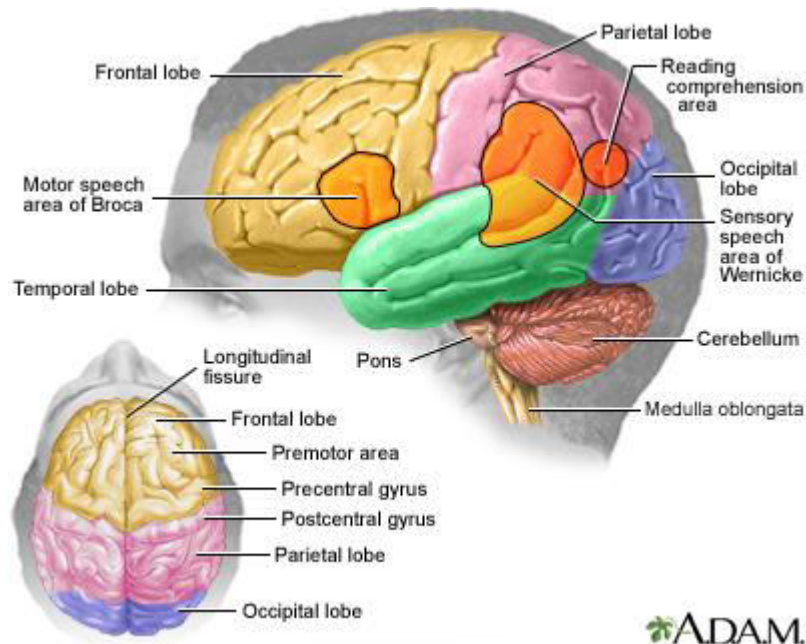
Figure: Several parts of Brain

When a person has Alzheimer's, his brain changes. It has fewer healthy cells, and it gets smaller over time. Most of the time, the brain cells also form two types of flaws:

- Neurofibrillary tangles. These are twisted fibers inside brain cells that keep nutrients and other important things from moving from one part of the cell to another

- Beta-amyloid plaques. These are sticky clumps of proteins that build up between nerve cells instead of breaking down like they do in healthy brains.

Plaques and tangles damage the healthy brain cells around them. The damaged cells die, and the brain shrinks. These changes cause the symptoms of Alzheimer's, such as memory loss, speech problems, confusion, and mood swings.

Brain cells affected by the disease also make lower amounts of the chemicals called neurotransmitters that nerves use to send messages to each other.

Scientists don't know if these brain cell changes cause Alzheimer's or happen because of it.

(Fujishima, M. and Kiyohara, Y.2002).

1.7 Differentiation of Alzheimer;s disease from other etiologies

A. Alzheimer's disease versus normal aging

Everyone's memory gets worse with age, so how can you tell the difference between normal aging and signs of Alzheimer's disease?

There definitely is a distinction between the two, experts say. "Alzheimer's disease is not normal aging," said Heather Snyder, senior associate director of medical and scientific relations at the Alzheimer's Association.

Alzheimer's disease is a type of dementia, a general term for a condition in which someone develops cognitive problems as a result of changes in the brain. Alzheimer's is thought to be caused by the buildup of toxic proteins in the brain.

The most common symptom of Alzheimer's is difficultly remembering things , particularly new information, such as an appointment you have made. While people who are aging normally may forget things as well, they will typically remember them later -- in other words, you remember that you forgot.

But in some people with Alzheimer's disease , that doesn't happen. "You forget something and then you don't get that information back, it doesn't seem familiar to you even if someone reminds you," Snyder said.

Another example might be forgetting to pay your monthly bills, which would be a sign of normal aging, versus forgetting how to pay your bills or how to manage your budget, which would be a sign of Alzheimer's, Snyder said.

Snyder stresses that Alzheimer's affects individuals differently, so not everyone will have the same symptoms. If you are concerned that you or a family member is experiencing signs of Alzheimer's, you should speak with a health care professional, Snyder said.

Difficulty completing tasks: People with Alzheimer's may have difficulty with everyday tasks, such as driving to the grocery store. "You've gone to the same grocery store for 20 years, and suddenly you're not quite sure how to get to that grocery store, or you're not quite sure how to get home," Snyder said. Those who are aging normally may sometimes need help with tasks, such as figuring out how to record a TV show, the Alzheimer's Association says.

Trouble with words: Those with Alzheimer's disease may have trouble engaging in conversation, stopping in the middle or repeating themselves. They may also call an object by the wrong name. Someone who is experiencing normal aging may occasionally have trouble thinking of exactly what they want to say, Snyder said.

Misplacing things: Sometimes those with Alzheimer's disease may misplace something, and then not be able to find it later because they don't identify the object, such as a purse, as their own, Snyder said. Other times, they lose something and can't retrace their steps to find it. Or they may even forget that they need the object they have lost. "We all lose our keys and our glasses...but losing my glasses and not even necessarily remembering that I need glasses might be an example," of a sign of Alzheimer's, Snyder said.

Trouble with visual perception: Those with Alzheimer's may have trouble judging distances or determining the height of a stair or a curb, Snyder said. Or they might think someone else is in the room when they walk by a mirror. People who age normally may have trouble seeing due to cataracts.(Smith, B., Ali, S. and Quach, H. 2014).

B. Alzheimer's versus depression

As people age some are diagnosed with depression or a mood disorder, they might show similar symptoms to Alzheimer's disease. We are going to give you 10 tips in how to differentiate these two medical conditions.

• Onset: Depression often has a clear beginning, death of a relative, separation, divorce, abandonment, illness of relative or self, accident, or even life crisis. Conversely, in Alzheimer's disease the onset might be slow and will start as gradual irritability and forgetfulness.

• Development: Depression symptoms can appear quickly and be very obvious, while in Alzheimer's disease the development can last for years.

• Clinical History: It is more common to experience depressive episodes if the person has a history of depressive symptoms through life. With Alzheimer's the person may have a clean history of psychiatric conditions.

• Neurological Damage: People diagnosed with Alzheimer's are usually affected in 4 principal functions that are language, knowledge of the world, completing repetitive tasks like tying shoelaces, and the planning and execution of multi-step directions. Depressed people can

appear to have similar difficulties achieving simple things, communicating with others, and forgetfulness.

• Magical Thinking: One interesting characteristics in Alzheimer's is the creation of fabricated histories to explain episodes in life no longer remembered.

• Attitude: In a person who suffers from depression complaints are common and failure tends to be overrated. Typically a person who suffers from Alzheimer's will make errors without being too judgmental of themselves.

• Task Failure: In a person with Alzheimer's once a skill or ability is lost, it almost always remains lost, if the person suffers from depression they may use skills properly at times and not others.

• Reactions to positive affect: People who are depressed often find it difficult to react positively. Conversely, a person with Alzheimer's still can often enjoy life and show spontaneous happiness.

• Social Skills: In a depressed person the onset of this condition has a significant loss of social activity, they don't want to go out, don't call their friends, don't want anyone to visit. With Alzheimer's there is usually no loss of joy in social contact.

• Neurologic Tests: Alzheimer's disease has specific brain abnormalities in diagnostic tests such as CT scans and EEG's (Computerized Axial Tomography or Electroencephalography)

(Roberts, J., McLaughlin, S. and Connell, C. 2014).

C. **The Difference Between Alzheimer's and Dementia**

A good analogy to the term dementia is "fever." Fever refers to an elevated temperature, indicating that a person is sick. But it does not give any information about what is causing the sickness.

In the same way, dementia means that there is something wrong with a person's brain, but it does not provide any information about what is causing the memory or cognitive difficulties.

Dementia is not a disease - it is the clinical presentation or symptoms of a disease.

There are many possible causes of dementia. Some causes are reversible, such as certain thyroid.   .

If these underlying problems are identified and treated, then the dementia reverses and the person can return to normal functioning

Approximately 5.3 million Americans currently live with Alzheimer's Disease.

- .As people get older, the prevalence of Alzheimer's disease increases,with approximately 50% of people age 85 and older having the disease.

- It is important to note, however, that although Alzheimer's is extremely common in later years of life, it is not part of normal aging. For that matter, dementia is not part of normal aging.

- If someone has dementia (due to whatever underlying cause), it represents an important problem in need of appropriate diagnosis and treatment by a well-trained health care provider who specializes in degenerative diseases

1.8 Diagnosis of Alzheimers

There's no specific test today that confirms you have Alzheimer's disease. Your doctor will make a judgment about whether Alzheimer's is the most likely cause of your symptoms based on the information you provide and results of various tests that can help clarify the diagnosis.

Doctors can nearly always determine whether you have dementia, and they can often identify whether your dementia is due to Alzheimer's disease. Alzheimer's disease can be diagnosed with complete accuracy only after death, when microscopic examination of the brain reveals the characteristic plaques and tangles.

To help distinguish Alzheimer's disease from other causes of memory loss, doctors now typically rely on the following types of tests.

A. Physical and neurological exam

Your doctor will perform a physical exam, and is likely to check your overall neurological health by testing your:

- Muscle tone and strength

- Ability to get up from a chair and walk across the room

- Sense of sight and hearing

- Coordination

- Balance

B. Lab tests

Blood tests may help your doctor rule out other potential causes of memory loss and confusion, such as thyroid disorders or vitamin deficiencies.

C. Mental status and neuropsychological testing

Your doctor may conduct a brief mental status test to assess your memory and other thinking skills. In addition, your doctor may suggest a more extensive assessment of your thinking and memory. Longer forms of neuropsychological testing may provide additional details about your mental function compared with others' of a similar age and education level.

D. Brain imaging

Images of the brain are now used chiefly to pinpoint visible abnormalities related to conditions other than Alzheimer's disease — such as strokes, trauma or tumors — that may cause cognitive change. New imaging applications — currently used primarily in major medical centers or in clinical trials — may enable doctors to specific brain changes caused by Alzheimer's.

Brain-imaging technologies include:

- **Magnetic resonance imaging (MRI).** An MRI uses radio waves and a strong magnetic field to produce detailed images of your brain. MRIs are used to rule out other conditions that may account for or be adding to cognitive symptoms. In addition, they may be used to assess whether shrinkage in brain regions implicated in Alzheimer's disease has occurred.

- **Computerized tomography (CT).** A CT scan produces cross-sectional images (slices) of your brain. It's currently used chiefly to rule out tumors, strokes and head injuries.

- **Positron emission tomography (PET).** During a PET scan, you'll be injected in a vein with a low-level radioactive tracer. The tracer may be a special form of glucose (sugar) that shows overall activity in various brain regions.

This can show which parts of your brain aren't functioning well. New PET techniques are able to detect your brain level of plaques (amyloid) and tangles (tau), the two hallmark abnormalities linked to Alzheimer's. However, these new PET techniques are generally found in research settings or in clinical trials.

• **Cerebrospinal fluid.** In special circumstances such as rapidly progressive dementia or very young onset dementia, a cerebrospinal fluid examination may be performed. The spinal fluid can be tested for biomarkers that indicate the likelihood of Alzheimer's disease.

E. Future diagnostic tests

Researchers are working with doctors to develop new diagnostic tools to help definitively diagnose Alzheimer's. Another important goal is to detect the disease before it causes the symptoms.

New tools under investigation include:

- Additional approaches to brain imaging

- More-sensitive tests of mental abilities

- Measurement of key proteins or protein patterns in blood or spinal fluid (biomarkers)

Genetic testing generally isn't recommended for a routine Alzheimer's disease evaluation. The exception is people who have a history of early-onset Alzheimer's disease. However, anyone with a family history of early Alzheimer's needs to meet with a genetic counselor to discuss the risks and benefits of genetic testing.

F. Mini-mental state exam (MMSE)

During the MMSE, a health professional asks a patient a series of questions designed to test a range of everyday mental skills.The maximum MMSE score is 30 points. A score of 20 to 24 suggests mild dementia, 13 to 20 suggests moderate dementia, and less than 12 indicates severe

dementia. On average, the MMSE score of a person with Alzheimer's declines about two to four points each year.

G.Mini-cog

During the mini-cog, a person is asked to complete two tasks:

1. Remember and a few minutes later repeat the names of three common objects

2. Draw a face of a clock showing all 12 numbers in the right places and a time specified by the examiner

The results of this brief test can help a physician determine if further evaluation is needed.

(Purandare, N., Luthra, V., Swarbrick, C. and Burns, A. 2007).

1.9 Treatment

Currently, there is no cure for Alzheimer's. But drug and non-drug treatments may help with both cognitive and behavioral symptoms. Researchers are looking for new treatments to alter the course of the disease and improve the quality of life for people with dementia.

Current Alzheimer's medications can help for a time with memory symptoms and other cognitive changes. Two types of drugs are currently used to treat cognitive symptoms:

*   **Cholinesterase inhibitors.** These drugs work by boosting levels of a cell-to-cell communication by providing a neurotransmitter (acetylcholine) that is depleted in the brain by Alzheimer's disease. The improvement is modest. Cholinesterase inhibitors can improve neuropsychiatric symptoms, such as agitation or depression, as well.

Commonly prescribed cholinesterase inhibitors include donepezil (Aricept), galantamine (Razadyne) and rivastigmine (Exelon). The main side effects of these drugs include diarrhea, nausea, loss of appetite and sleep disturbances. In people with cardiac conduction disorders, serious side effects may include a slow heart rate and heart block.

*   **Memantine (Namenda).** This drug works in another brain cell communication network and slows the progression of symptoms with moderate to severe Alzheimer's disease. It's sometimes used in combination with a cholinesterase inhibitor. Side effects may include constipation, dizziness and headache.

Sometimes other medications such as antidepressants are used to help control the behavioral symptoms associated with Alzheimer's disease. But some medications should only be used with great caution. For example, some common sleep medications — zolpidem (Ambien), eszopiclone (Lunesta) and others — may increase confusion and the risk of falls.

Anti-anxiety medications — clonazepam (Klonopin) and lorazepam (Ativan) — increase the risk of falls, confusion and dizziness. Always check with your doctor before taking any new medications.

Creating a safe and supportive environment

Adapting the living situation to the needs of a person with Alzheimer's is an important part of any treatment plan. For someone with Alzheimer's, establishing and strengthening routine habits and minimizing memory-demanding tasks can make life much easier.

We can take these steps to support a person's sense of well-being and continued ability to function:

1.Always keep keys, wallets, mobile phones and other valuables in the same place at home, so they don't become lost.

2.See if your doctor can simplify your medication regimen to once-daily dosing, and arrange for your finances to be on automatic payment and automatic deposit.

3.Develop the habit of carrying a mobile phone with location capability so that you can call in case you are lost or confused and people can track your location via the phone. Also, program important phone numbers into your phone, so you don't have to try to recall them.

4.Make sure regular appointments are on the same day at the same time as much as possible.

- Use a calendar or whiteboard in the home to track daily schedules. Build the habit of checking off completed items so that you can be sure they were completed.

- Remove excess furniture, clutter and throw rugs.

- Install sturdy handrails on stairways and in bathrooms.

- Ensure that shoes and slippers are comfortable and provide good traction.

- Reduce the number of mirrors. People with Alzheimer's may find images in mirrors confusing or frightening.

- Keep photographs and other meaningful objects around the house.

Exercise

Regular exercise is an important part of everybody's wellness plan — and those with Alzheimer's are no exception. Activities such as a daily walk can help improve mood and maintain the health of joints, muscles and the heart.

Exercise can also promote restful sleep and prevent constipation. Make sure that the person with Alzheimer's carries identification or wears a medical alert bracelet if she or he walks unaccompanied.

People with Alzheimer's who develop trouble walking may still be able to use a stationary bike or participate in chair exercises. You may be able to find exercise programs geared to older adults on TV or on DVDs.

Nutrition

People with Alzheimer's may forget to eat, lose interest in preparing meals or not eat a healthy combination of foods. They may also forget to drink enough, leading to dehydration and constipation.

- **High-calorie, healthy shakes and smoothies.** You can supplement milkshakes with protein powders (available at grocery stores, drugstores and discount retailers) or use your blender to make smoothies featuring your favorite ingredients.

- **Water, juice and other healthy beverages.** Try to ensure that a person with Alzheimer's drinks at least several full glasses of liquids every day. Avoid beverages with caffeine, which can increase restlessness, interfere with sleep and trigger a frequent need to urinate.

Certain nutritional supplements are marketed as "medical foods" specifically to treat Alzheimer's disease. The Food and Drug Administration (FDA) does not approve products marketed as medical foods. Despite marketing claims, there's no definitive data showing that any of these supplements is beneficial or safe.

Alternative medicine

Various herbal mixtures, vitamins and other supplements are widely promoted as preparations that may support cognitive health or prevent or delay Alzheimer's. Currently, there's no strong evidence that any of these therapies slow the progression of cognitive decline.

- **Omega-3 fatty acids.** Omega-3 fatty acids in fish may help prevent cognitive decline. Studies done on fish oil supplements haven't shown any benefit, however.

- **Curcumin.** This herb comes from turmeric and has anti-inflammatory and antioxidant properties that might affect chemical processes in the brain. So far, clinical trials have found no benefit for treating Alzheimer's disease.

- **Ginkgo.** Ginkgo is a plant extract containing several substances. A large study funded by the NIH found no effect in preventing or delaying Alzheimer's disease.

- **Vitamin E.** Although vitamin E isn't effective for preventing Alzheimer's, taking 2,000 international units daily may help delay the progression in people who already have the disease. However, study results have been mixed, with only some showing this benefit. Further research into the safety of 2,000 international units daily of Vitamin E in a dementia population will be needed before it can be routinely recommended.

Supplements promoted for cognitive health can interact with medications you're taking for Alzheimer's disease or other health conditions. Work closely with your health care team to create a treatment plan that's right for you. Make sure you understand the risks and benefits of everything it includes. (Kivipelto, M.2001)

Chapter Two
Literature Review

2.1. Prevalence of Alzheimer's Disease in a Community Population of Older Persons

Clinically diagnosed Alzheimer's disease and other dementing illnesses were assessed in a geographically defined US community. Of 3623 persons (80.8% of all community residents over 65 years of age) who had brief memory testing in their homes, a stratified sample of 467 persons underwent neurological, neuropsychological, and laboratory examination. Prevalence rates of Alzheimer's disease were calculated for the community population from the sample undergoing clinical evaluation. Of those over the age of 65 years, an estimated 10.3% (95% confidence limits, 8.1% and 12.5%) had probable Alzheimer's disease. This prevalence rate was strongly associated with age. Of those 65 to 74 years old, 3.0% (95% confidence limits, 0.8 and 5.2) had probable Alzheimer's disease, compared with 18.7% (95% confidence limits, 13.2 and 24.2) of those 75 to 84 years old and 47.2% (95% confidence limits, 37.0 and 63.2) of those over 85 years. Other dementing conditions were uncommon. Of community residents with moderate or severe cognitive impairment, 84.1% had clinically diagnosed Alzheimer's disease as the only probable diagnosis. These data suggest that clinically diagnosed Alzheimer's disease is a common condition and that its public health impact will continue to increase with increasing longevity of the population. (Evans, 1989)

2.2 Midlife vascular risk factors and Alzheimer's disease in later life: longitudinal, population based study

Objective was To examine the relation of midlife raised blood pressure and serum cholesterol concentrations to Alzheimer's disease in later life. Main outcome measures Midlife blood pressure and cholesterol concentrations and development of Alzheimer's disease in later life. People with raised systolic blood pressure ($\geq$160 mm Hg) or high serum cholesterol concentration ($\geq$6.5 mmol/l) in midlife had a significantly higher risk of Alzheimer's disease in later life, even after adjustment for age, body mass index, education, vascular events, smoking status, and alcohol consumption, than those with normal systolic blood pressure (odds ratio 2.3, 95% confidence interval 1.0 to 5.5) or serum cholesterol (odds ratio 2.1, 1.0 to 4.4). Participants with both of these risk factors in midlife had a significantly higher risk of developing Alzheimer's disease than those with either of the risk factors alone (odds ratio 3.5, 1.6 to 7.9). Diastolic blood pressure in midlife had no significant effect on the risk of Alzheimer's disease. Raised systolic blood pressure and high serum cholesterol concentration, and in particular the combination of these risks, in midlife increase the risk of Alzheimer's disease in later life. (Kivipelto, 2001)

2.3. Midlife Coffee and Tea Drinking and the Risk of Late-Life Dementia: A Population-Based CAIDE Study

Caffeine stimulates central nervous system on a short term. However, the long-term impact of caffeine on cognition remains unclear. We aimed to study the association between coffee and/or tea consumption at midlife and dementia/Alzheimer's disease (AD) risk in late-life. Participants of the Cardiovascular Risk Factors, Aging and Dementia (CAIDE) study were randomly selected from the survivors of a population-based cohorts previously surveyed within the North Karelia Project and the FINMONICA study in 1972, 1977, 1982 or 1987 (midlife visit). After an average follow-up of 21 years, 1409 individuals (71%) aged 65 to 79 completed the re-examination in 1998. A total of 61 cases were identified as demented (48 with AD). Coffee drinkers at midlife had lower risk of dementia and AD later in life compared with those drinking no or only little coffee adjusted for demographic, lifestyle and vascular factors, apolipoprotein E ε4 allele and depressive symptoms. The lowest risk (65% decreased) was found in people who drank 3–5 cups per day. Tea drinking was relatively uncommon and was not associated with dementia/AD. Coffee drinking at midlife is associated with a decreased risk of dementia/AD later in life. This finding might open possibilities for prevention of dementia/AD. (Eskelinen et al., 2009)

2.4. Prevalence and Subtypes of Dementia in Taiwan: A community Survey of 5297 Individuals

To study the prevalence rate of dementia in Taiwan, the relative frequencies of its subtypes, and its associations with age, education, gender, and residence location. Thirty-one cases of dementia were identified by the DSM-III-R criteria, including 18 cases of Alzheimer's disease, 10 cases of vascular dementia, and three cases of other dementias. The prevalence rate in individuals aged 65 and over was 2.0%. Aging and illiteracy were associated with higher rates of dementia; gender and residence location made no difference.

The prevalence rate of dementia was low in this Chinese population. consistent with common findings from other parts of the world, a high rate of dementia was associated with older age and illiteracy, and Alzheimer's disease was the most frequent cause. (Liu et al., 1995)

2.5. A Population-Based Study on the Incidence of Dementia Disorders Between 85 and 88 Years of Age

To investigate the incidence of Alzheimer's disease, vascular dementia and other dementias in a population between 85 and 88 years of age. A representative population sample of nondemented 85-year-old residents (n = 347). Sufficient information was obtained about 92% of the subjects at risk. Sixty-three subjects (18.2%) became demented between ages 85 and 88, giving an incidence of 90.1/1000/year (61.3/1000/year for men and 102.7/1000/year for women; P = .085). The incidence of Alzheimer's disease was 36.3/1000/year, vascular dementia 39.0/1000/year (P = 1.000), and that of other dementias 9.1/1000/year. This study shows that almost one-tenth of nondemented persons between the ages of 85 and 88 become demented each year, emphasizing the magnitude of the dementia problem in the very old, the fastest growing segment of western populations (Aevarsson and Skoog, 1996).

2.6. Prevalence of dementia and major dementia subtypes in Spanish populations: A reanalysis of dementia prevalence surveys, 1990-2008

This study describes the prevalence of dementia and major dementia subtypes in Spanish elderly.The reanalyzed study population (aged 70 year and above) was composed of Central and North-Eastern Spanish sub-populations obtained from 9 surveys and totaled 12,232 persons and 1,194 cases of dementia (707 of Alzheimer's disease, 238 of vascular dementia). Results showed high variation in age- and sex-specific prevalence across studies. The reanalyzed prevalence of dementia was significantly higher in women; increased with age, particularly for Alzheimer's disease; and displayed a significant geographical variation among men. Prevalence was lowest in surveys reporting participation below 85%, studies referred to urban-mixed populations and populations diagnosed by psychiatrists. Prevalence of dementia and Alzheimer's disease in Central and North-Eastern Spain is higher in females, increases with age, and displays considerable geographic variation that may be method-related. People suffering from dementia and Alzheimer's disease in Spain may approach 600,000 and 400,000 respectively. However, existing studies may not be completely appropriate to infer prevalence of dementia and its subtypes in Spain until surveys in Southern Spain are conducted. (de Pedro-Cuesta et al., 2009)

2.7. Prevalence of Alzheimer's disease and vascular dementia: association with education. The Rotterdam study

To estimate the prevalence of dementia and its subtypes in the general population and examine the relation of the disease to education.7528 participants of the Rotterdam study aged 55-106 years. 474 cases of dementia were detected, giving an overall prevalence of 6.3%. Prevalence

ranged from 0.4% (5/1181 subjects) at age 55-59 years to 43.2% (19/44) at 95 years and over. Alzheimer's disease was the main subdiagnosis (339 cases; 72%); it was also the main cause of the pronounced increase in dementia with age. The relative proportion of vascular dementia (76 cases; 16%), Parkinson's disease dementia (30; 6%), and other dementias (24; 5%) decreased with age. A substantially higher prevalence of dementia was found in subjects with a low level of education. The association with education was not due to confounding by cardiovascular disease.The prevalence of dementia increases exponentially with age. About one third of the population aged 85 and over has dementia. Three quarters of all dementia is due to Alzheimer's disease. In this study an inverse dose-response relation was found between education and dementia—in particular, Alzheimer's disease. (Ott et al., 1994)

2.8. Risk Factors for Alzheimer Disease: A Population-Based Case-Control Study in Istanbul, Turkey

The objective is to study risk factors for Alzheimer disease (AD) in Istanbul, Turkey. This is a population-based case-control study. We screened people over age 70 in the community for cognitive impairment. The screen positives and a proportion of screen negatives underwent neurologic examination in the second phase. Cases were 57 "probable" AD patients and controls were 127 cognitively normal individuals identified by neurologic examination. Odds ratios (OR) were calculated using multivariate logistic regression analysis. Having a university/college degree had a protective effect on AD risk (OR = 0.10, 95% confidence interval [CI] = 0.02–0.50). Exposure to occupational electromagnetic field had an OR of 4.02 (95% CI = 1.02–15.78). Use of electricity for residential heating also showed elevated risk (OR = 2.77, 95% CI = 1.12–6.85). Our results suggest that having a higher education is protective from AD and that electromagnetic field exposure at work or at home is a significant risk factor. (Harmanci et al., 2003)

2.9. Prevalence of Alzheimer's Disease and Other Dementing Disorders: Assiut-Upper Egypt Study

The aim of this study was to determine the prevalence rate of Alzheimer's disease (AD) and other types of dementias among the population over the age of 60 years in Assiut governorate. A 3-phase cross-sectional population-based study was carried out to screen 2,000 subjects residing in 11 different locations representing the sociocultural status of the area. We subjected each proband to a modified form of the Mini Mental State Examination test. Subjects scored 21 or less were investigated according to a standardized protocol. We found 90 demented

subjects yielding a crude prevalence ratio (case per 100 population over the age of 60) of 4.5. A diagnosis of subtypes of dementia was reached in 83 cases. Prevalence ratios for dementia subtypes were 2.2 for AD, 0.95 for multi-infarct dementia. 0.55 for mixed dementias and 0.45 for secondary dementias. Age-specific prevalence tends to be doubled every 5 years. Occupation, level of education and residence did not affect the prevalence or severity of dementia. Comparison with other studies suggests that dementia of all types is as frequent in Assiut governorate as elsewhere. (Farrag et al., 1998)

2.10. Incidence and risk factors of vascular dementia and Alzheimer's disease in a defined elderly Japanese population

We followed 828 nondemented residents of Hisayama Town, Kyushu, Japan, aged 65 years or older (88.3% of the elderly population) for 7 years starting in 1985 in order to determine the type-specific incidence of dementia and its risk factors in the general Japanese population. Only two subjects were lost to the follow-up, during which period 103 subjects developed dementia. Morphologic examination of the brains of 89 subjects (86.4%) was made by autopsy or CT. We made the initial diagnosis of dementia based on the DSM-111-R criteria, with the diagnoses of vascular dementia (VD) being based on the NINDS-AIREN criteria and Alzheimer's disease (AD) on the NINCDS-ADRDA criteria. The incidence of VD and AD increased with age for both sexes. The age-adjusted total incidence (per 1,000 person-years) of dementia was 19.3 for men and 20.9 for women. The corresponding rates for VD were 12.2 for men and 9.0 for women, and for AD, 5.1 for men and 10.9 for women. Among the VD subjects whose brain morphology we examined, the most frequent type of stroke was multiple lacunar infarcts (42%), but half these subjects lacked a stroke episode in their histories. Multivariate analysis showed that age, prior stroke episodes, systolic blood pressure, and alcohol consumption were significant independent risk factors for the occurrence of VD. In contrast, age and a low score on Hasegawa's dementia scale were significant risk factors for AD, and physical activity was a significant preventive factor for AD. Our findings suggest that asymptomatic stroke is an important factor in the development of VD, with age, prior stroke episodes, systolic blood pressure, and alcohol consumption being independent risk factors for its occurrence. Age and a low scare on Hasegawa's dementia scale are significant risk factors for AD, with moderate physical activity having a statistically significant preventive effect (FUJISHIMA and KIYOHARA, 2002).

2.11. Public knowledge about dementia in Germany—results of a population survey

Objectives The following research questions are addressed:(1) What does the German public know about dementia? (2) Are social factors, care experience and contact with dementia patients associated with knowledge about dementia? (3) Is knowledge associated with attitudes/ beliefs about dementia?

Methods Analyses are based on a German mail survey conducted in 2012. Sample consists of persons aged 18–79 years. 1795 persons filled out the questionnaire (response rate 78 %). Respondents were asked about their

knowledge of and attitudes about dementia. Results Knowledge about cause, prevention, diagnosis, treatment and life impact of dementia is characterized by a relatively high uncertainty. People with care experiences and people from higher status groups know more about dementia. People with more knowledge are less likely to believe that dementia patients have a high quality of life, but tend to be less skeptical about early detection of dementia. Conclusions To increase knowledge, reduce uncertainty and modify attitudes towards dementia and those who are afflicted, educational programs and contact-based approaches should be considered (Lüdecke, von dem Knesebeck and Kofahl, 2015).

2.12. Public knowledge and beliefs about dementia risk reduction: a national survey of Australians

With the dramatically increasing contribution of Alzheimer's Disease and other forms of dementia to the global burden of disease, countries are being urged to address this as a public health priority. This study investigated whether Australian adults recognise this as an important health issue, and hold beliefs and knowledge that are consistent with recommendations concerning dementia risk reduction. This research was undertaken to guide national brain health awareness and education strategies. (Smith, Ali and Quach, 2014).

2.13. Knowledge of dementia among South Asian (Indian) older people in Manchester, UK

The aim of this study was to examine knowledge of dementia in South Asian older people, as compared with Caucasian older people. Attendees, not known to suffer from dementia, of one South Asian and two predominantly Caucasian day centres

for older people in Manchester (UK) were asked to complete the Dementia Knowledge Questionnaire (DKQ). The DKQ was translated into Gujarathi and Urdu by the professional translators. One hundred and ninety-one DKQs from Indian and 55 DKQs from Caucasian

(white UK/Irish/European) older people were included in the analyses. Knowledge of dementia was poor in both Indian and Caucasian older people, especially so in the former. The median (25th–75th percentile) total DKQ scores were 3 (2–5) in Indians and 6 (3.5–9) in Caucasians. Indian older people showed significantly less knowledge about basic aspects and epidemiology of dementia when compared to Caucasian older people. Both groups faired equally badly on questions about aetiology and symptomatology. Indian older people were less aware of personality, reasoning, and speech being the affected in dementia and respectively.

Conclusion Indian older people in Manchester (UK) do not seem to have sufficient knowledge about dementia, which may be one of the reasons for their relative absence in the local dementia treatment clinics. (Purandare et al., 2007)

2.14. **Public beliefs and knowledge about risk and protective factors for Alzheimer's disease**

The purpose of this study was to assess public beliefs and knowledge about risk and protective factors for Alzheimer's disease (AD). Respondents were 1641 adults (mean age = 64.4 years, 53.6% female, 81.7% White). Most (60.1%) indicated interest in learning their AD risk, with 29.4% expressing active worry. Many failed to recognize that medications to prevent AD are not available (39.1%) or that having an affected first-degree relative is associated with increased disease risk (32%). Many respondents believed that various actions (e.g., mental activity, eating a healthy diet) would be effective in reducing AD risk.Older and middle-aged adults are interested in their AD risk status and believe that steps can be taken to reduce disease risk. Tailored education efforts are needed to address potential misconceptions about risk and protective factors (Roberts, McLaughlin and Connell, 2014).

2.15 Aim and Objective of the study

1. To know the student's knowledge of AD in Bangladesh

2. To find out the presence of risk factors associated with AD among them.

3. To find out their knowledge about treatment or protective factor among them.

Chapter Three
Methodology

3.1 Study Area

The data was collected from different University in Dhaka city. Different education level students information were collected mainly graduate were there.

3.2 Total Number of participants

- Data was collected from 411 students

3.3 Criteria

- Both male and female student

- Mainly single

- Student

3.4 Procedure

- For collecting data a questionnaire was prepared according to required information.

- The collected data were analysed with the help of Microsoft Office Excel 2010 and filtered out accordingly for analysis.

- Some graphical representation were made from those analysis statuses

Chapter Four
Result

4.1. Gender
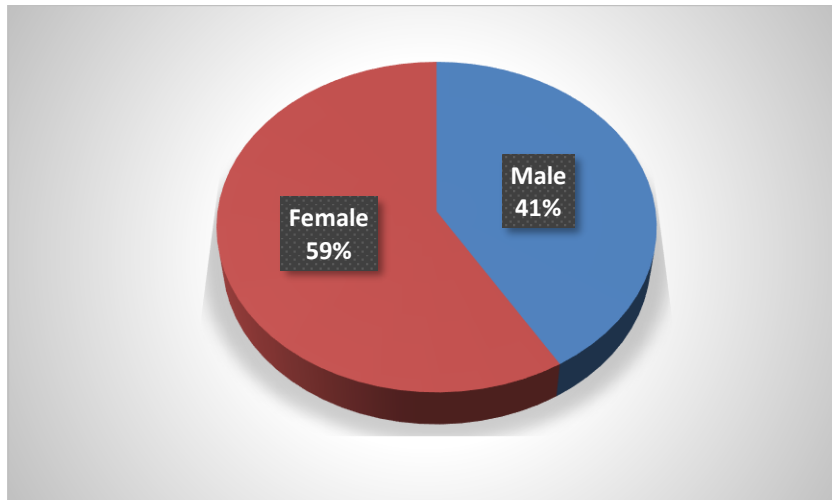
Figure: Gender

Among all (411) the students, female participants were 59% and male participants were 41%.

4.2. Marital status
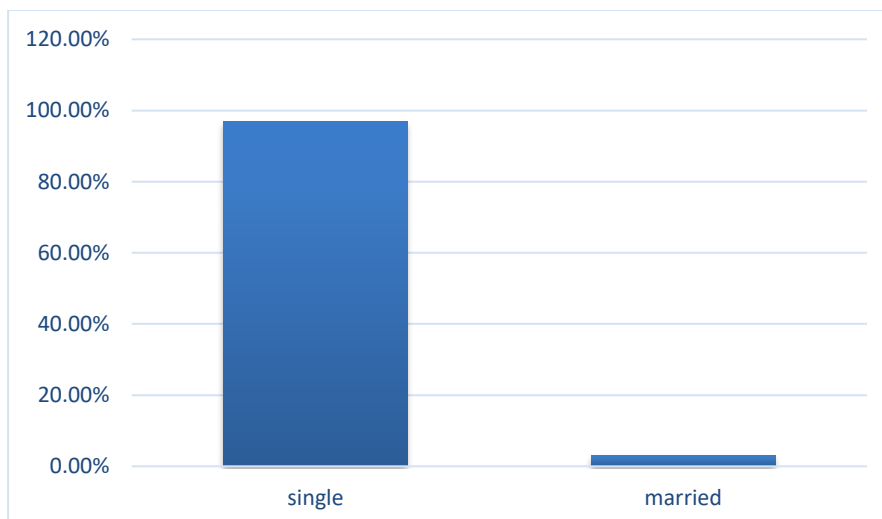
Figure: Marital status

Majority of the participants were single (96.84%) and married were (3.16%).

4.3. Educational level
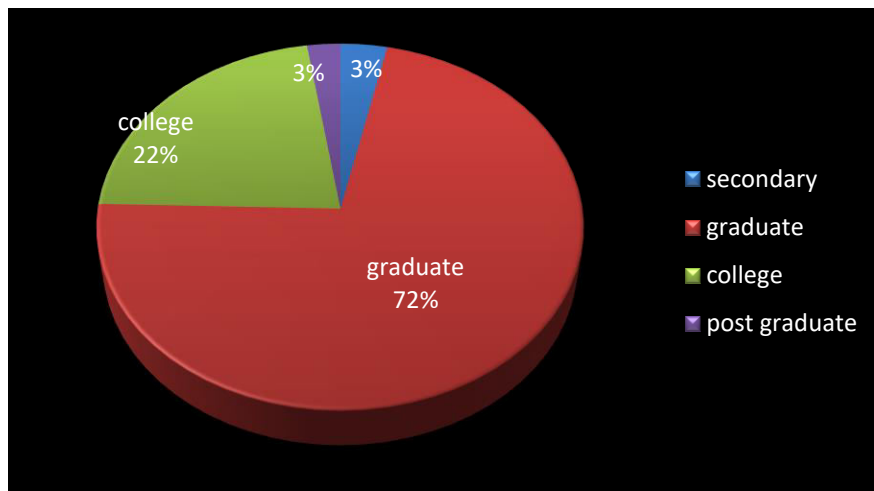
Figure: Educational level

Among all the students (411), majority of the participants have studied up to graduate(72%), college (22%), secondary and post graduate(3%).

4.4. Income per month
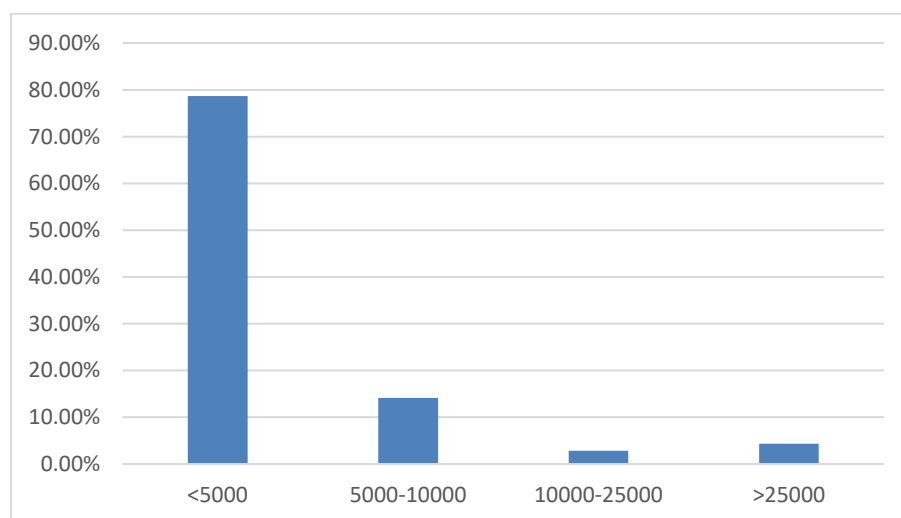
Figure: Income per month

Maximum students (79%) income less than 5000, 14.14% students income between 5000-10000, 2.83% income between10000-25000 and 4% greater than 25000.

4.5. Living with family
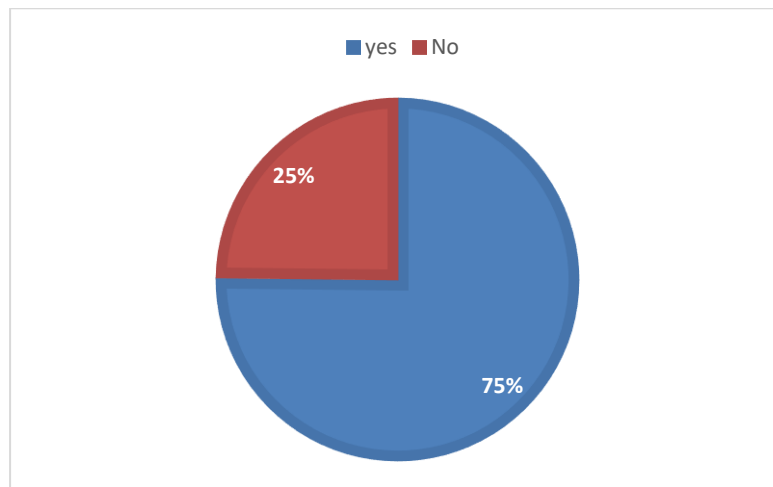
Figure: Living with family

Majority of the participants are living with family (75%) and the rest don't live with family (25%).

4.6. Knowledge about Alzheimer's disease
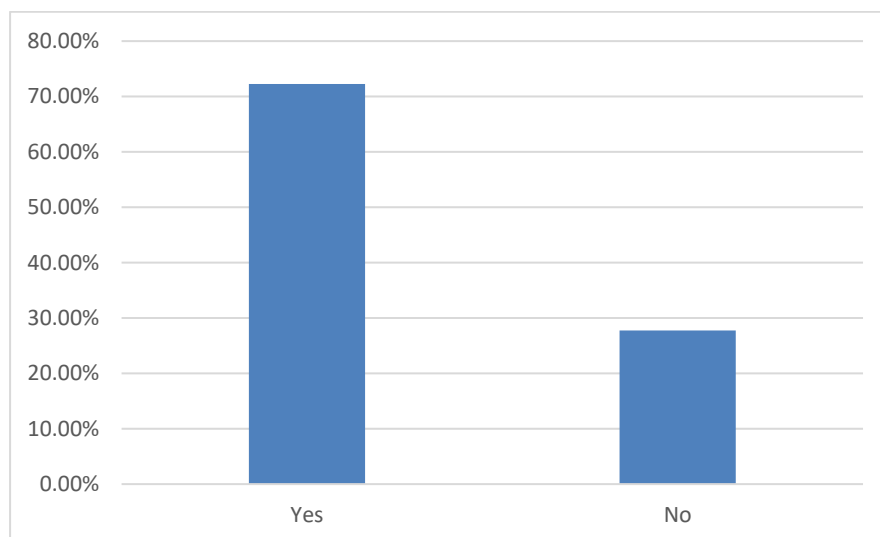
Figure: Knowledge about Alzheimer disease

Among 411 students 73% know about Alzheimer disease and the rest of them 28% don't know even the term.

4.7. Family history of Alzheimer disease
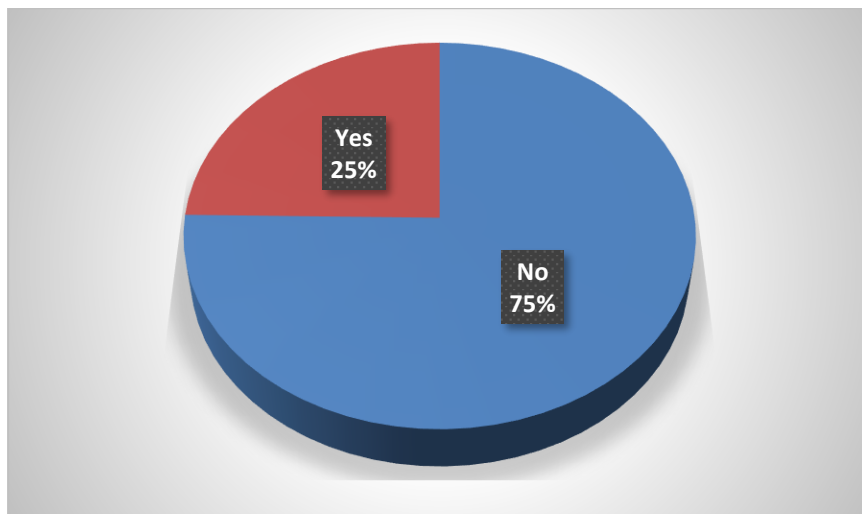
Figure: Family history of Alzheimer disease

In this study, total 411 students participated and among them 25% have family history and 75% don't have that history and among them some don't know if they have family history of AD or not.

4.8. Stages of Alzheimer disease
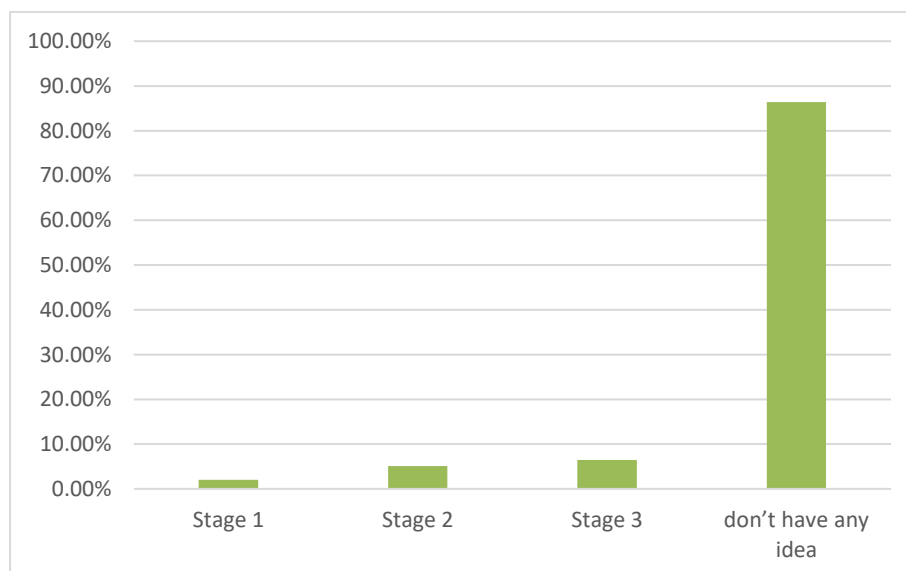
Figure: Stages of Alzheimer disease

Among all, 86.39% don't have any idea about the stage of AD, 2.04% know about stage 1, 5.10% know about stage 2 and 6.46% knows stage 3.

4.9. Know anyone who had Alzheimer disease
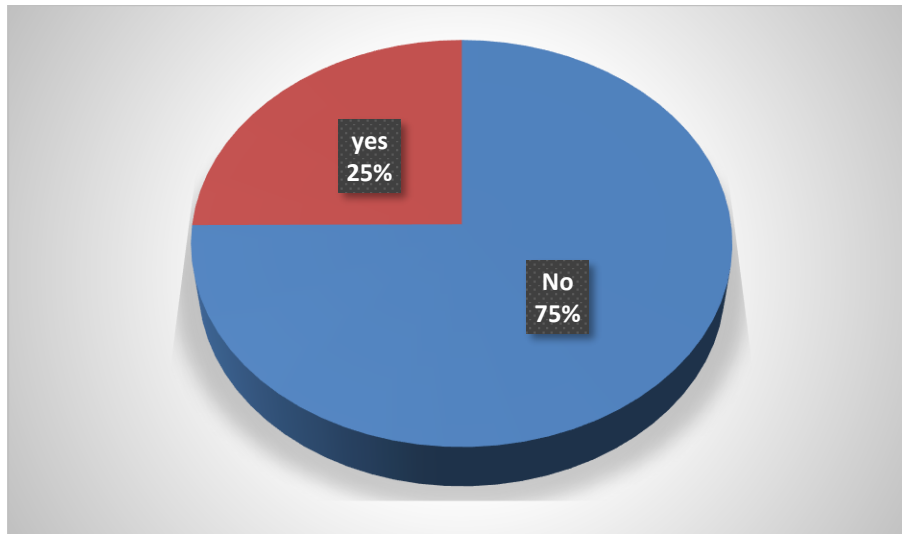
Figure: Know anyone who had Alzheimer disease

Among the participants 25% know anyone who had Alzheimer's disease among their family and 75% don't know.

4.10. **Relation with affected person**
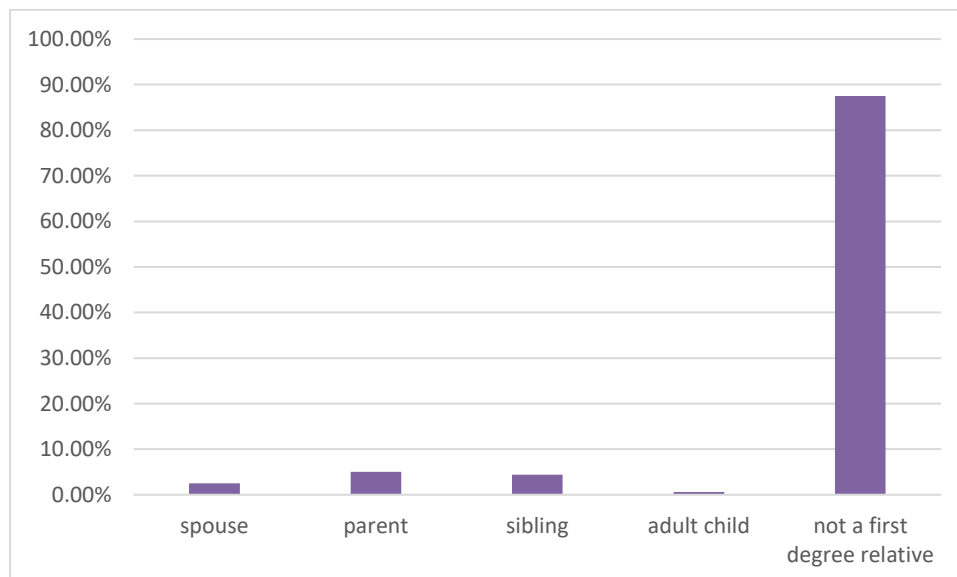
Figure: Relation with affected person

The participants relation with affected person maximum is not a first degree relative 87.5%, spouse are2.50% ,parent 5%, sibling 4.38% and adult child 0.63%.

4.11.Concern about Alzheimer disease
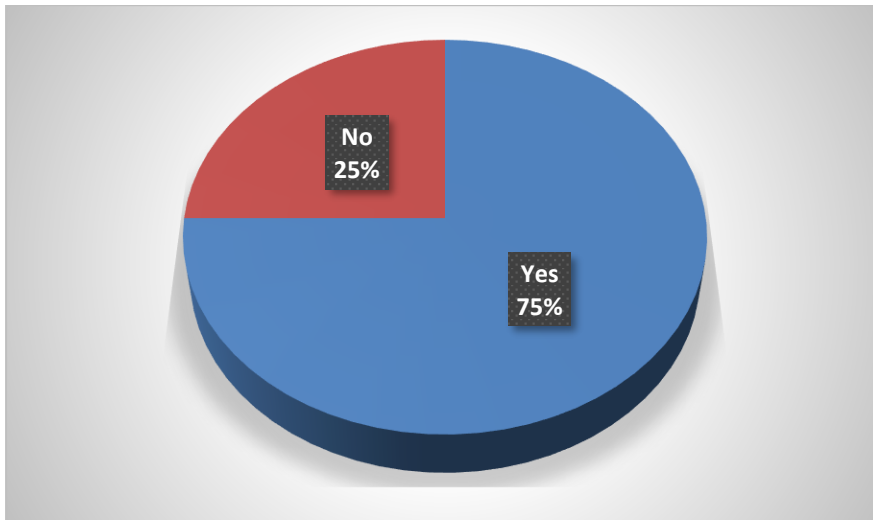
Figure: Concern about Alzheimer's disease

75% students are Concern about Alzheimer's disease and rest of them are not.

4.12. Chances of someday getting Alzheimer's
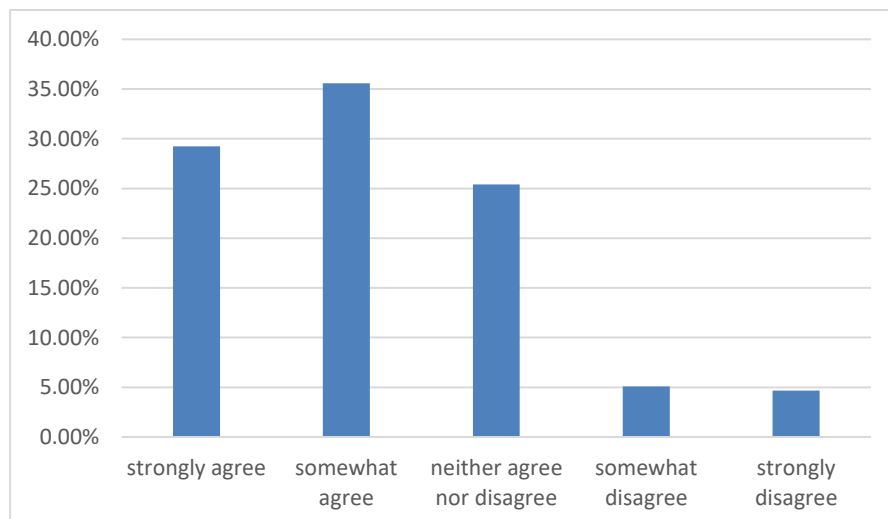
Figure: Chances of someday getting Alzheimer's

29.24% strongly agree about the chances of getting AD , 35.59% somewhat agree, 25.42% neither agree nor disagree,5.08% somewhat disagree and 4.66% strongly disagree.

4.13. Believe you will get Alzheimer's someday
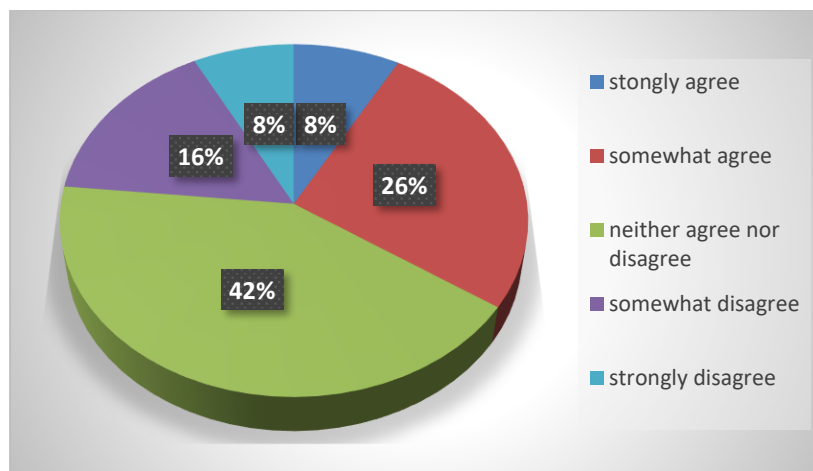
Figure: Believe you will get Alzheimer's someday

Among the students 42% neither agree nor disagree, 26% somewhat agree,16% somewhat disagree,8% strongly disagree and 8% strongly agree about get someday AD.

4.14. Worry about getting Alzheimer's someday
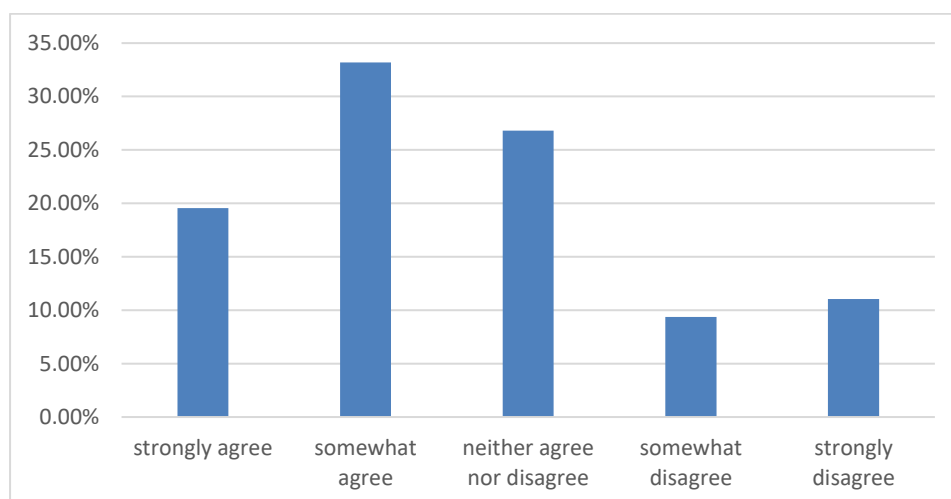
Figure: Worry about getting Alzheimer's someday

19.57% strongly agree, 33.19% somewhat agree, 26.81% neither agree nor disagree, 9.36% somewhat disagree, 11.06% strongly disagree.

4.15. Drug prevent Alzheimer's   disease
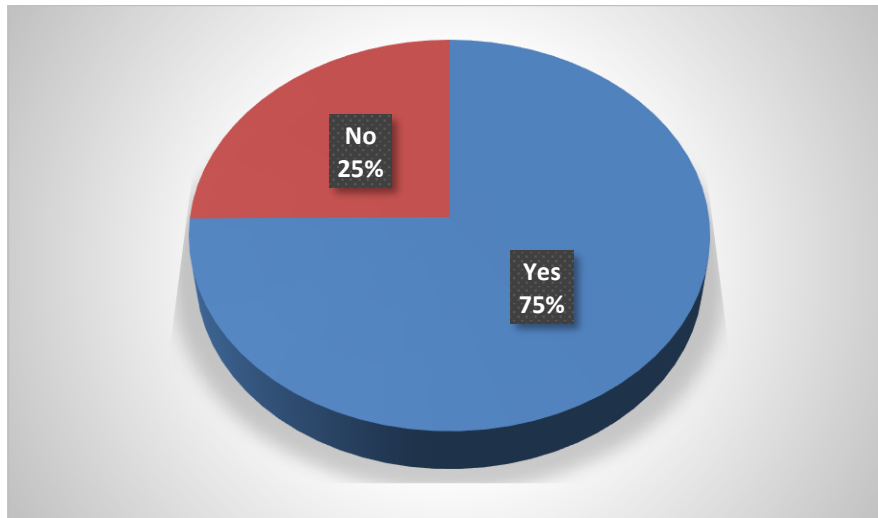
Figure: Drug prevent Alzheimer's disease

75% students think that drug can prevent AD and 25% don't agree with that.

4.16. People with Alzheimer's can't make decisions
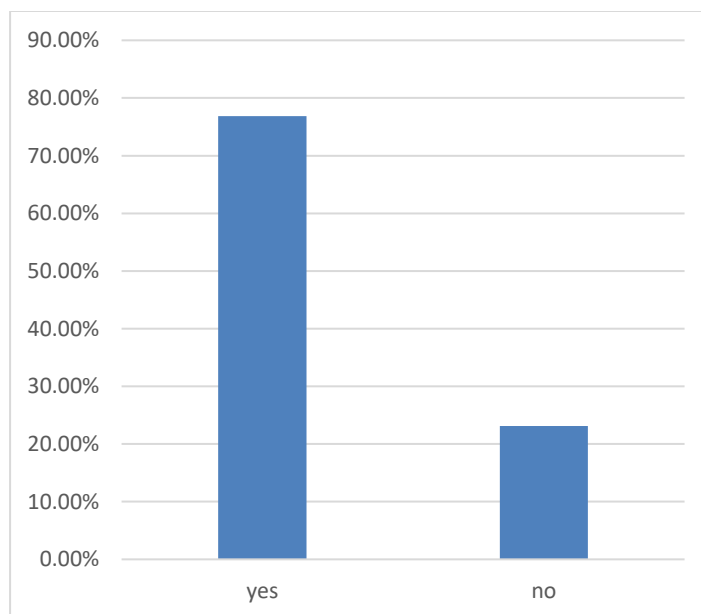
Figure: People with Alzheimer can't make decisions

77% agree with this question and rest are not.

4.17. Alzheimer's disease is contagious
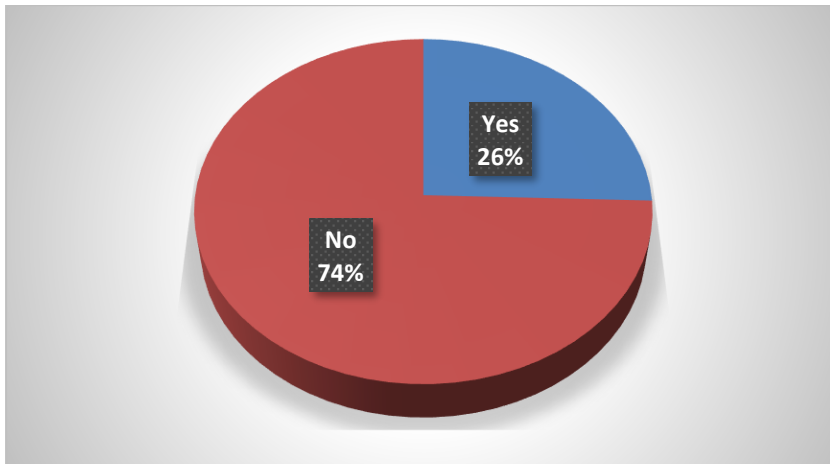
Figure: Alzheimer's disease is contagious

74% think that AD is not contagious or don't know and 26% agree with this question.

4.18. Long lived human will develop Alzheimer's disease
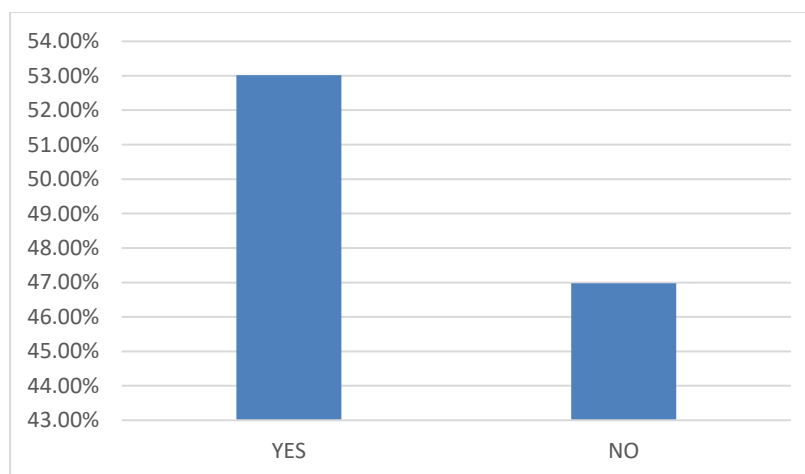
Figure: Long lived human will develop Alzheimer's disease

53.02% agree with this and 46.98% don't.

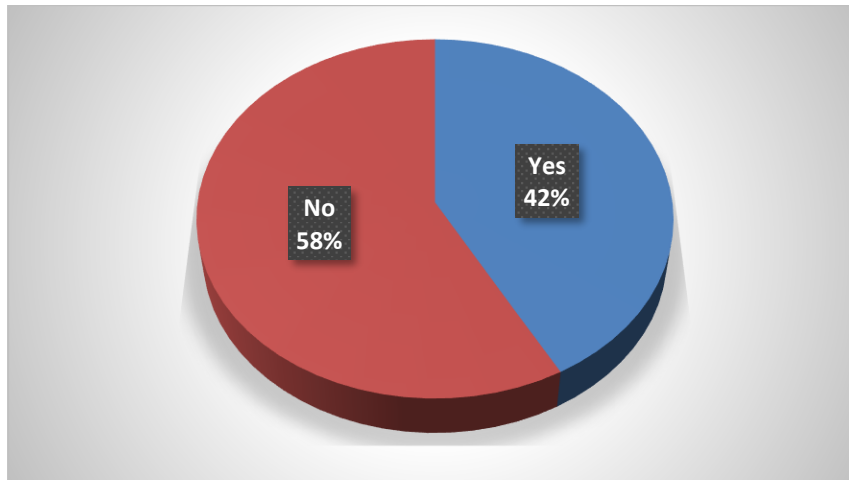**4.19. Alzheimer's disease is a form of insanity**

Figure: Alzheimer's disease is a form of insanity

42% think that Alzheimer's disease is a form of insanity and 58% don't think Alzheimer's disease is a form of insanity.

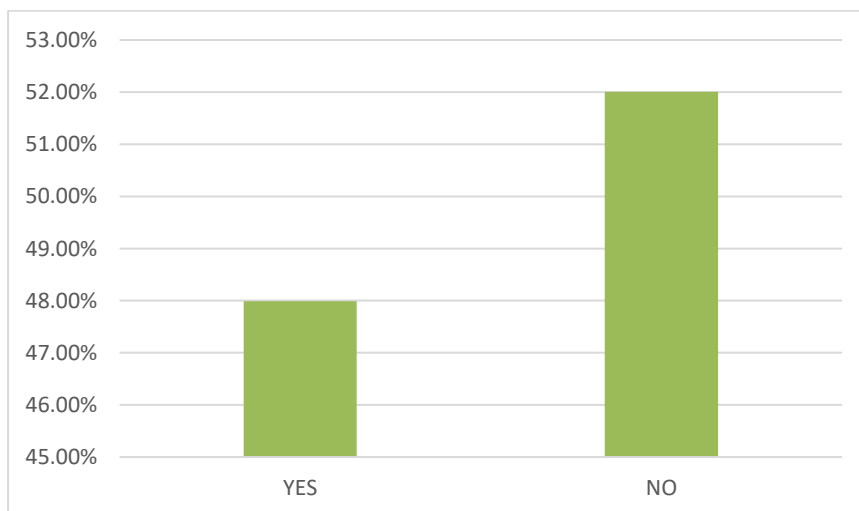**4.20. Alzheimer's is normal process of aging like graying hair and wrinkles**

Figure: Alzheimer's is normal process of aging

About 48% said yes on this matter and rest of others 52% said no Alzheimer's is normal process of aging like graying hair and wrinkles.

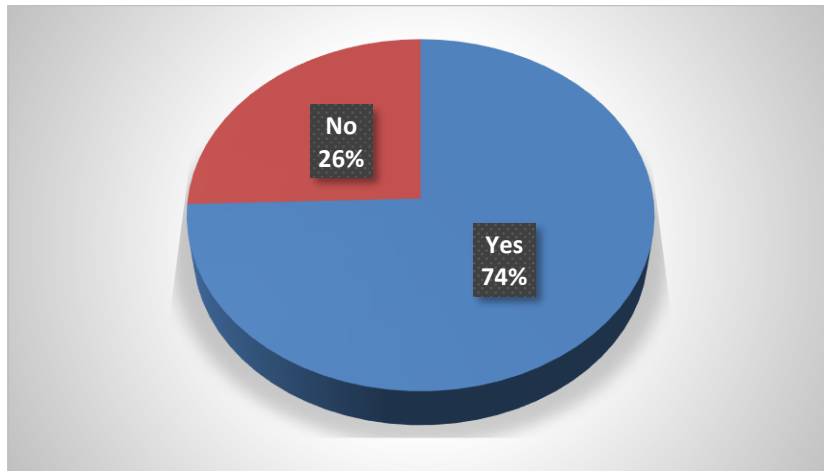**4.21. Alzheimer's disease person develop physical and mental problems**

Figure: Alzheimer's disease person develop physical and mental problems

74% said that they think Alzheimer's disease person develop physical and mental problems but 26% are not.
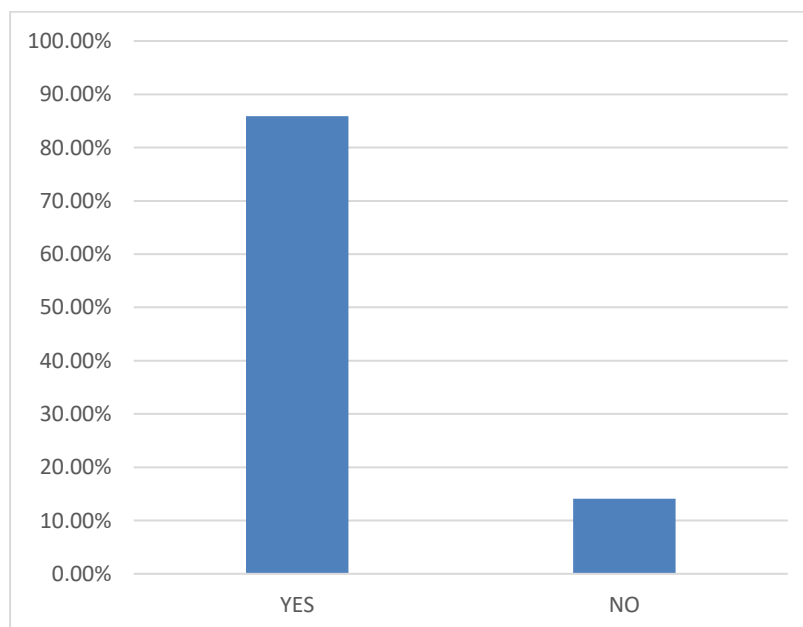
4.22. Major symptom is memory loss

Figure: Major symptom is memory loss

About 86% agree with that and rest of them are not.

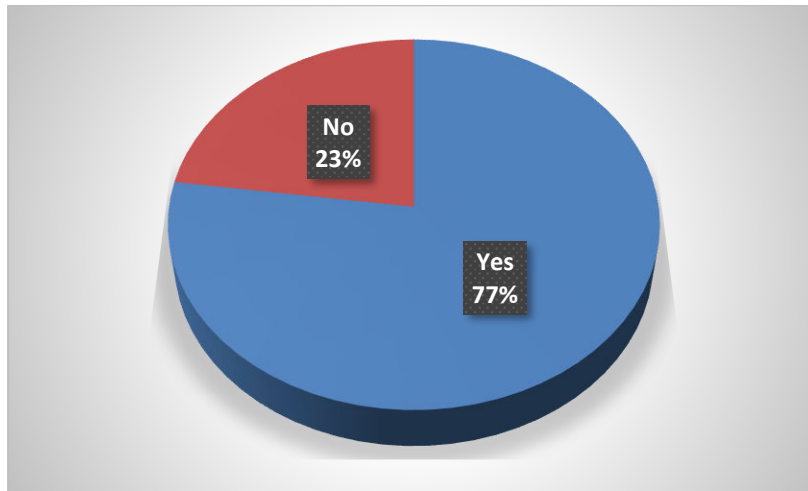**4.23**. **Over 75 years forgetfulness is indicative of beginning of Alzheimer's disease**

Figure: Over75 years forgetfulness is indicative of beginning of Alzheimer's   disease

77% think this is right Over 75 years forgetfulness is indicative of beginning of Alzheimer's disease but 23% don't.

4.24. **If spouse died survivor suffer from depression as if it was Alzheimer's   disease**
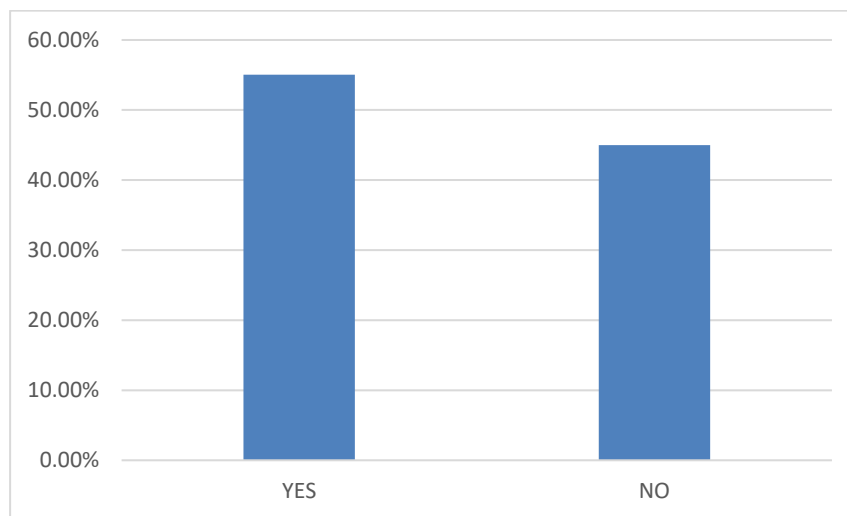

Figure: If spouse died survivor suffer from depression as if it was Alzheimer's disease

55% agree with this that If spouse died survivor suffer from depression as if it was Alzheimer's disease and 45% are not.

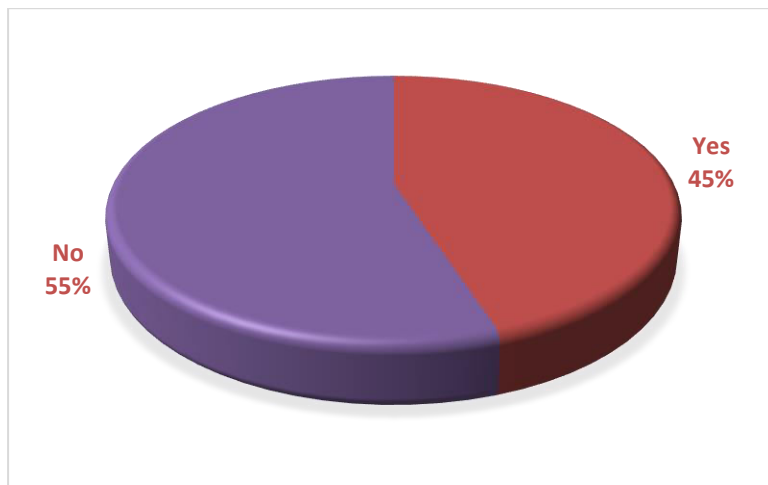**4.25. Sluttering is an inevitable part of Alzheimer's   disease**

Figure: Sluttering is an inevitable part of Alzheimer's   disease

75% said that Sluttering is an inevitable part of Alzheimer's disease but 55% not**.**

4.26. Men are more likely to develop Alzheimer's than women
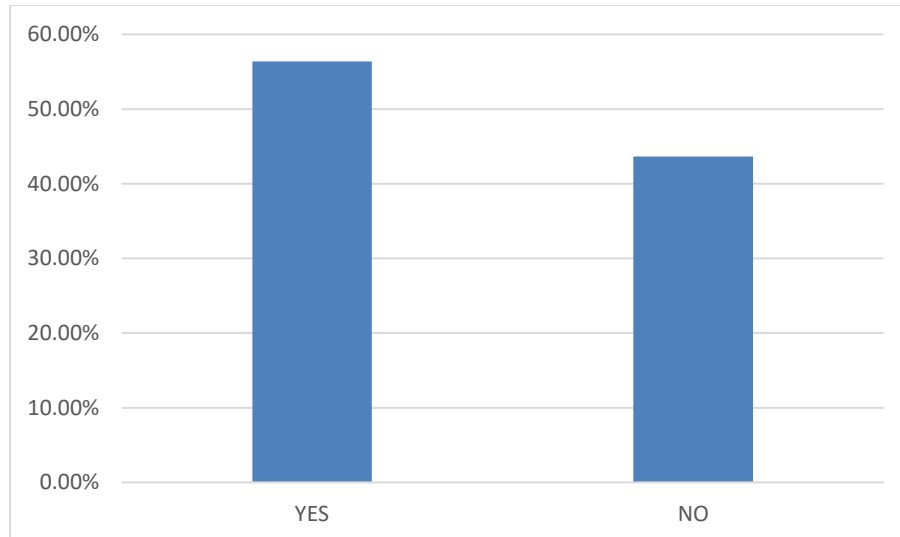

Figure: Men are more likely to develop Alzheimer's than women

56.38% agree with Men are more likely to develop Alzheimer's than women but 43.62% are not.
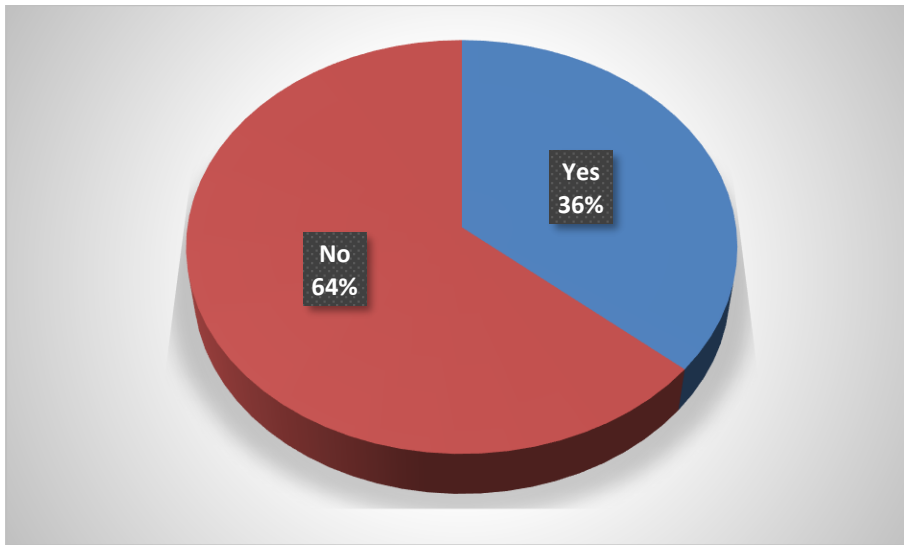
4.27. Alzheimer's disease is generally fatal

Figure: Alzheimer's disease is generally fatal

36% said yes with this question but 64% are not agree with this.

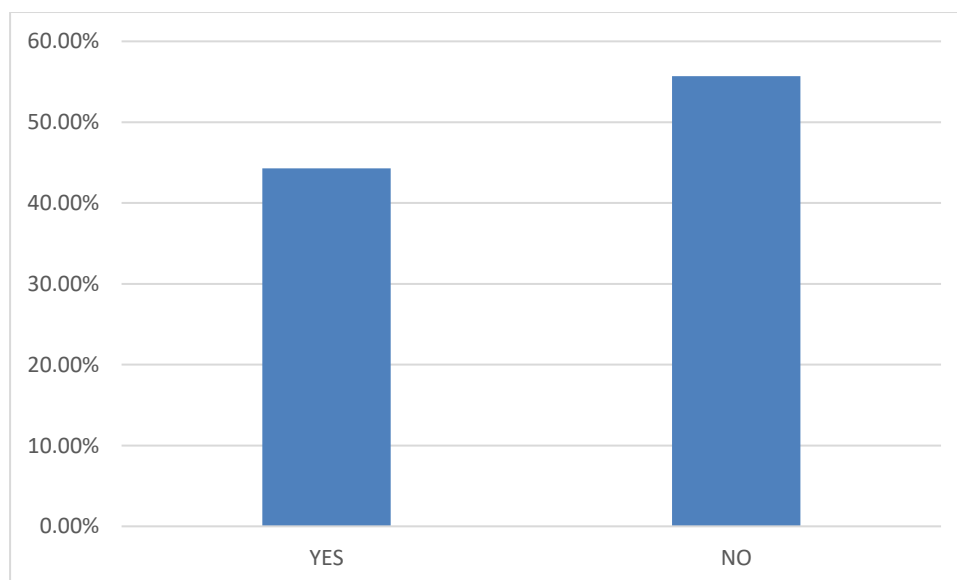## 4.28. Majority Alzheimer's people live in asylums

Figure: Majority Alzheimer's people live in asylums

44.3% think this is right but rest 55.7% don't think that.

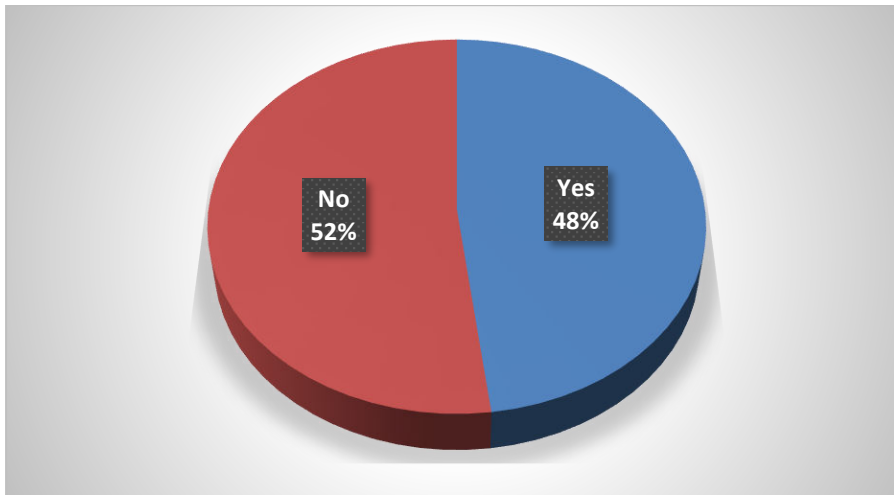### 4.29. **Aluminium is cause of Alzheimer's disease**

Figure: Aluminium is cause of Alzheimer's disease

48% agree with Aluminium is cause of Alzheimer's disease and 52% don't.

4.30. **Alzheimer's disease diagnosed by blood test**
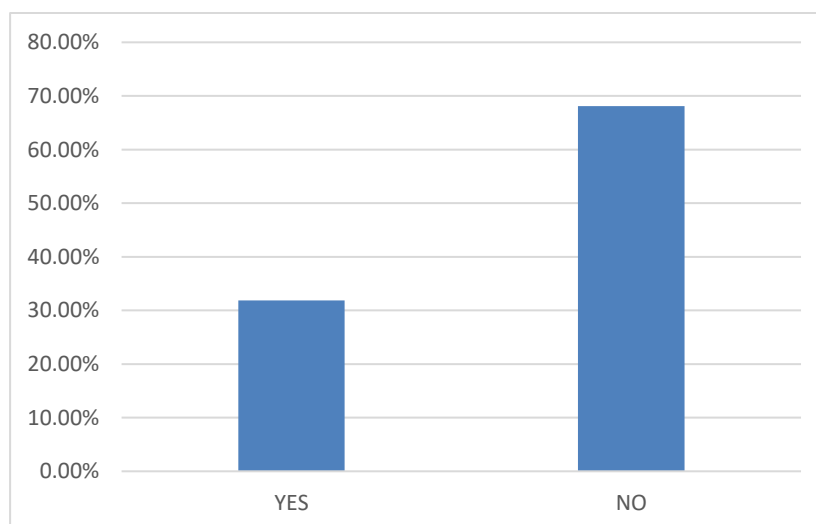
Figure**:** Alzheimer's disease diagnosed by blood test

About 32% said yes about this and 68% said no about that Alzheimer's disease diagnosed by blood test.

4.31. Hypertension can cause Alzheimer's disease
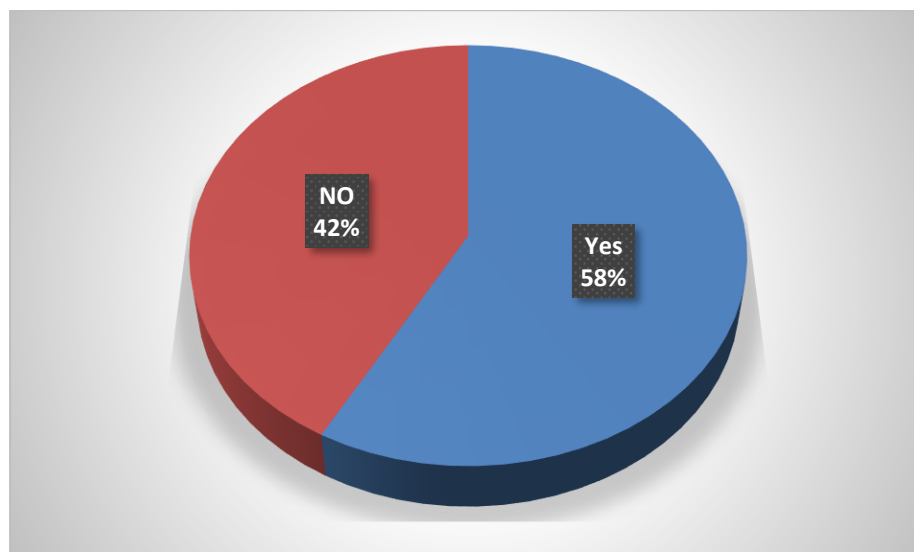
Figure: Hypertension can cause Alzheimer's disease

58% think that Hypertension can cause Alzheimer's disease and 42% think this is wrong**.**

4.32. Know about protective factor of Alzheimer's disease
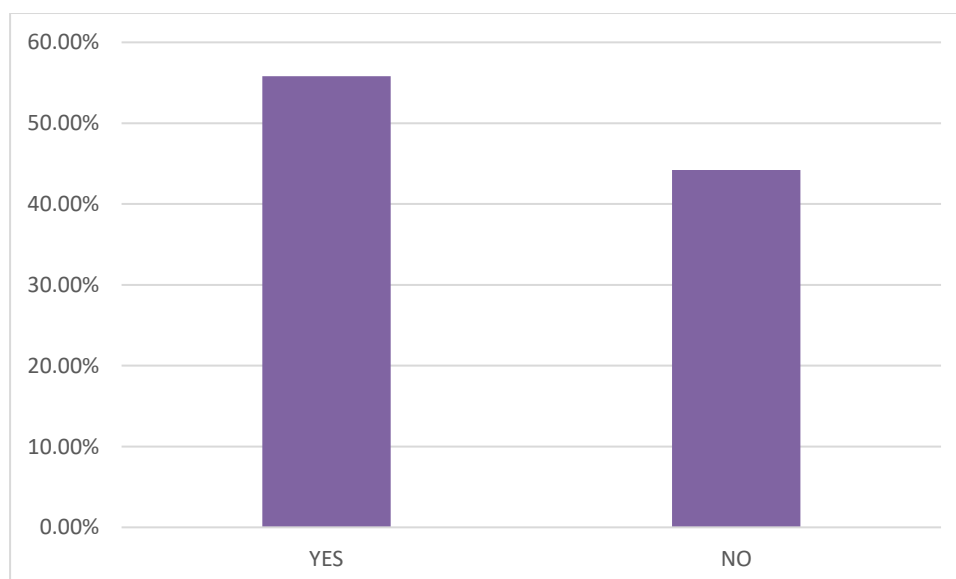
Figure: Know about protective factor of Alzheimer's disease

55.81% Know about protective factor of Alzheimer's disease and 44.19% are not.

4.33. Keeping mentally active
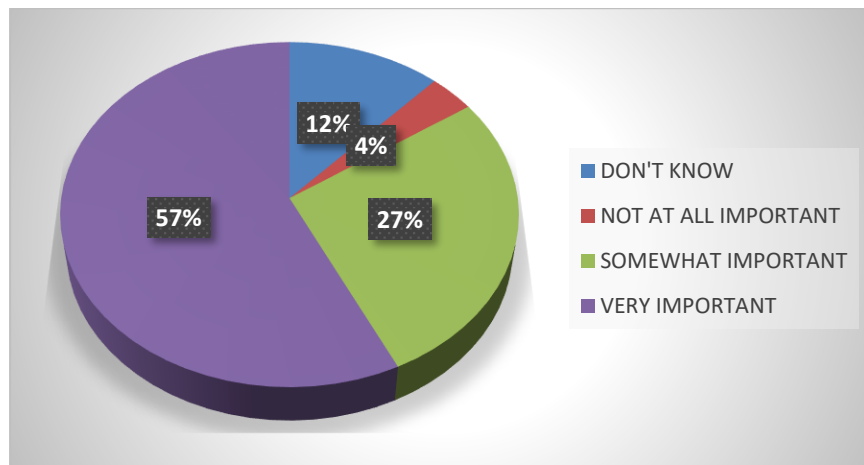
Figure: Keeping mentally active

57% think this is very important, 27% think this is somewhat important, 12% don't know about this and 4% think it is not at aii important.

4.34. Eating a healthy diet
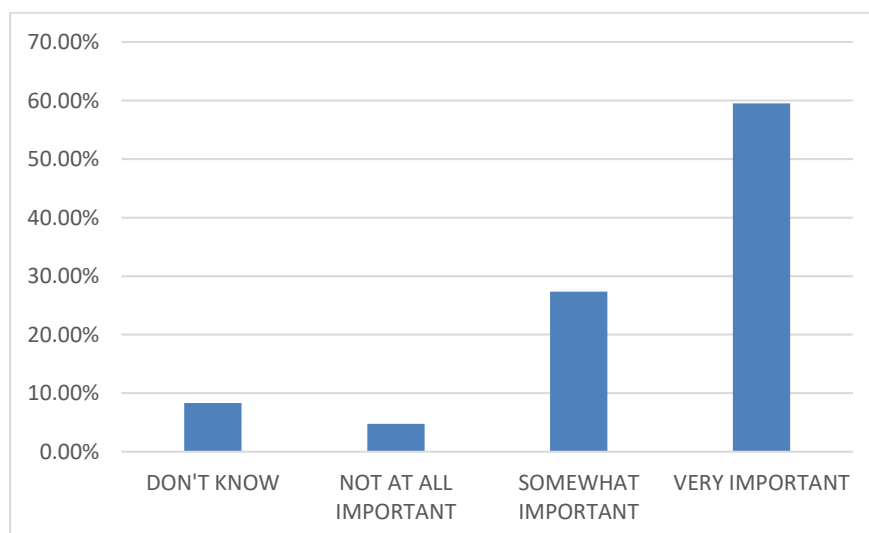
Figure: Eating a healthy diet

8.33% don't know about this, 4.76% think it is not at all important, 27.38% think this is somewhat important and 59.52% think this is very important.

4.35. Keeping physically active
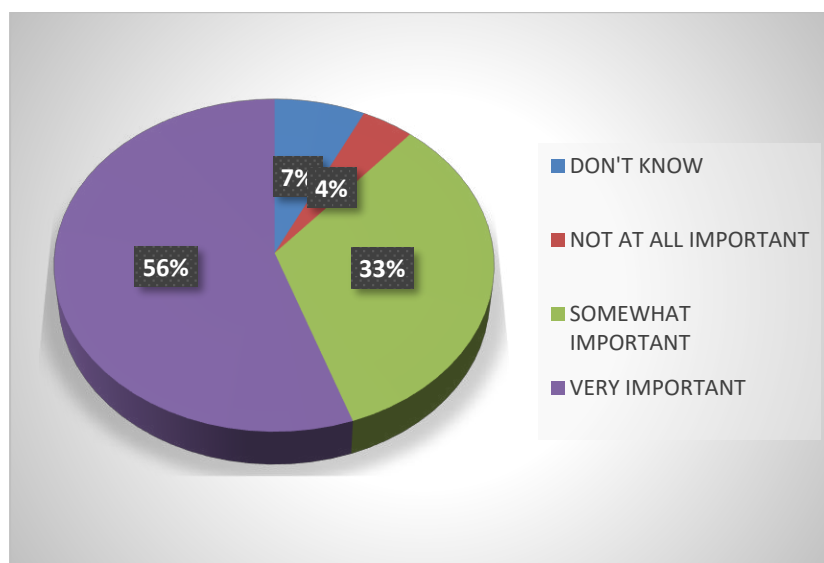
Figure: Keeping physically active

56% think this is very important, 33% think this is somewhat important, 7% don't know about this and 4% think it is not at all important.

4.36. Taking vitamins /dietery supplements
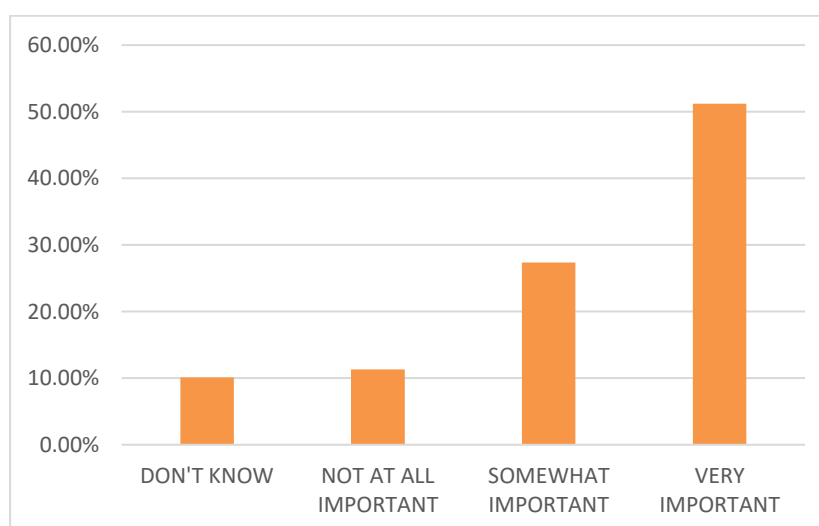
Figure: Taking vitamins /dietery supplements

10.12% don't know about this, 11.31% think it is not at all important, 27.38% think this is somewhat important and 51.19% think this is very important.

4.37. How many knows about sign and symptom of Alzheimer's   disease
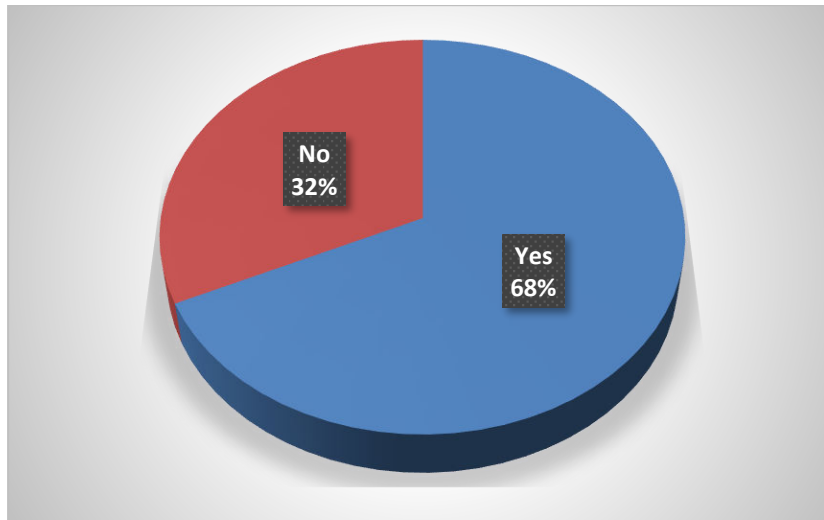
Figure: How many knows about sign and symptom of Alzheimer's   disease

About 68% know about sign and symptom of Alzheimer's disease but rest ae not.

4.38. Know about risk factor of Alzheimer's disease
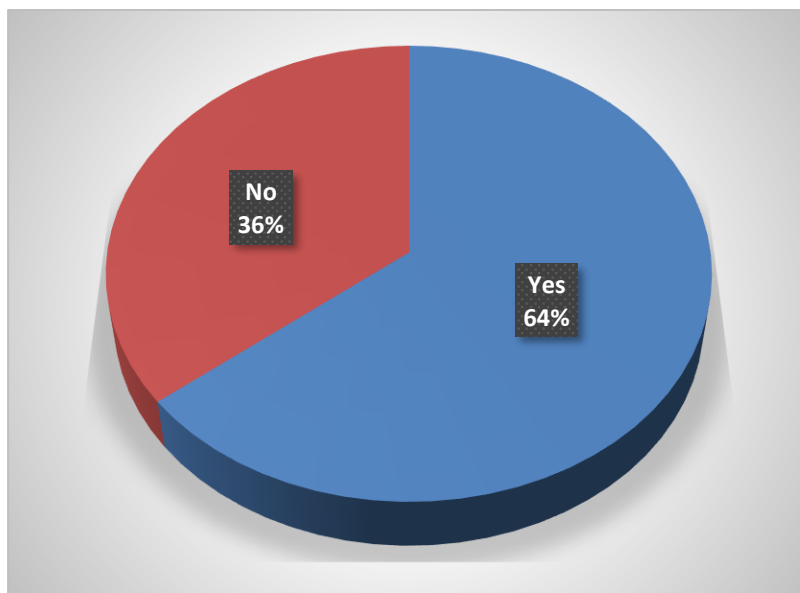
Figure: Know about risk factor of Alzheimer's disease

64% knows about risk factor but 36% don't.

4.39. Knowledge about sign and symptom of Alzheimer's disease
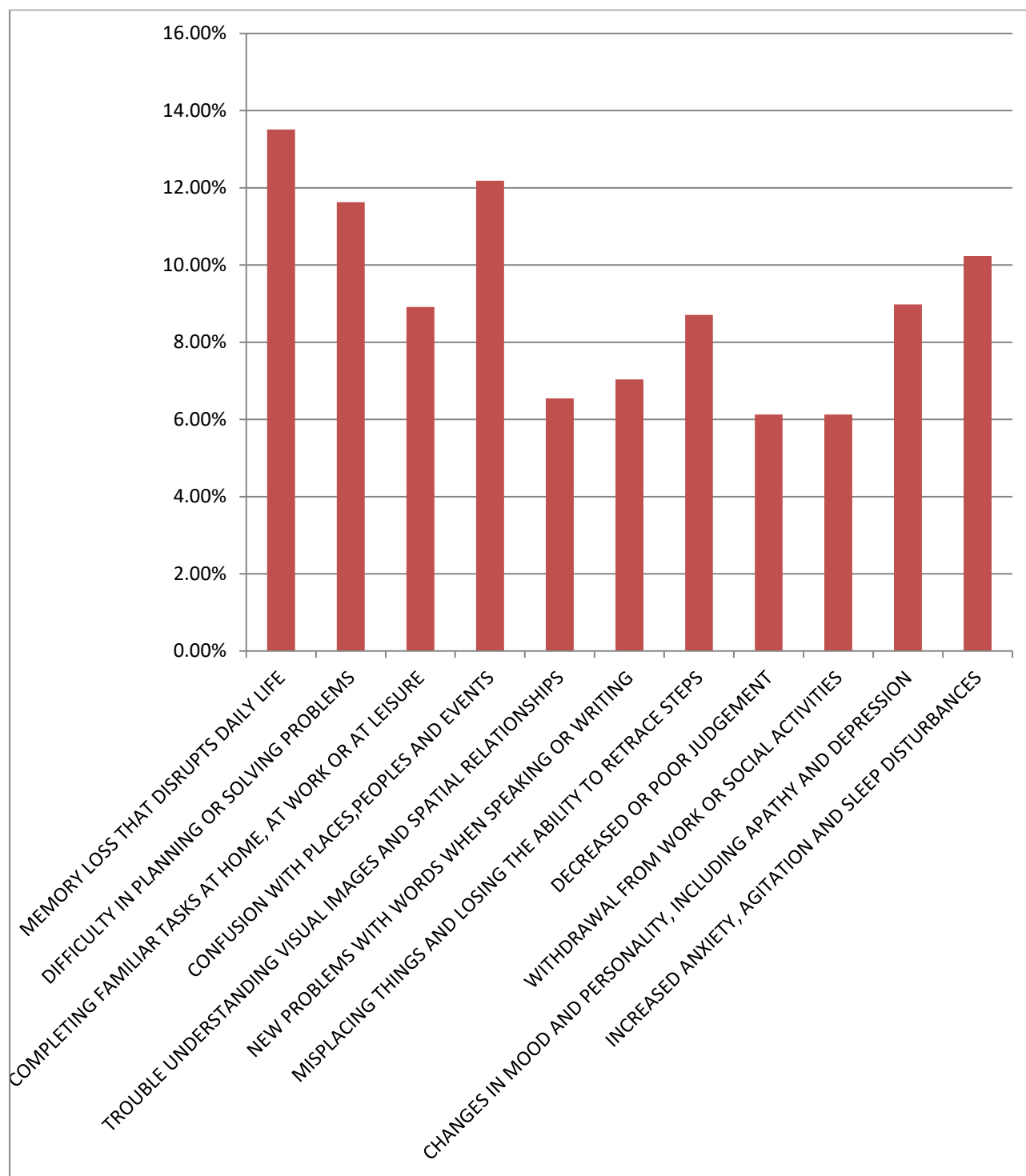
Figure: Knowledge about sign and symptom of Alzheimer's disease

In the survey, it was seen that among all the symptom most of students had selected memory loss(13.51%), confusion with place and people (12.19%), difficulty planning or solving problems (11.63%).

4.40. Knowledge about risk factor of Alzheimer's disease
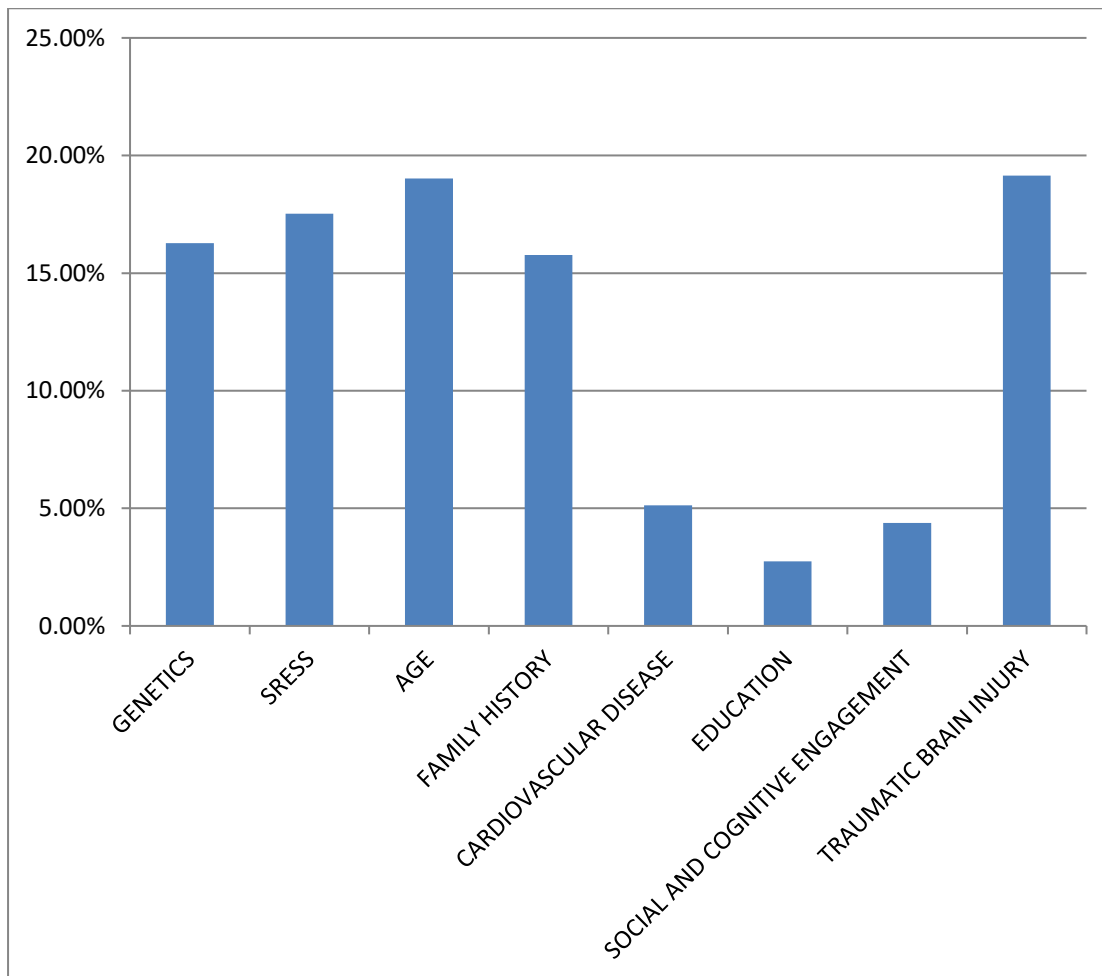
Figure: Knowledge about risk factor of Alzheimer's disease

In the survey, it was seen that among all the symptom most of students had selected traumatic brain injury (19.15%), Age (19.02%), Stress (17.52%) and Genetics (16.27%).

Chapter Five
Discussion and Conclusion

5.1 Discussion

The aim of this study was to identify Alzheimer's disease related knowledge among Bangladeshi students including health and social care students like pharmacy students.. To measure Alzheimer's Disease Knowledge Scale (ADKS) several factor like sign and symptom, Stages of Alzheimer's disease, risk factor and protective factor related question were utilized. A total of 411 students from various disciplines participated in this study. As expected, those in well known with health care education showed higher levels of knowledge than those in a different background. The study identified a moderate level knowledge among health and social care students. The revealed that the students were also ignorant of many facts and had many misconceptions pertaining to Alzheimer's Disease (AD). In addition, significant differences in knowledge were evident between student groups.

A study was performed by Wortmann among 1641 participants and most of them around 60.9% correctly answered the item regarding availability of prescription drugs to prevent AD. Our study result also shows 35% of all the subjects correctly answered that prescription drugs that prevent Alzheimer's disease are available . (Wortmann *et al*., 2010).

Moreover in another study which states that 51.3% of respondents endorsed genetics as a very important risk factor for AD. Approximately 20.5% believed stress to be very important in increasing AD risk. Several strategies for reducing AD risk were endorsed: keeping mentally active (61.4% reporting as very important), eating a healthy diet (44.3%), keeping physically active (40.6%) and taking vitamins/herbal supplements (20.5%) (Smith, Ali and Quach, 2014). In our study, 16% supported genetics as a very important risk factor and 20% believed stress to be very important in increasing AD risk. Several strategies for reducing AD risk were allowed: Keeping mentally active (47% said as very important), eating a healthy diet (40%), keeping physically active (53%) and taking vitamins/dietary supplements (47%).

A study conducted by Inger Hilde Nordhusabc among Norwegian psychologists and found that , there were no statistical differences between responders and nonresponders in terms of age and clinical speciality. But in our study About 52% disagreed that Alzheimer's disease is normal process of aging and 58% think that Hypertension can cause ALZHEIMER'S disease. Among 25% respondents 19.02% select age as a risk factor of AD and traumatic brain injury 19.15%. (Inger Hilde Nordhusabc et al ,2011)

Another study by Brian J. Nagle found in 'United States medical students knowledge of Alzheimer disease survey' that Sixty-six first year students (40.7%) and 111 final year students (61.3%) reported any type of previous experience with AD but in our study we found that 75% didn't experience AD before.(Brian J. Nagle,2011)

In our study, 19.57% strongly agree, 33.19% somewhat agree, 26.81% neither agree nor disagree, 9.36% somewhat disagree, 11.06% strongly disagree. This result signifies with the study result of Roberts which states that (63.8%) reported having known someone with AD, 13.3% reported having had a close relative affected with the disease,60.1% said they would like to know their chances of developing AD, 22.9% reported a belief that they would one day have AD and 29.4% noted some worry about the disease. (Roberts *et al*., 2014)

A survey conducted by Sundaran Kada stated that the Norwegian health and social care undergraduate students reported higher AD knowledge (78.4% correct answers) than the Canadian professional health caregivers (58% correct answers) and undergraduate students (41.9% correct answers). (Rust & See, 2007)

Comparing the Norwegian students' findings with those for Hong Kong health and social care students, the analyses of the percentage of correct answers reveals the following: for nursing students there is a difference of 32.5% (Norwegian 81% vs. Hong Kong students 48.5% correct answers); for occupational therapy students the difference is 29.6% (Norwegian 78.6% vs. Hong Kong students 49% correct answers); and for social work students the difference is 48.3% (Norwegian 74.3% vs. Hong Kong students 26% correct answers). (Kwok et al., 2011)

In our study, Though majority of them are graduate 72% don't know even the term. And the rest 28% don't have clear idea about this.

About 86.39% don't have any idea about the stage of AD.

It was seen that among all the symptom most of students had selected memory loss (13.51%), confusion with place and people (12.19%), difficulty planning or solving problems (11.63%).

Among all the risk factor most of students had selected memory loss(13.51%), confusion with place and people (12.19%), difficulty planning or solving problems (11.63%).

The participants relation with affected person maximum is not a first degree relative 87.5%, spouse are 2.50% ,parent 5%, sibling 4.38% and adult child 0.63%.

5.2 Conclusion

In the conclusion, the results of present study revealed low levels of knowledge regarding Alzheimer's disease risk factor, protective factor and sign and symptom. The knowledge is very low among educated people also. some are even unknown about the term Alzheimer. Among the huge population of Bangladesh, collected data are not adequate to represent the whole country. So the result may not fully appropriate. But awareness would lead to early detection of disease and enhance their knowledge. So training programmes, increasing public awareness are needed to help them preventing Alzheimer's disease. Efforts should be made by both government and non-government agencies to improve knowledge.

Chapter Six
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