Knowledge and Attitude of HIV/AIDS among Secondary School and College Students of Narsingdi

A dissertation submitted to the Department of Pharmacy, East West University, in partial fulfillment of the requirement for the degree of bachelor of Pharmacy.

Submitted by

Rahnuma Sultana Rimu

ID: 2013-1-70-070

East West University

Aftabnagar, Dhaka, Bangladesh

Declaration by the Research Candidate

Myself, **Rahnuma Sultana Rimu**, ID: 2013-1-70-070, hereby declare that the dissertation entitled- **"Assessment of Knowledge and Attitude of HIV/AIDS Among Secondary School and College Students in Narsingdi"** submitted by me to the Department of Pharmacy, East West University in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy, is a genuine and authentic research work carried out by me under the supervision and guideline of Ms.Nigar Sultana Tithi, Senior Lecturer, Department of Pharmacy, East West University, Dhaka. I further certify that all sources of information of dissertation are duly acknowledged and the contents of this dissertation in full or in parts have not been submitted to any other institute or University or any other degree.

…….

Rahnuma Sultana Rimu
ID: 2013-70-070
Department of Pharmacy,
East West University

Certificate by the Supervisor

This is to certify that the dissertation entitled- **"Knowledge and Attitude of HIV/Aids among Secondary and College Students of Narsngdi."** submitted to the Department of Pharmacy, East West University in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy was carried out by **Rahnuma Sultana Rimu**, ID: 2013-1-70-070, under my supervision and guidance.

…….

Nigar Sultana Tithi

Senior Lecturer and Supervisor

Department of Pharmacy,

East West University

Certificate by the Chairperson

This is to certify that the thesis entitled- **"Assessment of Knowledge and Attitude of HIV/AIDS among Secondary School and College Students in Narsingdi"** submitted to the Department of Pharmacy, East West University, in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy, is a original and genuine research work carried out by **Rahnuma Sultana Rimu**, ID: 2013-1-70-070, under the guidance of Ms.Nigar Sultana Tithi, Senior Lecturer, Department of Pharmacy, East West University, Dhaka.

…….

Dr. Chowdhury Faiz Hossain

Professor and Chairperson

Department of Pharmacy,

East West University

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Dedication

This Research paper is dedicated to

My beloved Parents,

Who are my Biggest Inspiration

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Abstract

HIV/ AIDS are the most serious health problem in the world. The global epidemic of HIV/AIDS is now progressing at a rapid rate among young people. Therefore, awareness is needed to control and prevent the transmission of HIV/AIDS. The purpose of our study was to determine the knowledge level of school and college students of Narsingdi and assess their attitude towards HIV/AIDS patients. The study was conducted on 357 students of 3 different school and college of Narsingdi district by using a structured questionnaire. Almost all (99.88%) students had heard about HIV/AIDS. The major sources of information was educational institute (79.83%) and the second highest source was media (13.17%) . Majority of the students said that there is no treatment (62.26%) and vaccine (50.42%) available. According to most of respondents the disease can be transmitted by blood transfusion (98.22%) and mother to fetus (97.03%). Some students had misconception about the mode of transmission such as kissing and talking (22.93%), mosquito bite (21.57%), drinking and eating on same glass or plate (21.57%). Regarding the knowledge about control and prevention most of them had better knowledge. Most participants (87.39%) thought that avoiding needle share was the major mode of prevention. Most participants had positive attitude towards infected person. According to the study it can be said that knowledge about HIV/AIDS among school and college students are moderate though they have many types of misconception about it. There are chances to reduce the misconception. Different awareness program in mass media, training of teachers and proper health and sex education in school and college level are needed to increase the level of knowledge and awareness of HIV/AIDS.

CHAPTER 1

INTRODUCTION

1.1 Overview

HIV stands for human immunodeficiency virus. If left untreated, HIV can lead to the disease AIDS (acquired immune deficiency syndrome).Unlike some other viruses, the human body can't get rid of HIV completely. So once one has HIV, they have it for life (AIDS, HIV and The Immune System, 1997).

HIV is one member of the group of viruses known as retroviruses. The term "retrovirus" stems from the fact that these kinds of viruses are capable of copying RNA into DNA. The virus has two exact copies of single-stranded RNA as its basic genetic material (genome) in the very center of the organism. The genome is surrounded by a spherical core made of various proteins in tightly-packed association with one another. The core is itself surrounded by a membrane (called an "envelope", made of fat [lipids] and various membrane-bound proteins). One of the membrane-bound proteins can bind to a particular protein on the surface of certain immune cells, called T-cells which results in the virus becoming physically attached. Upon binding, the virus is brought inside of the T-cell and the envelope is removed by enzymes normally present inside the cell. The internal core is thus exposed, and it too is broken-down. This last phase results in exposure of the virus's RNA genetic material. An enzyme attached to the RNA, known as "reverse transcriptase", begins to make a complimentary base-pair single-strand copy of the RNA into DNA. The single strand of DNA is also copied by the same enzyme to form double-stranded DNA. This DNA inserts somewhere into one of the 46 chromosomes within our cells, and there it is used as a template for production of all of the things necessary to form new virus particles (replication of the virus). These new virus particles can be subsequently released from the infected cell, and can infect adjacent cells (AIDS, HIV and The Immune System, 1997).

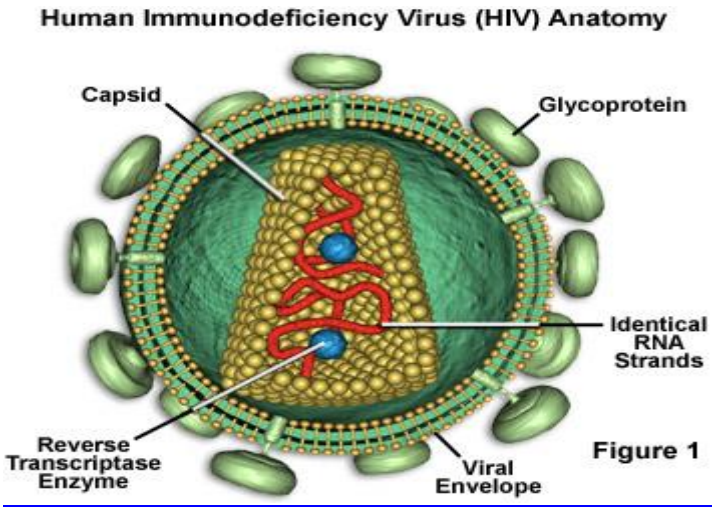

Figure 1.1: HIV virus anatomy

HIV attacks the body's immune system, specifically the CD4 cells (T cells), which help the immune system fight off infections. If left untreated, HIV reduces the number of CD4 cells (T cells) in the body, making the person more likely to get infections or infection-related cancers. Over time, HIV can destroy so many of these cells that the body can't fight off infections and disease. Opportunistic infections or cancers take advantage of a very weak immune system and signal that the person has AIDS, the last state of HIV infection (AIDS.gov, 2017e).

1.2 HIV strains and types

Each time HIV replicates (by infecting a new cell), small changes or mutations may occur. This means there are many different forms of HIV, including within the body of a single person living with HIV. There are two types of HIV (AVERT, 2017c).

1.2.1 HIV-1 and HIV-2

HIV type 1 and HIV type 2 are two distinct viruses. Worldwide, the predominant virus is HIV-1.

The relatively uncommon HIV-2 virus is concentrated in West Africa, but has been seen in other countries. It is less infectious and progresses slower than HIV-1. While commonly used antiretroviral drugs are active against HIV-2, optimum treatment is poorly understood (AVERT, 2017c).

1.2.2 Groups within HIV-1

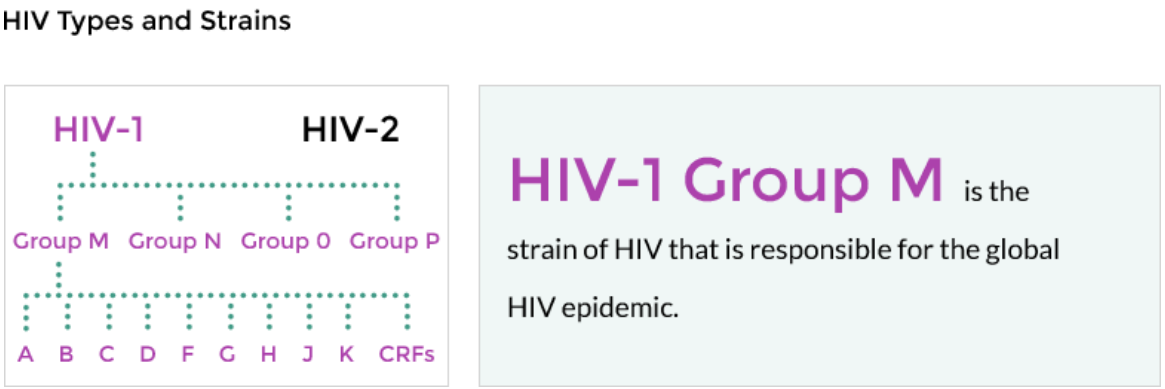

Fig 1.2: HIV types and strains

The strains of HIV-1 can be classified into four groups. The most important group, M, is the 'major' group and is responsible for the majority of the global HIV epidemic. The other three groups are N, O and P. They are quite uncommon and only occur in Cameroon, Gabon and Equatorial Guinea (AVERT, 2017c).

1.2.3 Subtypes within HIV-1 group M

Within group M there are known to be at least nine genetically distinct subtypes of HIV-1. These are subtypes A, B, C, D, F, G, H, J and K. Additionally, different subtypes can combine genetic material to form a hybrid virus, known as a 'circulating recombinant form' (CRFs), of which quite a few have been identified (AVERT, 2017c).

The dominant HIV subtype in the Americas, Western Europe and Australasia is subtype B. As a result, the great majority of HIV clinical research has been conducted in populations where subtype B predominates. However this subtype represents only 12% of global HIV infections. In contrast, less research is available for subtype C, although just under half of all people living with HIV have subtype C. It is very common in the high prevalence countries of Southern Africa, as well as in the horn of Africa and India (AVERT, 2017c).

The greatest diversity of subtypes is found in Cameroon and the Democratic Republic of Congo - the region where the HIV-1 epidemic originated. However, these geographical patterns in the distribution of subtypes are changing over time, due to migration and the mixing of populations. Some studies suggest that certain subtypes have a greater risk of transmission or faster disease progression than others. On the other hand, antiretroviral drugs (ARVs), although largely developed in relation to subtype B, have generally proven to be effective against a wide range of subtypes (AVERT, 2017c).

Nonetheless, comparative research on these important issues is relatively limited, partly because individuals with different subtypes are found in distinct geographical locations. A more practical concern is the tests used to diagnose HIV and monitor the level of virus in the body (viral load). Tests that are sensitive to the full range of subtypes (and to group O and HIV-2) do exist but may not be readily available in all settings. This is a concern in places where diverse subtypes are prevalent (AVERT, 2017c).

1.3 Acquired immune deficiency syndrome (AIDS)

AIDS stands for acquired immunodeficiency syndrome. AIDS is the final stage of HIV infection, and not everyone who has HIV advances to this stage (AIDS.gov, 2017).

AIDS is the stage of infection that occurs when one's immune system is badly damaged and one become vulnerable to opportunistic infections. When the number of CD4 cells falls below 200 cells per cubic millimeter of blood, patients are considered to have progressed to AIDS. (The CD4 count of an uninfected adult/adolescent who is generally in good health ranges from 500 cells/mm3 to 1,600 cells/mm3.) People can also be diagnosed with AIDS if they develop one or more opportunistic infections, regardless of their CD4 count (AIDS.gov, 2017).

Without treatment, people who progress to AIDS typically survive about 3 years. Once patients have a dangerous opportunistic illness, life-expectancy without treatment falls to about 1 year. However, if they are taking ART and maintain a low viral load, then they may enjoy a near normal life span. Patients will most likely never progress to AIDS (AIDS.gov, 2017).

1.4 Opportunistic infections and their relation to HIV/AIDS

People with healthy immune systems can be exposed to certain viruses, bacteria, or parasites and have no reaction to them—but people living with HIV/AIDS can face serious health threats from what are known as "opportunistic" infections (OIs). These infections are called "opportunistic" because they take advantage of weakened immune system, and they can cause devastating illnesses. OIs are signs of a declining immune system. Most life-threatening OIs occur when CD4 count is below 200 cells/mm3. OIs are the most common cause of death for people with HIV/AIDS. The CDC developed a list of more than 20 OIs that are considered AIDS-defining conditions (AIDS.gov, 2017b).

If people have HIV and one or more of these OIs, they will be diagnosed with AIDS, no matter what their CD4 count happens to be:

-Candidiasis of bronchi, trachea, esophagus, or lungs

-Invasive cervical cancer

-Coccidioidomycosis

-Cryptococcosis

-Cryptosporidiosis, chronic intestinal

-Cytomegalovirus disease (particularly CMV retinitis)

-Encephalopathy, HIV-related

-Herpes simplex: chronic ulcer(s) (greater than 1 month's duration); or bronchitis, pneumonitis, or esophagitis

-Histoplasmosis

-Isosporiasis, chronic intestinal (greater than 1 month's duration)

-Kaposi's sarcoma

-Lymphoma, multiple forms

-Mycobacterium avium complex

-Tuberculosis

-Pneumocystis carinii pneumonia

-Pneumonia, recurrent

-Progressive multifocal leukoencephalopathy

-Salmonella septicemia, recurrent

-Toxoplasmosis of brain

-Wasting syndrome due to HIV

Because they can be so dangerous to patient's health, it is essential to understand the signs, symptoms, prevention, and management of OIs (AIDS.gov, 2017b).

1.5 Origin of HIV AND AIDS

Scientists identified a type of chimpanzee in Central Africa as the source of HIV infection in humans. They believe that the chimpanzee version of the immunodeficiency virus (called simian immunodeficiency virus, or SIV) most likely was transmitted to humans and mutated into HIV when humans hunted these chimpanzees for meat and came into contact with their infected blood (CDC.gov, 2017a).

HIV is a type of lentivirus, which means it attacks the immune system. In a similar way, the SIV virus (simian immunodeficiency virus) attacks the immune systems of monkeys and apes (AVERT, 2017b).

Studies show that HIV may have jumped from apes to humans as far back as the late 1800s. Over decades, the virus slowly spread across Africa and later into other parts of the world. The virus has existed in the United States since at least the mid to late 1970s (CDC.gov, 2017a).

1.5.1 Crossing of HIV from chimps to humans

The most commonly accepted theory is that of the 'hunter'. In this scenario, SIVcpz was transferred to humans as a result of chimps being killed and eaten, or their blood getting into cuts or wounds on the human hunter. Normally, the hunter's body would have fought off SIV, but on a few occasions it adapted itself within its new human host and became HIV-1 (AVERT, 2017b).

There are four main groups of HIV strains (M, N O and P), each with a slightly different genetic make-up. This supports the hunter theory because every time SIV passed from a chimpanzee to a human, it would have developed in a slightly different way within the human body, and produced a slightly different strain. This explains why there is more than one strain of HIV-1 (AVERT, 2017b).

1.5.2 Ways of HIV-2 get passed to humans

HIV-2 comes from SIV in sooty mangabey monkeys rather than chimpanzees. The crossover to humans is believed to have happened in a similar way (through the butchering and consumption of monkey meat). It is far rarer, and less infectious than HIV-1. As a result, it infects far fewer people, and is mainly found in a few countries in West Africa like Mali, Mauritania, Nigeria and Sierra Leone (AVERT, 2017b).

1.6 HIV and the Immune System

One of the proteins that envelope HIV named gp 120, (a sugar-containing protein called a glycoprotein) “recognizes" a protein on helper T-cells named CD4, and physically associates with it. The CD4 protein is a normal part of a helper (both Th1 and Th2) T-cell's membrane. Thus, CD4 is a specific receptor for HIV. This virus however, can also infect other cells which include macrophages and certain other kinds of cells which can engulf substances through a process known as phagocytosis. As a consequence of the interaction with CD4 on helper T-cells, HIV specifically infects the very cells necessary to activate both B-cell and cytotoxic T-cell immune responses. Without helper T-cells, the body cannot make antibodies properly, nor can infected cells containing HIV (an intracellular pathogen) be properly eliminated. Consequently, the virus can multiply, kill the helper T-cell in which it lives, infect adjacent helper T-cells, repeat the cycle, and on and on, until eventually there is a substantial loss of helper T-cells (AIDS, HIV and The Immune System, 2017).

The fight between the virus and the immune system for supremacy is continuous. Our body responds to this onslaught through production of more T-cells, some of which mature to become helper T-cells. The virus eventually infects these targets and eliminates them, too. More T-cells are produced; these too become infected, and are killed by the virus. This fight may continue for up to ten years before the body eventually dies, apparently because of the inability to any-longer produce T-cells. This loss of helper T-cells finally results in the complete inability of our body to ward-off even the weakest of organisms (all kinds of bacteria and viruses other than HIV) which are normally not ever a problem to us. This acquired condition of immunodeficiency is called, AIDS (AIDS, HIV and The Immune System, 2017).

1.7 The HIV Life Cycle

Binding and Fusion: HIV begins its life cycle when it binds to a CD4 receptor and one of two co-receptors on the surface of a CD4+ Lymphocyte. The virus then fuses with the host cell. After fusion, the virus releases RNA, its genetic material, into the host cell. (AIDSinfo,2017)

Reverse Transcription: An HIV enzyme called reverse transcriptase converts the single stranded HIV RNA to double-stranded HIV DNA. (AIDSinfo,2017)

Integration: The newly formed HIV DNA enters the host cell's nucleus, where an HIV enzyme called integrates "hides" the HIV DNA within the host cell's own DNA. The integrated HIV DNA is called provirus. The provirus may remain inactive for several years, producing few or no new copies of HIV (AIDSinfo, 2017).

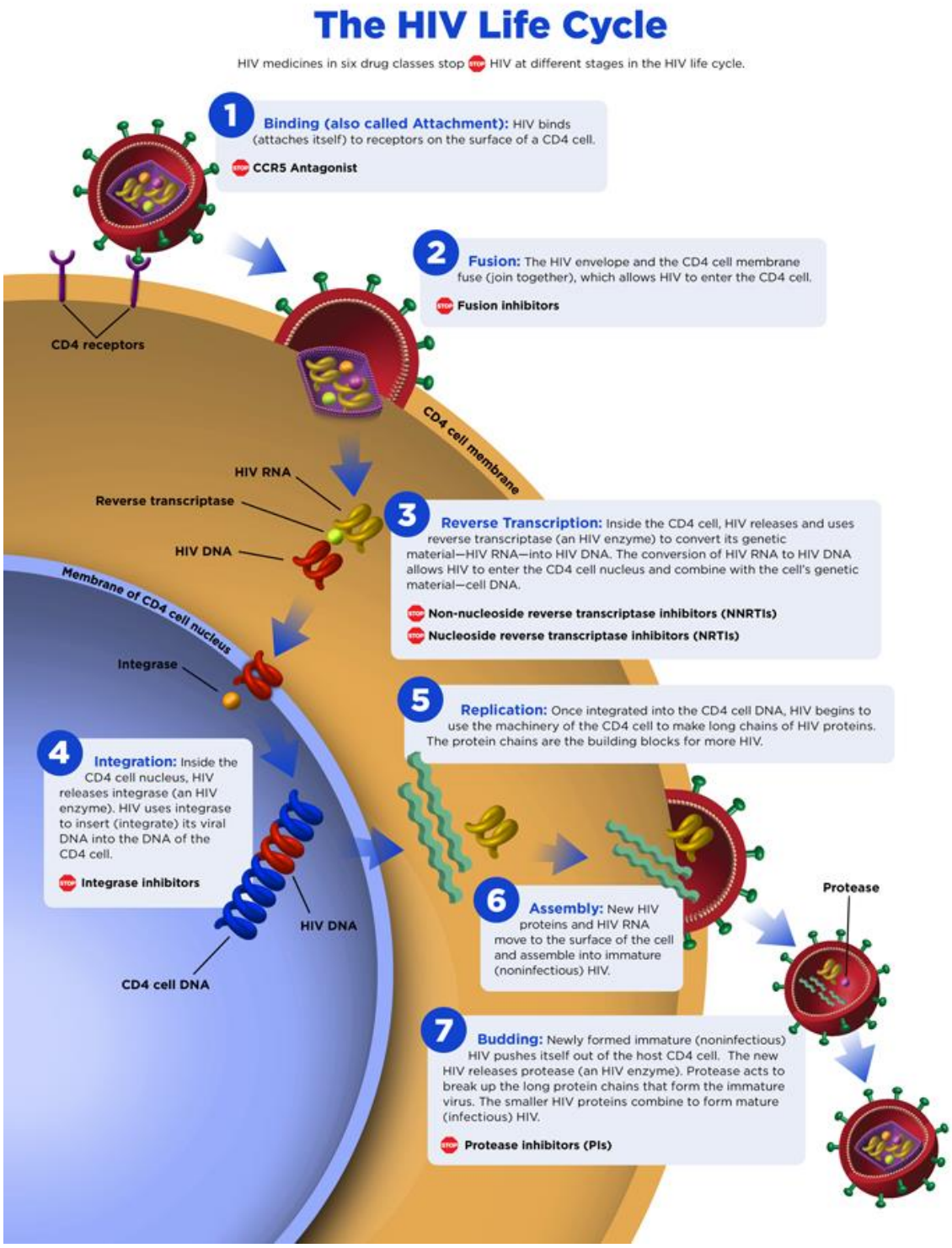

Fig 1.3: HIV life cycle

Transcription: When the host cell receives a signal to become active, the provirus uses a host enzyme called RNA polymerase to create copies of the HIV genomic material. Transcription of the viral genes env, gag and pol takes place to produce viral RNA, some of which will be incorporated into new virions and the rest is used in translation to produce three large, non-functional polyproteins, one derived from env, one from gag and the other from gag-pol gene (Virology Journal, 2017).

Assembly: An HIV enzyme called protease cuts the first long chains of HIV proteins into smaller individual proteins and produce viral glycoproteins (gp120, gp41), which are incorporated into cell membrane. The remaining two polypeptides remain intact and move to the inner surface membrane (Virology Journal, 2017).

Budding: The newly assembled virus pushes out ("buds") from the host cell. During budding, the new virus steals part of the cell's outer envelope. This envelope, which acts as a covering, is studded with protein/sugar combinations called HIV glycoproteins. These HIV glycoproteins are necessary for the virus to bind CD4 and coreceptors. The new copies of HIV can now move on to infect other cells (AIDSinfo, 2017).

1.8 Stages of HIV

Without treatment, HIV advances in stages, overwhelming immune system and getting worse over time. The three stages of HIV infection are: (1) acute HIV infection, (2) clinical latency, and (3) AIDS (acquired immunodeficiency syndrome) (AIDS.gov,2017c).

1.8.1 Acute infection stage

Within 2-4 weeks after HIV infection, many people develop flu-like symptoms, often described as “the worst flu ever.” Symptoms can include fever, swollen glands, sore throat, rash, muscle and joint aches and pains, and headache. This is called “acute retroviral syndrome” (ARS) or “primary HIV infection,” and it’s the body’s natural response to the HIV infection. During this early period of infection, large amounts of virus are being produced in the body. The virus uses CD4 count to replicate and destroys them in the process. Because of this, CD4 cells can fall rapidly. Eventually the immune response will begin to bring the level of virus in the body back down to a level called

a viral set point, which is a relatively stable level of virus in the body. At this point, your CD4 count begins to increase, but it may not return to pre-infection levels. During the acute HIV infection stage, people are at high risk of transmitting HIV to the sexual or drug using partners because the levels of HIV in the blood stream are very high (AIDS.gov,2017c).

1.8.2 Clinical latency stage

After the acute stage of HIV infection, the disease moves into a stage called the "clinical latency" stage. "Latency" means a period where a virus is living or developing in a person without producing symptoms. During this stage, people who are infected with HIV experience no symptoms, or only mild ones. (This stage is sometimes called "asymptomatic HIV infection" or "chronic HIV infection" (AIDS.gov, 2017c).

During this stage, the HIV virus continues to reproduce at very low levels, although it is still active. If patients take ART, they may live with clinical latency for several decades because treatment helps keep the virus in check. For people who are not on ART, the clinical latency stage lasts an average of 10 years, but some people may progress through this stage faster. People in this symptom-free stage are still able to transmit HIV to others, even if they are on ART, although ART greatly reduces the risk of transmission (AIDS.gov, 2017c).

1.9 Mode of Transmission

HIV is not spread easily. Only certain body fluids from a person who has HIV can transmit HIV. The body fluids are:

- Blood
- Semen (cum)
- Pre-seminal fluid (pre-cum)
- Rectal fluids
- Vaginal fluids
- Breast milk

These body fluids must come into contact with a mucous membrane or damaged tissue or be directly injected into the bloodstream (by a needle or syringe) for transmission to occur. Mucous membranes are found inside the rectum, vagina, penis, and mouth (AIDS.gov, 2017a).

HIV is spread mainly by

- Having anal or vaginal sex with someone who has HIV without using a condom or taking medicines to prevent or treat HIV.
- Anal sex is the highest-risk sexual behavior. Vaginal sex is the second highest-risk sexual behavior.
- Sharing needles or syringes, rinse water, or other equipment used to prepare injection drugs with someone who has HIV. HIV can live in a used needle up to 42 days depending on temperature and other factors (AIDS.gov, 2017a).

Less commonly, HIV may be spread

- From mother to child during pregnancy, birth, or breastfeeding. Although the risk can be high if a mother is living with HIV and not taking medicine.
- By being stuck with an HIV-contaminated needle or other sharp object. This is a risk mainly for health care workers (AIDS.gov, 2017a).

In extremely rare cases, HIV has been transmitted by

- Oral sex—putting the mouth on the penis, vagina or anus. In general, there is little to no risk of getting HIV from oral sex. But transmission of HIV, though extremely rare, is theoretically possible if an HIV-positive man ejaculates in his partner's mouth during oral sex.
- Receiving blood transfusions, blood products, or organ/tissue transplants that are contaminated with HIV. This was more common in the early years of HIV, but now the risk is extremely small because of rigorous testing of the blood supply and donated organs and tissues.
- Eating food that has been pre-chewed by an HIV-infected person. The contamination occurs when infected blood from a caregiver's mouth mixes with food while chewing. The only known cases are among infants.

- Being bitten by a person with HIV. Each of the very small number of documented cases has involved severe trauma with extensive tissue damage and the presence of blood. There is no risk of transmission if the skin is not broken.
- Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or blood-contaminated body fluids.
- Deep, open-mouth kissing if the person with HIV has sores or bleeding gums and blood from the HIV-positive partner gets into the bloodstream of the HIV-negative partner. HIV is not spread through saliva (AIDS.gov, 2017a).

1.10 Symptoms of HIV

The symptoms of HIV vary, depending on the individual and what stage of the disease people are in; the early stage, the clinical latency stage, or AIDS (the late stage of HIV infection). Below are the symptoms that some individuals may experience in these three stages. Not all individuals will experience these symptoms (AIDS.gov, 2017d).

1.10.1 Early stage of HIV

Some people may experience a flu-like illness within 2-4 weeks after HIV infection. But some people may not feel sick during this stage.

Flu-like symptoms can include:

-Fever - Rash

-Night sweats -Chills

-Muscle aches -Swollen lymph nodes

-Sore throat -Fatigue

-Mouth ulcers

These symptoms can last anywhere from a few days to several weeks. During this time, HIV infection may not show up on an HIV test, but people who have it are highly infectious and can

spread the infection to others. Each of these symptoms can be caused by other illnesses. And some people who have HIV do not show any symptoms at all for 10 years or more (AIDS.gov, 2017d).

1.10.2 Clinical latency stage

After the early stage of HIV infection, the disease moves into a stage called the clinical latency stage (also called "chronic HIV infection"). During this stage, HIV is still active but reproduces at very low levels. People with chronic HIV infection may not have any HIV-related symptoms, or only mild ones (AIDS.gov, 2017d).

1.10.3 Progression to AIDS: AIDS (acquired immunodeficiency syndrome) is the late stage of HIV infection. Symptoms can include:

-Rapid weight loss

-Recurring fever or profuse night sweats

-Extreme and unexplained tiredness

-Prolonged swelling of the lymph glands in the armpits, groin, or neck

-Diarrhea that lasts for more than a week

-Sores of the mouth, anus, or genitals

-Pneumonia

-Red, brown, pink, or purplish blotches on or under the skin or inside the mouth, nose, or eyelids

-Memory loss, depression, and other neurologic disorders.

Each of these symptoms can also be related to other illnesses. So the only way to know for sure if anyone has HIV is to get tested.

Many of the severe symptoms and illnesses of HIV disease come from the opportunistic infections that occur because the body's immune system has been damaged (AIDS.gov, 2017d).

1.11 Tests for HIV

There are three broad types of tests available: antibody tests, combination or fourth-generation tests, and nucleic acid tests (NAT). HIV tests may be performed on blood, oral fluid, or urine (CDC, 2017b).

1.11.1 Antibody test

Most HIV tests, including most rapid tests and home tests, are antibody tests. Antibodies are produced by the immune system when people exposed to viruses like HIV or bacteria. HIV antibody tests look for these antibodies to HIV in the blood or oral fluid. In general, antibody tests that use blood can detect HIV slightly sooner after infection than tests done with oral fluid (CDC, 2017b).

It can take 3 to 12 weeks (21-84 days) for an HIV-positive person's body to make enough antibodies for an antibody test to detect HIV infection. This is called the window period. Approximately 97% of people will develop detectable antibodies during this window period. If one gets a negative HIV antibody test result during the window period, they should be re-tested 3 months after your possible exposure to HIV (CDC, 2017b).

The OraQuick HIV Test, which involves taking an oral swab, provides fast results. People have to swab their mouth for an oral fluid sample and use a kit to test it. Results are available in 20 minutes. The Home Access HIV-1 Test System is a home collection kit, which involves pricking the finger to collect a blood sample, sending the sample by mail to a licensed laboratory, and then calling in for results as early as the next business day. This test is anonymous. The manufacturer provides confidential counseling and referral to treatment (CDC, 2017b).

1.11.2 Combination or fourth-generation test

It looks for both HIV antibodies and antigens. If anyone infected with HIV, an antigen called p24 is produced even before antibodies develop. Combination screening tests are now

recommended for testing done in labs and are becoming more common in the United States. There is now rapid combinations test available (CDC, 2017b).

It can take 2 to 6 weeks (13 to 42 days) for a person's body to make enough antigens and antibodies for a combination, or fourth-generation, test to detect HIV. This is called the window period. If anyone gets a negative combination test result during the window period, they should be retested 3 months after your possible exposure (CDC, 2017b).

1.11.3 A nucleic acid test (NAT)

It looks for HIV in the blood. It looks for the virus and not the antibodies to the virus. The test can give either a positive/negative result or an actual amount of virus present in the blood (known as a viral load test). This test is very expensive and not routinely used for screening individuals unless they recently had a high-risk exposure or a possible exposure with early symptoms of HIV infection (CDC, 2017b).

It can take 7 to 28 days for a NAT to detect HIV. Nucleic acid testing is usually considered accurate during the early stages of infection. However, it is best to get an antibody or combination test at the same time to help the doctor interpret the negative NAT. This is because a small number of people naturally decrease the amount of virus in their blood over time, which can lead to an inaccurate negative NAT result. Taking pre-exposure prophylaxis (PrEP) or post-exposure prophylaxis (PEP) may also reduce the accuracy of NAT if people have HIV (CDC, 2017b).

1.12 HIV treatment

HIV treatment doesn't cure HIV. When successful, it reduces the amount of the virus (your 'viral load') to very low ('undetectable') levels. that it is not able to cause damage to the immune system. It's now recommended that everyone diagnosed with HIV starts treatment straight away regardless of their CD4 count. Once patients start treatment, it is likely they will be taking it for the rest of their life. Treatment with anti-HIV drugs is sometimes called combination therapy because people usually take three different drugs at the same time. It is also known as

antiretroviral therapy, or highly active antiretroviral therapy - HAART for short (Terrence Higgins Trust, 2017).

1.12.1 Types of HIV treatment

Over 25 anti-HIV drugs are now available, in six 'classes' of drugs. Each class works against HIV in a particular way. People will take a combination of drugs – usually three.

The classes of anti-HIV drugs are:

- Nucleoside reverse transcriptase inhibitors (NRTIs or 'nukes').
- Nucleotide reverse transcriptase inhibitors (NtRTIs).
- Non-nucleoside reverse transcriptase inhibitors (NNRTIs or 'non-nukes').
- Protease inhibitors (PIs).
- Fusion and entry inhibitors.
- Integrase inhibitors.

(Terrence Higgins Trust, 2017)

1.12.1.1 Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs)

They work by interrupting the life cycle of HIV as it tries to copy itself. These drugs also have other actions that prevent HIV from replicating in the body (Healthline, 2017).

1.12.1.2 Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

These drugs work in the same way as NRTIs. They stop the virus from replicating itself in your body (Healthline, 2017).

1.12.1.3 Protease inhibitors

They work by binding to protease. This is a protein that HIV needs to replicate in the body. When protease can't do its job, the virus can't complete the process that makes new copies. This reduces the number of viruses that can infect more cells (Healthline, 2017).

1.12.1.4 Entry inhibitors (including fusion inhibitors)

Entry inhibitors are another class of HIV medications. HIV needs a host T cell in order to make copies of itself. These drugs block the virus from entering a host T cell. This prevents the virus from replicating itself. These drugs also prevent the destruction of targeted cells. This action helps your immune system work better (Healthline, 2017).

1.12.1.5 Integrase Inhibitors

These stop HIV from making copies of itself by blocking a key protein that allows the virus to put its DNA into the healthy cell's DNA. They're also called integrase strand transfer inhibitors (INSTIs) (Healthline, 2017).

1.1 Table: Classes of drugs with examples

Class	Drug
NRTI	Abacavir Efavirenz Emtriacitabine Tenofovir disoproxil fumarate Lamivudine Zidovudine Rilpivirine Didanosine Stavudine (Healthline,2017)
NNRTI	Rilpivirine Etravirine Delavirdine mesylate Efavirenz Nevirapine (Healthline,2017)
Protease inhibitor	Tipranavir Indinavir Atazanavir Saquinavir Lopinavir Fosamprenavir Ritonavir Cobicistat Darunavir Atazanavir Nelfinavir (Healthline,2017)
Entry inhibitor	Enfuvirtide ibalizumab, PRO 140, and others are being tested for approval. (WebMD,2017a)
Integrase inhibitor	Dolutegravir Elvitegravir Raltegravir (Healthline,2017)

1.12.1.6 Chemokine co-receptor antagonists (CCR5 antagonists)

CCR5 antagonists prevent the spread of HIV. These drugs block infection in one of two molecules found on the surface of each body cell. Because it only affects one molecule, this drug is usually used with other medications for full HIV treatment. An example of this type of drug includes: Maraviroc (Healthline, 2017).

1.12.1.7 Cytochrome P4503A (CYP3A) inhibitors

CYP3A is an enzyme that protects liver and gastrointestinal (GI) health. HIV can destroy this enzyme, leading to problems with your liver and GI tract. CYP3A inhibitors protect these enzymes to keep you healthy. These drugs affect your liver and come with the risk of jaundice. This may cause yellowing of your skin and the whites of your eyes. An example of this type of drug includes: Cobicistat (Tybost) (Healthline, 2017).

1.12.1.8 Immune-based therapies

Because HIV affects your immune system, researchers are studying ways that drugs can help boost immunity. Certain immune-based treatments have been successful in some people. Like some protease inhibitors, these drugs are used off-label for HIV. They are used along with other HIV medications. An example of an immune-based therapy includes: hydroxychloroquine sulfate which is a drug approved to treat autoimmune diseases such as lupus and rheumatoid arthritis (Healthline, 2017).

1.13 Side effects of HIV therapy

There are many potential side effects associated with antiviral therapies. The most common ones for each class of drug are summarized in readily available product information. Some specific toxicities are summarized by class below:

- Most NRTIs can cause mild nausea and loose stools. In general, these symptoms resolve with time.
- ZidovuZdin has been associated with decreased production of blood cells by the bone marrow, most often causing anemia, and occasionally hyperpigmentation (most often of the nails).
- Stavudine can damage nerves and cause peripheral neuropathy, a neurological condition with numbness and/or tingling of the feet and hands, and inflammation of the pancreas (pancreatitis) that causes nausea, vomiting, and mid/upper abdominal pain.
- DDI also causes pancreatitis and, to a lesser extent, peripheral neuropathy. Peripheral neuropathy can become permanent and painful, and pancreatitis can be life-threatening if therapy is not discontinued. The drug ddC also is associated with peripheral neuropathy, as well as oral ulcers.
- Abacavir Sulfate can cause a hypersensitivity reaction during the first two to six weeks of therapy in approximately 5% of individuals. The hypersensitivity reaction most often causes fever and other symptoms, such as muscle aches, nausea, diarrhea, rash, or cough.
- Tenofovir Disoproxil Fumarate is generally well tolerated although there may be rare kidney damage and may have a greater impact on reducing bone density than other agents.
- Emtricitabine is also well tolerated except for the occasional development of hyperpigmentation, most often on the palms and soles. This hyperpigmentation occurs more frequently in people of color.
- Although all NRTIs can be associated with lactic acidosis (a serious condition in which lactic acid accumulates in the blood), it may occur more often with some drugs, such as d4T. Although this complication of treatment is rare, it can be severe and life threatening. Early symptoms of lactic acidosis are nausea, fatigue, and sometimes shortness of breath. Lactic acidosis needs to be watched for and, if suspected, requires that therapy be discontinued until symptoms and laboratory test abnormalities resolve.
- There has been a great deal of attention given to the more recently identified problem of "lipodystrophy." Individuals suffering from this syndrome can be categorized as having lipohypertrophy (fat accumulation) syndromes, such as the "buffalo hump" on the back of the neck, breast enlargement, or increased abdominal girth. The NRTIs appear to be most closely linked to lipoatrophy, in particular D4T and to a lesser extent ZDV. In fact, some studies have suggested slow accumulation of fat in those who modify

the NRTI component of their regimen. Some NRTIs also have been linked to elevation in lipid (fat) levels in the blood.

- NNRTIs: the most common side effect associated with NNRTIs is a rash.
- Side effects associated with Efavirenz are mostly dizziness, confusion, fatigue, and vivid dreams. These tend to be most prominent during the first weeks of therapy and then often decrease in severity.
- Fusion inhibitors: the only drug in this class is T-20. The most common side effects are redness and pain at the site of injection.
- CCR5 antagonist: although there were some early concerns of liver inflammation for drugs in this class.
- Integrase strand transfer inhibitors: RAL has not been strongly linked to any specific side effect in clinical trials. However, there have been some cases of muscle problems and of increasing depression that needs to be watched for when starting this or any new medications (WebMD, 2017a).

1.14 Monitoring antiviral therapy

The goals of antiviral therapy are to enhance immunity and delay or prevent clinical advancement to symptomatic disease without inducing important side effects or selecting for drug-resistant virus. Currently, the best marker of a drug's activity is a decrease in the viral load. Ideally, prior to initiating treatment, the viral load and the CD4 cell count should be checked and the viral load test then repeated after approximately four weeks of treatment. If the patient is beginning a regimen that includes two to three drugs for which the patient's virus does not appear to be resistant, it is expected that the amount of virus should decrease by at least a hundredfold during this interval. The ultimate goal is for the viral load to decrease to undetectable levels which should occur by approximately 12-24 weeks. There are some individuals that despite taking all of their medications correctly will suppress their viral load to less than 200 copies/mL but not consistently undetectable levels. It is not completely known how to optimally manage this situation but many experts would continue to monitor on current therapy as long as viral load remains below 200 copies/mL. Those who are not having an appropriate response to therapy need to be questioned to make sure that they are taking their medications correctly, and if not, why. If the viral load is not going to undetectable levels and the patient is taking the medications correctly, then it is likely that there is a resistant virus to some of the medications. (WebMD. 2017b)

1.15 Risks of missing doses or stopping antiviral therapy

It is strongly advised that individuals on an antiviral regimen not miss any doses of their medications. Unfortunately, life is such that doses often are missed. Reasons for missing doses range from just forgetting to take the medication, leaving town without the medication, or because of a medical emergency, such as the need for urgent surgery. For example, after an appendectomy for acute appendicitis, a patient may not be able to take oral medication for up to several days. When a dose is missed, the patient should contact his or her physician without delay to discuss the course of action. The options in this situation are to take the missed doses immediately or simply resume the drugs with the next scheduled dose. (WebMD. 2017b)

Although every missed dose increases the chance that the virus will develop resistance to the drugs, a single missed dose should not be cause for alarm. On the contrary, it is an opportunity to learn from the experience and determine why it happened, if it is likely to happen again, and what can be done to minimize missing future doses. Furthermore, if a patient cannot resume medication for a limited time, such as in a medical emergency, there still is no cause for alarm. In this circumstance, the patient should work with their HIV provider to restart therapy as soon as is feasible. Stopping antivirals is associated with some risks of developing drug resistance, and those who wish to stop therapy for any one of a number of reasons should discuss this with their health-care professional in advance to establish the best strategy for safely accomplishing this (WebMD. 2017b).

1.16 Treatment for HIV during pregnancy

One of the greatest advances in the management of HIV infection has been in pregnant women. Prior to antiviral therapy, the risk of HIV transmission from an infected mother to her newborn was approximately 25%-35%. The first major advance in this area came with studies giving ZDV after the first trimester of pregnancy, then intravenously during the delivery process, and then after delivery to the newborn for six weeks. This treatment showed a reduction in the risk of transmission to less than 10%. Although less data are available with more potent drug combinations, clinical experience suggests that the risk of transmission may be reduced to less than 5%. Current recommendations are to advise HIV-infected pregnant women regarding both the unknown side effects of antiviral therapy on the fetus and the promising clinical experience

with potent therapy in preventing transmission. In the final analysis, however, pregnant women with HIV should be treated essentially the same as nonpregnant women with HIV. Exceptions would be during the first trimester, where therapy remains controversial, and avoiding certain drugs that may cause greater concern for fetal toxicity, such as Efavirenz (WebMD. 2017b).

All HIV-infected pregnant women should be managed by an obstetrician with experience in dealing with HIV-infected women. Maximal obstetric precautions to minimize transmission of the HIV virus, such as avoiding scalp monitors and minimizing labor after rupture of the uterine membranes, should be observed. In addition, the potential use of an elective Caesarean section (C-section) should be discussed, particularly in those women without good viral control of their HIV infection where the risk of transmission may be increased. Breastfeeding should be avoided if alternative nutrition for the infant is available since HIV transmission can occur by this route. When breastfeeding is done, it should be in conjunction with antiretroviral therapy for the mother if at all possible (WebMD. 2017b).

1.17 Prevention

HIV is often spread by people who don't know they have it. So it's always important to protect ourselves and others by taking these steps:

- Practice of safer sex: Using a condom every time having sex (including oral sex) until makes sure that the partners aren't infected with HIV or other sexually transmitted infection (STI).
- Not having more than one sex partner at a time. The safest sex is with one partner who has sex only with one.
- Talking with partner before having sex for the first time. Finding out if he or she is at risk for HIV. Get tested together. Getting tested again at 6, 12, and 24 weeks after the first test can be done to be sure neither of them are infected. Using condoms in the meantime.
- Avoid drinking a lot of alcohol or using illegal drugs before sex. People may let down their guard and not practice safer sex.
- Not sharing personal items, such as toothbrushes or razors.
- Never share needles or syringes with anyone.

- If anyone is at high risk for getting infected with HIV, he\ she can take antiretroviral medicine to help protect themselves from HIV infection. Experts may recommend this for:
  - People whose sexual practices put them at high risk for HIV infection, such as men who have sex with men and people who have many sex partners.
  - People who inject illegal drugs, especially if they share needles.
  - Adults who have a sex partner with HIV.

To keep the risk low, people still need to practice safer sex even while they are taking the medicine (WebMD. 2017b).

1.18 Myths of HIV

- HIV is a death sentence: "With proper treatment, we now expect people with HIV to live a normal life span," says Dr. Michael Horberg, national director of HIV/AIDS for Kaiser Permanente. "Since 1996, with the advent of highly active, antiretroviral therapy, a person with HIV in an industrialized nation can expect to live a normal life span, so long as they take their prescribed medications," adds Dr. Amesh A. Adalja, a board-certified infectious disease physician with the University of Pittsburgh.
- One can tell if someone has HIV/AIDS by looking at them: Often, there are no visible signs of HIV/AIDS. "Some people develop HIV symptoms shortly after being infected. For others, it can take up to 10 years for symptoms to appear," says Dr. Gerald Schochetman, senior director of infectious diseases with Abbott Diagnostics. Schochetman worked at the CDC during the height of the AIDS crisis. Further, the first symptoms of HIV, including a fever, fatigue, and muscle aches, may only last for a few weeks. "Thus, it's very hard for people to know if they or someone else has HIV without being properly tested," says Schochetman.
- Straight people don't have to worry about HIV infection: "We know that the highest risk group is men who have sex with men," says Dr. Horberg. This group accounts for about 78 percent of new infections, according to the CDC. "However, heterosexuals accounted for 24 percent of new HIV infections in 2010, and about two-thirds of those were women."

- HIV-positive people can't safely have children: It is possible to have a child if one and his\her partner is HIV-positive. While it's impossible to guarantee that the infection won't pass on to the child, the U.S. Department of Health and Human Services says there are ways to greatly reduce the risk. For example, an HIV-positive woman can take antiretroviral therapy (ART) before and during pregnancy. "As long as a partner takes their medication correctly and has an undetectable viral load, the likelihood of transmitting the infection to their child is pretty slim to none," explains psychotherapist Keeley Teemsma, who has specialized in the treatment of HIV/AIDS patients.
- HIV always leads to AIDS: HIV is the infection that causes AIDS. But this doesn't mean all HIV-positive individuals will actually develop AIDS. "With current therapies, levels of HIV infection can be controlled and kept low, maintaining a healthy immune system for a long time and therefore preventing opportunistic infections and a diagnosis of AIDS," explains Dr. Richard Jimenez, professor of public health at Walden University.
- With all of the modern treatments, HIV is no big deal: This sort of attitude has led some to practice carefree and reckless sexual behavior. "The younger generation has lost some fear of HIV because of the success of treatment," explains Dr. Adalja. "This has caused them to engage in risky behaviors, leading to high rates of infection in young men who have sex with other men."
- If I take PrEP, I don't need to use a condom: PrEP (pre-exposure prophylaxis) is a medication that can prevent HIV infection in advance. According to Dr. Horberg, a recent study from Kaiser Permanente followed people using PrEP for two and a half years, and found that it was effective at preventing HIV infections. However, it doesn't protect against other sexually transmitted diseases or infections. "Prep is recommended to be used in combination with safer sex practices, as our study also showed that half of the patients participating were diagnosed with a sexually transmitted infection after 12 months," says Dr. Horberg.
- If one test negative for HIV, he\she can have unprotected sex: If you or your partner was recently infected with HIV, it may not show up on an HIV test until about three months later. "Traditionally used antibody-only tests work by detecting the presence of antibodies in the body that develop when HIV infects the body," explains Dr. Schochetman. "But it takes about three weeks for there to be enough antibodies for detection. "Before you should even consider having unprotected sex, you should take a second HIV test three months after the first, to confirm your negative reading. If you are

having regular sex, the San Francisco AIDS Foundation suggests getting tested every three months. Other tests, known as HIV combo tests, can detect the virus earlier.

- If both partners have HIV, there's no reason for a condom: Not all strains of HIV are the same, and being infected with more than one can lead to greater complications, or a "superinfection," according to Dr. Schochetman. "The new HIV strain may exhibit a different drug resistance profile than the original HIV infection," he explains. "And the new virus may show resistance to the current treatment, or cause the current treatment option to be ineffective" (Healthline, 2017).

1.19 Epidemiology

HIV continues to be a major global public health issue. In 2015, an estimated 36.7 million people were living with HIV (including 1.8 million children) – a global HIV prevalence of 0.8%.1 2.The vast majority of this number live in low- and middle- income countries. In the same year, 1.1 million people died of AIDS-related illnesses.Since the start of the epidemic, an estimated 78 million people have become infected with HIV and 35 million people have died of AIDS-related illnesses(AVERT,2017a).

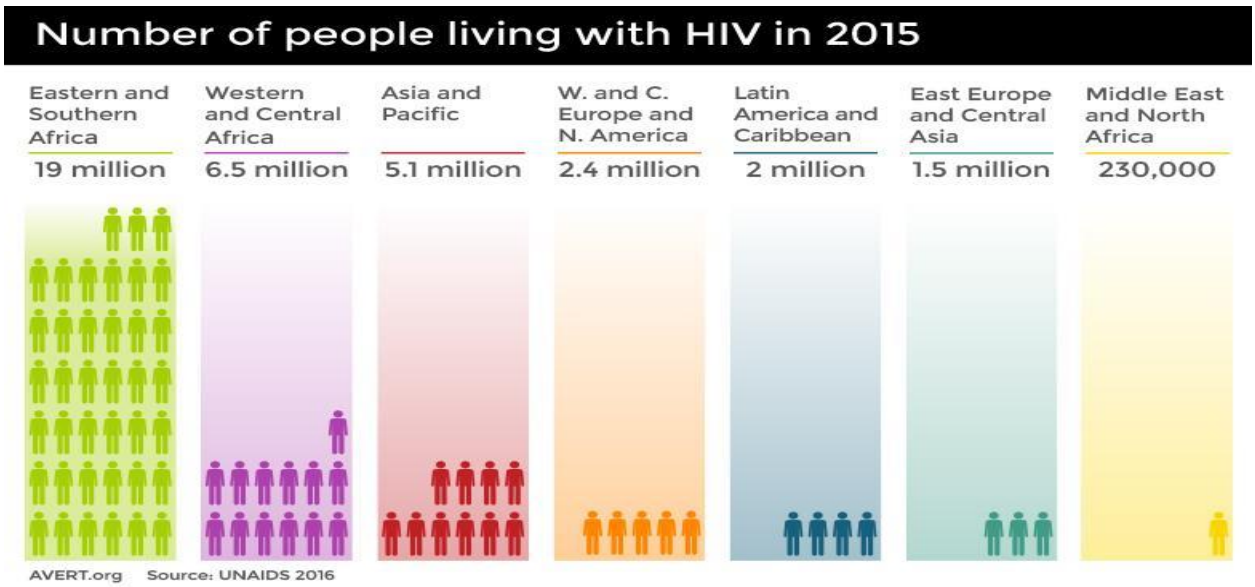

Fig 1.19: Number of people living with HIV in 2015 (AVERT, 2017a)

In 2015, there were roughly 2.1 million new HIV infections, 150,000 of which were among children. Most of these children live in sub-Saharan Africa and were infected via their HIV-positive mothers during pregnancy, childbirth or breastfeeding (AVERT, 2017a)

Progress in decreasing new HIV infections among adults has slowed in recent years. Since 2010, the annual number of new infections among adults (15+) has remained static at 1.9 million (AVERT, 2017a).

A comparison of country data shows huge discrepancies in efforts to slow the spread of new infections. Some countries have achieved a decline of 50% or more in new HIV infections among adults over the last 10 years, while many have made no measurable progress. Yet others are experiencing worrying increases in new HIV infections (AVERT, 2017a)

In 2015, US$ 19 billion was invested in the HIV and AIDS response in low- and middle- income countries with 57% of the total HIV resources in these countries coming from domestic budgets. Rising numbers of new HIV infections in many countries means that US$ 26.2 billion will be required for the response to the epidemic in 2020, with US$ 23.9 billion required in 2030 (AVERT, 2017a).

1.20 Scenario in Bangladesh

Bangladesh remains a low HIV prevalence country with less than 0.1% overall prevalence in general population over the years. The HIV prevalence remains less than 1% both among key and bridge populations. Till date, the country has registered a total of 3674 cases of HIV infection. However, the estimated number of people living with HIV is around 9500. Although the prevalence remains low, Bangladesh is one of the only four countries in Asia and the Pacific where prevalence has increased more than 25% over a decade till 2012.

- In 2014 Number of people living with HIV are 8,900 [8,000 - 9,800]
- Adults aged 15 to 49 prevalence rate <0.1% [<0.1% - <0.1%]
- Adults aged 15 and up living with HIV 8,600 [7,700 - 9,400]
- Women aged 15 and up living with HIV 2,900 [2,600 - 3,100]
- Children aged 0 to 14 living with HIV <500 [<500 - <500]
- Deaths due to AIDS <1000 [<1000 - 1,200]
- Orphans due to AIDS aged 0 to 17 N/A (UNAIDS, 2015).

CHAPTER 2

LITERATURE REVIEW

A study was done to assess the knowledge and attitude of high school students regarding AIDS in Iran. 4641 students from 52 high schools in Tehran were gone through cluster sampling by anonymous questionnaires in February 200. The students identified television as their most important source of information about AIDS. Only a few students answered all the knowledge questions correctly, and there were many misconceptions about the routes of transmission. 46% believed that Human Immunodeficiency Virus positive (HIV positive) students should not attend ordinary schools. Most of the students wanted to know more about AIDS. In this study knowledge level was associated with students' attitudes and discipline ($p < 0.001$). Although the knowledge level seems to be moderately high, misconceptions about the routes of transmission were common. (Tavoosi and Zaferani, 2004)

Another study was done to assess sexual behavior, and knowledge and attitude towards HIV/AIDS among out of school youth in Bahir Dar Town, northwest Ethiopia. Intervention to control the spread of HIV/AIDS in out of school youth is under way in Bahir Dar Town. This survey was therefore conducted in April 1994 by Fabtahun and Chala to provide baseline data on sexual behavior, knowledge and attitude towards HIV/AIDS. A total of 1115 out of school young people from eight randomly selected school/ college of the town were interviewed. Fifty one (4.6%) respondents said they have never heard of AIDS. Mean number of sexual partners for those who practiced sex was 3.9 +/- 2.5. Knowledge scores were better than attitude and practice scores. Age, sex, marital status, educational status and occupation were significantly related with knowledge, attitude and practice scores ($p < 0.05$). The association of knowledge scores with attitude and practice scores was not statistically significant; $p = 0.056$ and $p = 0.07$, respectively. In addition to improving knowledge, emphasis should be given to other measures such as making the services accessible to the youth. A similar survey is recommended after the intervention program is over. (Fantahun and Chala, 1996)

A study was done to find the Knowledge about AIDS/HIV infection among female college students in Pakistan. Farid and Choudhry, (2003) reported that Ninety-five percent students had heard about HIV/ AIDS and its presence in Pakistan, 61.7% students knew that HIV/AIDS is caused by germs and 91.2% knew about its transmissibility. Over 70% of students knew that HIV can be transmitted through sexual

contact, infected blood transfusion, and re-use of infected injection needles. Moreover, only 19.2% mentioned ear/nose piercing with infected needles while 46.8% mentioned breast feeding as sources of transmission of HIV/AIDS. However, 57% were of the view that second hand clothing cannot spread AIDS. Individuals having multiple sexual partners (78.2%), drug addicts (38.8%), homosexuals (39.2%), commercial sex workers (52.2%) and health care workers (16.2%) were identified as high risk groups. Only 33.2% of students perceived that women are at higher risk of acquiring HIV as compared to men. Regarding prevention of AIDS, 61.0% mentioned avoiding promiscuous sex, 49.3% knew use of condoms and 60.2% were aware that AIDS can be prevented by avoiding homosexuality. Sixty-eight percent and 70.2% students respectively held the view that avoiding used needles for injections in hospitals and laboratories for screening blood or blood products can prevent AIDS, while 78.2% and 55.8% respectively knew that there is no cure or vaccine available for AIDS. Majority of the students (71.5%) have discussed AIDS with their friends while discussion with siblings, parents and teachers was not common (Farid and Choudhry, 2003).

Onah *et al*., (2004) report that all the respondents had heard of HIV/AIDS among undergrates in Enugu, Nigeria. The respondents exhibited a high knowledge of HIV/AIDS. For the 68.9% respondents who had ever had sexual intercourse, the mean number of sexual partners, which they had before and after they became aware of HIV/AIDS, did not differ significantly (Onah *et al*., 2004).

A survey was conducted the survey among 326 tertiary level students in different colleges located in Dhaka city. Students demonstrated a high knowledge of transmission and prevention of HIV and AIDS yet with considerable misconception. All students said that unprotected sex with an HIV-positive man or woman can transmit the HIV virus to a negative man or woman. Multivariate regression analysis indicated that the students who had more knowledge on HIV and AIDS were: older boys, fathers having more income, business or service as father's occupation, having more mass media exposure, being senior students and being students of arts, social sciences, and science. The findings of this study suggest that a special course on health education, including risk perceptions of HIV and AIDS and issues related to sexual and other high risk behavior, should be included in the course curricula irrespective of disciplines at tertiary levels. Among 326 students, 35 % were female and 65 % were male. They were also distributed according to their knowledge about the meaning of HIV/AIDS and the difference

between HIV and AIDS. Among them 100 % of the students were found to have knowledge about the meaning of HIV/AIDS and 84.9 % knew that AIDS was caused by HIV. However, a large percentage of about 60 % students did not know the difference between HIV and AIDS. The data and information on the assessment of the respondents' knowledge about the name of agent of AIDS showed that 100 % were aware of the HIV and 22.23% had knowledge about the chance of getting infection from a patient with HIV /AIDS. Furthermore, 46.73 % knew about the pricked infected needle as the mode of transmission of HIV, whereas 40.05 % thought splashing of blood fluids in the wound as mode of transmission and 52.45 % believe that injury by infected surgical needle as another potential way of transmission of HIV infection. Moreover, the knowledge about the preventive measures of HIV infection among the respondents was also being evaluated. This survey revealed that 100 % students believed that the transmission of HIV could be prevented by safer sex, where as 82 % thought that it could be prevented by avoiding multiple sex partners and 98 % of students had opinion about the safe blood transfusion as preventive measure against HIV and AIDS (Shuma and Halder, 2015).

A study was done to find out adolescent knowledge and awareness about AIDS/HIV and factors affecting them in Bangladesh. Adolescents are more vulnerable than adults of unplanned pregnancies, sexually transmitted diseases and HIV/AIDS. Among the adolescents, girls are more vulnerable to STDs including HIV/AIDS as their knowledge about different diseases is very poor. This investigated adolescent's knowledge about sexually transmitted diseases including HIV/AIDS, its mode of transmission and ways of its prevention. In here method was used called Cross sectional study design was adopted for this study. Data on 3362 female adolescents irrespective of their marital status was analyzed. The study found that a large proportion of adolescents were not aware about sexually transmitted diseases and AIDS. More than half of the adolescents ever heard about AIDS respectively. On an average, about one tenth of them 54.8% had better knowledge on AIDS in terms of mode of transmission and prevention (Rahman, Kabir and Shahidullah, 2009).

Another survey to get the knowledge of HIV and AIDS among 392 tertiary students in Bangladesh was conducted who were the students of University of Dhaka, Bangladesh. Survey responded that the student had a high knowledge of transmission and prevention of HIV and AIDS including a few considerable misconceptions. All students knew that AIDS is one of the STDs so unprotected sex with an

HIV-positive person can transmit the HIV virus to a negative one besides at the same time 43.6% of students believed that there is a preventive vaccine for HIV and 39.8% understood that HIV can be cured if it is diagnosed early. They notable point they found that the older boys, fathers having more income, business or service as father's occupation, having more mass media exposure, being senior students, living in a university dormitory, and being students of faculty of arts, social sciences, and science know this case better than the others (Hossain, Kabir and Ferdous, 2006).

To get the idea about HIV Riskrception and Constraints to Protective Behavior among Young Slum Dwellers in Ibadan, Nigeria a survey was conducted. This study examined the relationship between HIV/AIDS risk perception and protective behavior among sexually-active urban young slum dwellers in Ibadan, Nigeria. The multistage sampling techniques were used for selecting 1,600 respondents aged 15-24 years. Of these, 1,042 (65%) respondents who reported unprotected sex in the last three months were selected for analysis. Although the sexually-active respondents demonstrated basic knowledge of HIV/AIDS and high risk perception, risky behavior was common and protective behavior was poor. About 48% of 505 males and 12% of 537 females had multiple partners. Similarly, 29% of males and 38% of females were engaged in transactional sex. Only 14% of males and 5% of females used any form of protection, resulting in the high rates of sexually transmitted infections reported by 27% of males and 10% of females. Structural and environmental constraints were identified as barriers to adopting protective behavior. Therefore, program and policy interventions should be designed to address the peculiar circumstances of urban young slum dwellers to curtail the HIV epidemic (Adedimeji *et al.*, 2007).

According to a survey conducted by Kabiru *et al.*, (2011) nineteen percent of males and 35% of females had been tested. Among tested youth, 74% of males and 43% of females had requested for their most recent HIV test while 7% of males and 32% of females reported that they were required to take their most recent HIV test (i.e., the test was mandatory). About 60% of females who had ever had sex received an HIV test because they were pregnant. They found modest support for the HBM in explaining variation in testing behavior. In particular, we found that perceived risk for HIV infection may drive HIV testing among youth. For example, about half of youth who had ever had sex but had never been tested reported that they had not been tested because they were not at risk (Kabiru *et al.*, 2011).

Another study was found based on Awareness and Knowledge of AIDS among Indian Women under 22: Evidence From 13 States. The study was carried out over 30,000 women under 22 years in 13 (out of 25) Indian states where HIV is thought to be highly prevalent-Maharashtra, West Bengal, Tamil Nadu, and ten other less populous states-were surveyed about their awareness and knowledge of AIDS. Only one in six women had heard of AIDS. Among those, knowledge about transmission and prevention is poor. Multivariate analyses reveal that rural, poorly educated, and poor women are the least likely to be AIDS-aware and if aware, have the poorest understanding of the syndrome. Despite low levels of awareness and knowledge, we find a strong positive association between AIDS awareness and knowledge and condom use (Balk and Lahiri, 1997).

Wang *et al*., (2010) reported that, total of 531 respondents recruited in this study, all of them were students from various school and college. The awareness of HIV/AIDS-related knowledge in male students was 91.9%, in female students was 87.2%. Although the sexually-active respondents demonstrated basic knowledge of HIV/AIDS and high risk perception, risky behavior was common and protective behavior was poor. About 48% of 505 males and 12% of 537 females had multiple partners. Similarly, 29% of males and 38% of females were engaged in transactional sex. Only 14% of males and 5% of females used any form of protection, resulting in the high rates of sexually transmitted infections reported by 27% of males and 10% of females (Wang *et al*., 2010).

A school-based AIDS education programme for secondary school students in Nigeria: a review of effectiveness was done. Nigerian secondary school students are becoming sexually active at an increasing earlier age. Sexually active students are at risk of contracting STDs, including HIV infection. As a result, health education initiatives to increase level of knowledge, influence attitudes and encourage safe sexual practices are being implemented in schools, but the effectiveness of these programs have not been evaluated. In this study, the knowledge, attitude and sexual risk behaviors of 223 students who received a comprehensive health education intervention were compared with 217 controls. At post-test, intervention students exhibited greater knowledge about HIV/AIDS transmission and prevention ($P < 0.05$). Intervention students were less likely to feel AIDS is a white man's disease and were more likely to

be tolerant of people living with the disease (P < 0.05). After the intervention, the mean number of reported sexual partners among the experimental students significantly decreased from 1.51 to 1.06, while it increased from 1.3 to 1.39 among the controls. Among the intervention students there was also an increase in consistent use of the condom and the use of the condom at last sexual intercourse. We conclude that students can benefit from specific education programs that transmit important information necessary to prevent risky behavior, and improve knowledge and attitudes on HIV/AIDS (Fawole and Asuzu, 1999).

A study based on Knowledge and Attitude of college Students in Kerala towards HIV/AIDS, sexually transmitted diseases and sexuality was done. Knowledge about the spread of HIV and safe sexual practices has a critical impact on the prevention of the acquired immune deficiency syndrome (AIDS).They assessed the knowledge of and attitude towards AIDS, sexually transmitted diseases (STDs) and sexuality among college students in Thiruvananthapuram district, Kerala. They performed a community-based, cross-sectional survey of 625 randomly selected undergraduate college students (I064 boys, 1046 girls, age 8-22 years).They administered a pre- tested, structured questionnaire to assess the knowledge and attitude of the students towards AIDS, STDs and sexuality. They generated knowledge and attitude scores from the student responses, and used multivariable linear regression to study the association of these scores with select predictor variables (notably gender and place of residence). All the students in their sample had heard about AIDS. However, only 45% knew that AIDS is not curable at present only 34% were aware of the symptoms of STDs, and 47% knew that STDs are associated with an increased risk of AIDS. In multivariable analyses, male students (p < 0.00l), and urban residents (p=0.006) demonstrated a higher knowledge of AIDS and STDs. Students from urban areas (p=0.014) and those practicing the Christian religion (p=0.042) demonstrated more favorable attitudes towards AIDS (Lal and Sharma, 2000).

A study was conducted to find out the Sexual activity of out-of-school youth, and their knowledge and attitude about STDs and HIV/AIDS in Southern Ethiopia. A cross-sectional survey on sexual activity of out-of-school youth (15-24 years), and their knowledge and attitude towards STDs and HIV/AIDS was done in Awassa in June 1995. Most (94.4%) study subjects knew about HIV/AIDS, whereas, a lesser

proportion of them knew the common STDs other than HIV/AIDS. Few of them were aware that the two are inter-related, one facilitating the transmission of the other. Forty-nine percent of the respondents (mean age 17+2 years) claimed to have started sex before the study date. Of these, 27.6% reported condom use during their most recent coitus. Thirty-six percent of the sexually active subjects admitted to have had more than one sex partner during the past 6 months (mean = 2.9+2). Lack of adequate knowledge, being careless often times, fear that condom will reduce sexual excitement, and pressure from sex partners appeared to be the common reasons for less use of condom during sex. The majority (91.0%) agreed that sex education and family life education for young people should be started early in life; in fact a quarter of them suggested as early as 10-12 years. It was concluded that out-of-school youth are sexually active; a considerable number of the sexually active are not practicing safe sex; and even if they have information about HIV/AIDS and STDs, it was not strong enough to bring about any significant behavioral change. This warrants the need for a continued expansion of Information, Education and Communication (IEC) linked with services to the youth, particularly the out-of-school youth which are at a higher risk (Taffa, 2012).

A study describes German nursing students (180) knowledge and attitudes relating to HIV/AIDS, their homophobia level, willingness to care for people with AIDS, and their approach to possible sexual risk behaviors. A questionnaire was used to collect the data (response rate 97.8%). The results indicated that the nursing students had a rather high knowledge level concerning AIDS. However, there were gaps of knowledge, such as regarding AIDS immunopathology or the symptoms of the disease. Single nursing students and those having cared for a person with AIDS had a more thorough knowledge about the disease. In general, the attitudes towards AIDS and people with AIDS were tolerant and positive, and homophobia was only found with a small minority. Students having positive attitudes towards people with HIV/AIDS had less homophobia compared to those having negative attitudes towards persons suffering from AIDS. Those with positive attitudes were more willing to care for patients with HIV/AIDS, while those with a high homophobia level were less willing to do so. In addition, students having a high AIDS knowledge level tended less towards negative attitudes and homophobia than those with a low level of knowledge. The implications of the research for nursing education will be discussed (Lohrman and Valimaki, 2000).

Significance of this study

According to Linda-Gail Bekker, International AIDS Society President, 'The medical advances that have transformed HIV treatment have yet to alter the stark reality for young people, particularly in low to middle-income countries, such as those in sub-Saharan Africa, and young people within key populations. Even as AIDS-related mortality overall decreased in recent years, AIDS-related deaths among adolescents increased by 50%. AIDS, in other words, is far from over - especially for young people' (The World Bank, 2017).

The risks of HIV infection, the challenges of accessing services and the solutions to these challenges change at different stages of someone's life. As a result, UNAIDS recommends the adoption of a 'life-cycle approach' to HIV prevention, which responds to the changing contexts that people face at different ages. A life-cycle approach means examining the biological, social and behavioral factors that independently, cumulatively and interactively affect adolescents' and young people's vulnerability to HIV and the lives of those living with HIV (AVERT, 2017d).

Current low prevalence situation can possibly mask an increasing prevalence in the general population due to high risk factors in Bangladesh. The factors relating to open borders, sex industry, the link between more vulnerable groups and bridging populations, gaps in healthcare delivery, low levels of HIV/AIDS awareness, heavy labor migration, gender inequities and poverty have been identified as being important factors in the spread of HIV infection (WHO, 2017).

There are many factors that put young people at an elevated risk of HIV. Adolescents and young people have growing personal autonomy and responsibility for their individual health. The transition from childhood to adulthood is also a time for exploring and navigating peer relationships, gender norms, sexuality and economic responsibility (AVERT, 2017d).

The social context of Bangladesh does not permit adolescents to discuss reproductive health topics as well as sexually transmitted diseases like HIV/AIDS openly with their parents, teachers or other senior members of the country (AVERT, 2017a).

Young people are vulnerable to HIV at two stages of their lives; early in the first decade of life when HIV can be transmitted from mother-to-child, sometimes known as vertical transmission and the second decade of life when adolescence brings new vulnerability to HIV (AVERT, 2017d).

Considerable data gaps exist in our knowledge of HIV among adolescents and young people. This is particularly the case for younger adolescents because of the challenges in getting parental approval for their involvement in surveys and a lack of age-appropriate questions. Where data exist, limited sample sizes and lack of disaggregation limits the available evidence to inform programming. In part because of these gaps, adolescents and young people are often missing from national HIV strategic plans (AVERT, 2017d).

Ethical and legal issues make it difficult to conduct studies and research on people under 18, limiting what data is available about how HIV affects young people (AVERT, 2017d).

Through the Adolescent Empowerment project, Kishori Abhijan, UNICEF and NGO partners are informing adolescents on HIV and AIDS and its preventative behaviors. The project encourages adolescents to become actively involved in the prevention drive. Under the project, peer leaders receive life-skills training that equip them to tackle issues of HIV and AIDS among others. Adolescents become agents of change by encouraging conversations within communities and breaking some of the taboos surrounding reproductive health. HIV/AIDS is one of four key issues being covered under the Life-Skills Based Education (LSBE) project, being piloted in secondary schools in10 districts of Bangladesh. UNICEF supported the government to integrate LSBE into secondary school curriculum to bring about behavior change among Bangladeshi adolescents. Life-skills based education -including HIV/AIDS prevention - is also provided to urban working children through the project 'Basic Education for Hard-to-reach Working Children' (AVERT, 2017d).

Bangladesh government has inserted HIV & AIDS information into the national textbooks of grade VI to XII (Save The Children, 2017).

Several studies had carried out to understand the knowledge level on HIV\AIDS among university students, married women, general people, people in rural and urban areas, migrant workers among rural higher secondary school students in Bangladesh (AVERT, 2017d).

But there is no such study among the young students in our country in school level though young people are at great risk of getting HIV.The objective of this study is to show the result whether they are aware of the high risk factors, transmission modes, preventions, treatments of HIV\AIDS or not. Whether they have misconceptions about it. Whether The addition of HIV/AIDS related context in text books are helping them to understand about the risk factors, ways of prevention,right mode of transmission,recent advancement on HIV/AIDS treatment. Those knowledge are required from the

adolescent period of life to remain safe and healthy and and to maintain a low prevalane situation of HIV\AIDS in our country. If the students are properly informed about the diseases, it will help to disseminate the information in the society more effectively and efficiency (AVERT, 2017d).

Our study can help to take necessary steps to control the spread of HIV and AIDS. Government can take information from our study and can take step to increase the knowledge of the school/college level students.

Objectives of the study

- To determine the knowledge level of school and college students in Bangladesh about HIV/AIDS.
- Their perception about correct mode of transmission of HIV/AIDS.
- Misconception about the mode of transmission of HIV/AIDS.
- Their perception of mode of prevention and control.
- Their attitude towards HIV infected person.

CHAPTER 3

METHODOLOGY

Type of the study

It was a survey based study.

Study area and population

The study was carried on 357 students in 3 school and college of Narshingdi district.

Inclusion criteria

- Students of class 8-12
- Both males and females
- Any discipline

Exclusion criteria

- Students unwilling to take part in the survey

Development of the questionnaire

The questionnaire was developed based on different findings in available journals and research paper and also from the observation of different behavior of Bangladeshi people. The questionnaire was formed both in Bangla and English language.

Data collection method

The data was collected by both face to face interview and questionnaire supply.

Sampling technique

In this study convenient sampling was followed.

Data analysis

After collecting, all the data were checked and analyzed with the help of Microsoft Excel 2010.

CHAPTER 4

RESULTS

4.1 Age distribution among the respondents

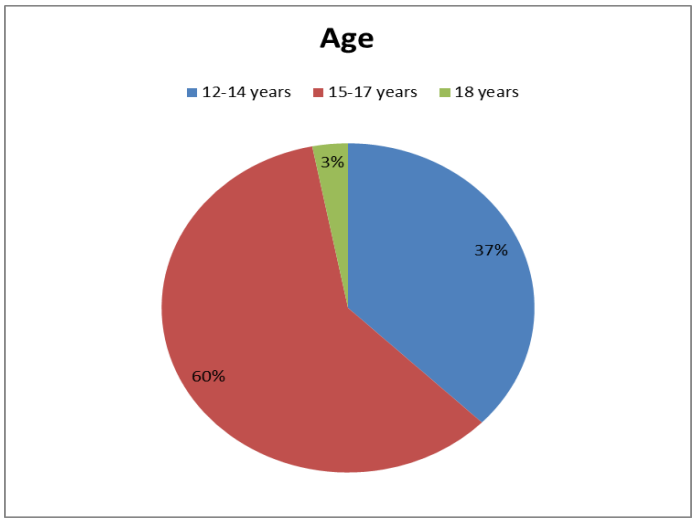

Fig 4.1: Age distribution

Among 357 respondents, majority 60% students were in the age group 15-17 years, 37% students were in the age group 12-14 years and only 3% students were in the age group 18 years.

4.2 Gender distribution of the respondents

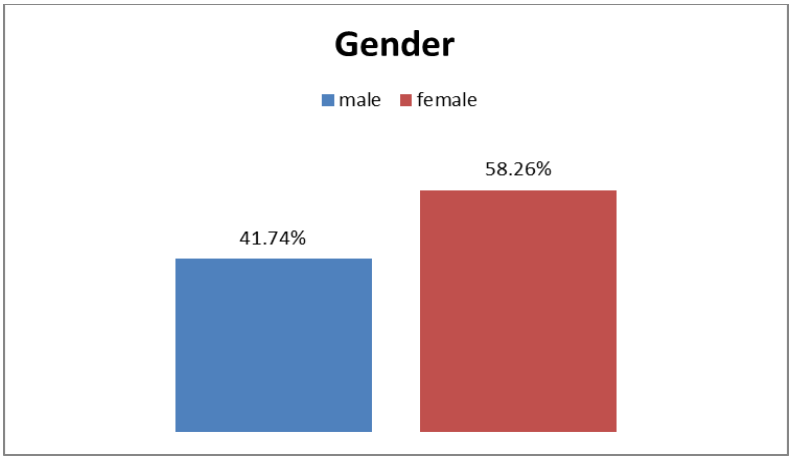

Fig 4.2: Gender distribution

In this study, 41.74% students were male and 58.26% students were female.

4.3 Distribution of class among students

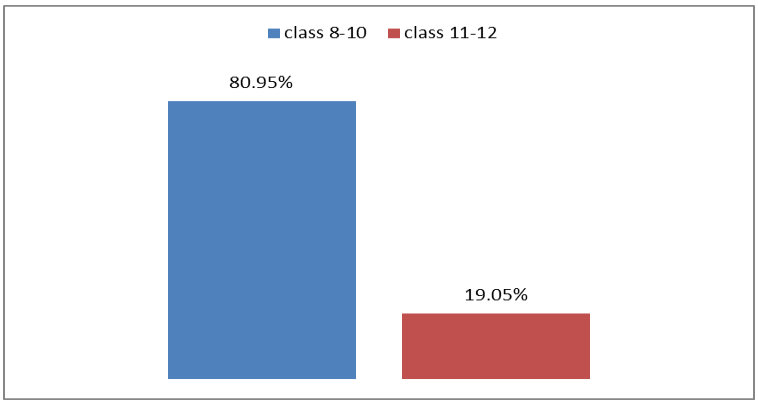

Fig 4.3: Distribution of class

Here, the majority students (80.95%) were from class 8-10 and 19.05% students were from class 11-12 among the 357 students in total.

4.4 Students having different groups

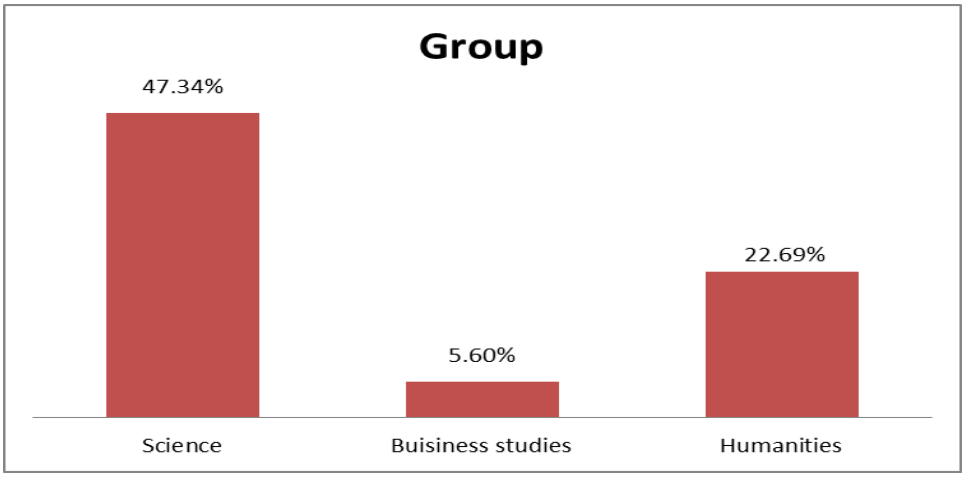

Fig 4.4: Students having different groups

The study was conducted between 357 students but class 8 has no groups. So this graph has shown groups of class 9-12. Among them majority of the students were from science group which were about 47.34%, about 5.60% students were from business studies group and 22.69% students were from humanities group.

4.5 Marital status of the participants

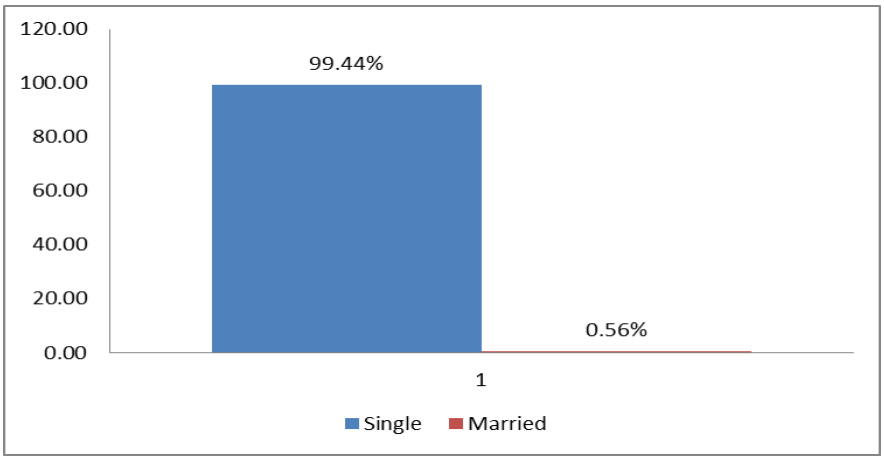

Fig 4.5: Marital status of the participants

Almost all (99.44%) students were single. Only 0.56% students were married.

4.6 Aware of the term HIV/AIDS

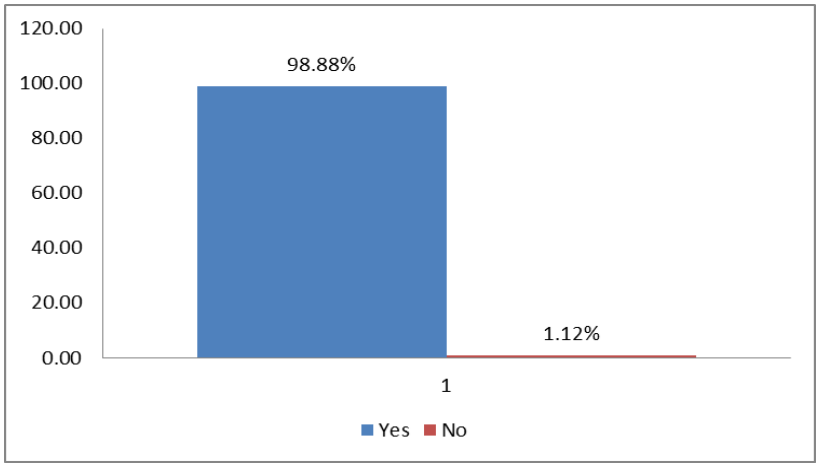

Fig 4.6: Aware of the term HIV/AIDS

During this study it was found that almost all 99.88% students had heard about HIV/AIDS. Only a few 1.12% students did not hear the term.

4.7 Source of knowledge

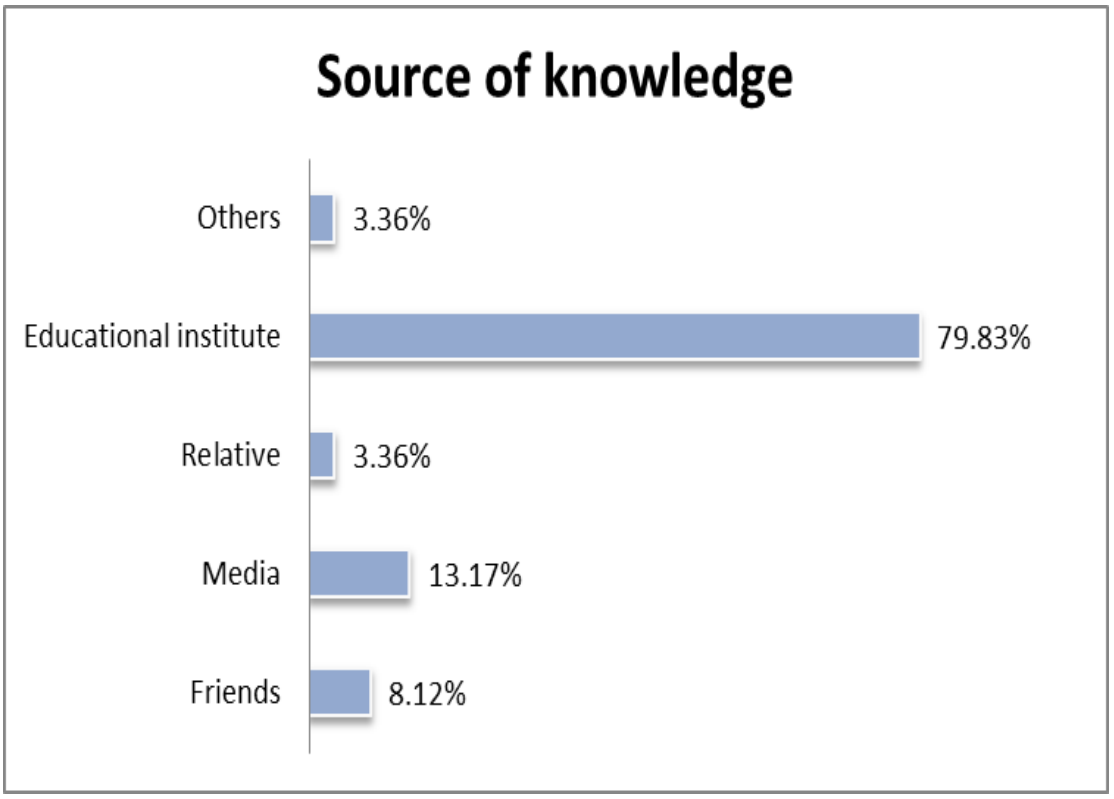

Fig 4.7: Source of knowledge

Among the 357 students, 79.83% gained their knowledge on HIV/AIDS from the educational institutes which was the major source. 13.17% students heard about it from the media which was the second highest source of knowledge. 8.12%, 3.36% students also heard the term from friends and relatives respectively and for 3.36% students there were other sources.

4.8 Knowledge about the difference between HIV and AIDS

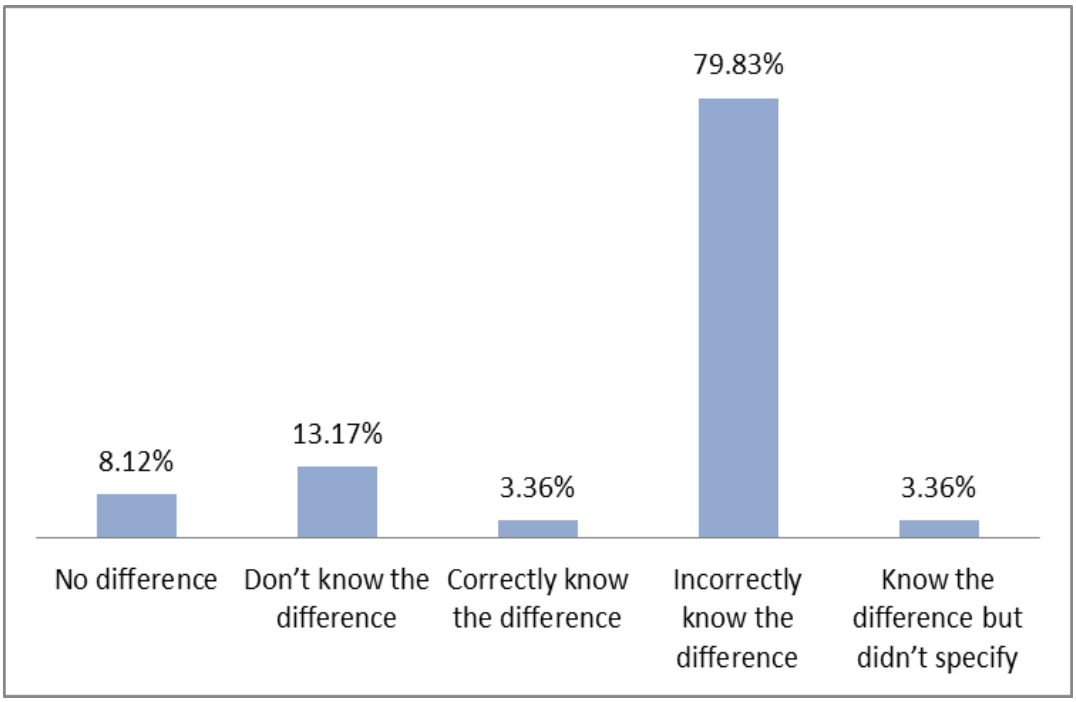

Fig 4.8: Knowledge about the difference

Among the 357 respondents, 86.55% students knew that there is difference between HIV/AIDS. From the 86.55% students only 3.36% students knew the correct difference but majority (79.83%) students didn't know the about the correct difference and 3.36% students knew that there is a difference between HIV/AIDS but they didn't specify what is the difference. 8.12% thought that there is no difference and 13.17% students didn't know there is a difference between HIV/AIDS.

4.9 Knowledge about treatment of HIV and AIDS

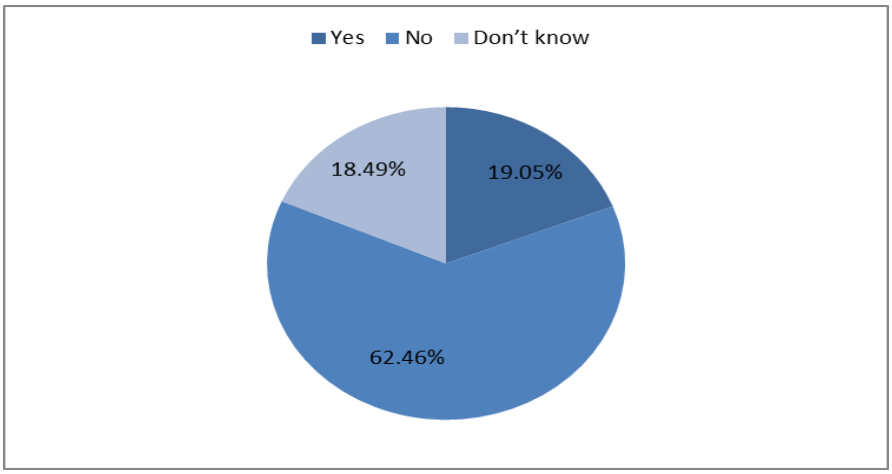

Fig 4.9: Knowledge about treatment of HIV and AIDS.

On this question 19.05% students informed HIV and AIDS can be treated, about 62.46 % students confirmed it is not treatable and 18.49% had no idea about this.

4.10 Knowledge about vaccine availability

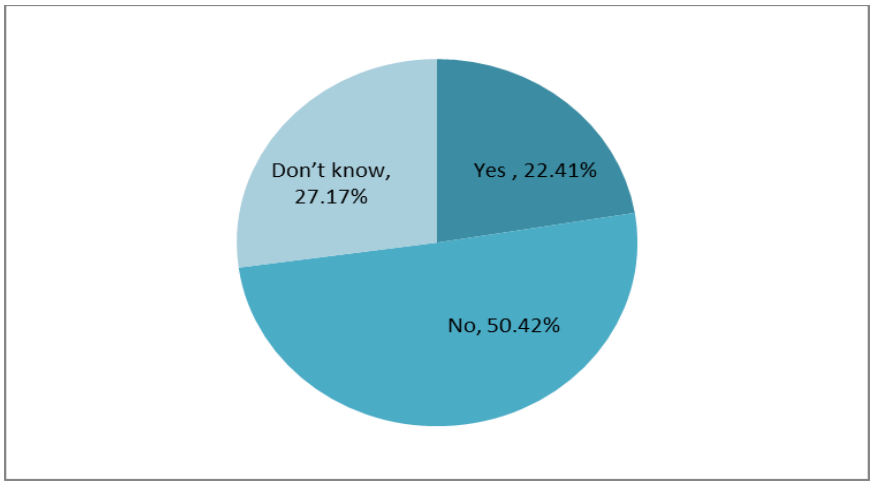

Fig 4.10: Knowledge about vaccine availability

In the survey maximum (50.42%) students answered "there is no vaccine available". About 22.41% informed there is vaccine available, and 27.17% marked they don't know about this topic.

4.11 HIV/AIDS among the family members of the respondents

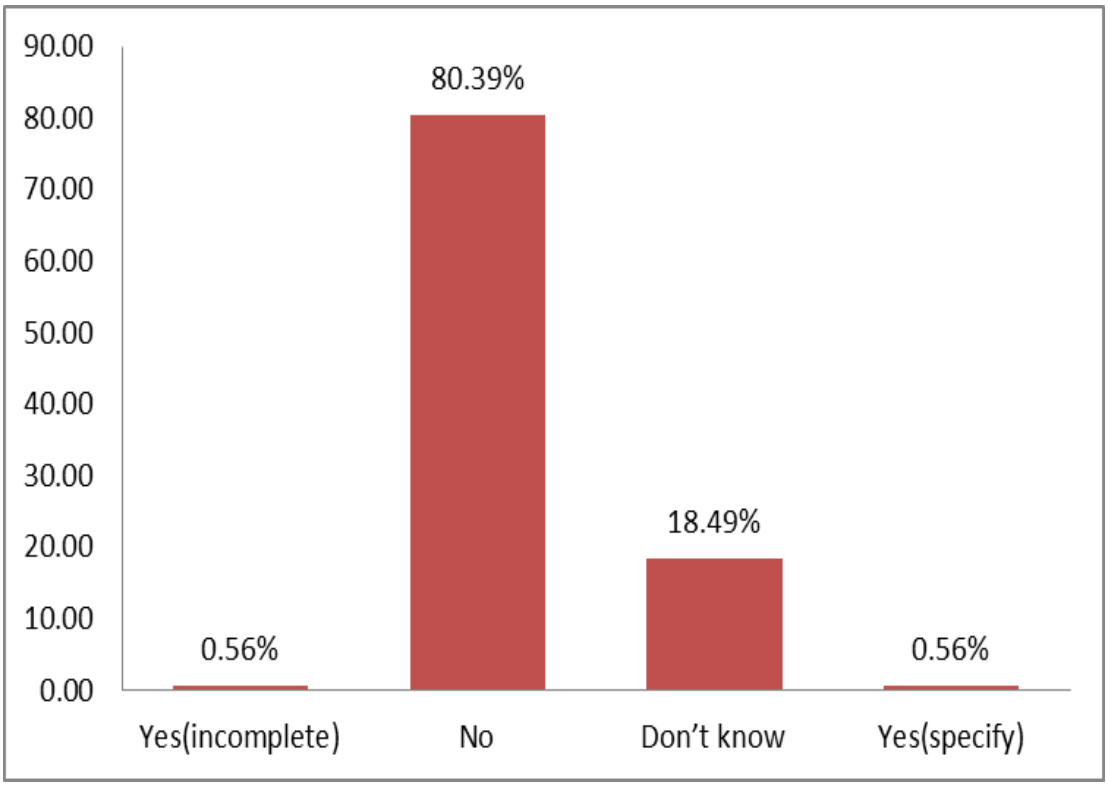

Fig 4.11: HIV/AIDS among the family members of the respondents

Form the total 357 students, 80.39% students confirmed that they had no HIV/AIDS patient in their family, 0.56% students said that they had HIV/AIDS patient in their family and they specified their relationship with the patient, 0.56% students confirmed that they had HIV/AIDS patient in their family but didn't specify their relation with the patient and 18.49% students were not sure about the answer.

4.12 Graph for correct mode of transmission of HIV/AIDS

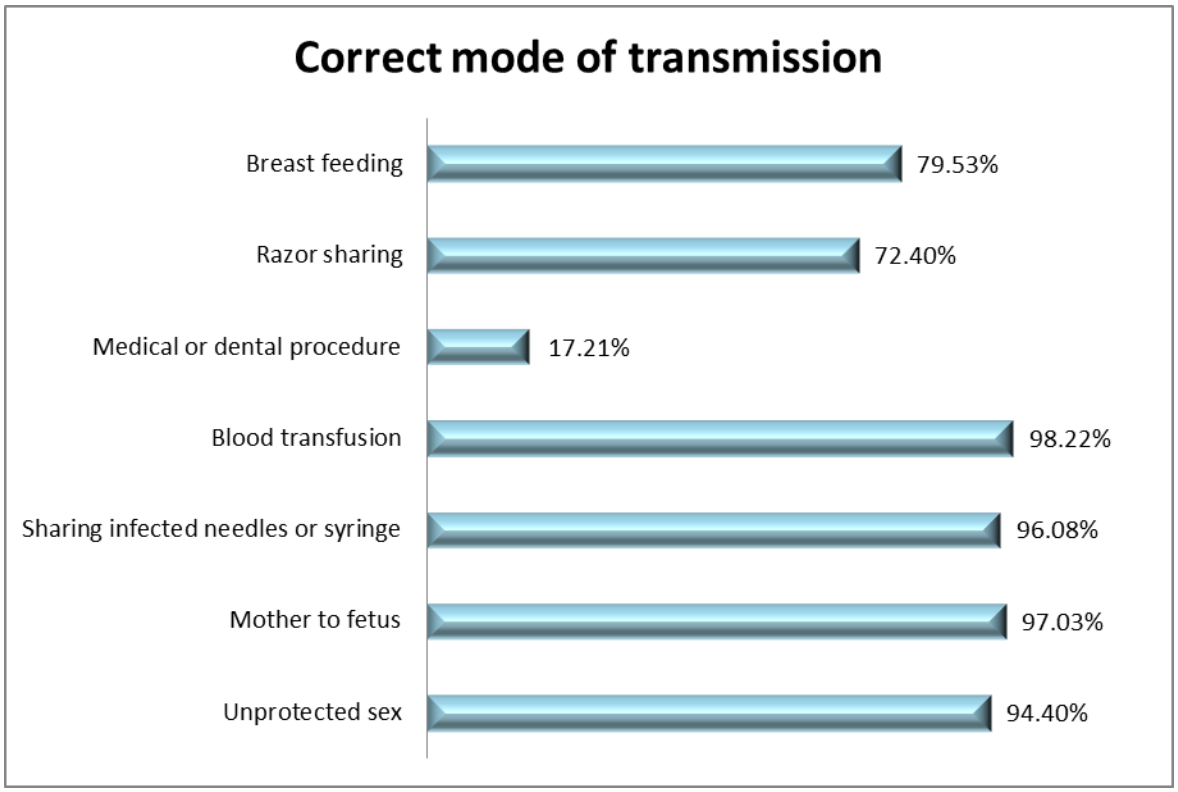

Fig 4.12: Correct mode of transmission of HIV/AIDS.

We found that among the responders (94.40%) supported that “HIV can be transmitted by unprotected sex”. About 97.03% students said HIV can be transmitted from mother to fetus. 96.08% marked sharing infected needles or syringe as a way of mode of transmission. 98.22% claimed “by blood transfusion HIV can be transmitted”. 17.21%, 72.40% and 79.53% population informed HIV can be transmitted by Medical or dental procedure, razor sharing, Breast feeding respectively.

4.13 Misconception about mode of transmission of HIV/AIDS

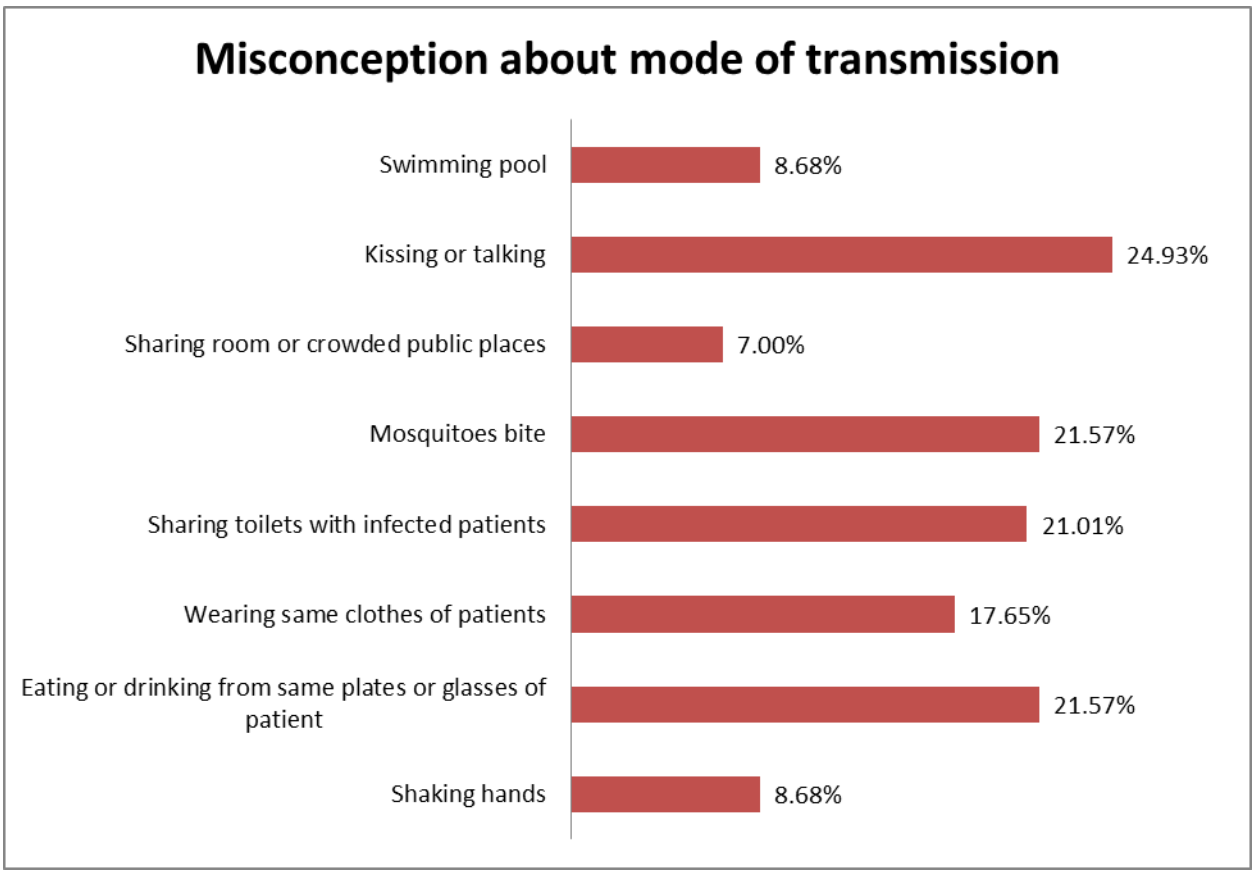

Fig 4.13: Misconception about mode of transmission of HIV/AIDS.

Some students from the total 357 population had some misconceptions about mode of transmission; approximately 8.68% thought that by shaking hand HIV can be transmitted. 21.57% said by drinking and eating on same glass or plate HIV can be transmitted. 17.65% responders said by wearing same cloth it also can be transmitted. 21.01% said by sharing toilet with infected person HIV can be transmitted. 21.57%, 7%, 24.93%, 8.68% responders marked mosquitoes Bites, sharing room or crowded places, kissing or talking, swimming pool respectively as a mode of transmission.

4.14 Knowledge about control and prevention of HIV and AIDS

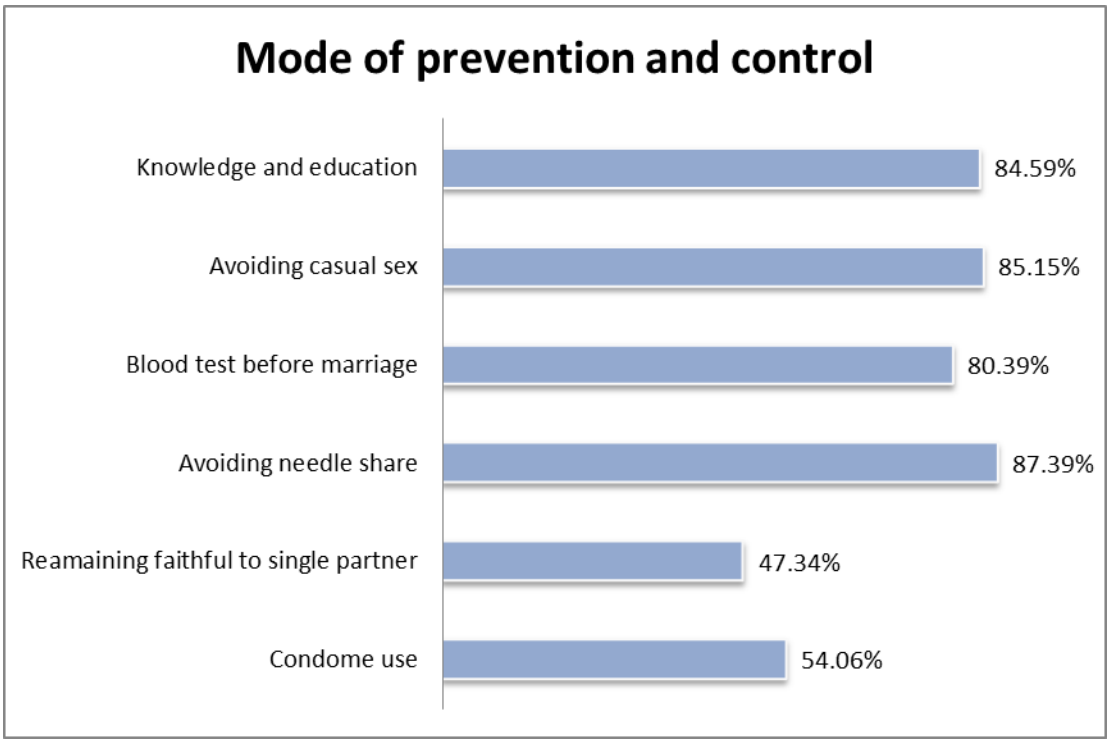

Fig 4.14: knowledge about control and prevention of HIV and AIDS

In our study we found, most of the students (85.15%) said “avoiding casual sex is prevention and control method”. 47.34%, 87.39%, 80.39%, 54.06%%, 84.59% marked remaining faithful to single partner, avoiding needle share, blood test before marriage, condom use, knowledge and Education respectively as the control and prevention method.

4.15 Attitude towards infected people

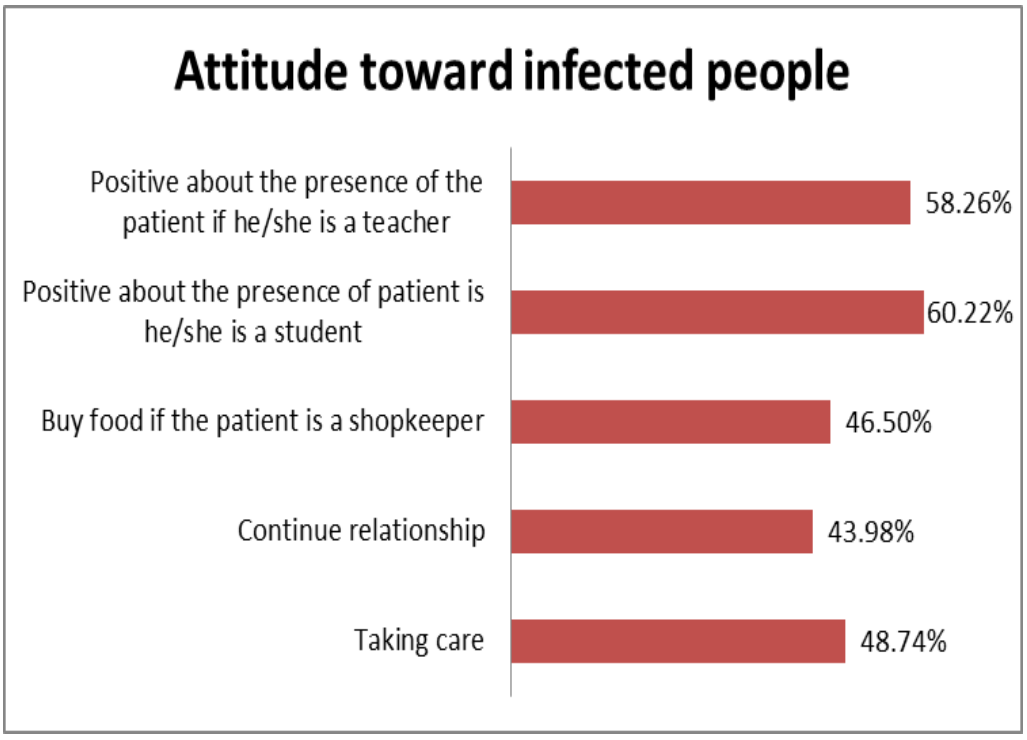

Fig 4.15: Attitude towards infected people

From total 357 responders, 58.26% students said that if the patient is a teacher, they would be positive about his/her presence in the school or college, 60.22% would be positive if he/she is a student, 46.50% students would buy food from the infected person, 43.98% would like to continue relation with the patient and 48.74% students would like to take care of the patient.

CHAPTER 5

DISCUSSION

This study was carried on 357 school and college students. The study was conducted on 3 school and colleges at Narshingdi district in Bangladesh. Among the study population majority (60%) students were in the age group 15-17 years, 37% students were in the age group 12-14 years and only 3% students were in the age group 18 years. Among the students 41.74% students were male and 58.26% students were female.

The majority of the students (80.95%) were from class 8-10 and only 19.05% students were from class 11-12 among the 357 students in total. Among them 47.34% were from science, 5.60% were from business studies and 22.69% students were from humanities group. Almost all (99.44%) students were single.

Almost all the students (99.88%) said that they had heard about HIV/AIDS. The major source of their knowledge was educational institute (79.83%) and media was the second source (13.17%). In a study done by Gupta *et al*. (2013) found majority of the Indian secondary school students (85.0%) heard HIV/AIDS from television, followed by the newspaper and friends/relatives (39.5%).

From the study we noticed that, 86.55% students knew that there is difference between HIV/AIDS but only 3.36% students correctly mentioned the difference. Wong et al., (2008) reported that many Malaysian young adult (64.9%) were unable to correctly differentiate HIV from AIDS.

In this study, 62.46 % students confirmed that HIV is not treatable and 18.49% had no idea about this. Only 19.05% students informed HIV and AIDS can be treated. In a study done in Saudi Arabia by Alotabi *et al* (2016), 81.3% students had said that there is no definite cure for HIV.

In the survey half of the (50.42%) students answered that there is no vaccine available. About 22.41% informed there is vaccine available, and 27.17% did not know the answer.

Form the total 357 students, 80.39% students confirmed that they had no HIV/AIDS patient in their family, 0.56% students said that they had HIV/AIDS patient in their family and they specified their relationship with the patient, 0.56% students confirmed that they had HIV/AIDS patient in their family but didn't specify their relation with the patient and 18.49% students were not sure about the answer.

Most of the students knew about the mode of transmissions of HIV/AIDS. Among the responders majority (98.22%) claimed that by blood transfusion HIV can be transmitted and many responders knew that HIV can be transmitted by unprotected sex (94.40%), from mother to fetus (97.03%), sharing infected needles or syringe (96.08%). About 17.21%, 72.40% and 79.53% population informed HIV can

be transmitted by Medical or dental procedure, razor sharing, Breast feeding respectively. In a similar type of study done by Gupta *et al*. (2013), 95.1% of the students said that it was transmitted through unprotected sex followed by sharing injections (88.2%), blood transfusion (84.3%), and sex with multiple partners (69.6%).

But some students from the total 357 population had some misconceptions about mode of transmission such as kissing or talking (24.93%), mosquito bites and drinking and eating on same glass or plate (21.57%), sharing toilets with infected persons (21.09%). Mehra *et al*. (2014) found (34.3%) VCT (voluntary counseling and testing) Clients who thought that it can be transmitted by mosquito bite, while 23.3% and 29.9% incorrectly stated that it can be transmitted by eating with and by sharing towels/clothes/handkerchief of a person with HIV/AIDS, respectively.

In our study we found that majority students (87.39%) thought that avoiding needle share can prevent and control HIV. Farid and Choudhry (2003) found that 68% and 70.2% students respectively held the view that avoiding used needles for injections in hospitals and laboratories for screening blood or blood products can prevent AIDS.

Avoiding casual sex is the second highest prevention and control method which was marked by 85.15% students. In a study on private university students of Bangladesh done by Shuma and Halder, (2015) 100% student believe that transmission of HIV could be prevented by safer sex where as 82% thought that it could be prevented by avoiding multiple sex partner.

About 47.34%, , 80.39%, 54.06%% and 84.59% marked remaining faithful to single partner, blood test before marriage, condom use, knowledge and Education respectively as the control and prevention method.

We noticed in our study that positive attitude towards HIV infected person was lower to medium. From total 357 responders, 58.26% students said that if the patient is a teacher, they would be positive about his/her presence in the school or college, 60.22% would be positive if he/she is a student, 46.50% students would buy food from the infected person, 43.98% would like to continue relation with the patient and 48.74% students would like to take care of the patient. The reason behind this type of attitude towards the HIV infected person was maybe due to the misconceptions about mode of transmission of this disease such as some responders thought that by drinking and eating on same glass or plate (21.57%), sharing toilets with infected persons (21.09%), shaking hands (8.68%) HIV can be transmitted. In a study done on Knowledge, attitudes and practices regarding HIV/AIDS among senior

secondary school students in Fako Division, South West Region, Cameroon by Nubed and Akoachere (2016), 52.6 % respondents indicated a willingness to take care of a sick HIV-positive relative or continue friendship with an HIV-positive friend while only 56.9 % could buy food and other goods from an HIV-positive person. The majority of the participants accepted that an HIV-positive student should be allowed to continue her/his studies (71.6 %) and that an HIV-positive teacher should be allowed to continue her/his teaching profession (75 %).

CHAPTER 6

CONCLUSION

In our study we observed that a significant level of awareness with some misconceptions towards HIV/AIDS among the school and college students. There were medium positive attitude towards the infected person due to those misconceptions. To reduce the misconceptions, education and intervention programs are needed to be arranged to increase the level of knowledge and awareness of HIV/AIDS. Our study suggest that more information on HIV/AIDS should be included in the textbooks of secondary school students in addition to teachers' training that can facilitate the teaching process of this taboo subject. As we found some students who do not have enough knowledge about HIV/AIDS, Government should be more active to increase the knowledge level of school and college students through the mass media which can play a significant role to give proper knowledge about misconception as well as actual knowledge of HIV/AIDS.

CHAPTER 7

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