

A study on knowledge and attitude of HIV/AIDS among university students of Bangladesh

**A Dissertation submitted to the Department of Pharmacy, East West University,
Bangladesh, in partial fulfillment of the requirements for the Degree of Bachelor of
Pharmacy**

Submitted by

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Declaration by the Research Candidate

I, Md. Zahid Hasan, ID: 2012-3-70-042, hereby declare that the dissertation entitled “Knowledge, Awareness and Attitude of university students among HIV/AIDS and infected person” submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, under the supervision and guidance of Nishat Nasrin, Senior Lecturer, Department of Pharmacy, East West University, Dhaka.

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Certificate by the Supervisor

This is to certify that the thesis entitled " Knowledge, Awareness and Attitude of university students among HIV/AIDS and infected person " submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a bonafide record of original and genuine research work carried out by Md. Zahid Hasan, ID: 2012-3-70-042 in 2016 of his research in the Department of Pharmacy, East West University, under our supervision and guidance.

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Dedication

This Research Paper is dedicated to my beloved Parents and my friends.

Table of contents

Serial No	Contents	Page no
	List of Figure	i
	List of Table	i
	Abstract	ii
	Chapter 1: Introduction	1-22
1.1	Overview	1
1.2	History	1-3
1.3	Mode of transmission	3
1.4	Control and Prevention	4
1.5	Stages of AIDS	4
1.5.1	Acute Primary Infection	5
1.5.2	The Asymptomatic stage	5
1.5.3	Symptomatic HIV Infection	6
1.6	Action of HIV virus on immune cell	6-7
1.7	Treatment	8
1.7.1	Nonnucleoside Reverse Transcriptase Inhibitors (NNRTIs)	8-9
1.7.2	Nucleoside reverse transcriptase inhibitors (NRTIs)	9-11
1.7.3	Protease inhibitors	11-12
1.7.4	Fusion inhibitor	13
1.7.5	CCR5 antagonists (CCR5s)	13-14
1.7.6	Integrase strand transfer inhibitors (INSTIs)	14-15
1.8	Global Epidemiology	16-21
1.8.1	People living with HIV accessing antiretroviral therapy	16
1.8.2	People living with HIV	16
1.8.3	New HIV infections	16
1.8.4	AIDS-related deaths	17
1.8.5	HIV/tuberculosis	17

1.8.6	Investments	17
1.8.7	Regional Statistics	18-21
1.8.7.1	Sub-Saharan Africa	18
1.8.7.2	Asia and the Pacific	19
1.8.7.3	Latin America	19-20
1.8.7.4	Eastern Europe and Central Asia	20-21
1.8.7.5	The Caribbean	21
1.8.7.6	Middle East and North Africa	21
1.9	Scenario in Bangladesh	22
	Chapter 2: Literature Review	23-27
2.1	Knowledge of HIV and AIDS among tertiary students in Bangladesh.	23
2.2	Adolescent knowledge and awareness about AIDS/HIV and factors affecting them in Bangladesh.	23
2.3	Knowledge, perceptions and awareness about HIV/AIDS among private university students in Bangladesh.	24
2.4	Awareness and knowledge of HIV/AIDS among married women in rural Bangladesh and exposure to media: a secondary data analysis of the 2011 Bangladesh Demographic and Health Survey.	25
2.5	Awareness on prevention and control of HIV/AIDS among the adults attending an urban hospital in Dhaka	25
2.6	Awareness and knowledge of AIDS among Indian women: evidence from 13 states.	26
2.7	Survey on HIV/AIDS-related knowledge and behavior of high risk population in Taiyuan City.	26
2.8	Assessing Knowledge of, and Attitudes to, HIV/AIDS among University Students in the United Arab Emirates.	26
2.9	HIV/AIDS awareness and sexual practices among undergraduates in Enugu, Nigeria.	27

2.10	Knowledge about AIDS/HIV infection among female college students	27
	Significance of the study	28
	Aims of the study	29
	Chapter 3: Methodology	30-31
3.1	Type of the Study	30
3.2	Study Population	30
3.3	Inclusion Criteria	30
3.4	Exclusion Criteria	30
3.5	Data Collection Method	30
3.6	Development of the Questionnaire	31
3.7	Sampling Technique	31
3.8	Data collecting period	31
3.9	Data Analysis	31
	Chapter 4: Results	32-46
4.1.1	Aged distribution	32
4.1.2	Gender distribution	33
4.1.3	Department wise distribution	34
4.1.4	Year of study	35
4.1.5	Marital status	36
4.2.1	Heard about HIV/ AIDS	37
4.2.2	Source of information	38
4.2.3.1	Knowledge about Differences between HIV and AIDS	39
4.2.3.2	Knowledge about Differences between HIV and AIDS	40
4.2.4	Knowledge about treatment of HIV and AIDS	41
4.2.5	Knowledge about vaccine availability	42
4.2.6	Knowledge about mode of Transmission	43
4.2.7	Misconception about mode of transmission of HIV and	44

	AIDS	
4.2.8	Knowledge of control and prevention of HIV and AIDS	45
4.3	Attitude toward HIV infected person	46
	Chapter 5: Discussion and Conclusion	47-49
5.1	Discussion	47-48
5.2	Conclusion	49
	Chapter 6: References	50-53

List of Table

Table No	Table	Page No
Table 4.1	Attitude toward HIV infected person	46

List of Figure

Figure No	Figure	Page No
Fig1.1	Action of HIV on immune cell	7
Fig1.2	Mechanism of Nucleoside Reverse Transcriptase Inhibitors	10
Fig1.3	Mechanism of action of protease inhibitor	11
Fig1.4	Mechanism of action of Fusion Inhibitor	13
Fig1.5	Mechanism of action of NSTIs	15
Fig4.1 .1	Age distribution	32
Fig 4.1.2	Gender of the Responds	33
Fig 4.1.3	Department wise distribution	34
Fig 4.1.4	Year of study	35
Fig 4.1.5	Marital status of responds	36
Fig4.2.1	Heard about HIV/ AIDS	37
Fig4.2.2	Source of information	38
Fig4.2.3.1	Knowledge about Differences between HIV and AIDS	39
Fig4.2.3.2	Knowledge about Differences between HIV and AIDS	40
Fig4.2.4	Knowledge about treatment of HIV and AIDS	41
Fig4.2.5	Knowledge about vaccine availability	42
Fig 4.2.5	Knowledge about mode of Transmission	43
Fig4.2.7	Misconception about mode of transmission of HIV and AIDS	44
Fig4 .2.8	Knowledge of control and prevention of HIV and AIDS	45

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. University people are at high risk of HIV and AIDS infections. 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 University students in Bangladesh about HIV/AIDS and to support government efforts to control the spread of HIV and AIDS. The survey was conducted on 1003 different university students in Dhaka city by using a pre-structured questionnaire. All of the respondents have heard about the term HIV/AIDS. The major sources of information were media (63.5%) and educational institute (36.6%). Majority of the students said that there is no treatment (60.10%) and vaccine (63%) available. According to most of respondents the disease can be transmitted by unprotected sex (94.2%), mother to fetus (86.4%), sharing infected needles or syringe (90.2%), blood transfusion (92.1%) and breast feeding (69.1%). Some respondents said it can be transmitted by razor sharing (40.2%) and medical or dental procedure (30.1%). Some students had misconception about the transmission. About 22% students said it can be transmitted by mosquito bite. Regarding the knowledge about control and prevention most of them had better knowledge. Most participants had positive attitude towards infected person. The study suggested that to reduce the misconception, and increase awareness education and intervention programs are needed to increase the level of knowledge and awareness of HIV/AIDS.

Key word: HIV/AIDS; Knowledge; University student; Socio-Demographic Factors; Bangladesh

Chapter 1

Introduction

1.1 Overview

HIV/AIDS is one of the most destructive diseases humankind has ever faced. It brings with it profound social, economic and public health consequences. It has become one of the world's most serious health and development challenges. HIV is a leading cause of death worldwide. The first cases were reported in 1981 and since the beginning of the pandemic more than three decades ago; approximately 30 million people have died of AIDS-related illnesses. There are an estimated 35.3 million People Living with HIV (PLHIV).

HIV stands for Human Immunodeficiency Virus, and is the virus that causes AIDS. HIV destroys certain blood cells that are crucial to the normal functioning of the immune system, which defends the body against illness.

AIDS stands for Acquired Immunodeficiency Syndrome. It occurs when the immune system is weakened by HIV to the point where a person is susceptible to any number of Opportunistic Infections (OIs) or diseases. Having AIDS is defined as presenting with HIV and one or more OIs (Sanyal, 2006).

1.2 History

The first case of HIV infection in a human was identified in 1959. The infected individual lived in the Democratic Republic of the Congo. He did not know (and research could not identify) how he was infected.

The first cases of HIV in the United States date back to 1981. Homosexual men began dying from mysterious, pneumonia-like infections. In June 1981, the U.S. Centers for Disease Control and Prevention (CDC) first described the symptoms of this unknown disease in one of their publications. Soon, healthcare providers from around the country began reporting similar cases. The number of people with the disease increased. Sadly, so did the number of people dying from the unidentified disease.

In September 1982, the CDC uses the term acquired immune deficiency syndrome (AIDS) for the first time when describing the mystery disease. That same year, the first AIDS clinic opened in San Francisco.

In 1984, Dr. Robert Gallo and colleagues at the National Cancer Institute discovered what causes AIDS. Gallo found the human immunodeficiency virus (HIV), which is the virus responsible for HIV infections. The infection is distinct from AIDS, the full-blown syndrome that, along with the consequences of a damaged immune system (such as pneumonia and Kaposi's sarcoma), is most often fatal.

America's romantic leading man in the 1950s and '60s, Rock Hudson, passed away from complications related to AIDS in 1985. When he passed, he willed \$250,000 to help establish the American Foundation for AIDS Research (amfAR). amfAR helps fund research and education around the globe.

U.S. Food and Drug Administration (FDA) approved the first commercial blood test, ELISA. The ELISA test allowed hospitals and healthcare facilities to quickly screen blood for the disease.

Once the diseases were identified, HIV and AIDS quickly became an epidemic in the country. By 1994, AIDS was the leading cause of death among Americans ages 25 to 44.

The FDA approved the first protease inhibitor in 1995. This began a new era of strong treatment and response called highly active antiretroviral therapy (HAART). By 1997, HAART was the standard of treatment for HIV. Soon, the number of deaths caused by AIDS begins to fall. This medicine plan nearly cut the number of AIDS-related deaths in half in just one year. However, HAART had its detractors. Many were worried the treatment plan was too aggressive and might actually make treatment-resistant HIV strains.

The FDA approved the first at-home HIV test kit in 2002. The test was 99.6 percent accurate. This opened up the possibility for people to test their status in the privacy of their own homes.

HIV and AIDS do not yet have cures. Once a person is infected with the virus, they cannot get rid of the virus. They can treat it and slow the progression of the disease.

For people who are not infected, there is hope you may be able to prevent an infection. In 2013, the CDC released a study that found that a daily dose of medication may be able to halt the transfer of HIV from a positive person to a negative person (Holland, 2013).

1.3 Mode of Transmission

HIV is spread through contact with certain body fluids from a person infected with HIV. These body fluids include:

- Blood
- Semen
- Pre-seminal fluid
- Vaginal fluids
- Rectal fluids
- Breast milk

The spread of HIV from person to person is called HIV transmission. The spread of HIV from an HIV-infected woman to her child during pregnancy, childbirth, or breastfeeding is called mother-to-child transmission of HIV.

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

HIV attacks and destroys the infection-fighting CD4 cells of the immune system. Loss of CD4 cells makes it difficult for the body to fight infections and certain cancers. Without treatment, HIV can gradually destroy the immune system and advance to AIDS (Centers for Disease Control and Prevention, 2015).

1.4 Control and Prevention

HIV/AIDS can be controlled and prevent by

1. Knowing the HIV status of sex partner or by testing before sex.
2. By using condom every time during sex and doing safe sex (oral sex is more safe then vaginal or anal sex.)
3. By avoiding sharing drug injected needle eg. injection or by using sterile injection.
4. By using Pre-exposure prophylaxis (PrEP) which is an HIV prevention option for people who don't have HIV but who are at high risk of becoming infected with HIV. PrEP involves taking a specific HIV medicine every day. PrEP should always be combined with other prevention options, such as condoms.
5. Pregnant HIV-infected women take HIV medicines during pregnancy and childbirth to reduce the risk of passing HIV to their babies. Their newborn babies also receive HIV medicine for 6 weeks after birth. The HIV medicine reduces the risk of infection from any HIV that may have entered a baby's body during childbirth (Centers for Disease Control and Prevention, 2015).

1.5 Stages of AIDS

There are three stages:

- Acute Primary Infection
- The Asymptomatic Stage/ Clinical latency stage
- Symptomatic HIV Infection/ Progression to AIDS

1.5.1 Acute Primary Infection

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
- Chills
- Rash
- Night sweats
- Muscle aches
- Sore throat
- Fatigue
- Swollen lymph nodes
- 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.

1.5.2 The Asymptomatic 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.

For people who aren’t taking medicine to treat HIV (called antiretroviral therapy or ART), this period can last a decade or longer, but some may progress through this phase faster. People who are taking medicine to treat HIV the right way, every day may be in this stage for several decades because treatment helps keep the virus in check. It’s important to remember that people can still transmit HIV to others during this phase but are much less likely to transmit HIV than those who are not virally suppressed.

1.5.3 Symptomatic HIV Infection

If anyone has HIV and are not on ART, eventually the virus will weaken your body's immune system and you will progress to AIDS, 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 (AVERT, 2016).

1.6 Action of HIV virus on Immune cell

HIV can infect multiple cells in body, including brain cells, but its main target is the CD4 lymphocyte, also called a T-cell or CD4 cell. When a CD4 cell is infected with HIV, the virus goes through multiple steps to reproduce itself and create many more virus particles.

The process is broken up into the following steps:

Binding and Fusion: This is the process by which HIV binds to a specific type of CD4 receptor and a co-receptor on the surface of the CD4 cell. This is similar to a key entering a lock. Once unlocked, HIV can fuse with the host cell (CD4 cell) and release its genetic material into the cell.

Reverse Transcription: A special enzyme called reverse transcriptase changes the genetic material of the virus, so it can be integrated into the host DNA.

Integration: The virus' new genetic material enters the nucleus of the CD4 cell and uses an enzyme called integrase to integrate itself into your own genetic material, where it may "hide" and stay inactive for several years.

Transcription: When the host cell becomes activated, and the virus uses your own enzymes to create more of its genetic material—along with a more specialized genetic material which allows it make longer proteins.

Assembly: A special enzyme called protease cuts the longer HIV proteins into individual proteins. When these come together with the virus' genetic RNA material, a new virus has been assembled.

Budding: This is the final stage of the virus' life cycle. In this stage, the virus pushes itself out of the host cell, taking with it part of the membrane of the cell. This outer part covers the virus and contains all of the structures necessary to bind to a new CD4 cell and receptors and begin the process again (U.S. Department of Health & Human Services, 2016).

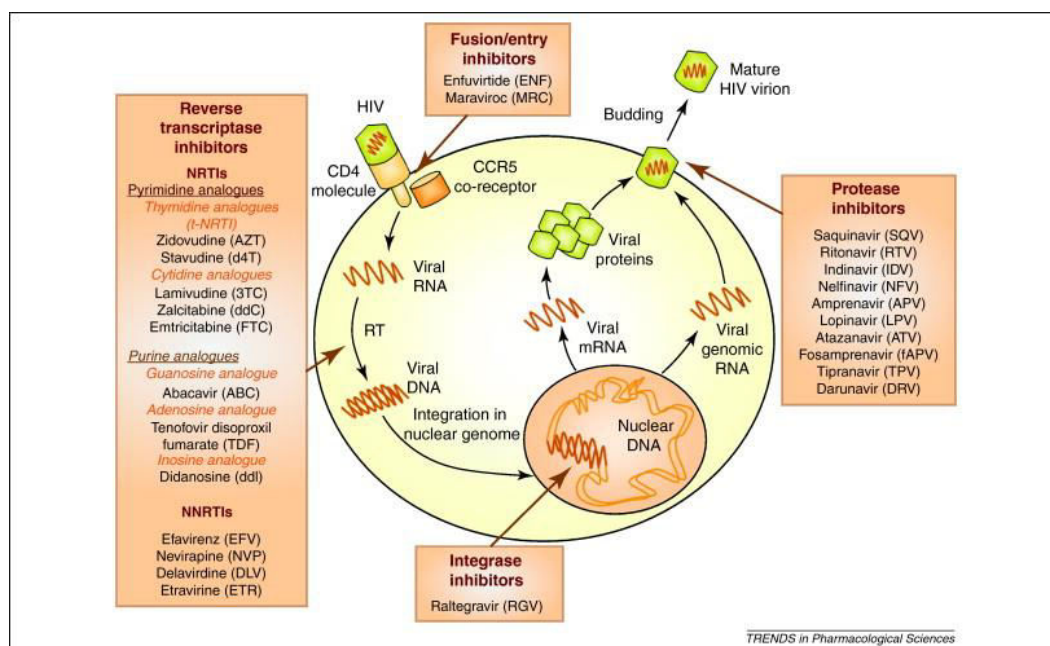


Fig.1.1: Action of HIV on immune cell (Apostolova, 2011).

1.7 Treatment

HIV is treated using a combination of medicines to fight HIV infection. This is called antiretroviral therapy (ART). ART isn't a cure, but it can control the virus so that you can live a longer, healthier life and reduce the risk of transmitting HIV to others.

ART involves taking a combination of HIV medicines (called an HIV regimen) every day, exactly as prescribed.

These HIV medicines prevent HIV from multiplying (making copies of itself), which reduces the amount of HIV in your body. Having less HIV in your body gives your immune system a chance to recover and fight off infections and cancers. Even though there is still some HIV in the body, the immune system is strong enough to fight off infections and cancers.

By reducing the amount of HIV in your body, HIV medicines also reduce the risk of transmitting the virus to others.

ART is recommended for all people with HIV, regardless of how long they've had the virus or how healthy they are. If left untreated, HIV will attack the immune system and eventually progress to AIDS.

HIV medicines are grouped into six drug classes according to how they fight HIV. The six drug classes are:

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- Nucleoside reverse transcriptase inhibitors (NRTIs)
- Protease inhibitors (PIs)
- Fusion inhibitors
- CCR5 antagonists (CCR5s) (also called entry inhibitors)
- Integrase strand transfer inhibitors (INSTIs)

1.7.1 Nonnucleoside Reverse Transcriptase Inhibitors (NNRTIs)

The NNRTIs act by binding non-competitively to the RT enzyme. The binding causes conformational change in the three-dimensional structure of the enzyme and create the NNIBP. Binding of NNRTI to HIV-1 RT makes the p66 thumb domain hyper extended because it induces rotamer conformation changes in amino acid residues Tyr-181 and Tyr-188. This affects the catalytic activity of the enzyme and blocks the HIV-1 replication by

inhibiting the polymerase active site of the RT's p66 subunit. The global conformational change additionally destabilizes the enzyme on its nucleic acid template and reduces its ability to bind nucleotides. The transcription of the viral RNA is inhibited and therefore the replication rate of the virus reduces. Although the exact molecular mechanism is still hypothetical this has been demonstrated by multiple studies to be the primary mechanism of action.

These NNRTIs are available:

- Rilpivirine
- Etravirine
- Delavirdine
- Efavirenz
- Nevirapine

Resistance to NNRTIS

Mutations in the pockets of the enzyme bring down the binding affinity of the NNRTIS to the enzyme. This is credited to the low genetic barrier to resistance of NNRTIS. Level of virus replication, how easily the enzyme can mutate are crucial factors to consider in determining resistance to NNRTIS (Iyidogan and Anderson, 2014).

1.7.2 Nucleoside reverse transcriptase inhibitors (NRTIs)

As nucleoside reverse transcriptase inhibitors (NRTIs) and nucleotide reverse transcriptase inhibitors (NtRTIs) have a similar mechanism of action, they are usually regarded as a single drug class.

When reverse transcription occurs in the presence of these drugs, they disrupt the construction of a new piece of proviral DNA. Instead of taking up a natural nucleotide from the supply in the cell, reverse transcriptase may use an NRTI or NtRTI triphosphate instead. Because these drugs have a slightly different structure than natural nucleotides, they cannot form the necessary chemical bonds, and natural nucleotides cannot be added on to continue

the chain. Since HIV has no mechanism for correcting such mistakes, NRTIs and NtRTIs can interrupt reverse transcription and thereby halt HIV replication.

NRTIs and NtRTIs can stop reverse transcription and interfere with workings of human cells. Because they resemble the natural building blocks of DNA, there is a risk that NRTI or NtRTI triphosphates may be taken up when host cells reproduce. Some researchers believe this is a not a major problem, since the equivalent human enzyme, called DNA polymerase, has a much lower affinity than reverse transcriptase for NRTI/NtRTI triphosphates. Moreover, human cells have mechanisms for recognizing and correcting mistakes in DNA production.

Nevertheless, certain NRTIs do have side-effects that have been attributed to damage to a specific type of DNA found within the mitochondria, tiny structures responsible for energy production within cells. Mitochondrial DNA also must be copied when a cell divides, a process carried vulnerable to the effects these drugs.^{1 2} Symptoms thought to be related to mitochondrial damage include lactic acidosis, lipodatrophy (fat loss in the face and limbs), and peripheral neuropathy. Throughout by an enzyme called polymerase-gamma. Compared with DNA polymerase, this enzyme has a relatively high affinity for NRTI/NtRTI triphosphates, so mitochondrial DNA is more Resistance to NRTIS (U.S. Department of Veterans Affairs, n.d.).

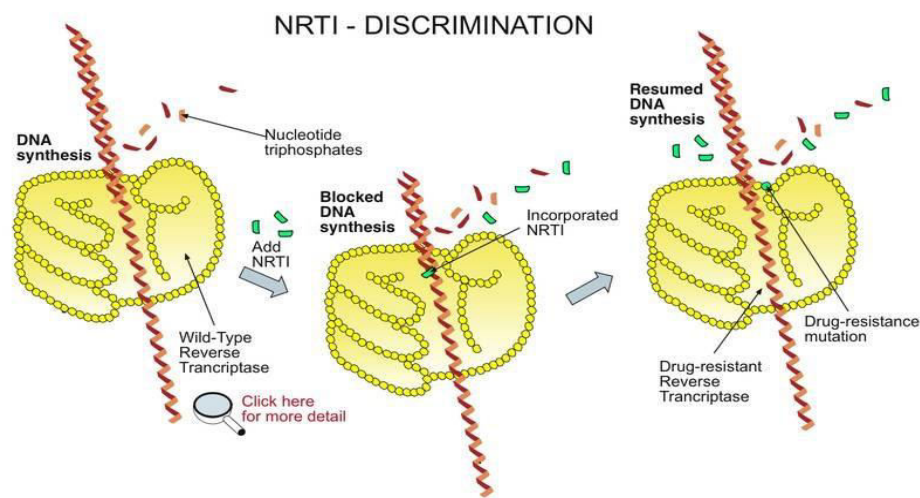


Fig1.2: Mechanism of Nucleoside Reverse Transcriptase Inhibitors (Sgugenetics, 2014).

HIV resistance to NRTIs develops when it is given room for it to complete viral DNA synthesis and when NRTI-resistant RT retains the capacity to take up normal dNTPs with ease. This resistance can occur when NRTI-TP is incorporated or when NRTI is taken away from the end of the viral DNA after incorporation by RT (Iyidogan and Anderson, 2014).

Drugs in this group are

- Emtricitabine
- Lamivudine
- Zidovudine
- Didanosine
- Tenofovir
- Stavudine
- Abacavir (U.S. Department of Veterans Affairs, n.d.).

1.7.3 Protease inhibitors

Protease inhibitors block the activity of the protease enzyme, which HIV uses to break up large polyproteins into the smaller pieces required for assembly of new viral particles. While HIV can still replicate in the presence of protease inhibitors, the resulting virions are immature and unable to infect new cells.

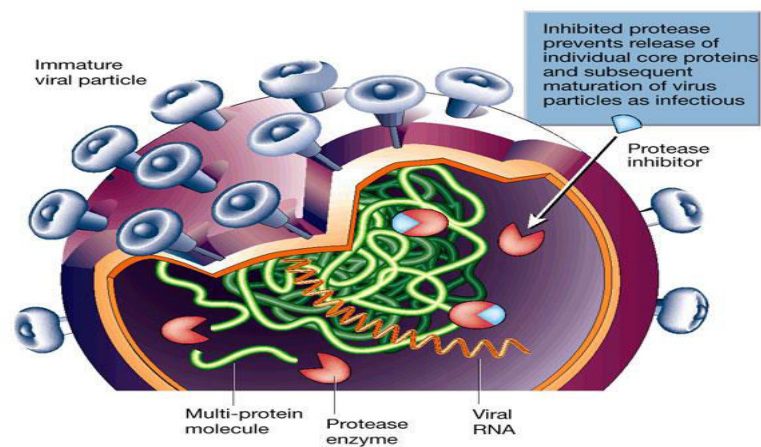


Fig1.3: Mechanism of action of protease inhibitor (Nature, n.d.).

Protease inhibitors are metabolized by enzymes in the liver and can interact with other medications by speeding up or slowing down their processing in the body. Ritonavir, in particular, is a strong inhibitor of these liver enzymes and slows the processing of many other drugs.

While this normally would be considered a drawback, researchers discovered that a small dose of ritonavir could be used to ‘boost’ blood levels of other protease inhibitors and extend dosing intervals. Kaletra combines in one pill both lopinavir and a boosting dose of ritonavir.

The HIV protease contains a binding pocket into which drugs must fit in order to block the activity of the enzyme. As HIV replicates, constant mutations change the shape of this structure. Some such changes make it impossible for one or more protease inhibitors to bind to the enzyme, resulting in drug resistance.

Second-generation protease inhibitors (atazanavir, darunavir, fosamprenavir, lopinavir, and tipranavir) work against HIV variants that have developed resistance to older drugs in this class. Darunavir and tipranavir differ from the others in that they are synthetic nonpeptidic drugs (NAM Aidsmap, 2016).

The licensed protease inhibitors are:

- Amprenavir (Agenerase)
- Atazanavir (Reyataz)
- Darunavir (Prezista)
- Fosamprenavir (Telzir, Lexiva)
- Indinavir (Crixivan)
- Lopinavir/ritonavir (Kaletra, Aluvia)
- Nelfinavir (Viracept)
- Ritonavir (Norvir)
- Saquinavir (Invirase)
- Tipranavir (Aptivus) (NAM Aidsmap, 2016).

1.7.4 Fusion inhibitor

It is class of antiretroviral drugs that work on the outside of the host CD4 cell to prevent HIV from fusing with and infecting it. Fusion inhibitors act by binding to an envelope protein and blocking the structural changes necessary for the virus to fuse with the host CD4 cell. If HIV cannot penetrate the host cell membrane and infect the cell, HIV cannot replicate within the host cell (Food and Drug Administration, 2016).

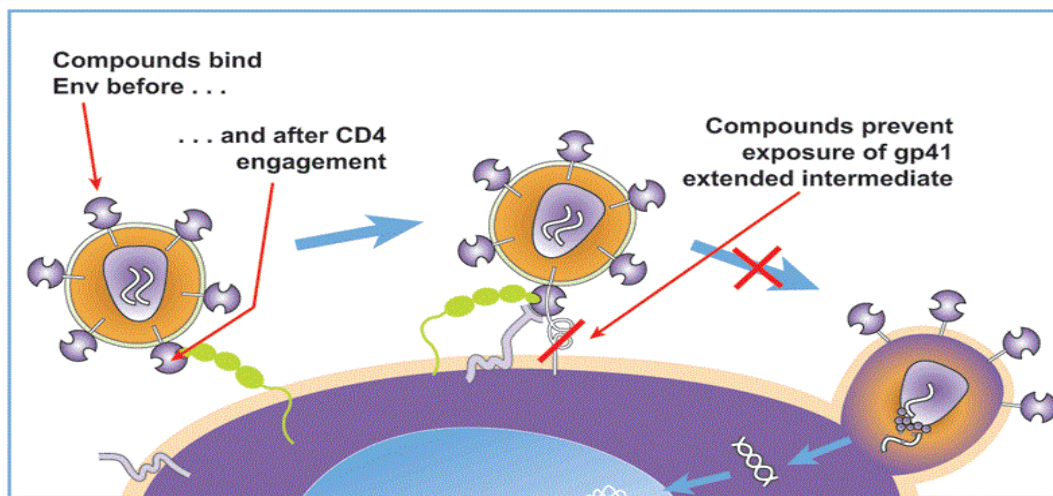


Fig1.4: Mechanism of action of Fusion Inhibitor (Thebody, n.d.).

1.7.5 CCR5 antagonists (CCR5s)

It is also called entry inhibitor. Entry inhibitors work by preventing HIV from entering healthy CD4 cells (T-cells) in the body. They work differently than many of the approved anti-HIV drugs—the protease inhibitors (PIs), the nucleoside reverse transcriptase inhibitors (NRTIs), and the non-nucleoside reverse transcriptase inhibitors (NNRTIs)—which are active against HIV after it has infected a CD4 cell.

Entry inhibitors work by attaching themselves to proteins on the surface of CD4 cells or proteins on the surface of HIV. In order for HIV to bind to CD4 cells, the proteins on HIV's outer coat must bind to the proteins on the surface of CD4 cells. Entry inhibitors prevent this from happening. Some entry inhibitors target the gp120 or gp41 proteins on HIV's surface. Some entry inhibitors target the CD4 protein or the CCR5 or CXCR4 receptors on a CD4

cell's surface. If entry inhibitors are successful in blocking these proteins, HIV is unable to bind to the surface of CD4 cells and gain entry into the cells.

HIV-positive people who have become resistant to PIs, NRTIs, and NNRTIs will likely benefit from the entry inhibitors because they are a different class of drugs. This is good news for HIV-positive people who have tried and failed many of the currently approved anti-HIV medications.

Drugs In this group is:

- 2 Enfuvirtide
- 3 Maraviroc (Rao, 2009).

1.7.6 Integrase strand transfer inhibitors (INSTIs)

There are several ways to target integrase but strand transfer inhibition is the most intuitively obvious and readily pursued to date. Other targets include, for example, the protein domains beyond the active site of IN. The domains interact with viral or host DNA and are important for binding to the enzyme. It is possible to hamper functions of the enzyme by disrupting or removing these bindings. PIC is a multimeric protein structure inside the host cell, composed of both viral and host proteins. Integrase is a part of PIC's viral component. PIC's viral and host proteins are believed to modulate intrinsic activity of the enzyme, shuttle PIC to the nucleus and direct integration of viral DNA into a transcriptionally active region of the host genome. If it were possible to exclude certain proteins from the PIC it would block the ability of the virus to integrate into the host genome. The process where the retroviral RNA is transcribed to DNA and then integrated into the host cell's genome.

Mg²⁺ and Mn²⁺ are critical cofactors in the integration phase. Inactivating these cofactors (e.g. through chelation) causes functional impairment of IN. This concept gives researchers the opportunity to design and develop highly efficient IN inhibitors (INIs). In fact, all small molecule HIV-1 INIs that are now being researched contain a structural motif that coordinates the two divalentmagnesium ions in the enzyme's active site.

Raltegravir and elvitegravir share the same mechanism of action against integrase: to bind to the active site of Mg^{2+} ions.[8] Competitive inhibitors compete directly with viral DNA for binding to integrase in order to inhibit 3'-end processing.[15] In doing this the inhibitors completely block the active site from binding to target DNA. This inhibition is called strand transfer inhibition (Iyidogan and Anderson, 2014).

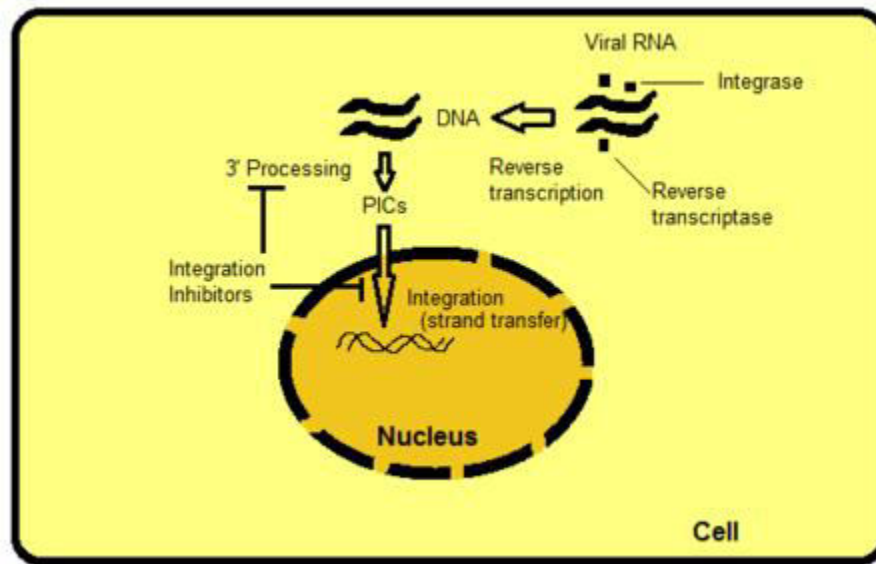


Fig1.5: Mechanism of action of INSTIs (INSTI, n.d.).

Drugs In these groups are:

1. Isentress
2. Tivicay
3. Vitekta (Iyidogan and Anderson, 2014).

1.8 Global Epidemiology

HIV continues to be a major global public health issue. It spread day by day all over the country. The no of HIV infected person has increase rapidly. According to the report of UNAIDS in 2015:

- 15.8 million people accessing antiretroviral therapy (June 2015)
- 36.9 million [34.3 million–41.4 million] people globally were living with HIV (end 2014) 2 million [1.9 million–2.2 million] people became newly infected with HIV (end 2014) 1.2 million [980 000–1.6 million] people died from AIDS-related illnesses (end 2014)

1.8.1 People living with HIV accessing antiretroviral therapy

- As of June 2015, 15.8 million people living with HIV were accessing antiretroviral therapy, up from 13.6 million in June 2014.
- 41% [38%-46%] of all adults living with HIV were accessing treatment in 2014, up from 23% [21%-24%] in 2010.
- 32% [30%-34%] of all children living with HIV were accessing treatment in 2014, up from 14% [13%-15%] in 2010.
- 73% [68%-79%] of pregnant women living with HIV had access to antiretroviral medicines to prevent transmission of HIV to their babies in 2014; new HIV infections among children were reduced by 58% from 2000 to 2014.

1.8.2 People living with HIV

- In 2014, there were 36.9 million [34.3 million–41.4 million] people living with HIV.
- Since 2000, around 38.1 million people have become infected with HIV and 25.3 million people have died of AIDS-related illnesses.

1.8.3 New HIV infections

- New HIV infections have fallen by 35% since 2000.
- Worldwide, 2 million [1.9 million–2.2 million] people became newly infected with HIV in 2014, down from 3.1 million [3.0 million–3.3 million] in 2000.
- New HIV infections among children have declined by 58% since 2000.
- Worldwide, 220 000 [190 000–260 000] children became newly infected with HIV in 2014, down from 520 000 [470 000–580 000] in 2000.

1.8.4 AIDS-related deaths

- AIDS-related deaths have fallen by 42% since the peak in 2004.
- In 2014, 1.2 million [980 000–1.6 million] people died from AIDS-related causes worldwide compared to 2 million [1.7 million–2.7 million] in 2005.

1.8.5 HIV/tuberculosis

- Tuberculosis-related deaths in people living with HIV have fallen by 32% since 2004.
- Tuberculosis remains the leading cause of death among people living with HIV, accounting for around one in three AIDS-related deaths.
- In 2014, the percentage of identified HIV-positive tuberculosis patients who started or continued on antiretroviral treatment reached 77%

1.8.6 Investments

- The world appears to be within reach of achieving the investment target in the 2011 Political Declaration on HIV/AIDS, which called on the global community to mobilize between US\$ 22 billion and US\$ 24 billion in low- and middle-income countries for the AIDS response by 2015.
- At the end of 2014, US\$ 20.2 billion was invested in the AIDS response in low- and middle-income countries.
- Domestic resources constituted 57% of the total resources available for AIDS in low- and middle-income countries in 2014.
- Between 2009 and 2014, 84 out of 121 low- and middle income countries increased their domestic spending on AIDS. Of these countries, 46 reported an increase of more than 50%, including 35 countries which reported an increase in domestic spending of more than 100%.
- 44 low- and middle income countries looked to international donors for 75% or more of their AIDS financing needs.
- UNAIDS estimates that US\$ 31.1 billion will be required for the AIDS response in 2020, with US\$ 29.3 billion required in 2030.

1.8.7 Regional Statistics

1.8.7.1 Sub-Saharan Africa

- In 2014, there were 25.8 million [24.0 million–28.7 million] people living with HIV in sub-Saharan Africa.
- Women account for more than half the total number of people living with HIV in sub-Saharan Africa.
- In 2014, there were an estimated 1.4 million [1.2 million–1.5 million] new HIV infections in sub-Saharan Africa.
- New HIV infections declined by 41% between 2000 and 2014.
- Sub-Saharan Africa accounts for 66% of the global total of new HIV infections.
- In sub-Saharan Africa, 790 000 [670 000–990 000] people died of AIDS-related causes in 2014.
- Between 2004 and 2014 the number of AIDS-related deaths in sub-Saharan Africa fell by 48%.
- In sub-Saharan Africa, 10.7 million people were accessing antiretroviral treatment, 41% of all people living with HIV in the region, up from fewer than 100 000 people in 2002.
- 36% [34%-39%] of men and 47% [43%-55%] of women were accessing antiretroviral therapy in sub-Saharan Africa in 2014.
- Five out of seven people on antiretroviral therapy live in sub-Saharan Africa.
- There were 190 000 [170 000–230 000] new HIV infections among children in sub-Saharan Africa in 2014.
- Since 2009, there has been a 48% decline in new HIV infections among children in the 21 priority countries of the Global Plan to eliminate new HIV infections among children and keeping their mothers alive in Africa.

1.8.7.2 Asia and the Pacific

- In 2014, there were 5 million [4.5 million–5.6 million] people living with HIV in Asia and the Pacific.
- In 2014, there were an estimated 340 000 [240 000–480 000] new HIV infections in the region.
- New HIV infections declined by 31% between 2000 and 2014
- China, Indonesia and India account for 78% of new HIV infections in the region
- In Asia and the Pacific, 240 000 [140 000–570 000] people died of AIDS-related causes in 2014.
- Between 2000 and 2014 the number of AIDS-related deaths in the region increased by 11%.
- Treatment coverage is 36% [32%–41%] of all people living with HIV in Asia and the Pacific.
- An estimated 3.2 million adults did not have access to antiretroviral therapy in Asia and the Pacific in 2014.
- Only two countries in Asia and the Pacific, Thailand and Cambodia, have more than 50% of all people living with HIV currently on antiretroviral treatment.
- There were 21 000 [16 000–27 000] new HIV infections among children in Asia and the Pacific in 2014.
- Since 2000, there has been a 27% decline in new HIV infections among children in the region.

1.8.7.3 Latin America

- In 2014, there were 1.7 million [1.4 million–2 million] people living with HIV in Latin America.
- In 2014, there were an estimated 87 000 [70 000–100 000] new HIV infections in the region.
- New HIV infections declined by 17% between 2000 and 2014
- In Latin America, 41 000 [30 000–82 000] people died of AIDS-related causes in 2014.

- Between 2005 and 2014 the number of AIDS-related deaths in the region fell by 29%
- Treatment coverage is 47% [40% – 56%] of all adults aged 15 and over living with HIV in Latin America and 54% [46% – 64%] among children aged 0 to 14 years
- There were 2000 [1300–2900] new HIV infections among children in Latin America in 2014.
- Western and Central Europe and North America
- In 2014, there were 2.4 million [1.5 million – 3.5 million] people living with HIV in Western and Central Europe and North America.
- In 2014, there were an estimated 85 000 [48 000–130 000] new HIV infections in the region (UNAIDS, 2015).
- The United States of America accounts for more than half of new HIV infections in the region.
- In Western and Central Europe and North America, 26 000 [11 000–86 000] people died of AIDS-related causes in 2014.
- Between 2005 and 2014 the number of AIDS-related deaths in the region remained constant.
- There were <500 [<200–<500] new HIV infections among children in Western and Central Europe and North America in 2014.

1.8.7.4 Eastern Europe and Central Asia

- In 2014, there were 1.5 million [1.3 million–1.8 million] people living with HIV in Eastern Europe and Central Asia.
- In 2014, there were an estimated 140 000 [110 000–160 000] new HIV infections in the region.
- New HIV infections rose by 30% between 2000 and 2014.
- In Eastern Europe and Central Asia, 62 000 [34 000 – 140 000] people died of AIDS-related causes in 2014.
- Between 2000 and 2014 the number of AIDS-related deaths in the region more than trebled.
- Treatment coverage is 18% [16%-21%] of all adults aged 15 and over living with HIV in Eastern Europe and Central Asia.

- There were 1200 [<1000–1600] new HIV infections among children in Eastern Europe and Central Asia in 2014.

1.8.7.5 The Caribbean

- In 2014, there were 280 000 [210 000–340 000] people living with HIV in the Caribbean.
- In 2014, there were an estimated 13 000 [9600–17 000] new HIV infections in the region.
- New HIV infections declined by 50% between 2000 and 2014.
- In the Caribbean, 8800 [5700–13 000] people died of AIDS-related causes in 2014.
- Between 2000 and 2014 the number of AIDS-related deaths in the region fell by more than half.
- Haiti accounted for about half of all AIDS-related deaths in the region in 2014.
- Treatment coverage is 44% [33%-54%] of people 15 years or older living with HIV in Caribbean and 36% [32%-42%] among children
- There were <500 [<500–<1000] new HIV infections among children in Caribbean in 2014.

1.8.7.6 Middle East and North Africa

- In 2014, there were 240 000 [150 000–320 000] people living with HIV in the Middle East and North Africa.
- In 2014, there were an estimated 22 000 [13 000–33 000] new HIV infections in the region.
- New HIV infections rose by 26% between 2000 and 2014.
- In the Middle East and North Africa, 12 000 [5300–24 000] people died of AIDS-related causes in 2014.
- Between 2000 and 2014 the number of AIDS-related deaths in the region more than trebled.
- There were 2400 [1800–3300] new HIV infections among children in the Middle East and North Africa in 2014 (UNAIDS, 2015).

1.9 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

2.1 Knowledge of HIV and AIDS among tertiary students in Bangladesh

Hossain, Kabir and Ferdous, (2006) had done an survey on the levels and predictors of knowledge on HIV and AIDS, with population number 392 tertiary level students 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).

2.2 Adolescent knowledge and awareness about AIDS/HIV and factors affecting them in bangladesh.

Rahman, Kabir and Shahidullah, (2009) have reported that 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).

2.3 Knowledge, perceptions and awareness about HIV/AIDS among private university students in Bangladesh

Shuma and Halder, (2015) conducted the survey among 326 tertiary level students in different private universities 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, living in a university dormitory, and being students of faculty 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).

2.4 Awareness and knowledge of HIV/AIDS among married women in rural Bangladesh and exposure to media: a secondary data analysis of the 2011 Bangladesh Demographic and Health Survey

Asaduzzaman, *et al.*, (2014) reported that they collect data from 11,570 rural married women aged 15–49 years old. They found that approximately two-thirds of women (63.0%) aged 15–49 years had heard about HIV/AIDS. Exposure to each type of media was significantly associated with awareness of HIV/AIDS. Comparing to those who were not exposed to each of the investigated media, the knowledge of HIV/AIDS were significantly high for those exposed to newspapers/magazines less than once a week (95%), newspapers/ magazines at least once a week (95%), television at least once a week (95%). It was suggested that television can be utilized to increase awareness and comprehensive knowledge of HIV/AIDS through effective programs. Although the level of exposure was still low, significant associations between exposure to newspapers/magazines and comprehensive knowledge of HIV/AIDS suggested potential of written messages to promote knowledge of HIV/AIDS (Asaduzzaman *et al.*, 2014).

2.5 Awareness on prevention and control of AIDS/HIV among the adults attending an urban hospital in Dhaka

Hossain, *et al.*, (2015) reported that 46.5 percent of the adults had average knowledge about HIV/AIDS. Knowledge regarding HIV/AIDS was good in 10.3 percent cases, neither good nor bad in 27.1 percent cases and poor in 16.1 percent respondents. 54 percent of the male adults and 50.48 percent of female adults had good knowledge. Lower age (18-27 years) group adults had good knowledge about HIV/AIDS in 53 percent. The knowledge about HIV/AIDS was good in 53.97 percent of literate group. The married adults had good knowledge in 50.85 percent cases. In the employed group, 55.17 percent had good knowledge about HIV/AIDS (Hossain *et al.*, 2015).

2.6 Awareness and knowledge of AIDS among Indian women: evidence from 13 states.

Balk and Lahiri, (1997) reported that the study carried out over 30,000 ever-married women 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).

2.7 Survey on HIV/AIDS-related knowledge and behavior of high risk population in Taiyuan City

Wang *et al.*, (2010) reported that, total of 531 respondents recruited in this study, 186 were commercial sex workers, 238 were drug users and 107 were MSM. The awareness of HIV/AIDS-related knowledge in sex workers was 61.9%, in drug users was 77.2% and in MSM was 90.4%. The condom user in sex workers at the last sexual activity was 74.9%, and in MSM was 58.9%. Sharing needle with others in intravenous drug users during the month before entering into the drug addiction treatment center was 57.9%. Except of sex workers in the top grade entertainment places, there was no statistically significant correlation between knowledge and behavior in these three high risk groups (Wang *et al.*, 2010).

2.8 Assessing Knowledge of, and Attitudes to, HIV/AIDS among University Students in the United Arab Emirates

Haroun *et al.*, (2016) report that, the overall average knowledge score of HIV/AIDS was 61%. Non-Emirati and postgraduates demonstrated higher levels of knowledge compared to Emirati and undergraduate students respectively. No significant differences between males and females; and marital status were found. Eighty-five percent of students expressed negative attitudes towards people living with HIV, with Emirati and single students significantly holding more negative attitudes compared to non-Emiratis and those that are married respectively (Haroun *et al.*, 2016).

2.9 HIV/AIDS awareness and sexual practices among undergraduates in Enugu, Nigeria.

Onah *et al.*, (2004) report that all the respondents had heard of HIV/AIDS. 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).

2.10 Knowledge about AIDS/HIV infection among female college students.

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).

Significance of the study

HIV/ AIDS is becoming major public concern in the world and is one of the major global and regional health problem that have devastated large populations almost all over the world.

It is now the seventh leading cause of death among 1-4 year olds, sixth among 15-24 year olds and 1st among 25- 44 year olds. Two hundred sixteen HIV positive cases have been reported from Bangladesh in 2006. Two hundred forty have already developed AIDS among 874 HIV positive cases out of which 109 AIDS patients have already died. In achieving the World Health Organization (WHO) goal of reducing the global infection of HIV/AIDS and the healthy people 2010 goal of increasing the length and quality of life of individuals with HIV/AIDS (Shuma and Halder, 2015).

There is a study conducted about this topic on 2015 among private university students in Bangladesh. We want to see the knowledge of both public and private university students in Bangladesh.

Although Bangladesh is a low HIV-prevalence country, it is important that prevention efforts are maintained to limit further spread of the virus. Lack of knowledge on the control and prevention of this virus is harmful and main reason for spread the disease. Mostly university students are at risk so their knowledge about prevention and control is important. If the students are properly informed about the diseases, it will help to disseminate the information in the society more effectively and efficiency.

Our key aim is to support government efforts to control the spread of HIV and AIDS. They can take information onto our study and can take step to increase the knowledge of the university student.

Aims of the study

The aims of the study were to

- Determine the knowledge level of University students in Bangladesh about HIV/AIDS.
- Their perception of risk factor of HIV/AIDS

Chapter 3

Methodology

3.1 Type of the Study

It was a survey based study.

3.2 Study Population

In this study, University students were the study population. The study was carried out on 1003 Students of different universities inside Dhaka city. The Universities were:

- Dhaka University
- Jagannath University
- Jahangirnagar University
- East West University
- Bangladesh University
- North South University
- Ahsanullah University of science and technology
- ASA University
- Uttara University
- South East University

3.3 Inclusion Criteria

- University Students
- Both males and females

3.4 Exclusion Criteria

- Anyone without University student.

3.5 Data Collection Method

The data was collected through questionnaire that is formed in English language. It is a questionnaire consists of multiple choice type questions. The data was collected by both face to face interview and by questionnaire supply.

3.6 Development of the Questionnaire

The questionnaire was developed based on different findings in available journal and research paper. Also from the observation of different behavior of Bangladeshi people.

3.7 Sampling Technique

In this study random sampling was followed.

3.8 Data collecting period

The duration of data collection was about five months that started from January, 2016 up to May, 2016.

3.9 Data Analysis

After collecting, all the data were checked and analyzed with the help of Microsoft Excel 2007.

Chapter 4

Results

4.1 .1 Age distribution

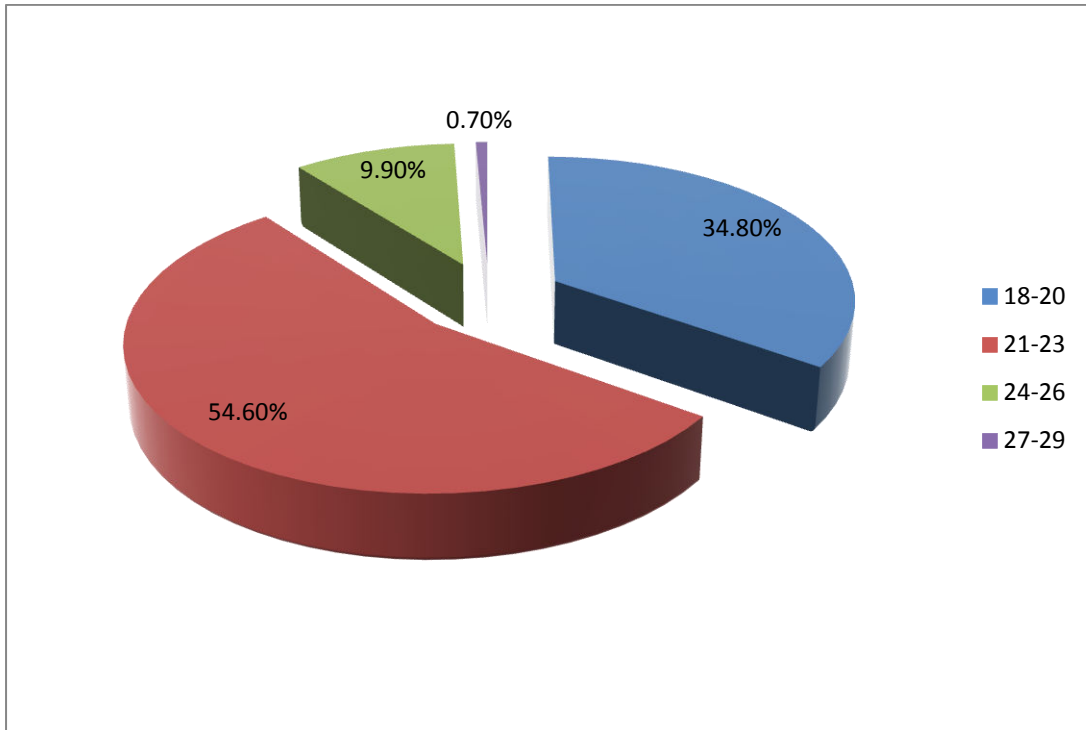


Fig4.1 .1: Age distribution

In this survey about 54.6% students were in the age range between 21to 23, 34.8% were in age range 18-20, only few students were in age range 24-26 and 27-29.

4.1.2 Gender distribution

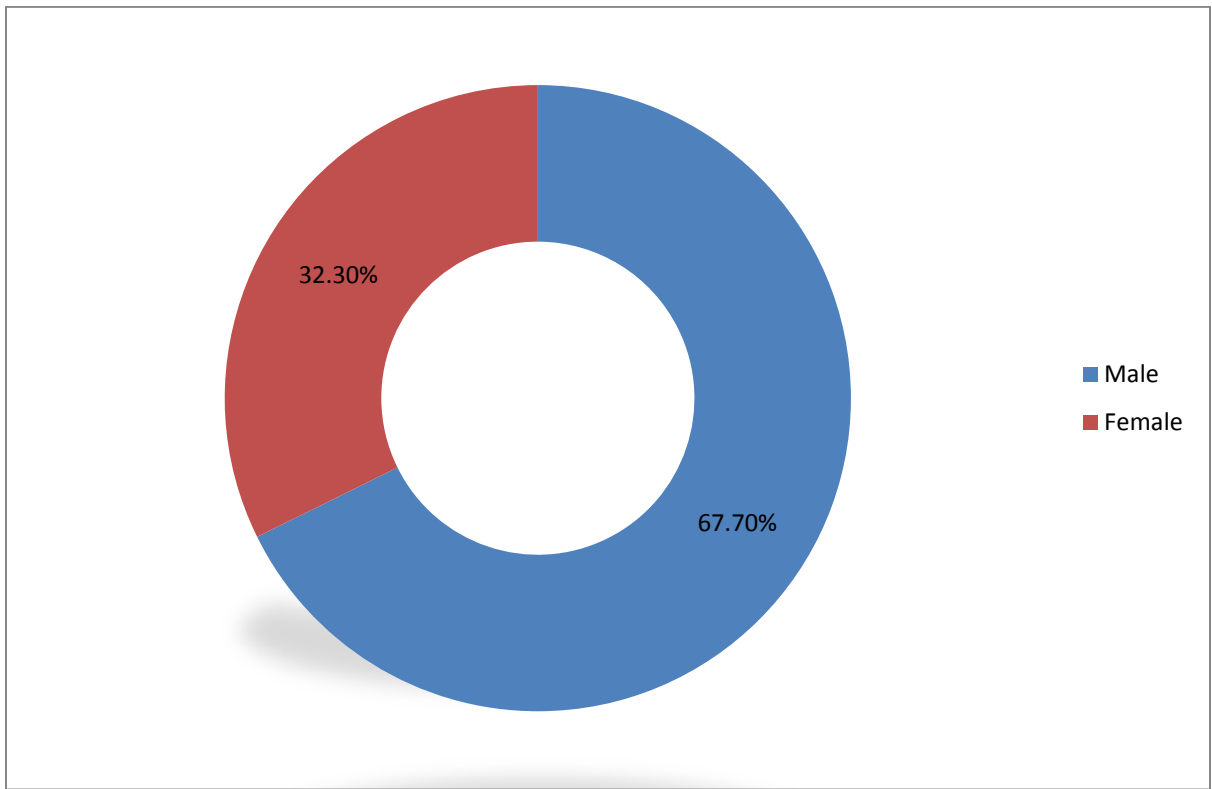


Fig 4.1.2: Gender of the Responds

In this study we found, about 68% male and 32% female students.

4.1.3 Department wise distribution

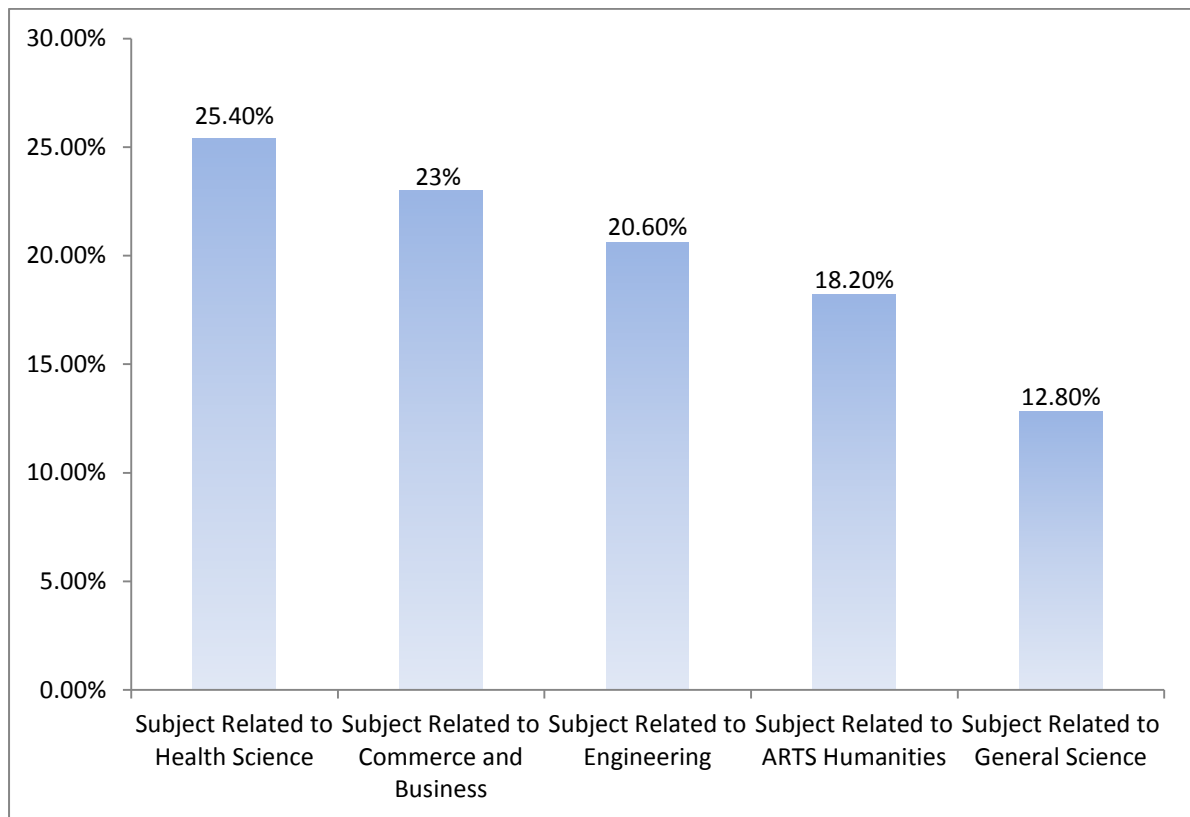


Fig 4.1.3: Department wise distribution

From the graph we can tell that 25.4% students were from subject related to the Health science, 23% were from commerce and business studies, 20.6% from Engineering, 18.2% from Art's related subject, 12.8% from general science subject.

4.1.4 Year of study

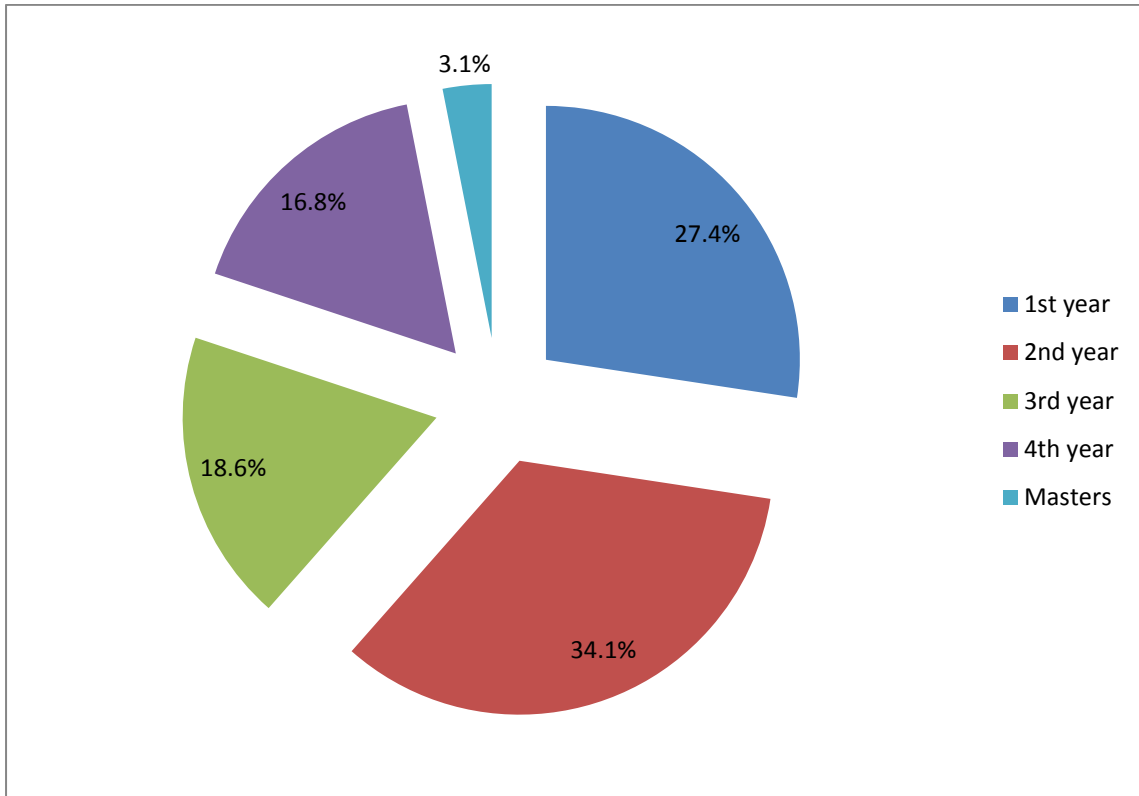


Fig 4.1.4: Year of study

In our study about 27% students were from 1st year, 34.1% from 2nd year, 18.6% from 3rd year, 16.8% from 4th year, whereas only few students from masters.

4.1.5 Marital status

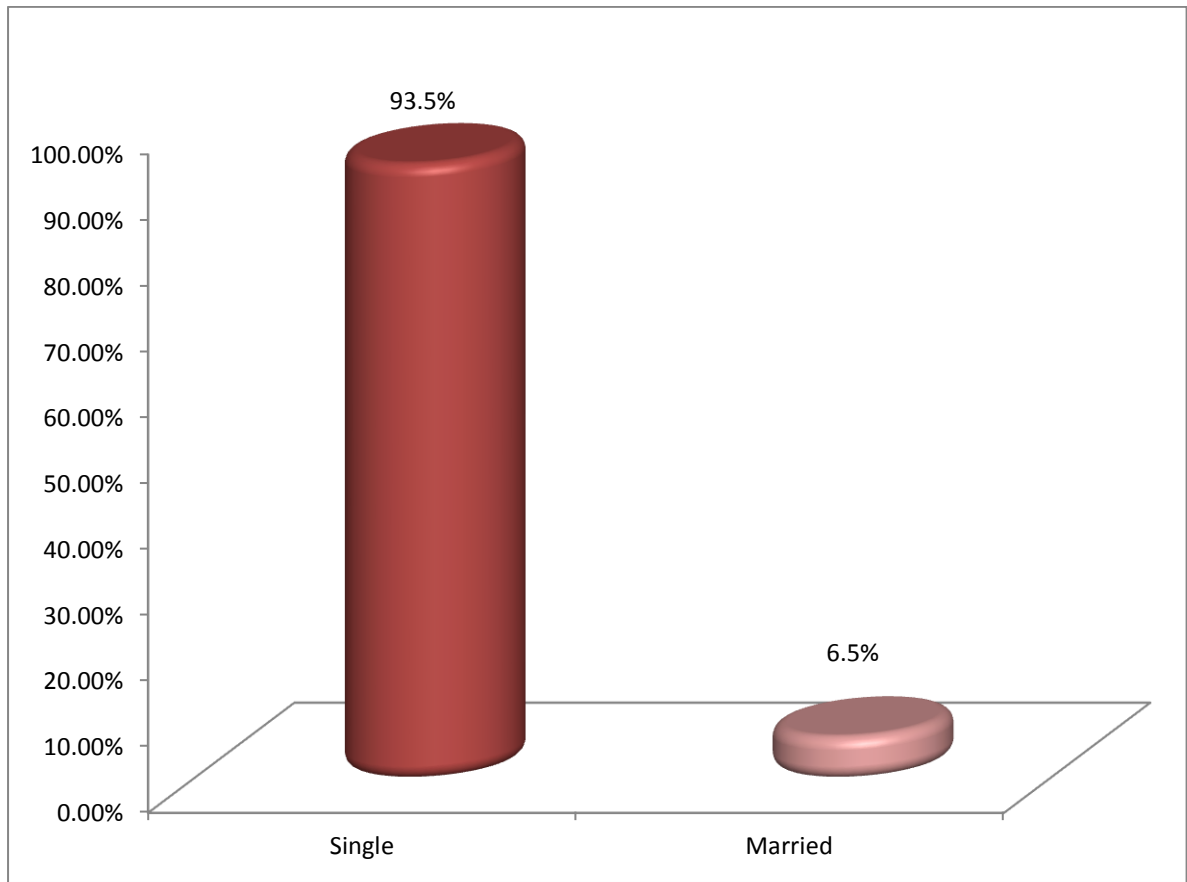


Fig 4.1.5: Marital status of respondents

Among the total students maximum population (about 94%) were single, only few students were married.

4.2.1 Heard about HIV/ AIDS

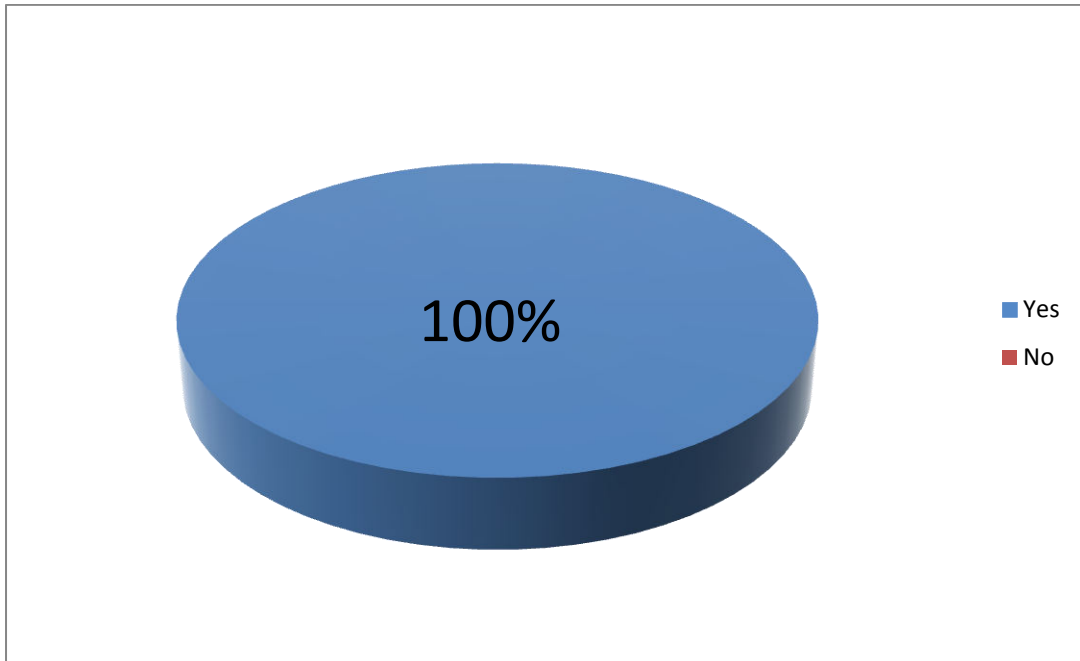


Fig4.2.1: Heard about HIV/ AIDS

In this study all responders confirmed that they have heard about HIV and AIDS.

4.2.2 Source of information

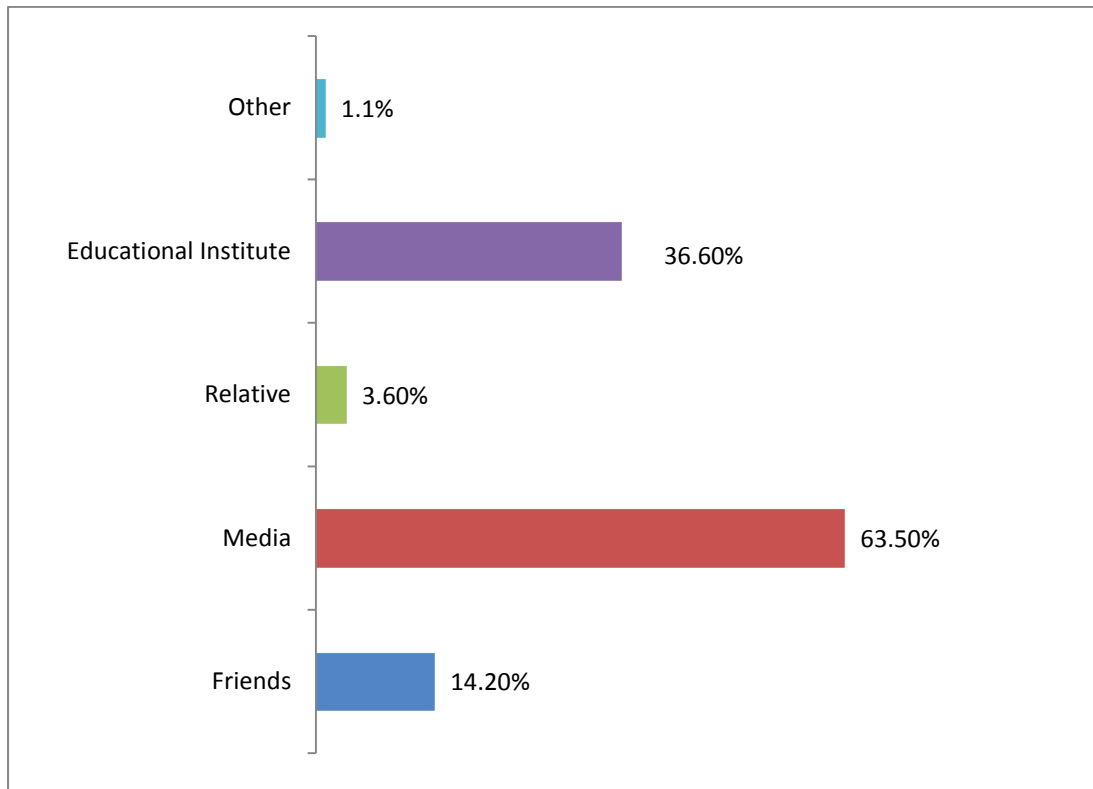


Fig4.2.2: Source of information

Among the study population 63.5% were informed through media, 36.6% from Educational institutes, 14.2%, 3.60%, 1.1%, students were informed from Friends, Relative and Other sources respectively.

4.2.3.1 Knowledge about Differences between HIV and AIDS

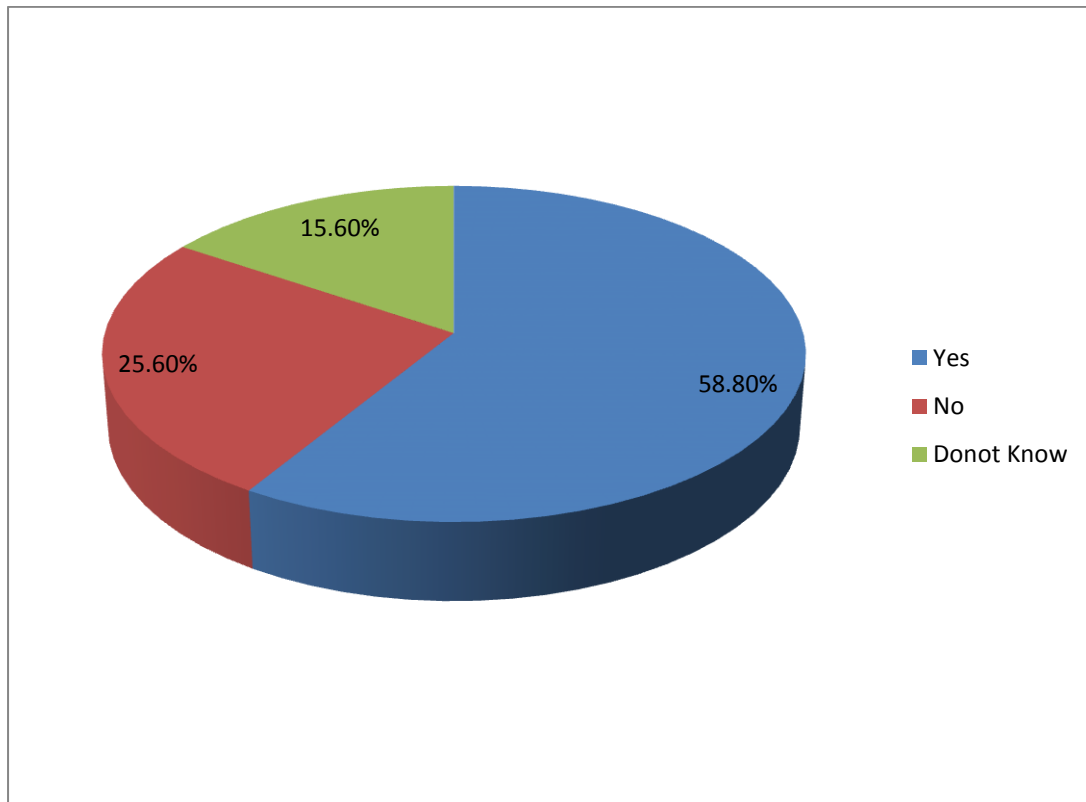


Fig4.2.3.1: Knowledge about Differences between HIV and AIDS

Among the students 58.8% students confirmed that there was difference between HIV and AIDS, whereas 25.6% informed there are no differences between HIV and AIDS and 15.6% had no idea about this.

4.2.3.2 Knowledge about Differences between HIV and AIDS

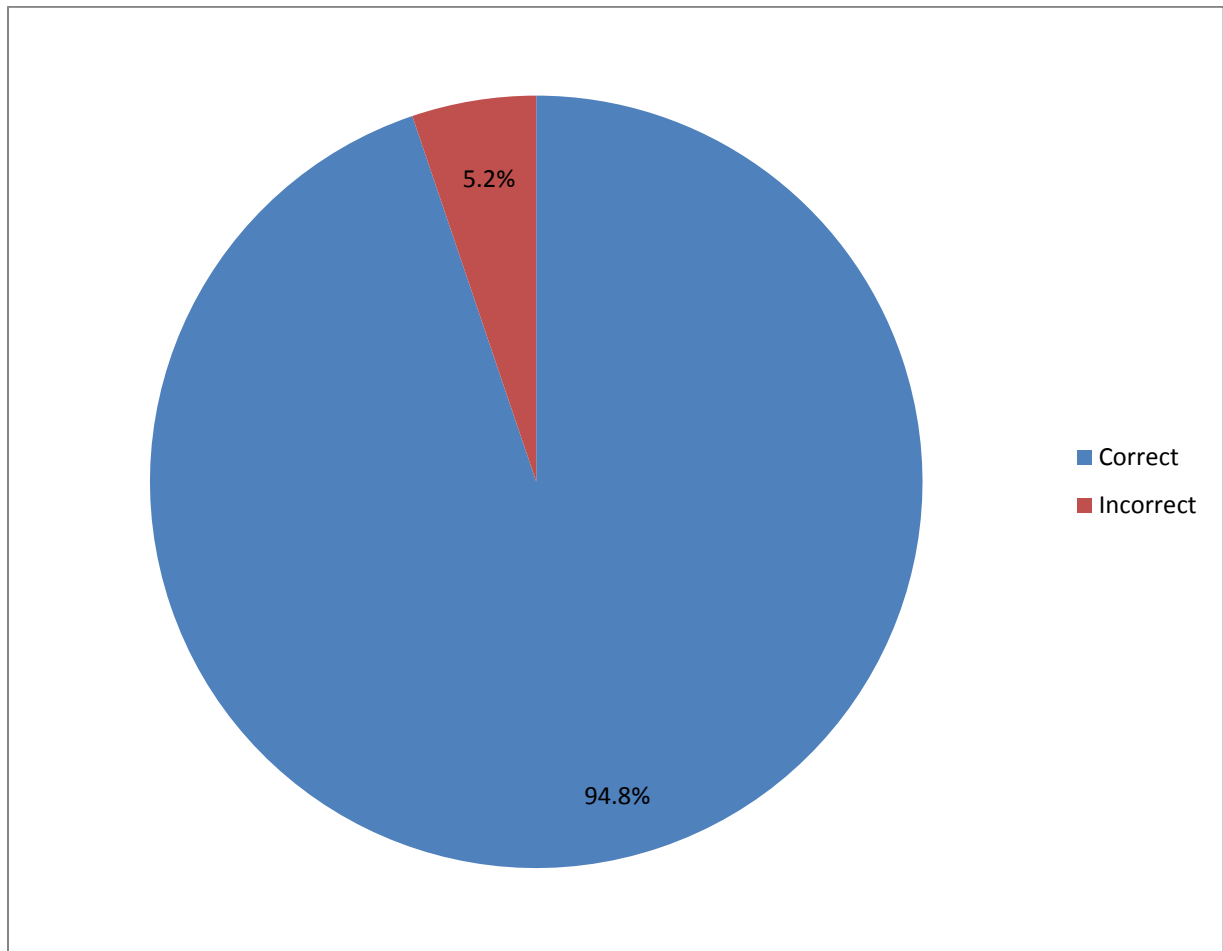


Fig4.2.3.2: Knowledge about Differences between HIV and AIDS

Among the respondents who said there is difference between HIV and AIDS (N=590), 94.8% could specified correctly. 5.2% delivered wrong answer.

4.2.4 Knowledge about treatment of HIV and AIDS

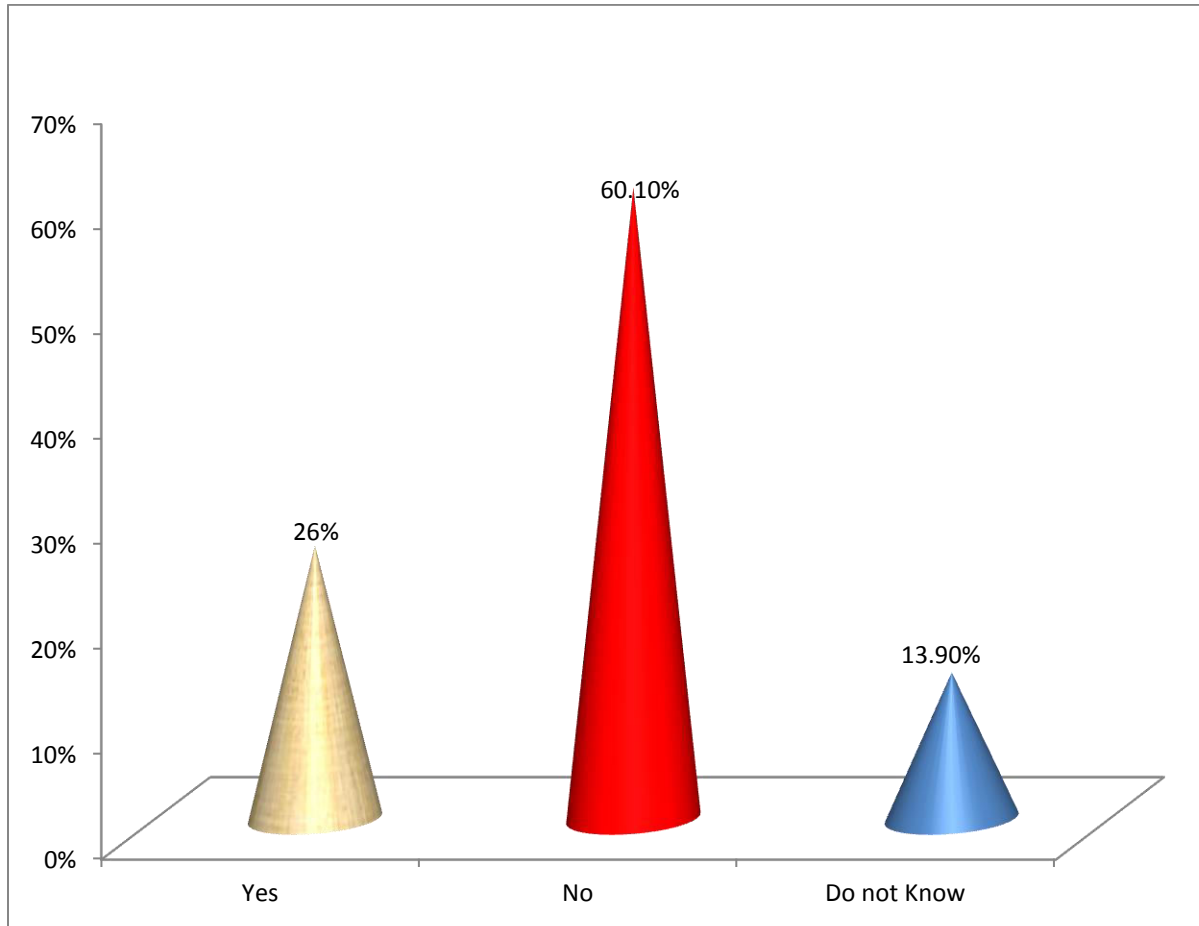


Fig4.2.4: Knowledge about treatment of HIV and AIDS

On this question 26% students informed HIV and AIDS can be treated, about 60.1 % students confirmed it is not treatable and 13.9% had no idea about this.

4.2.5 Knowledge about vaccine availability

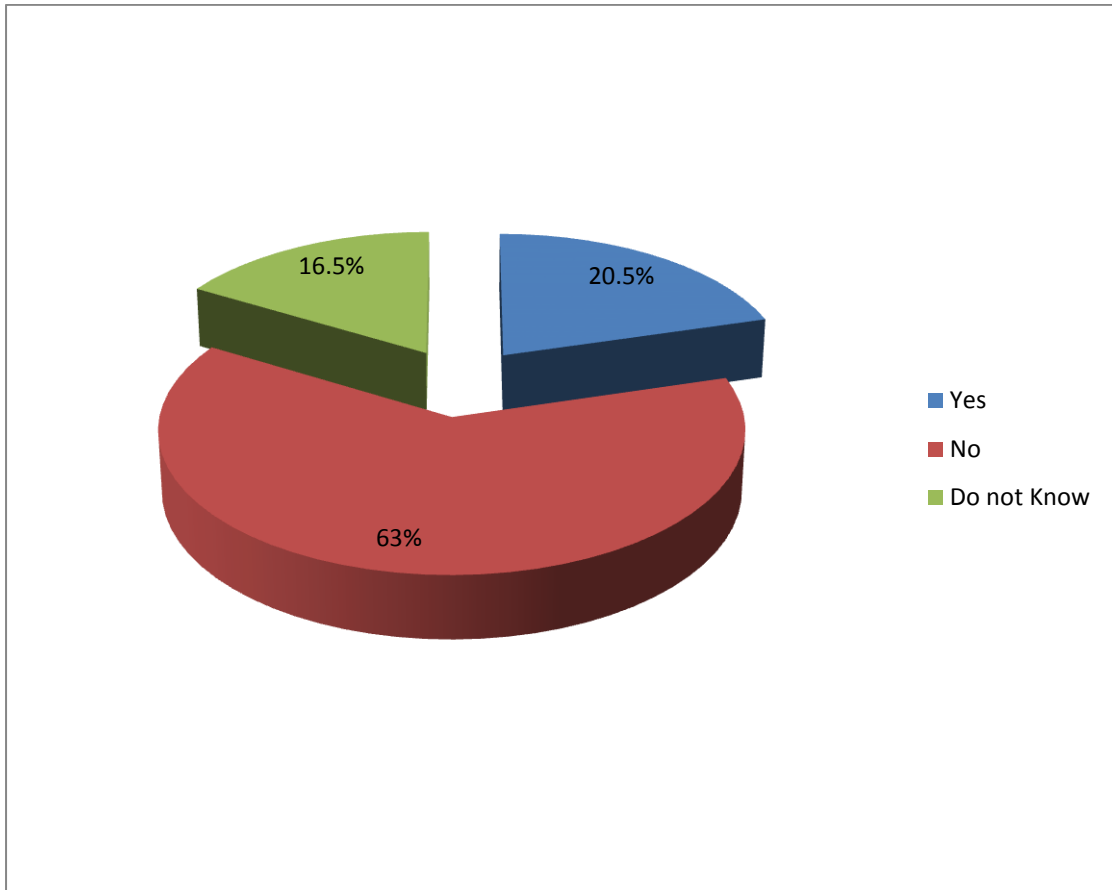


Fig4.2.5: Knowledge about vaccine availability

In the survey maximum (63%) students answered “there is no vaccine available”. About 20% informed there is vaccine available, and 16.5 % marked they don’t know about this topic.

4.2.6 Knowledge about mode of Transmission

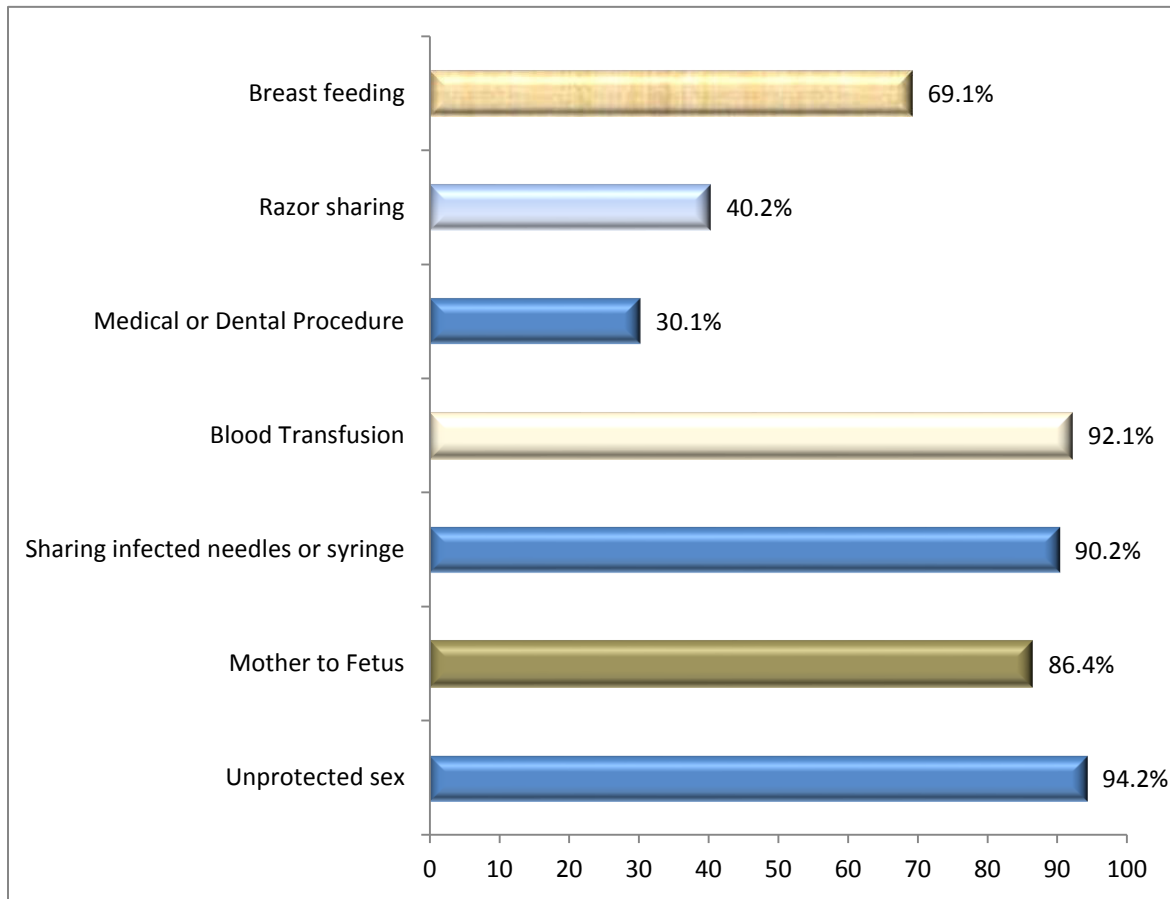


Fig 4.2.6: Knowledge about mode of Transmission

We found, most of the Responders (94.2%) supported that “HIV can be transmitted by unprotected sex”. About 86.4% students said HIV can be transmitted from mother to fetus. 90.2% marked sharing infected needles or syringe as a way of mode of transmission. 92.1% claimed “by blood transfusion HIV can be transmitted”. 30.1%, 40.2% and 69.1% population informed HIV can be transmitted by Medical or dental procedure, razor sharing, Breast feeding respectively.

4.2.7 Misconception about mode of transmission of HIV and AIDS

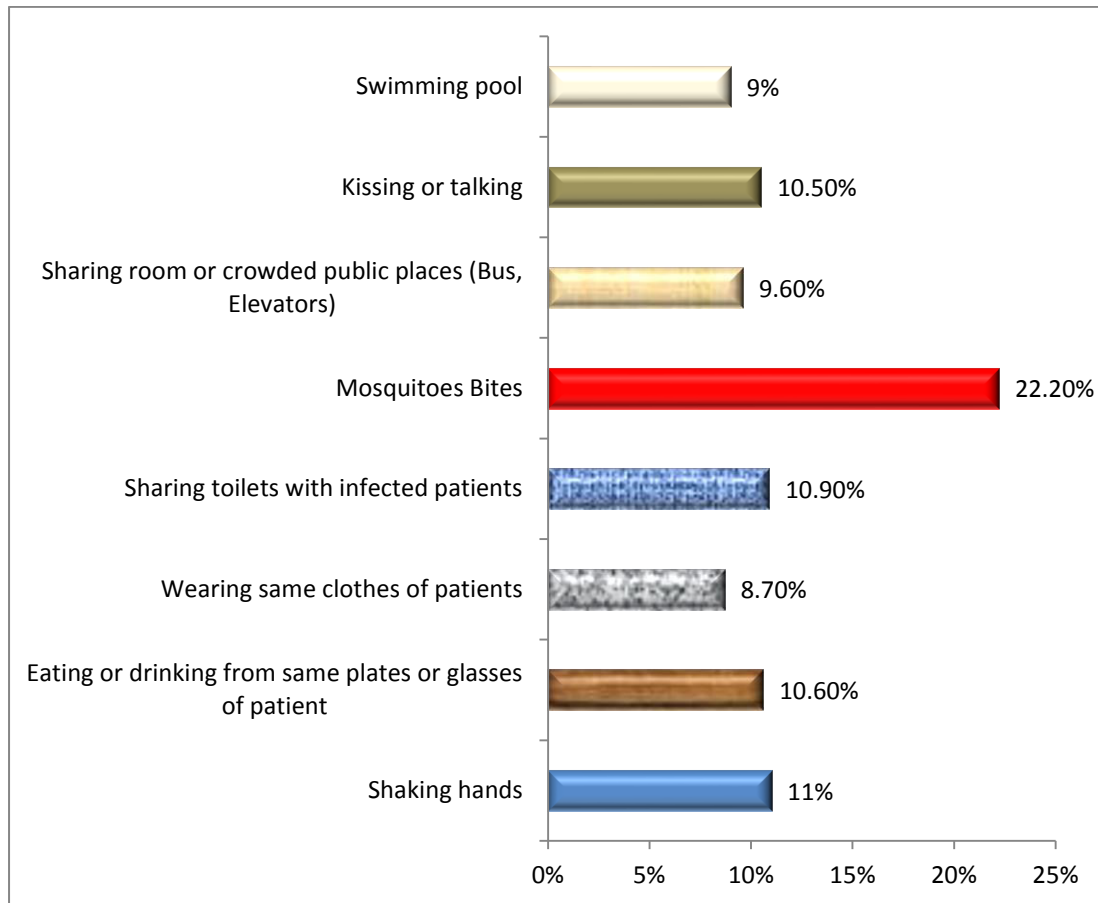


Fig4.2.7: Misconception about mode of transmission of HIV and AIDS

Among the students some didn't have clear concept, approximately 11% confirmed by shaking hand HIV can be transmitted. 10.6% said by drinking and eating on same glass or plate HIV can be transmitted. 8.7% responders said by wearing same cloth it also can be transmitted. 10.9% said by sharing toilet with infected person HIV can be transmitted. 22.2%, 9.6%, 10.5%, 9% responders marked mosquitoes Bites, sharing room or crowded places, kissing or talking, swimming pool respectively as a mode of transmission.

4.2.8 Knowledge of control and prevention of HIV and AIDS

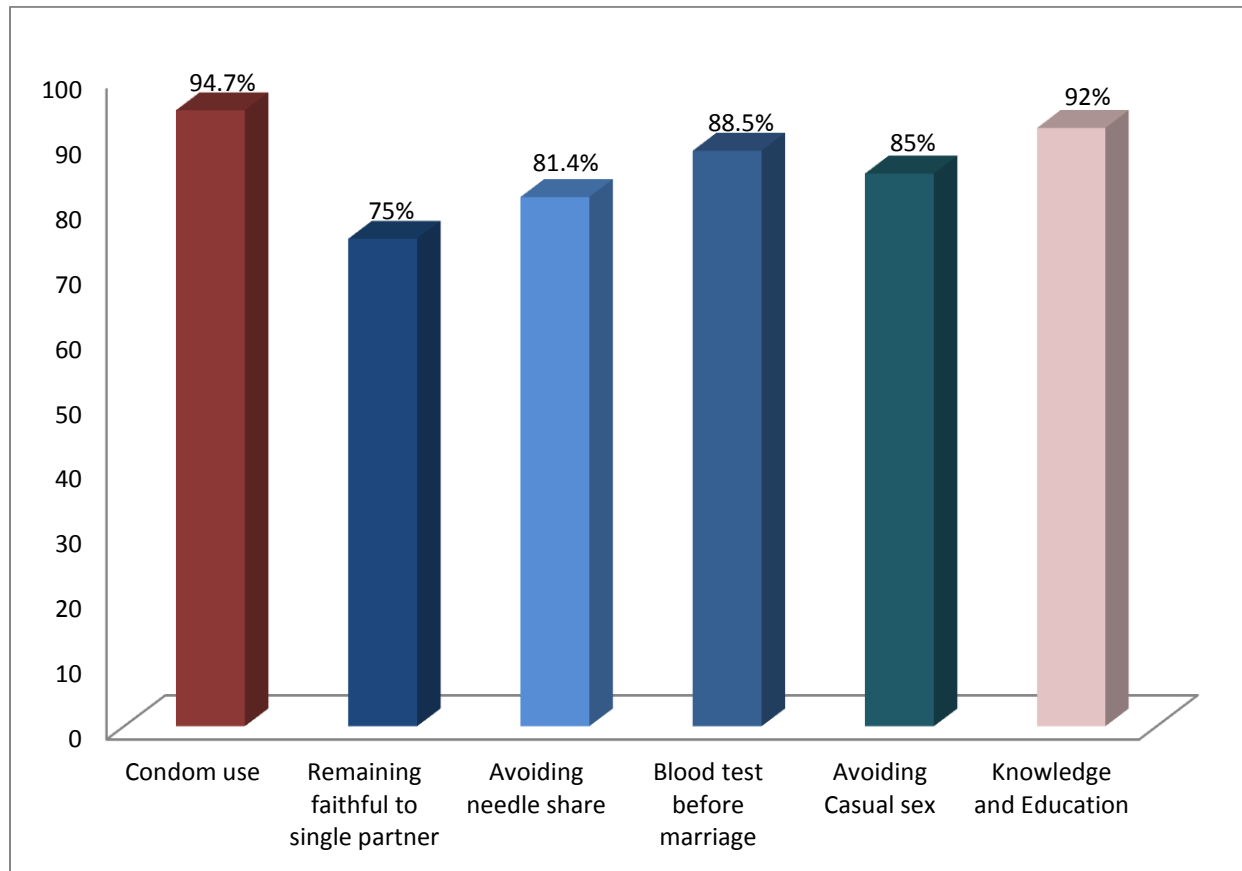


Fig4 .2.8: Knowledge of control and prevention of HIV and AIDS

In our study we found, most of the students (94.7%) said “Condom use is prevention and control method”. 75%, 81.4%, 88.5%,85%, 92% marked Remaining faithful to single partner, Avoiding needle share, Blood test before marriage, Avoiding Casual sex, Knowledge and Education, respectively as the control and prevention method.

4.3 Attitude toward HIV infected person

Table 4.1 Attitude toward HIV infected person

Attitude toward infected person	Yes	No	Do not Know
Taking care	91.6%	3.5%	4.9%
Continuing relationship	83.8%	10.5%	5.7%
If person is shopkeeper, then buying food from him	89.2%	7.6%	3.2%
If person is student, be positive his presence in school.	91.5%	4.7%	3.8%
If person is teacher, be positive his presence in school.	90.7%	5.1%	4.2%

Most (91.6%) participants wanted to take care of the infected person whereas only 3.5% of people didn't want to take care of them.

Maximum percentage (83.8%) of responds wanted to continue relationship with infected person.

Most of the responds wanted to buy food from infected shopkeeper and would be positive towards the infected person.

Chapter 5

Discussion and Conclusion

5.1 Discussion:

The survey was based on the knowledge, awareness and attitude towards HIV/AIDS. Our study conducted onto 1003 students of different universities in Dhaka city. Most of the students were between ages range 21-23 (54.6%) and 18-20 years (34.8%). About 67.7% population was male whereas the female was 32.3%. Shuma and halder (2015) also found high percentage (65%) of male in their study only 35% were female. In our study majority of the students were from subject related to health science, commerce and business.

In our study most of the students were from 2nd year (34.1%) and 1st year (27.4%), 3rd year and 4th year students were less. Only few students were during master degree.

In our study all students informed that they heard about the term HIV/AIDS. Farid and Choudhry (2003) found 95% Pakistani student who heard about the term HIV. Wong *et al.*, (2008) found 4.3% Malaysian young adults who had never heard of HIV/AIDS.

From the study we notify that the major source of information is media (63.5%) and Educational institute (36.6%). 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%). In our study 58.8% student confirmed there was difference between HIV and AIDS. Shuma and Halder (2015) found 60% student who did not know there was difference between HIV.

Among the population who told they know there are difference between HIV and AID (N=590), 94.8% population specified correctly. Wong *et al.*, (2008) reported that many Malaysian young adult (64.9%) were unable to correctly differentiate HIV from AIDS.

In our survey we found, among the responds 26% students informed HIV and AIDS can be treated, 20.5% informed there is vaccine available. Hossain, Kabir and Ferdous, (2006) informed they found 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.

We found that most respondents (94.2%) supported that HIV can be transmitted by unprotected sex, followed by blood transfusion (92.1%), sharing infected needles or syringe (90.2%), fetal transfusion (69.1%). Wong *et al.*, (2008) found most of the Malaysian young

adults told that HIV is transmitted via sharing injecting needles with an infected person (94.8%), having sexual intercourse with (93.7%), receiving a transfusion of infected blood or receiving an organ (91.9%), having sex with multiple sexual partners (91.4%), and from an infected mother to her fetus (85.6%).

In our study we found some students who had misconception about transmission of HIV/AIDS. They told HIV/ AIDS can be transmitted by shaking hand (11%), drinking and eating on same glass or plate (10.6%), wearing same cloth (8.7%), sharing toilet with infected person (10.9%), mosquitoes bites (22.2%). Mehra *et al.*, (2014) found (34.3%) VCT 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.

We found in our study, most of the population had better knowledge about control and prevention of HIV/ AIDS. About 95% and 75% population informed that condom use and remaining faithful to single partner, to be the way of prevention of HIV transmission respectively. Shuma and Halder, (2015) reported that 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 82% respondents thought the transmission of HIV can be prevented by avoiding needle share. Farid and choudhry (2003) found, 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.

According to 92% respondents of our study knowledge and education is important for control and prevention of HIV/AIDS.

We notify in our study that most of the study subjects had positive attitude towards HIV infected person in term of taking care, continuing relationship, and buying food, his or her presence in school. In a study Thanavanh *et al.*, 2013 Positive attitudes towards HIV/AIDS were observed among 55.7% of respondents.

5.2 Conclusion

In our study we observed a significant level of awareness with some misconception towards HIV/AIDS among university students in Dhaka and around Dhaka city. To reduce the misconception, Education and intervention programs are needed to increase the level of knowledge and awareness of HIV/AIDS. 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 university students. The mass media and educational institute should give proper knowledge about misconception as well as actual knowledge of HIV/AIDS.

Chapter 6

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