CHAPTER TWO

REVIEW OF LITERATURE
CHAPTER - II
REVIEW OF LITERATURE

In this chapter, the collected review from the available relevant studies is arranged into three main categories and discussed accordingly. The review is divided into:

A. Theories about the origin of the HIV infection.

B. Factors responsible for epidemic and spread of HIV/ AIDS and its impact.

C. Major strategies for HIV/ AIDS infection.

A. Theories About the Origin of the HIV Infection:

There are many theories which have been proposed to explain the entry of HIV virus into human beings. But the relevant selected theories are discussed in this context.

Green Monkey Theory:

There are several diseases that have animal reservoirs; i.e. Lassa fever and plague. The animal that has received most attention as a possible source of HIV virus has been the 'African Green Monkey'. The evidence that appeared to support this is that the virus HIV-2 is genetically similar to a virus SIV (Simian immunodeficiency virus which is the causitive germ for Simian immunodeficiency syndrome i.e. SIDS in monkey), which was found in some monkey kept for experiments in a laboratory in California. People belonging to some
African tribes wrongly believe that injecting monkey’s blood in the pubic area has an aphrodisiac effect. They believe that their sexual potency will be increased by these injections. Sexual intercourse with monkeys (bestiality) was also alleged for introduction of HIV infection into human race.

**Germ Warfare Theory:**

This theory is based on a paper published by three East-German Scientists in 1986. They reported that, HIV was produced by the American military during the cold war era as a weapon to be used for biological warfare. This theory was strongly denied by the United States Government and has been criticised because the technology for genetic engineering did not exist in the early 1970. When HIV would make a highly unsuitable pathogen for germ warfare as there would be no means of protecting one’s own people.

**Mutation Theory:**

Viruses are continually changing and mutating into new strains. It seems highly likely hypothesis that a mutation took place in a virus to produce a new virus with deadly properties of HIV. It is impossible to tell in which country that mutation first took place searching through case records it has been suggested that the first recorded case of infection has been found in a woman in 1959, from ‘Zaire’ and in a ‘New Orleans’ teenager who died with strange symptoms in 1969. Hence, like wildfire
it rapidly spread throughout the world due to ease of travel between countries. There are certain factors which also attributed to spread of HIV at a higher degree into the community.

B. Factors Responsible For Epidemic And Spread of HIV/ AIDS and its Impact:

There are a wide array of interrelated demographical, social, behavioural and medical factors which are contributing to the present worldwide epidemic of sexually transmitted diseases (STD’s), HIV/ AIDS, identified by several group of scientists and concerned researchers. In developed countries and even more so in developing countries these factors may vary with more or less degree of HIV/ AIDS infection. While it is possible to identify some important contributory causes, it may often be beyond our ability to influence some of them.

Young Age:

The young people are the sexually most active group. Since the Second World War the proportion of young people in most countries has risen rapidly and is continuing to rise (Jones, 1986). According to UN estimates, the number of young people aged between 15 to 24 in Africa is expected to double by the year 2000. In the Arab countries the 15 to 24 age group represents a fifth of the total population. This is in direct contrast to the populations of the developed world, although those countries had their post-war “baby boom” which gave rise to a large population of young people in the 1960s and 1970s.
Antal (1986) programmes at Geneva stated that, the young age groups which are the most sexually active account for most of the infected STD's and HIV cases. GOI (1986) report concluded that, among the examined population with STD's cases, Fifty per cent were the young unmarried boys in Aurangabad district of Maharashtra state. Age between 15 to 30 are increasingly afflicted as a result of a general easy on-set of sexual experience and promiscuity (Osoba and Ogrenbanjo, 1986). Leslie Harwit et.al. (1988) claimed that, young people in virtually every culture are sexually active. The median age at first intercourse was found 14 to 15 years in Africa, 16 to 20 years in Europe and North America. Even the frequency and complications of STD's were noticed at higher degree level in sexually active young people. Major risk factors like unprotected sex, including homosexuality, changing sex partners, use of unsterilised needs to inject drugs are the most causative factors leading to HIV infection. These were found more in the young people. These evidences are also supported by the Sun (1994); which revealed that, under 16 years high school students in Delhi reported that they had sexual intercourse with commercial sex workers (CSW) or with elderly women in their neighbourhood. Kanbargi and Kanbargi (1996), also observed the same experiences, in the Karnataka state about the premarital sexual intercourse experience among young age group.
Urbanization:

Increasing urbanization in the Third World has had a powerful effect on attitudes towards sexuality and sexual behaviour. Increasing population in many farming areas has led to shorter follow periods for the land, lower yields and smaller family plots, with the result that young men move to the cities in search of work, leaving behind the traditional villages and way of life. In a village traditional culture had strong sanctions against keeping an extra marital affairs. But when people go to the cities they leave behind such constraints. Frequently they experience loneliness, disorientation, bombardment of sophisticated films, literature and advertisements, all of which tend to promote free sexual activity. In these circumstances sexual experimentation, whether heterosexual or homosexual, is likely to be on the increase.

Several studies (Mann J., 1986; 1987; Garg et.al., 1993; Kapali, 1995 and Kanbargi and Kanbargi, 1996) reported impact of urbanization on AIDS. Thus, it seems that urbanization process as a social change, may be the most responsible factor in spreading STD’s, HIV and AIDS in the community.

Migration:

Due to our short meagre employment prospects in the region, large number of men are migrating abroad for work. In the Indian situation due to poverty and unemployment people from rural areas migrated in the search of employment and wages. These are usually
unmarried, men who until they are settled into the new cultural background, living situation, and forming stable relationship, are at risk of acquiring STD's through causal sexual encounters. Men working temporarily away from home in distant cities in many factories or those who are always on travelling jobs, like truck drivers, are also at risk of contracting STD's, HIV and AIDS. They pass the virus on to their wives or other women in their communities when return home. Antal (1986) indicated that migration is one of the important factor mostly associated with the increase of number of new STD's and HIV cases in the recent year. These evidences are also supported by Haeyman (1997); Murugasampillay (1997) and Rangaiyan et.al. (1998).

Tourism:

The increasing ease and low cost of air travel for tourism is also another factor by which STD's and HIV can be spread from one country to another country or from one region to another region. Thus, these means infection can be brought to distant countries (Jones, 1986). India is also one of the most beautiful country which attracts the foreign tourists to visit the attractive natural beautiful places. In India the evidence of STD's and HIV cases are noticed significantly more in such areas where a number of foreigners have visited as tourists. De'Souza S. (2001) reported that, near about 400 to 500 overseas tourists are arriving
daily in the pleasant weather and beautiful seashores of state of Goa in India. In new concept of enjoyment, instead of only visiting places people want ... new sexual experiences which leads to visiting red light areas. Hence, the epidemic of STD's and HIV are found more due to the impact of tourism. State Government of Goa has now established a special AIDS control board in the Government hospital as a precautionary measure of this disease. Hence, one can measure that travel has always been a mean by which disease spreads across the world.

**Malnutrition:**

Due to severe loss of nutritional status and simultaneously lower disease resistance capacity in the malnutrition stage, the spread of STD's infection is noticed more than in the well nourished person. As with most STD's the victims are usually sexually active, especially prostitutes, soldiers, sailors, homosexuals and so on. Now it is evident that STD's are the major problem in the world which affects nearly 30 per cent of the HIV spread and AIDS related complaints (ARC's) recently. Osoba and Ogunbanjo (1986); Sepulveda (1988); Mann (1989); Anderson and Kaleeba (1994); Heymann (1997); WHO (2000) focused on the linkage between malnutrition, STD's and HIV infection in the several segments of the population. Even, Moseson et.al. 1989; Bandy et.al. 1993 and Timbo and Tollefson, 1994 reported that, malnutrition, especially protein-energy deficiency acts as a
facilitating factor which contributes to the immunodeficiency state in the HIV infection.

**Social Stigma:**

Sexuality and its related issues are generally difficult to discuss openly due to complex social and religious attitudes. Hence, STD infections or suspicion of HIV infection leads to stigmatisation and discrimination which results into loss of employment forced separation from family, being looked down by the community, loss of education, etc. Persons who are already HIV infected and those who are concerned that they may be infected will actively avoid detection and contact health and social services. Those needing information, education, counselling or other support services will be driven under ground. The person who fears he or she may be infected will be reluctant to seek assistance out of fear or of being reported with severe personal consequences. The net result would be jeopardising educational outreach and thereby exacerbate the difficulty of preventing HIV infection. Several researchers reported that due to such type of social stigmatization the majority of the infected people are lacking behind the several funding aids related to this disease (**Mann, 1989, Shak, 1994 and Baride, 1999**).

**Acceptability of Contraceptive Measures:**

Men can protect themselves against the sexual transmission of HIV, women find it more problematic. This is the difficult and sensitive
issue that challenges health promotion. The condom is seen at present as the only effective preventive measure against sexual transmission of HIV. Yet for many women whatever the cultural context to suggest to their husband or partner that they should use a condom is seen as the evidence of the woman’s infidelity or insolence. In the traditional society insisting on safer sex or refusing to engage in sexual relations is highly impossible for the Indian rural women. Ravindran Sundari (1995) judged the use of acceptability of a contraceptive method by a male. It had been observed that, men rarely come forward to utilize condom. They are unwilling to use the condom especially for contraceptive purposes.

Bhatlavande and Gangakhedkar, 1999 and Dainik Sakal, 2001, collected reports about use of barrier methods during sexual intercourse among prostitutes in the red light areas. Many of the prostitutes had claimed that, majority of the male clients or visitors do not accept the use of condom during sexual intercourse even if they suggest it and provide it free.

Drug Resistance:

Increasing resistance to antibiotics has become a worldwide problem in the treatment of some sexually transmitted diseases. The amount of penicillin required to cure gonorrhoea has increased more than a hundred-fold since this antibiotic was first introduced for the
treatment of this condition. Antal (1986) stated that the continued and indiscriminate use of antibiotics by a large number of misinformed physicians and health workers not only favours the development of further resistant strains but also results in more treatment failures. Longer periods of infectivity, disease transmission and of complications. Heymann (1997) reported that, resistance of antibiotics is a phenomenon common to both emerging and re-emerging infections. Many well-known antibiotics are no longer effective against common infections such as pneumonia, genorrhoa and tuberculosis. Again he has stated that, if the arsenal of drugs against infections diseases loses its power, to the future patients with even a common local infection will become bleak. Whereas Murugasampillay (1997) argued controversy, he opined that, the emergence of new diseases like HIV/ AIDS is strongly associated with the epidemics of tuberculosis and kaposi sarcoma. It is probably due to the appearance of new disease agents or changes in existing agents, with increased infections and increased resistance to various common drugs. By use of these drugs, it suppresses the signs and symptoms of certain diseases for particular period; which is resulted in delaying the proper clinical and therapeutic treatment.

Other Causes:

Along with the several factors mentioned above which are responsible for the spread of HIV/ AIDS at a faster rate throughout the world; there are certain different other causes also noticed by many of
the scientists and researchers. To break the moral responsibility, over
population, changing marital patterns, ignorance about sex, curiosity of
sex, vulgarity of love, wide exposure in the big cities (Antal, 1986),
poverty in the villages and slum areas, illiteracy (Last, 1997), unsafe
sexual behaviour, male domination of rejecting control measures during
sexual intercourse (Ravindran Sundari, 1998); impact of cable channel
networking etc. ... were the interrelated factors which
have contributed to more or less to the epidemic of STD's/ HIV/ AIDS.

The spread of HIV/ AIDS infection has introduced a new
dimension to the world. There are certain new issues emerging as a
impact of this epidemic; which are challenging to overcome and to
minimize the situation in the new era. The gross impact found due to
this epidemic on the social, economic and health status of the
individuals, families and communities is discussed here.

Impact of HIV/ AIDS on the Socio-economic Structure and Health
Status:

Mann (1987) pointed out that, family structure and functions
were threatened both by infection and the loss of ... parents. ... The
social and economic fabric was dramatically affected by the epidemic
illness and death among productive youths (20 to 40 years old). The
combined impact of the HIV pandemic of AIDS and AIDS related
diseases found upon health care, insurance, legal systems, socio-
economic development, entire culture and populations is tremendous.
Anderson and Kaleeba (1994) stated that, home care lends itself to the ‘Ups and downs’ of a disease like AIDS. It was tempting to rely heavily on the families to provide care at home. People with AIDS and their families suffer from the stigma frequently found in the communities and health care units. Fear stemming from lack of knowledge contributes to the rejection of people with AIDS and sometimes their carers too. Without any moral and financial support from working agencies, communities and families may abandon their traditional caring roles, this can result in despair among carers and ultimately in the homelessness of AIDS patients.

Oliveira and Diniz (1994) revealed the epidemic of HIV/ AIDS impact with gender bias. They reported that, women now represent a considerable proportion of all infected persons than men in the worldwide data recently. Moreover, the women have little or no control over their sexual availability and where the refusal of sex or suggestion of using a sheath could bring the risk of rows, violence or abandonment by the partner. Hence, women become mostly affected due to heterosexual HIV infection in terms of relationship between socio-economic status and risk behaviour.

Erben (1995) also focussed on the impact of HIV/ AIDS with prominent effect on women. She stated that, women have been often viewed as 'reservoirs of infection', posing a threat to men and also to
their babies. She again highlighted the factors like psychological, cultural, legal barriers to women's decision making or independent action contributed to the easy mode of infection. Lower literacy, limited mobility, dependance on men, limited access to information, moral-cultural attitudes towards sexuality were the negatively influencing factors which disabled women either to protect themselves from infection or incapable to protect others.

Shah (1994) reported the effect of epidemic of HIV/AIDS on the social structure in such Saharan Africa. He found that, many couples reported to reduce their desired family size. Since they may have to look after the children of their relatives who are destined to die because of AIDS. On the other hand, they may be motivated to have more children due to the perceived high risk of infant and child death. Whereas in many countries where the threat from AIDS is the greatest, it was unheard of children to have no family to care for them. Some family members did not accept even uninfected orphan due to false belief that they will bring them bad luck or even infect them with the AIDS virus. Orphans have therefore become a tragic legacy of AIDS in many countries around the world (Heymann, 1995). Hence, the thrusting need of AIDS orphan care centres is the greater demand throughout the world (Ranyajin and Yoddumnern; 1995). The epidemic effect also found that there is greater loss of young adults (Thuriaux and Cherney, 1997).
In most countries, about one young adult in five was seropositive, millions of grandparents were having responsibility to bring up their affected grandchildren. Baride (1999) noted the global impact of HIV/AIDS on the demographic and economic status. He stated that, a significant increase in the reduced level of immunity, threatened family system, death rate by 15 per cent and tremendous loss of ‘man days of work’.

In the study of WHO (2000) regarding the impact of HIV/AIDS on the socio-economic status, it is stated that, epidemic impact affected people in their most productive age. Increased spending on health care; a drain on health care resource, which includes expenditure on hospitals, drugs and staff. Whereas it also results in loss of production and productivity in all sectors of the economy. It includes women’s labour in and outside the home, loss of investment, loss of consumer and purchasing power, etc. In developing countries these costs may further affect already troubled and burdened economics. This effect will have to pay heaviest price by the least developed countries and by poor and marginalised people in every country. WHO (2000) also reported that there is a pressing need to develop a large numbers of beds in the hospitals especially for the care of HIV/AIDS infected patients.

Epidemic effect of this disease has also affected the health status of the individual and community very significantly. Antal (1986)
observed that, AIDS and related infections may be result in abortions, infant death, significant ill health in the infant, particularly causing nerve damage, eye or lung infection. Uncontrolled fever, diahorrea, which leads to severe weight loss, malnutrition and loss of immune power, resulting into re-emergence of a particular disease like tuberculosis, gastrointestinal diseases, neurological diseases, skin infection and allergies (Keusch, 1990; Kotler et.al., 1990¹; Chlebowski et.al., 1995; Saloman et.al., 1998; Kulkarni, 1999 and WHO, 2000).

On the whole there are large number of factors which contribute to the epidemic of HIV/ AIDS infection. Each responsible factor is interlinked with other. Hence, the effect of this epidemic is found as a global impact on the socio-economic and health status of the individual and the community. It is very great challenge to control this growth without any effective drug. However, prevention is the only remedy to minimise this epidemic situation.

C. Major Control Strategies for HIV/ AIDS:

Persons suspected or known to be HIV-infected should remain integrated with society to the maximum possible extent. They should be helped to assume responsibility for preventing HIV transmission to others. Hence, wide exposure, health and support to the infected person will help to neutralize the spread of HIV/ AIDS infection to the certain extent. But again stigmatisation and discrimination of this disease is
major hurdle found against the preventive step. Therefore, World Health Assembly resolution directed WHO "to stress to the Member states and to all others concerned about the dangers of the health of everyone, discriminatory action and stigmatisation of HIV-infected people. They stressed out that, people infected with AIDS are also the members of population groups." Protecting the human rights and dignity of HIV/AIDS infected people and members of at risk groups, is not a question of the 'rights of the many' against the 'rights of the few', the protection of the uninfected majority depends upon and is inextricably bound with the protection of the right and dignity of the infected persons.

WHO has stressed the need for human rights organizations, non-governmental and governmental, to play an active role in this area, particularly at the national and local levels.

Let us first see the global AIDS strategy and then other effective major strategies for the prevention of HIV/AIDS infection.

I. **Global AIDS Strategy and Programmes**

During mid-1970s to 1981, the first phase of the HIV/AIDS epidemic known as 'silent' due to unnoticed causes of AIDS spread. The second phase of the HIV/AIDS epidemic developed roughly from 1981 to 1985, in this period the discovery of the HIV virus; modes of HIV transmission and large number of people infected with HIV were
marked in certain countries by uncertainty. In many cases, individuals, communities and governments were reluctant to respond to, and even to acknowledge the AIDS epidemic. In the face of this uncertainty and in the absence of a unified response to the spread of HIV, in 1985 WHO drafted a global strategy for AIDS prevention and control. This marked the beginning of the third phase of the AIDS epidemic, that of global mobilisation.

The Global AIDS strategy was reviewed and revised in May 1987, it was approved and adopted by the Fortieth World Health Assembly as the basis for worldwide response to the HIV/AIDS epidemic. This unanimous endorsement of the Global AIDS strategy has been further stressed by the Venice Summit of the Heads of States or Governments (Venice; June, 1987), the UN Economic and Social Council (Geneva; July, 1987, July 1988), the UN General Assembly (New York, October, 1987, October, 1988) and World Summit of Ministers of Health on programmes for AIDS Prevention (London, January, 1988). The Global AIDS strategy is built upon three broad objectives: i) prevention of HIV infection, ii) reduction of the personal and social impact of HIV infection and iii) unifying national and international efforts against AIDS.

The worldwide effort against AIDS which is under way was highlightened on 1st December, 1988; when people in every country observed the first World AIDS Day.
Global Programme on AIDS (GPA) was first established in February, 1987 by WHO, as the vehicle for putting into effect the Global AIDS strategy. GPA has provided a practical framework for national efforts around the world, as well as for international programmes. Today, GPA is working with over 150 countries around the world, helping them to develop strong national AIDS programmes. They give financial support, policy guidelines and recommendations to maintain the struggle against discrimination. Under this programme and strategy, National AIDS Control Board (NACB) are established in many of the developing countries including in India. Whereas NACB are generating their work to different states and regions. Now at every district place, the special AIDS cells have been opined by the communicable disease control ward in the government hospitals. There are 42 surveillance centres in India monitoring the AIDS programmes. Beside this the non-government organisations are emerging in the private sector by accepting the challenge about the control of the spread of this disease all over the world.

II. Strategy for Awareness and Change in Attitudes Among the Society About the Transmission of HIV/AIDS Infection:

AIDS is essentially a sexually transmitted disease, sexual behaviour is the prime focus of action for interrupting transmission. It is therefore important to have an information and sex education programme (SEP) aimed at all men and women, including adolescents,
which is particularly aimed at those who are at greater risk of HIV infection. In the absence of a cure or a vaccine, health education or Information Education and Communication (IEC) remain the primary tool for combating the HIV pandemic. Hence, health programmes must promote and protect health in particular by fostering healthy behaviour and lifestyles. Along with these activities more emphasis should be given to the moral development of the individual which helps to enhance self image, community and then the nation.

In the developing countries including India, a number of challenges lie ahead in designing and implementing good IEC programmes. These includes: overcoming public sensitivities about talking about sex, condoms, and avoiding conflicting messages. The programmes are also adopted to increase the healthy sexual behaviour and practices, to overcome the difficulties in accessing target audiences, to give appropriate knowledge and attitudes of health care workers and others, involved in interpersonal communication, wide exposure to mass media, etc. Before embarking on programme; it is important to identify the target population with their awareness as also the channel of communication among the high risk groups, without the study of this, it is very difficult to reach at the preventive goal.

Gita Devi et.al. (1988) conducted the study confined to analyse the knowledge about sex, acquired by the 200 college students from
selected colleges in Godavari district of Andhra Pradesh. The study reported a positive association between the age of the respondent with level of sex knowledge, perhaps due to greater exposure and increased sexual maturity with increasing age.

**Garg et al. (1993)** carried out the study taking 70 PHC health workers as sample, at Gharuan district, Ropar for the evaluation of their awareness about AIDS. The study revealed that, there was no relation between basic qualification with the knowledge of AIDS among the health workers. Majority of them were just aware about AIDS and totally unaware about sexually transmitted diseases. None of the worker was able to mention the signs and symptoms of the disease for the purpose of clinical diagnosis. Most of the workers agreed to get training regarding knowledge, practices about the prevention of AIDS.

**Oliveira and Diniz (1994)** reported about women-sexuality and AIDS in Brazil. The study indicated that, women were just known about the use of condoms as a barrier method for prevention of population growth. Hence, the study suggested to promote use of condoms not only as barrier for the population but also in prevention of STD’s, HIV/AIDS and cervical cancer.

A study conducted by **Kapali (1995)**, focused on the knowledge and awareness of modes of transmission of HIV, tests to identify the virus, the high risk groups, hygienic health practices, ethical dimensions
and other basic facts about AIDS among 25 male and 25 female college students selected from Madras city. The study revealed that, a significant paucity in knowledge and awareness of HIV/ AIDS. Predominance of misconceptions, mere diffusion of information was not found sufficient in any AIDS education package. The study further called for research into suitable models of education to allay fears about AIDS. Conducting intervention programmes is an effective tool for the prevention of this disease.

Kannan and Prabhakar (1997) pointed out the positive impact of intervention programme in Tirunelveli urban complex of Tamil Nadu towards the imparting knowledge about the scientific facts of STD's, HIV, AIDS, the risk involved in unsafe sex, and the need for use of condoms. Discussion on organising personal counselling, guidance for proper treatment for sex born disease, the nature and composition of the commercial sex work and the workers, its network and circuit, and the problems encountered in the implementation of the intervention programme gives a wide angle of success the prevention of this disease.

Singh (1997) examined the sexual behaviour of 400 industrial workers at the 20-40 range of age (28 years of mean age) among married, unmarried and widow workers in the Coimbatore city and estimated the extend of perceived risk of AIDS spread. Study found that majority of the unmarried workers continued to have premarital sexual
contact. Among the married nearby 50 per cent workers continued to sustain heterosexual contacts. Only one third of the married industrial workers sustain sex life with their wives only. And more than one third of the respondents have indicated prostitute, acquaintance, relatives and others as their source of heterosexual contact. when the respondents were made aware of the HIV infection and its serious consequences, 15 per cent agreed to reduce their heterosexual contact. With regard to using condom as a protective device, 19 per cent workers agreed to use condoms. Among the married respondents, one fourth persons (12.5 per cent) who desired to continue to keep extra marital sexual contact agreed to use condom during extra marital sexual contacts.

III. Role of Mass Media Regarding the Prevention of HIV/ AIDS Infection:

Some studies also deal with the crucial role of mass media in the intervention of programmes and awareness about STD’s, HIV and AIDS. The mass media are effective in putting the message across to large populations, it can provide an initial introduction to the subject to the greatest possible audience. Ideally the information should be presented clearly, simply and specifically, and with sufficient variability between presentations, so that the audience would remain interested. For young people it is most effective if they can identify with the speaker, and a dialogue format enhances their sense of involvement. Clear
recommendations of health preserving behaviour tend to elicit the greatest degree of acceptance and action.

**Gitadevi et.al. (1988)** stated that, majority of the college students from Godavari district of Andhra Pradesh reported that, they had acquired information about sex in their 10th class science books. Discussion on sex occupied the second position. The study also quoted that communication between parents with their adolescent children regarding sex knowledge was at negligible level.

**Leslie-Harwit and Mecheus (1988)** described about the popular mass media materials developed by different countries regarding communication of messages about STD’s, HIV and AIDS to the large population. France had found that comics strips, posters and advertising cartoons, ‘booklet’, as a popular guide in Netherlands, the Swiss had created several brochures on AIDS; from plain leaflets to cartoons or illustrated magazines; the United States had set up a ‘hotline’ telephone service to provide information on STD’s and AIDS. Several developing countries had their own information programmes, making use of radio announcements and television spots. UNICEF had sponsored film by which small group, peer discussion offers an opportunity to share views in an informed, concerned and responsible sitting; they also encourage and endorse self-esteem; succeed in behavioural change and decision making about sexual healthy practices. In the process of transforming knowledge the non-projected audio-visual aids also play a vital role.
Viedmo (1989) collected the students reaction from University of Geneva about role of mass media playing with awareness regarding AIDS. The young people thought that, there was either too much information or not enough, in the sense that the media sometimes used AIDS to make a sensational story, with the result that the public felt that AIDS was ‘something that happens to others’. Information becomes misinformation which lead negative reactions. Hence, one should keep in mind that the misuse of messages when not chosen properly leads to misleading instead of awareness.

Dijkstra Rob (1992) pointed out that, small scale health education leads to better knowledge and attitudes regarding AIDS, but no measurable changes were found in behaviour such as condom use in the rural community. The study suggested, video shooting should be done within a set environment, the villagers would identify. It increasingly attracts many people who might have had little exposure to television and it can bring a group of people together, motivating them to pay attention to AIDS and join in discussions of the different methods of health education. Video in combination with group discussion seems to be the most effective method as it really leads to behavioural change.

Aggleton (1998) suggested certain guidelines for good participatory education programmes on AIDS. He reported that, facts and misunderstandings about HIV/ AIDS must be clarified and
corrected. The programme should include the available resources (helplines, counselling and clinical services), places where condoms can be obtained; sources of confidential guidance and support. For effective programme, planning, controlling and evaluation would be essential. **Baldo (1998)** suggested, through pilot projects on school based AIDS education, AIDS education must be introduced into school curricula by training teachers and developing appropriate teaching and learning materials. Dramatization is also the most effective method with involvement of young people in acquiring knowledge, attitudes and skills to prevent the spread of HIV/ AIDS/ STD's and to minimize discrimination towards persons living with HIV/ AIDS, stated by **Kuffman and Hue (1998).**

On the whole, it can be concluded that awareness through effective mass media is very useful and effective strategy which promotes the participation, communication, interaction, discussion and guidelines about the sex knowledge is essential. It gives a platform to express the attitudes and sexual behavioural problems. Hence, it helps to minimise the discrimination and stigmatization and automatically helps in prevention of the HIV/ AIDS spread.
IV. **Strategy on Nutrition Intervention Counselling to the HIV/AIDS Infected Persons:**

HIV-infected persons have repeated episodes of illness and impairment requiring medical based clinical and nursing care. The management and care of HIV/AIDS persons involves a continuum of care requiring the services of people working at various levels in hospitals, clinics and health centres with NGOs and care providers in the community and home. At each of these levels some or all of the following can be provided medical and nursing care, therapeutic and clinical dietetics, counselling and social support. Significant improvement in the quality of life has resulted when such care is made accessible to individuals and families. This has been proved a better strategy for considerable prolonging of acute stage and the quality of life can be maintained in the infected persons. Whereas the strategies for nutrition care should specifically address risk factors or other problems (such as inadequate food access, decreased nutrient intake, and body composition changes), identified by the nutritional status screen and assessments. A complete nutrition assessment includes a review of: medical history and risk factors, a medication profile, a nutritional profile, a biochemical evaluation, notation off psychological, economic conditions prognosis, and development of a medical care plan.

A number of researchers have assessed the effectiveness of dietary counselling on the nutritional status of the people with HIV/
AIDS. Authors of these studies suggest that intensive counselling and the selective use of oral nutrition supplements can be effective intervention. Therefore, nutrition education and counselling provided by a registered dietitian or nutritionists are the key elements of health care for persons with HIV/AIDS.

**Dowling et al. (1990)** found that, dietetic intervention after 12 weeks with HIV patients were noticed more significant to increase the intakes of most nutrients, the effect being greater with the symptomatic CDC IV group of the AIDS patients.

Nutritional status and infection both affect the body’s immune system; infectious diseases influences the individual’s nutritional status, and nutritional deficiencies can, in turn, increase susceptibility to infectious diseases. Studies on interactions among nutrition, immunity and infection have provided valuable insights into the determinants of infections and into immuno regulation. As patients with AIDS develop advanced manifestations of AIDS, mutually determinental interactions exist among nutrition, immunity and infection.

HIV infection effects specific subsets of helper lymphocytes as well as macrophages and monocytes this diminishes a patient’s immunity and leads to a variety of opportunistic infections and neoplasms. A nutritional deficiency or imbalance may influence specific systems involved in the progression of HIV disease which influence
susceptibility to opportunistic infections and contribute to the severity of response of HIV related disease.

Reste (1988) reported that, the opportunistic infections of AIDS lead to increased nutritional requirements. Infection from any source causes fever accompanied by increased basal metabolic rate. Therefore, the patient requires additional calories and supplies of nutrients. Moseson et.al. (1989) found that, zinc deficiency has been associated with a greater susceptibility to infections, many of which were specially associated with HIV infection. Iron or zinc deficiencies provide a conductive situation for candida and salmonella infections to which patients with AIDS are susceptible.

Ullrich et.al. (1989) studied 45 HIV-infected patients with gastrointestinal complaints to determine the structure and function of the intestinal mucosa. They found that, malabosorption associated with gastrointestinal symptoms was common in HIV infected patients.

Carolyn et.al. (1990) examined the nutritional status of HIV-infected patients during the early disease stages. They found that intake of protein, iron and vitamins A, C and B-12 net or exceeded the RDA for preliminary period of infection. Whereas mean calorie intake was below the estimated calorie requirement. The study also revealed that the mean intake of vitamin B6, B12, zinc, iron and protein gradually decreased during the 16 months observation period. Due to hypometabolic state;
intestinal absorptions of the pentose sugar, xylose and of the triglyceride triolein were also significantly diminished were noticed to by Kotler et.al. (1990)\textsuperscript{1,2}. Whereas Trujillo et.al. (1990) found majority of AIDS patients were hypoalbuminemic due to marginal level intake of protein through their regular diet.

Chlebowski et.al. (1995) assessed the dietary intake pattern of 68 HIV-infected patients. They found that, energy intake and serum cholesterol level were progressively decreased. Vitamin B6, zinc and folic acid were also taken less than the RDA.

Castebon et.al. (1997) conducted a study to assess the nutritional status and dietary intake in 100 HIV-infected patients. The study reveals that majority of the HIV patients had noticed appetite problems. This leads to their poor intake of energy, protein and fats than the recommended dietary allowances (RDA) by WHO. The tendency of nutritional intake found was at very lower rate in symptomatic HIV patients than in asymptomatic.

However, the lower intake of foods directly reflects upon poor nutritional status. Certain studies about the impact of poor intake of foods or nutrients leads to the protein cell depletion, weight loss and finally poor nutritional status in HIV/ AIDS infection are being illustrated.
Impact of HIV/AIDS Infection on the Anthropometric Indices of the Infected Patients:

The progression of HIV infection ultimately affects the anthropometric measurements like body weight, mid arm muscle circumference, tricep skin fold thickness, and body mass index.

Malnutrition, which is characterized by severe weight loss and depletion of somatic and visceral protein. Malnutrition is almost present in all patients with AIDS. Kotler et.al. (1985) found that, body cell mass of most patients with AIDS was significantly depleted at the time of death and the extent of this depletion was similar to that in other chronic disease. The time of death from a chronic disease may be determined as much by the body's energy reserve as by the activity of the disease process itself. In another study, Kotler et.al. (1989) observed that, the timing of death from AIDS correlates closely with the depletion of the body's energy reserve. They found that the extrapolated and observed values of body mass at death were 54 per cent in AIDS patients, whereas body weight at death was projected to be 66 per cent of ideal.

The symptomatic stage of HIV disease is often characterized by gastrointestinal dysfunction and malabsorption that contribute to severe nutrient and weight loss, noticed by Andrassay (1990). Also the weight loss occurs through mechanisms including reduced dietary intake, gastrointestinal malabsorption and alteration in metabolic errors of
nutrients. Severe malnutrition with a weight loss of 10 per cent or more of baseline body weight, was a diagnostic criterion for AIDS, stated by Calederon et al. (1990). Carolyn et al. (1990) focussed on the decreased nutritional status in HIV-infected patients. Decreases in body weight, per cent body fat, body mass index were the earliest indications of decreased nutritional status in the HIV infection. Whereas decrease in total protein concentration, total lymphocyte count over a period of 5 months, haemoglobin and hematocrit concentrations were severe indications of decreased nutritional status in HIV infected patients. Dowling et al. (1990) evaluated the 17 asymptomatic (CDC II) and 17 symptomatic (CDC IV) HIV patients by anthropometrically. They found that symptomatic HIV patients were significantly lighter and had significantly lower values for usual weight, current body mass index, mid upper arm, mid-arm muscle circumference, triceps and subscapular skinfold thickness. Severity of weight loss is directly associated with the mature progression of HIV and AIDS related complaints. Trujillo et al. (1990) pointed out that majority of the patients assessed with HIV had lost more than 20 per cent of their body weight during 15 months. They again stated that, the massive weight loss was coupled with diarrhoea.

Chlebowski et al. (1995) noticed the progressive loss of tricep skinfold thickness, mid-arm muscle circumference of the 68 AIDS patients with 10-15 months of their detection of HIV positive report. Most of the harmones play a measurable role in the human body,
particularly testosterone in the male body normally helps to preserve lean body mass. But in case of HIV infection, it lead to disturb the function of testosterone. Hence, inadequate testosterone levels in HIV positive men may exacerbate wasting syndrome. Fields-Gardner (1995) claimed that due to disturbed testosterone levels in HIV positive men the lean body mass develops rapidly.

Castebon et.al. (1997) examined the anthropometric indices of symptomatic and asymptomatic 100 HIV patients. They revealed that, majority of the patients were thin (BMI < 2.15 kg/m²) as they had lower body mass index. Symptomatic patients were on the average, slighter than asymptomatic patients. They had a smaller arm circumference, in relation to their lean body mass, reflected by muscle circumference. Symptomatic patients had suffered a greater weight loss than asymptomatic patients. patients with a count of CD4 < 200mm³ had mean weight, arm circumference and muscle circumference significantly lower than patients with CD4 > 200 mm³. A significant difference were observed when the anthropometric data was compared according to gender.

Impact of HIV/ AIDS on the Nutritional Biochemical and Clinical Deficiency Symptoms of the Infected Patients:

There are number of researchers who have examined the impact of HIV/ AIDS infection on the nutritional biochemical and clinical symptoms of the infected patients. Kotler et.al., 1984; Dworkin et.al.,
1985; and Gillin et al., 1985 assessed the AIDS patients by clinical and biochemical examinations. Abnormal D-xylose absorption and steatorrhea were frequently seen in AIDS patients with diarrhea. Malabsorption or disturbances in the metabolism of carbohydrates, proteins and lipids were noticed in the HIV infected patients due to the alteration function of insulin and glucagon, produced by pancreas, reported by Pike and Brown (1985).

Many of the researchers postulated that selenium deficiency is a factor in the pathogenesis of cardiomyopathy in AIDS. Antonechcia et al. (1988) found a significant selenium deficiency in the myocardia of eight autopsied patients with AIDS. Doworking et al. (1988) stated that, selenium deficiency was a common finding in AIDS which mostly associated with diarrhea and malabsorption. Mantero Atiemza et al. (1991)\(^2\) indicates that a low level of selenium may be a cofactor in the impairment of immunologic functions observed in persons with HIV-I.

Andrassy (1990) revealed that, trace element depletion has been observed during the asymptomatic stage of HIV infection. These deficiencies are early indicators of the need for nutrition intervention before malnutrition and weight loss becomes severe. He again reported that, decreased blood haemoglobin and zinc deficiency are associated with decreased cellular immunity and increased infection. Chlebowski et al., 1989, Colford et al., 1993; Guenter et al., 1993 and
Saah et al., 1994 also supported to the prognostically association between decreased albumin, haemoglobin and hematocrit levels with the very low counts of CD4 in the HIV infection.

Certain studies also reveal that some essential vitamins are found to decrease their level due to the impact of HIV/ AIDS infection. Harriman et al., 1989 observed that, 8 of 11 patients with AIDS had reduced absorption vitamin B-12; which may be a very early manifestation of the disease. Bogden et al. (1990) pointed out that more than 25 per cent of patients with HIV-infection had deficiencies of ascorbic acid, carotenes, choline or zinc. Whereas more than 10 per cent of the patients had suffered from vitamin A, B6 and Vitamin E deficiencies. Borton (1990) reveals low level of vitamin B6 correlated with low numbers of T4 cells and with abnormal results of lymphocyte stimulation tests in the HIV infection. Javier et al. (1990) assessed the status of antioxidant nutrients i.e. vitamin E, C, betacarotene and selenium and measures of immune function in 70 HIV positive homosexual men who had no symptoms or signs other than lymphadenopathy. Their findings suggest a relationship between antioxidant nutrients and both humoral immunity and natural killer to cytotoxicity.
Impact of Therapeutic Dietetic and Nutrition Counselling On the Nutritional Status of HIV/ AIDS Patients:

There are several studies focussed on the intake of essential amounts of certain nutrients i.e. protein, carbohydrates, vitamins and minerals, to improve the immune function. Likewise many of the studies have also proved the effect of nutrition counseling, nutritional therapy treatment or dietary treatment to enhance and to maintain the nutritional status of the HIV patients. Such studies are collaboratively reviewed here.

A survey of Mantero-Atienza (1991) documented that 80 per cent of asymptomatic HIV-infected patients changed their diet at the time of or subsequent to their HIV diagnosis after the nutrition intervention programmes conducted in their respective areas. Majority of the patients decreased their intake of animal products and increased their intake of vegetables and seafoods, 87 per cent participants viewed, vitamin and mineral supplements of key importance in influencing their immune function than other nutrients. Some patients followed strict dietary regimens such as drinking a quart of freshly pressed orange or carrot juice every day, or following a ‘fruit juice day’ every week. Whereas patients often restricted the intake of fat, cholesterol and salt on the advice given by a concerned friends in the programme. Number of researchers highlighted in their respective studies that, use of different types of nutrients and special diets as a supplements along with their
regular diet of HIV/ AIDS patients found crucially important gain weight and decrease the risk of progression from HIV to AIDS.

King et.al. (1989) have shown that HIV patients experienced increased weight gain and good tolerance when elemental or peptide-based diets were given at home. In future, they suggested that, it is possible that nutritional pharmacological modules (i.e. adding n-3 fatty acids, glutamine, arginine and structured lipids to existing formula) will be useful for patients with AIDS to maintain their body weight.

Jeanne, et.al. (1991) indicated that, the supplement use of megadose levels of vitamin ‘C’, ‘E’ and minerals like zinc and iron had found benefitted to the AIDS patients.

Abrams et.al. (1993) prospectively studied the relationship between dietary intake at baseline and the development of AIDS during the course of 6 years in HIV-1 seropositive men. They documented that the hazard of AIDS decreased as consumption of micronutrients increased. When supplements were included, median intakes for most micronutrients reached to 300-350 per cent of the RDA among the AIDS patients. Tang et.al. (1993) reported that, high intake of vitamin ‘C’ (> 715 mg/day) niacin (> 61 mg/day) and zinc (> 1.3 times the RDA) at baseline were associated with a slower progression from HIV to AIDS.

Topping et.al. (1995) explained that, supplementation of Medical Nutritional Sample Snack Pack (MNSSP) given to the HIV patients
found tremendous effect on gaining their body weight within 4 to 8 weeks of period.

Glutathione peroxidase (GPX) and catalase glutathione (GSH) status plays an important role in the natural enzymatic defence system in detoxifying hydrogen peroxide in water. Selenium and beta-carotene supplementation could be great interest in protecting cells against oxidative stress. *Marie-Christin, et.al. (1996)* investigated the effect of selenium and beta-carotene supplementation in HIV-infected patients with relation to blood enzymatic antioxidant system; as GPX and GSH activity. They found that, GPX and GSH activities were significantly lower than in control subject; GPX and GSH activity increased significantly after the selenium and beta-carotene treatment in the HIV patients.

*Suttmann, et.al. (1996)* examined the effect of oral nutrition support with a fortified formula on the nutritional status of 11 HIV symptomatic patients. Formula fortified with ω-linoleric acid (1.8 g/day); arginine (7.8 g/day) RNA (0.75 g/day) and a standard formula were supplied to the HIV patients for 4 months. Fortified formula resulted in a weight gain (+ 2.9 kg/4 months vs – 0.5 kg/4 months with the control formula; P < 0.5), whereas no change in CD4 + lymphocyte counts were observed.
Stack, et.al. (1996) evaluated the use of high-energy, high-protein, oral, liquid, nutrition supplementation and nutrition counselling on the weight status of HIV patients. The study found that, majority of the subjects were able to gain or maintain weight with an average consumption of 11 ± 4 supplements per week for 6 ± 3 weeks. The overall weight changes was observed as 1.1 ± 2.2 kg.

Rebecca Hoh, et.al. (1998) conducted a study on the effect of oral nutritional supplements as whole casein protein (WP), with an enzymatic digest of a soy peptide-based (PEP) supplements in AIDS patients with weight loss for 49 subjects to 6 weeks period. The study observed that, supplementation of WP and PEP to the HIV patients noticed a significant increase of total energy intake and protein intake and also gained weight as compared with non-supplemented group of HIV patients.

Salomon, et.al. (1998) assessed an elemental diet containing medium-chain triglycerides and enzymatically hydrolyzed protein for the improvement of gastrointestinal tolerance in HIV infected patients. The results indicated that, feeding a nutritionally complete elemental diet containing 70 per cent of total fat as medium chain Triglycerides (MCT) significantly reduced fecal fat excretion and fecal fat concentration compared with a mixed food diet containing comparable total fat. Hence, the study suggested that, enteral feeding of HIV-
infected subjects with elemental diets can be an effective tool for the management of diarrohea.

Some studies also revealed the reverse effect of supplementation with megadoses of certain vitamins, minerals and other nutrients to the HIV-infected patients. Research carried out by Chandra and Dayton; 1982; Chandra; 1983 and 1984; Kochan et.al., 1984 and Food-Nutrition Board, 1989, have reported that excessive consumption of iron and zinc (greater than 20 times the RDA for 6 weeks) impair immune function. Whereas intake of vitamin ‘C’ in large doses given to AIDS patients may result in kidney stone formation and rebound scurvey which was observed by Guthrie (1986) and Food-Nutrition Board (1989). Martin et.al. (1991) also stated that, megadosing with certain nutrients may stimulate or depress immunity and increase susceptibility to infectious diseases.

Impact of Drug and Current Interventions to Control HIV/ AIDS:

Nutritional deficiencies can interfere with the delivery and metabolism of drug that may be harmful to the patients with AIDS. Malnutrition associated with HIV-related disease may alter the pharmacokinetic and pharmacodynamic responses to drug therapies used to decrease viral replication, boost immune response and treat opportunistic infection (Jansen and Teasley; 1988). Good nutritional status may influence a person’s response to drug therapy by decreasing
the incidence of adverse drug reactions, providing adequate substrates for reactions invoked by the medications and supporting organ functions (Raiten, et.al., 1991). Moreover, Baum, et.al., 1991 and Coodley, et.al., 1993, suggested that the therapeutic regimen with ‘Zidovudine (AZT)’ may play an important role in the nutritional abnormalities associated with treatments among AIDS people. Nucleoside analogues (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), and protease inhibitors (PIs) are the recommended drugs by Food and Drug Administration (FDA), USA. Instead of single use of this drug, regimes 2 NRTIs + PI or 2 NRTIs + NNRTIs or 2 NRTIs using a combination or two or three drugs belonging to different categories is now recently advocated as a aggressive management to inhibit the replication of HIV or reduction in viral load. Afterall these recommended drug therapies are mostly dependent on the diagnosis, of the infected patients. In conjunction with opportunistic infection basically there are two factors taken into account to confirm a diagnosis of HIV/ AIDS. First the number of CD4 cells in the blood drop to below 200 per microliter whereas a normal count is 800 to 1200 per microliter. Second, it is essential to demonstrate the presence of HIV in the blood using sensitive blood tests, the most widely used being the ‘Enzyme Linked Immuno Sorbent Assay (ELISA) which detects antibodies generated by the body in response to infection by HIV. Antibodies against HIV, however, start appearing in the blood in significant amount only 6 to 12 weeks after a
person has been infected with HIV. If the blood is tested in the period immediately after infection, known as a ‘window period’, the ELISA test will fail to indicate positively even though the virus is inside the white blood cells (WBC’s).

There are other diagnostic tests which are probably used in developed countries as a confirmative tests. These tests are not affordable in developing countries due to their high cost. These confirmative tests are as:

a) **The Western Blot Test (WBT):**

   This test is highly reliable. If ELISA is positive, this test is used to confirm the infection. The cost required for this test is approximately Rs. 1000 to 1200.

b) **Polymerase Chain Reaction (PCR):**

   This a new technique which can be used for early detection of the HIV infection, even before ELISA and WBT. This technique can be used to multiply one DNA molecule millions of times so that it can be detected by other tests. This is used to detect the HIV virus in a situation when antibodies are not yet developed.

c) **Viral Load Test (VLT):**

   It is a quantitative test which can determine with high reliability the approximate amount of viruses in the patients circulation. This test is usually used in drug trial and in patients who are on anti-HIV drugs.
d) The CD4 Count:

This test is widely used due to its sophistication. This is used to count the number of CD4 lymphocytes in the blood of HIV infected persons or number of defence cells in the patients blood circulation. It is usually obtained to establish baseline information for a patient before initiating treatment with Azidothymidine (AZT) treatment and thereafter monitoring the course of infection. A low CD4 cell count implies that the patient is more vulnerable to opportunistic diseases.

Along with the drug therapies certain researches are also going on to find out the remedies to control the HIV/ AIDS infection load. Sharma et.al. (2001) reported that, the protein extract from ‘Cinnani’ – a seafood, developed by aquaculture department in National Oceanography Centre, Goa. Where they found it effective against reducing the infection load and minimise the AIDS related complaints among the HIV/ AIDS infected persons. Besides this an ayurvedic therapies are also seen a positive impact in the improvement of CD4 cells count in HIV patients.

Hira et.al. (2001), Director of AIDS Research and Control Centre, Mumbai explained that, some traditional ayurvedic plant extracts are noticed to control the production of HIV in the human body as well as it helps to boost the body’s immune systems by 200 per cent over a period of seven days. The team found that CD4 cell counts increased in the patients by 50 to 200 per cent. A similar results are also reported and
supported by Kulkarni (1999). Even now the production of special condoms are developed at a cheap rate. These condoms are made up from spermicides containing Nono-xynol-9 (N-9) on the inside tip of the condom. Use of such type of condoms found effective in destroying both sperm and HIV virus.

However, evidence from the above review strongly support the hypothesis that nutrient deficiencies play a crucial role in the pathogenesis of HIV disease. Along with the use of allopathy, ayurvedic therapies, techniques or technology developed recently and nutrition strategy are effective remedic areas. But basically achieving optimal nutritional status in patients with HIV through nutrition care and dietary counselling strategy would be much better and preferable. Hence, the nutrition programmes must be launched to address the need of AIDS patients supported with drug therapy and change in attitudes of the infected patients is the prime need to control over the spread of infection.
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