More than two and half decades into the HIV/AIDS epidemic, we have witnessed significant treatment advances, yet the influences of self and society continue to have a considerable impact on quality of life among the HIV infected. To the extent that new medications don’t represent a cure, but a step forward in transforming HIV/AIDS from a deadly disease to a manageable chronic illness. Recent reports of a study estimates that HIV treatment will work for a quarter of a century (HIV Weekly, November, 2006). After HIV treatment was made available in late 1990s, it was thought that the life expectancy of somebody newly infected with HIV was between eight and thirteen years. But thanks to the pharmaceutical polytherapies-called generally Highly Active Anti-Retroviral Therapy (HAART), developed in 1996 has caused a sea-change in the way people with HIV could be cared for medically. Because of these potent combinations, people with HIV are now living much longer and healthier lives. Many doctors are now optimistic that most people who are treated with HIV therapy (and who take it properly and don’t find the side-effects too intolerable) will live a more or less normal life.

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span. Researchers in America have estimated how long HIV positive people in a large study can expect to live after starting HIV treatment. It is recommended that HIV treatment should be started when a persons CD4 cell count is 350 and asserted that if a particular regimen is followed as suggested by the UK treatment guidelines, they can live up to 25 years. There is a reliable evidence that if viral load is kept to undetectable levels, an HIV treatment combination will work for an indefinite period (HIV Weekly, November, 2006).

In the past, HIV disease meant almost invariably downward health course. New highly active retroviral therapy (HAART) regimens have improved health outlook for many persons living with HIV/AIDS but may create new psychological and coping challenges. Due to medical advancements, many people living with HIV infection in developed countries are living longer (Palella *et al.*, 1998). HIV infection can now present as a chronic illness with an uncertain natural disease history. The changing course of HIV infection has lead to a potential increase in the prevalence and impact of disability in people living with HIV infection. Despite the advances in the antiretroviral drug therapy, a vaccine or cure for HIV is still unavailable and not expected in the near future. Yet the improvements in the quantity of life do not necessarily imply enhancement in quality of life complimentary strategies for the management of HIV disease are important adjunctive therapeutic modalities. In this context it has been shown that HIV disease seems amenable to behaviour-based interventions designed to enhance health status and delay disease progression. Adherence to highly active antiretroviral therapy (HAART) coupled with good health behaviour, can contain HIV/AIDS in most instances. In contrast, poor HAART adherence coupled with poor health behaviour can lead to drug resistance and infection of partners with virulent mutated strains. Thus, now more than ever, behavioural medicine approaches to management and secondary prevention of HIV/AIDS are needed (Schneiderman, 1999).
Psychosocial treatments provide a method for conducting causal investigations within a clinical environment, that can also reveal about relations between psychosocial and bio-behavioural processes on the one hand and disease on the other hand.

**Psychoneuroimmunology and HIV/AIDS**

The plethora of research in the field of psychoneuroimmunology in last two decades, have also resulted in concerted efforts to summarize the research results for application to the deadly infection of the era of HIV (Lichtenstein, 1995; McDaniel & Gillenwater, 1999; Schneiderman, 1999). More generally, reviews have been produced to document the contribution of psychoneuroimmunology to explain stress-associated immune deregulation and it’s importance for human health (Glaser, 2005), psychological stress and human immune system (Segerstorm & Miller, 2004), the role of different psychological intervention in modulating aspects of immune function in relation to health and well-being (Gruzelier, 2002, 2002a), even with specific reference to hypnosis, relaxation, and guided imagery in relation to individual differences.

In his review Lichtenstein (1995) analyse that in what way the effect of stress has affected the immune parameters and disease progression reviewing earlier studies basically produced from Keicolt - Glaser and Glaser’s laboratory in Ohio State University and Miami group’s intensive research which were instrumental in measuring the direct physiological effects of stress on immune parameters. Keicolt-Glaser and Glaser evaluated the immune functioning of medical students (Glaser et al., 1985, 1986, 1987). Findings of study suggested that during periods of stress, in this case examination periods, students had a decrease in NK cell activity. NK cells are involved in non-specific immune surveillance against tumour cells and viruses. Additionally, gamma interferon levels (which aid in the body’s ability to produce cells to help fight infection) and blastogenesis (ability of cells to transform to
larger, more potent forms upon contact with foreign material) were lower during exam periods. These levels returned to normal after the stressful event was concluded. However, regardless of the familiarity of the stressful event, that is, no matter how many times the students had taken exams, they continued to have a decrease in immune functioning. Finally, Glaser found that students with a sense of isolation and loneliness (a control parameter) had lower NK cell activity than those students who did not report such feelings. This may be interpreted as suggesting that those who viewed the examination process as threatening and stressful experienced a greater decrease in immune functioning as measured by NK cell activity.

Snyder concluded that not only is the individual’s hardiness a factor, but the form stressful events take is of equal relevance (Snyder, 1993). In her study, Snyder assessed patient’s response to a novel antigen—a substance that induces an immune response (along the lines of an allergic reaction)—in the context of stressful events. She reports differences for patients experiencing and defining stress in terms of good versus bad. The group with bad stress, (those with repeated daily hassles as opposed to brief and infrequent major stress) had decreased immune function as measured by the proliferation of lymphocytes (B and T cells). The intensity of these daily hassles was of key significance. Like the previous studies, stress levels were measured by patient’s self report and a variety of mental health scales. Not only is the individual’s ability to cope with situations a factor now, but the intensity and frequency of the stressful event are of importance. Studying the psychological parameters of health, Kobassa, (1983) has introduced the concept of “hardiness”, which consists of commitment, control, and challenge. Commitment involves ones feelings toward work, family, social encounters and self. Those with commitment experience a sense of purpose within themselves and in what they do; they perceive themselves to be vital and active participant in their own lives. In opposition to commitment
lies alienation, a sense of isolation from the world. Control refers to a sense of power. Those with a high profile of control perceive that they can influence the outcome of events affecting them. Challenge is the ability to view all situations as potentially positive with successful outcomes. Individuals who experience low levels of challenge often perceive any given situation as a threat to their health and well-being. The works of those studying HIV infection and AIDS in context with hardiness scale (Kobassa, 1983) has contributed further insights. Although not mentioned in her work, others believe a fourth “C” should be added to the scale, namely community, also classified as social support (Solomon et al., 1987). Community plays a large role for those in a medically challenging situation. This last factor can help foster and maintain the individual’s control, commitment and challenge. Support involves the patient’s ability to access help in both the emotional and the problem-solving realms. Such behaviour would include expression of feelings, emotions, and thoughts, and accessing information from others; such as advice or explanations. Those who demonstrated such behaviour were reported to have a longer survival rate after exposure to Pneumocystis Carinii Pneumonia.

At the Centre for Biopsychosocial Study of AIDS at the University of Miami, researchers set out to further evaluate the behavioural changes that may affect immunological functioning. They conducted a variety of studies following groups of asymptomatic, healthy gay males for 5-10 weeks prior to and following notification of their HIV-1 antibody status (Antoni 1990, 1991, Antoni et al., 1991). Subjects were divided into intervention and control groups. Measured biological outcomes were evaluated by immunological, endocrinological, and neuropeptide levels for the duration of intervention prior to notification, and immediately after notification as well as follow-up intervals throughout the year post notification. Some 24 measures were assessed, including total T cells, B cells, T-helper cell subsets, NK cells subsets, serum IgG, IgA, and IgM, Epstein - Barr virus antibodies, plasma
cortisol and beta-endorphin levels. The psychological measures involved hardiness parameters, sexual and health behaviours, affect inventories, etc. The authors admit that controlling for confounding factors (factors not considered or evaluated such as sleep and physical activity levels) and compliance remains problematic. However, their research again yields support for the concepts offered by Kobassa. The individual’s ability to cope with a situation, the person’s hardiness, and belief system affect immunological, endocrine, and neuropeptide levels.

Their theory is as follows: control subjects showed anxiety, depression, and isolation leading to activation of the sympathetic nervous system (commonly viewed as the flight or fight system) and CRH (cortisol releasing hormone). This then leads to the increase of peripheral catecholamines and/or cortisol levels. When these levels are elevated, a decrease of positive immune enhancing hormones, peptides and cells occurs by way of negative feedback. These include interleukin-1, interleukin-2, and gamma-interferon to name a few. Once the decrease of positive hormones takes place, what has been found is a decrease in the ability of NK cells to attack foreign material, a decrease in the ratio of CD4 to CD8, and the decline in blastogenesis. The authors propose that when a person has undergone some form of stress management, this cascade fails to become engaged at such an intense level. The parasympathetic nervous system (the system responsible for general relaxation and calmness) then predominates. Thus, no increase in cortisol, peripheral catecholamines, and CRH occurs. An increase in the interleukin and interferon levels follows, as well as an increase in beta-endorphins and met-enkephalin. The final result is immune enhancement with an increase in NK cell activity, increase in CD4 and CD8, and increase in blastogenesis. This, they suggest, may decelerate possible disease progression.

Discussing the effect of psychoneuroimmunology and HIV disease progression mainly from epidemiological studies,
McDaniel and Gillenwater (1999), highlight the role of stressful life experience in declining lymphocyte population (Evans et al., 1995, 1997, Lesserman et al., 1999); role of depression (Lyketsos et al., 1993; Zorilla et al., 1996), bereavement (Kemeny et al., 1995), loneliness (Miller et al., 1997), pessimism and closetedness (Byrnes et al., 1998; Cole et al., 1996) on faster disease progression and lowering the efficiency of immune system.

The present chapter reviews the recent literature identifying areas where intervention studies have been conducted to highlight the role of psycho-biological factors in managing and supporting the well-being and health in the life of people living with HIV/AIDS. Cutting across the barriers of the disciplines (psycho-social, biomedical, or public health system), the chapter tries to integrate the findings of the research to suggest a module for health care for people living with HIV/AIDS.

**Role of Positive Emotions, Coping Effectiveness and Social Support**

In the last decade a lot of research has focused on the effect of positive emotions on health behaviour specifically health enhancing and disease preventing behaviour (Salovey et al., 2000; Taylor et al., 2000, Chesney et al., 2005). Following the biopsychosocial model’s emphasis on ‘conservation-withdrawal’ as a protective response to health (Engel, 1971), studies have been inspired to study the relationship of coping effectiveness and social support with health protection and disease progression. Chesney et al. (2005) in a review article on how positive emotions have been used in behavioural medicine, have reviewed intervention studies where positive emotion has been used to show salutary effect on health. Positive emotions can speed recovery of physiological response to stress (Frederickson and Levenson, 1998). Participants who viewed films designed to elicit positive states, following exposure to an initial fear arousing film, exhibited faster cardiovascular recovery than people who viewed...
sad films after the initial film. Further support for this association can be drawn from the literature on self-enhancers. As defined by Taylor et al., (2003) self-enhancers are individuals who characterize themselves in a manner that emphasizes their positive qualities. Laboratory research shows that person’s scoring high on self-enhancement have lower baseline cortisol levels, lower cardiovascular recovery than those who are less self-enhancing (Taylor, et al, 2003). HIV positive men who reported being more optimistic about their ability to slow the progression of their HIV disease practiced better health habits than did their more pessimistic counterparts (Taylor, et al., 2000).

Chesney and her colleagues in a series of studies have studied that coping effectiveness training as an intervention using stress and coping theory and elements of cognitive behavioural stress management intervention techniques in HIV positive people (Chesney, et al., 2003; Chesney and Folkman, 1994; Chesney, Folkman, and Chambers, 1996). The first study, using a randomized clinical trial reports that, by encouraging participants to acknowledge and share positive experiences in the treatment groups, keep track of positive events at the end of the day, use humour in coping, and identify sources of meaning in their lives, participants of experimental group (receiving Coping Effectiveness Training (CET)) demonstrated significantly greater decreases in the perceived stress, state anxiety and greater increases in a measure of coping self efficacy compared control. Based on these findings, Chesney et al., revised the intervention to include more specific training to enhance positive affect and meaning in life. Exercises were added to the group based intervention to train participants to recognize small positive experiences that occur in everyday life, acknowledge the positive experiences to others, and identify how the event or experience is meaningful in terms of personal values, and goals. The revised form of CET was tested in randomized clinical trial with 199 men living with HIV/ AIDS, who met inclusion criteria indicating elevated negative
affect. The findings of the second study was similar to that of the previous study (Chesney et al., 2003) but focused more on measures of positive affect like the measures on Positive States of Mind Scale and the Stress Related Personal Growth Scale. These findings indicate that the cognitive interventions can enhance positive affect and that these improvements are sustained over time. Remien et al. (2003) Using an enhanced stress and coping model to explain depression among HIV positive women, the research reported that interventions focused on improving coping self-efficacy, bolstering social support and decreasing stress in the lives of HIV positive women may help to reduce the negative effects of HIV disease on mood. In another study, Chesney et al. (2003) found that older men with HIV/AIDS were affected by social support more to effect their negative and positive mood than their younger counterparts.

Thus, being positive about day to day life experiences, reiterating positive life experiences, expressing positive emotions, perceiving meaning in life, bolsters the coping efficacy and reduces depression in the life of HIV positive people.

**Role of Spirituality in Disease Progression in HIV/AIDS**

Last few years in HIV/AIDS intervention research has seen a growing trend to correlate spirituality and religiosity with the positive affect and well being in HIV/AIDS patients. Ironson et al. (2004) studied the relationship between spirituality/religiousness index with long survival, health behaviour, less distress and low cortisol in people with HIV/AIDS. The authors found that four factors, sense of peace, faith in God, religious behaviour and compassionate view of others were significantly related to long survival with AIDS. Long survival was also significantly related to both frequency of prayer (positively) and judgmental attitude (negatively). In addition the spirituality-religiousness (SR) index yielded strong and significant correlation with less distress, more hope, social support, health behaviours,
helping others, and lower cortisol levels. Further, they identified urinary cortisol concentrations and altruistic behaviour as mediators of the relationship between SR and long survival. The implications suggest that being altruistic and less judgmental about others negatively affect disease progression and long survival positively. Chibnall et al. (2002) reported on the basis of their research to identify the role of demographic factors, disease, health care, and psychosocial- spiritual factors associated with death distress (death related depression and anxiety) that higher death distress was significantly associated with living alone, greater physical symptoms severity, more severe depression symptoms, lower spiritual well-being and less physician communication as perceived by the patient. So, attention to enhance the spiritual well-being was highlighted to buffer negative effects and death distress. Bormann (2006) studied the effect of Spiritual Mantram Repetition on HIV outcomes in a randomized controlled trial. The author examined the efficacy of a psycho-spiritual intervention of Mantram repetition - a word or phrase with spiritual association repeated silently throughout the day on psychological distress (intrusive thoughts, stress anxiety, anger and depression), quality of life, enjoyment, and satisfaction and existential spiritual well-being in HIV infected adults. The results showed that Mantram group improved significantly more than the control group in reducing trait anger and increasing spiritual faith and spiritual connectedness. Actual Mantram practice measured by wrist counters was inversely associated with quality of life, total existential spiritual well-being, meaning/peace, and spiritual faith. Intent to treat findings suggest that a Mantram group intervention and actual Mantram practice each make unique contribution for managing psychological distress and enhancing existential spiritual well-being in adults living with HIV/AIDS. In the extensive review on psychosocial factors, spirituality/ religiousness and immune function in HIV/AIDS patients, Ironson, et al., (2004) observed that diseases, such as tuberculosis and herpes, have been found to
be prone to be influenced by psychological and social factors that affect immunological resistance to them, so, too, has HIV. Because HIV is a disease characterized by immune system dysfunction and is also resisted by the immune system, it would seem that psychoneuro immunological effects on immune functions might have an even greater impact on the course of other infectious diseases. In particular, it appears that people’s psychological health, their ways of coping with stressors, social connections and beliefs and attitudes can play a significant role in the course of HIV infection. It also appears that individual’s religious and spiritual beliefs can affect these factors, thereby, indirectly playing a role in the course of HIV infection as well. Ironson et al. (2004) emphasized the impact of religious and spiritual beliefs and practices on the psychosocial factors that affect the disease progression and discuss the implications of the relationship for the treatment of HIV/AIDS. Koenig and Cohen (2002) in their edited book “The Link Between Religion and Health: Psychoneuroimmunology and Faith Factor”, also focused on the fact that religion helped individuals cope with stress through an existential exploration of why they had the illness; and attributed positive outcomes to the ameliorative effects of social support and concluded that religious participation enhanced social resources. Studies which have tried to examine the psychosocial factors that may be associated with reduced psychological distress and improved quality of life in HIV infected men and women, have reported association between adjustment and illness severity, coping style, perceived social support, optimism, meaning and spirituality in the stress and coping model. Amongst all the psychosocial variables in the model, a positive sense of meaning in life and fewer HIV related symptoms were the two predictors that uniquely contributed in explaining reductions in psychological distress. Similarly, the use of spirituality, a positive sense of meaning in life and fewer HIV related symptoms were the predictors that accounted for unique psychosocial resources that
may positively influence adjustment for those living with HIV infection (Koenig and Cohen, 2002).

**Intervention with Cognitive Behaviour Stress Management**

Stress management intervention for HIV positive persons have been designed to enhance coping skills and encourage health-promoting behaviours with the hope of decreasing distress and slowing disease progression. Carrico *et al.* (2006) studied the efficacy of a cognitive behavioural stress management (CBSM) intervention in combination with medication adherence training (MAT) in 130 gay and bi-sexual living with HIV infection. They concluded that although denial coping may be an effective means of distress reduction in the short term, reliance on this coping strategy may result in a decreased capacity to effectively manage a variety of disease related stressors in the long-term. CBSM-MAT addressed this potentially detrimental pattern by teaching stress reduction skills that may decrease depressed mood via reduced reliance on denial coping. Few (HIV+) homosexual men indicate that a group-based cognitive behaviour stress management interaction can decrease distress, buffer the psychological and immunological sequel of HIV+ sero-status notification, and improved surveillance of herpes viruses. Decreased dysphoria induced by CBSM appears to be a significant mediator of control over cellular immunity (Schneiderman, 1999). Antoni *et al.* (1991) in a comparative pre-post intervention study of a control and experimental group have reported that, one week after the sero-status notification, blood samples and psychometric data with control subjects showed significant increase in depression, but only slight decrease in mitogen responsivity and lymphocyte cell counts. Seropositive CBSM subjects did not show significant pre-post changes in depression and reveal significant increase in helper induced (CD4) and natural killer (CD8) cells. Moreover, the authors report that the slight increment in proliferative responses of phytohemagglutinin difference analysis suggests that
the psychological buffering and immunological effect of the CBSM manipulation may be attributable, in part; to relaxation skills practiced or to a general willingness to comply with the intervention guide. Thomason et al. (1996) discuss the psychosocial and psychological challenges faced by the HIV infected individuals, families and caregivers and the application of cognitive and behavioural strategies for intervention with these populations. Studies conducted on HIV positive homosexual men indicate that a group-based cognitive behaviour stress management (CBSM) interaction can decrease distress, buffer the psychological and immunological sequel of HIV+ serostatus notification, and improved surveillance of herpes viruses. Decreased dysphoria induced by CBSM appears to be a significant mediator of control over cellular immunity.

In all the studies conducted by the Miami group cognitive or behavioural modification was the main intervention offered. However, in a few studies, the effects of aerobic exercise were also examined. The results strongly indicated that at the time of notification of HIV antibody status, those who participated in the cognitive or behavioural modification or the aerobic exercise protocols experienced less or minimal decrease in immunological parameters. As opposed to control groups, psychological measures for depression post notification were less affected. The authors hypothesized that both the cognitive or behavioural intervention and the aerobic exercise facilitate better coping skills for the individual by acting as a buffer system to anxiety and depression. By offering individuals a method for coping and reframing the situation, the individual can view the information at notification as controllable and as a challenge. Furthermore, by engaging in aerobic conditioning or behavioural restructuring, the individual has been supposedly gaining a sense of commitment to his or her health. These interventions provide the individual with a sense of control, self-esteem, and power. Without these, a cascade of may events occurs which decreases the immunological, endocrine, and neuropeptide functioning of the individual.
Role of Hypnosis, Relaxation and Guided Imagery

Laidlaw et al. (2004) studied relationship of hypnotizability to changes in HIV immune blood markers as a response to psychological interventions. They administered a course of four weekly 2 hour training sessions coupled with self-hypnosis practice to HIV positive people who were naive to antiretroviral (ARV) medication. When highly hypnotizable subjects were compared to those of lower hypnotizability in a repeated measure analysis, their CD4+ T lymphocyte counts were significantly higher. Hypnotherapeutic interventions have been administered successfully for different symptom management in HIV positive people. Langenfeld, Cipani, & Borchawdt (2002) studied the effect of hypnotherapy on control of HIV/AIDS related pain in an intensive case study with A-B time series analysis design with an 11 weeks intervention period. There was a significant improvement in pain related symptoms and medication as a result of hypnotherapeutic intervention. The efficacy of hypnosis in the treatment of pruritus in people with HIV/AIDS has been studied by Rucklidge and Saunders (2002). In a time series study they gave 6 session self-hypnosis treatment (relaxation, deepening, imagery and home-practice) to HIV positive men and found that the intervention successfully helped in symptom management in the post intervention and follow-up data. In another study (Fukunishi et al., 1997) examined the efficacy of relaxation techniques in a sample of HIV positive people without AIDS in the early stages of infection, two experimental groups, one with relaxation intervention (progressive muscular relaxation and modified autogenic training) and the other with ordinary supportive psychotherapy were compared with no psychiatric treatment control group. The result reported significant lower scores on anxiety, fatigue, depression and confusion as measured by the profile of mood states after relaxation than before, thus suggesting the effectiveness of the relaxation and autogenic training for the mood changes in HIV+ people.
Gruzelier (2002a) reviewed the research studying the impact of hypnosis, relaxation, guided imagery, and individual differences on aspects of immunity and health. The review revealed evidence of immune control accompanied by reports of enhanced mood and well-being. Three recent investigations of the author and her colleagues with self-hypnosis training incorporating imagery of the immune system are outlined. In two studies, hypnosis buffered the effects of stress on immune functions in medical students at exam time, and the comparison of self-hypnosis with and without immune imagery confirmed advantages to targeted imagery for both immune function and mood, and importantly, fewer winter viral infections. The implications for health were investigated in a third study in patients with virulent and chronic herpes simplex virus-2 (HSV-2). Six weeks of training almost halved recurrence, improved mood and reduced the levels of clinical depression and anxiety. Individual differences in hypnotic susceptibility and absorption have typically been found to predict efficacy.

Further evidence of the behavioural intervention on positive emotional states is provided by research suggesting that ‘mindfulness based meditation’ (Kabat-Zinn et al., 1992) may be associated with changes in left-sided anterior brain activity that are associated with positive emotional states (Davidson et al., 1999). Not only greater effects observed in the mediators compared to waiting list controls but the mediators also showed increases in the antibody titers to influenza vaccine. This demonstrates that meditation can increase positive states of mind, which in turn may result in salutary health effects. Although there are not yet many intervention studies showing the effect of mindfulness based meditation for HIV positive people, there are studies conducted cancer patients revealing the effect of meditation on the health improvement and disease progression. Carlson et al. (2004), in their study of mindfulness -based stress reduction in relation to quality of life, mood, symptoms of stress and levels of cortisol, dehydroepiandrosterone sulphate (DHEAS) and melatonin in
breast and prostate cancer outpatients, concluded that MBSR programme enrollment was associated with enhanced quality of life and decreased stress symptoms in these patients, and resulted in possibly beneficial changes in hypothalamic-pituitary-adrenal (HPA) axis functioning.

**Exercise Intervention for HIV/AIDS**

Exercise is one key management strategy used by health care professionals to address impairments (problems with body function or structure as a significant deviation or loss such as pain or weakness), activity limitations (difficulties an individual may experience in life situations such as inability to work) in this population. Exercise may also be used to address unwanted changes in weight and body composition in people living with HIV infection. Aerobic exercise has been associated with improvements in strength, cardiovascular function, and psychological status in general populations (Laperriere et al., 1997). The psychological effects of exercise include reduction in stress, anxiety, and depression as well as improve self-esteem, well-being, body-image, and perceived control (Morgan & Goldsten, 1987). Both acute and chronic exercise have been shown to modulate immune function in healthy individuals, thus; raising the more general question of the impact of such activity upon the person whose immune system is already compromised by HIV infection (Shepard, 1998). Single bouts of exhausting physical activity and very heavy training programmes adversely affect immune function, thus leaving participants with an increased susceptibility to viral infections. However, more moderate intensities of training enhance a number of aspects of immune function. A more suitably graded exercise prescription might therefore, help with preserving lean tissue, improve cardiopulmonary function and immune status, and enhance quality of life in people living with HIV/AIDS.
Evidence to support these notions comes from two main research approaches: epidemiological surveys and clinical controlled trials. Epidemiological studies provide evidence for a positive association between exercise and physical and psychological well-being in HIV infected individuals. Mustafa et al., (1999), for example, in a study investigated the association between exercise and HIV progression in a large sample of homosexual men. It was found that individuals exercising regularly showed a slower decline in CD4 cells over a one-year period than non-exercisers. Secondly, exercising 3 to 4 times per week appears to provide more protective effect as compared to daily exercise...Nixon et al., (2003) on the basis of a systematic review suggested that aerobic exercise interventions appeared to be safe and may lead to improvements in cardiopulmonary fitness for adults living with HIV/AIDS.

Taken together, epidemiological studies provide persuasive evidence about a positive association between exercise and physical and psychological well-being in HIV infected individuals. Evidence for such an association, however, does not answer the question of the direction of such a relationship. An alternative (and quite plausible) assumption to the notion that exercise leads to better health in HIV and AIDS sufferers would be that patients who feel better exercise more, or are at least physically more active. The direction of this association as well as possible mechanisms underlying such a relationship can only be directly tested in randomised controlled trials. The common features of these studies include enrolment of a small sample of HIV infected individuals at various stages of the disease in 8-15 weeks exercise training programmes. Indicators of disease progression and physical and psychological well-being are then compared to a non-exercising control group at various stages during the trial. Findings of the study indicate that moderate levels of physical activity are safe and beneficial in the short term for individuals
infected with HIV. In particular, improvements in muscular strength and flexibility, cardiopulmonary function, decrease in depression, anxiety and anger, and an increase in CD4 lymphocytes following exercise training have been reported (LaPerriere et al., 1991; Lox, McAuley & Tucker, 1996; McArthur, Levine & Birk, 1993; Rigsby, Dishman, Jackson, Mclean & Raven, 1992; Terry, Sprinz & Ribeiro, 1999). In a literature review of lymphocyte changes in HIV/AIDS patients in conjunction with aerobic exercise interventions (LaPerriere, et al., 1997), no decline in relevant lymphocyte cells was found in any of the studies, regardless of the initial disease stage, lymphocyte counts or symptomatology. In addition, a trend toward an increase in the number of lymphocytes was indicated in most studies, with the more significant increases observed in those patients at earlier stages of disease. As a possible mechanism the authors suggest a stress-buffering effect of aerobic exercise, thus leading to a normalization of CD4+ cell count levels. Results from a recent meta-analysis of eight studies meeting the study entry criteria (randomised controlled trial, HIV+ adults, aerobic exercise performed at least three times/week for at least four weeks) suggest that aerobic exercise is safe and may be beneficial for adults living with HIV/AIDS (Nixon, O’Brien, Glazier and Tynan, 2003). The benefits identified relate to clinically significant improvements in cardiopulmonary fitness and psychological well-being.

Despite these demonstrated benefits of exercise, lack of consistent adherence to programmes by participants continues to be problematic. Drop-out rates from supervised exercise programmes as entered in Nixon et al.’s meta-analysis (2003) range from 15% to 76% with an average of 35%. It is obvious; that any potential benefits of exercise for HIV infected persons will only make a difference on a larger scale if we succeed in identifying the factors responsible for discontinuation of exercise programmes. Perceived better health, positive coping and gender (men) were found to predict improvements in exercise levels
following HIV diagnosis (Collins et al., 2001). In a similar vein, self-reported health status as measured by the MOS-HIV (Wu, Revicki, Jacobson and Malitz, 1997) was shown to be positively correlated with exercise participation (walking) in a descriptive survey of physical activity behaviours in a sample of persons living with HIV. In addition to other factors such as HIV-RNA (viral load) and self-reported CD4+ cell counts, measures of social support were significantly associated with weekly frequency of moderate or vigorous physical activity.

**Intervention to Improve Psychological Readiness for Successful HIV Medication and Adherence to Medical Regimen**

Balfour et al. (2006) have studied the effectiveness of psycho-education intervention in a randomized controlled trial (RCT) design for successful HIV medication and reducing depression before initiating AIDS care and found it effective. In the extensive review of intervention research to increase treatment adherence Chesney et al., (1995, 2006) reported that adherence to antiretroviral (ARV) therapy for HIV infections is critical for maximum benefit from treatment and for the prevention of HIV related complications and opportunistic infections. Multiple issues including patient factors (e.g. depression, substance use, treatment beliefs), treatment factors, (e.g. regimen complexity, side effects), and contextual factors (e.g. access to care) have been identified as predictors of adherence and have, to varying degrees, been the focus of interventions to improve medication adherence.

One patient factor that is consistently and meaningfully related to ARV medication adherence is adherence self-efficacy, (Jhonso, et al., 2003; Chesney, et al., 2000) or confidence in one’s ability to adhere to a treatment regimen in the face of challenges such as side-effects, interference with daily activities, environmental barriers to treatment, depression and lack of support from others. Self-efficacy is of paramount requisite factor for health behaviour change (Bandura, 1991; Bandura, 1986) and along with perception
of treatment efficacy are central to many theories of health behaviour including Health Belief Model (Becker et al., 1977). Findings linking adherence to self-efficacy have indicated the potential for interventions to bolster adherence self-efficacy for persons who are struggling with adherence.

Another factor that is often linked to ARV adherence is positive relations. In HIV treatment, treatment plan adherence has been associated with patients perceived level of engagement and satisfaction with their providers. (Demmer, 2003; Roberts, 2002). In their study Jhanson et al., (2006) found that adherence self-efficacy mediated the relationship between positive provider interactions and medication adherence. These findings have implications for improving adherence self-efficacy such that fostering positive interactions between providers and patients may lead to better medication adherence (Murri & Antinori, 2002). Effective interventions to improve provider relations may target the patients, the provider, or both. For example, helping providers create an environment in which the patient feels respected and understood may lead to greater confidence in the patient’s ability to stick to a treatment regimen. This may involve structural changes within clinical settings or provider training in which the provider has the opportunity to sit and talk with the patient, that may result in more positive interactions (Wilson & Kaplan, 2000). Physicians, training to increase collaborative negotiation in setting treatment goals and strategies also may bolster adherence self-efficacy, because patient perception of stress may undermine self-efficacy for anti-retroviral adherence (Baron & Kenny, 1986). It may also be beneficial to improve patient-physician communication about managing stressful life circumstances that influence medication adherence. Likewise, patient focused interventions may enhance skills improve provider/patient visits and lead to greater self-efficacy for medication adherence.

According to Jhanson et al., (2006) assertive communication skills, in which the patient is able to respectfully make specific
requests of therapy provider, may facilitate positive interactions. Other strategies by which the patient can influence the interaction with the provider (e.g. making lists of questions for the provider) may have a beneficial impact on the patient-provider interaction and thereby improve adherence self-efficacy. Such a focus has also implications for preventive medicine.

Various models have been proposed to promote psychosocial and bio-behavioural care for people with HIV disease among which the following few deserve mention in the framework of the present paper. Scofield, (1995), described a preventive psychosocial care structure that allows hospital social workers to intervene early, carry out comprehensive assessments, and follow a person with HIV disease throughout the illness. An HIV clinic with approximately 150 patients illustrates the structure; a case example explains how the programme works. In this model, the medical focus is changed from intervention primarily in acute medical crises to prevention and out-patient monitoring for people with HIV disease is presented, with particular attention to the use of a specialized assessment. The author suggest that early intervention, a thoughtful baseline assessment, and continued follow-up by a mental health professional, can help prevent the psycho-social crises inherent in an illness such as HIV/AIDS.

Whitakar et al., (2006), propagating for ‘Eupraxic model’ in patient centred medicine introduced ‘eupraxia’ as a positive contextual framework for medicine, where medicine is defined as ‘the prevention, diagnosis, treatment, and rehabilitation of illness’ (Oxford Dictionary, 2005), not solely the ability to diagnose physical disease and prescribe pharmaceuticals. The Greek word ‘Eupraxia’ contains a constellation of meanings integrating ‘well-being’, ‘best interests’, and ‘good practice’; in this way, it refers evenhandedly both to the person in care and the clinician, implicitly reflecting a collaborative and interdependent model of medicine. Explaining within this framework to meet the challenges of living long-term with HIV, the authors discuss the two major
approaches: one is the acute-care, pharmacotherapeutic approach of addressing individual illness episodes, which has proven itself over decades to be short-term, costly, ineffective, and to the sole benefit of pharmaceutical companies and physicians as their primary clinical agents (Angell, 2004); Another approach address is the larger challenge of long term well living integrating preventive and therapeutic medicine across the three domains of biopsychosocial medicine. Understanding the reality of living long-term with HIV, like any chronic illness, shows clearly that more is needed to live with health than pharmaceutical therapy can provide. According to the second approach, as emphasized by the authors, designing services to address the larger challenge requires an understanding of several related issues: what happens to the ‘patient’ as a person, not just a body, during illness and during care seeking: what are the natural resources of resilience and resistance to illness socially, behaviourally, psychologically, psychophysiological, and physiologically; what forms of medical practice can provide support for and strengthen those biopsychosocial factors of resilience to promote long-term wellness, rather than someone being just ‘not physically ill’ (Whitakar, 2006).

The assumptions of Whitakar’s model reminds the observation of Sir William Osler, more than a century ago, that, it is much more important to know what sort of a patient has the disease than what sort of a disease the patient has” (Silverman, Murray, and Brian, 2003). Over the years lots of research has been done to study the effects of negative emotions, and psychosocial correlates on health behaviour and disease processes, however, in last few decades, the focus is gradually shifting to study the effect of positive emotions and psychosocial correlates on promotion of health behaviour and enhancing the immuno-competence to lowering the progression of disease and management of chronic diseases (see Taylor et al., 2001; Chesney et al., 2005; Keyes & Hadit, 2003; Schneiderman, 1999; Schneiderman, Antoni, Saab, & Ironson, 2001). Keyes and Hadit (2003), in their book, Flourishing: Positive psychology and the
life well-lived, propose the following model of illness and wellness dichotomy to present the four states of mental and physiological health (Figure 1). In this model, the authors have explained wellness and illness as two different independent continuum, where, a life well-lived with positive health means not only absence of illness, but feeling of wellness too. The authors propose that dimensions and scales of subjective well-being are reviewed and conceived of as mental health symptoms. A diagnosis of presence of mental health along with absence of illness, has been conceptualized as ‘flourishing’ representing the holistic well-being of the individual, whereas, absence of mental health with the absence of illness is conceptualized as a condition known as languishing. The presence of illness and wellness represents the dimension of struggling, which is still an optimistic condition for the people with chronic illness like HIV with detectable viral load. People with HAART, and undetectable viral load can be helped to enjoy the state of flourishing with the practice of an integrated module of bio-behavioural medicine and the support of an effective patient care system and cooperative community structure.

**FIGURE 1**

**Model of Illness and Wellness**

<table>
<thead>
<tr>
<th>Science of Well-Being</th>
<th>Wellness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Illness</td>
<td>Struggling</td>
</tr>
<tr>
<td>Positive</td>
<td>Flourishing</td>
</tr>
</tbody>
</table>

**A. Three-tier Intervention Model for HIV Patient Care**

A. An integrated module of individual based intervention: On the basis of the extensive review of interventions applied and
verified for its effectiveness on the subjective well-being and disease progression in people living with HIV, the authors propose that development of an integrated module of intervention for the PLWHA including the following bio-behavioural modification may help and empower them to manage this chronic illness. The module should include:

1. Moderate level of exercise, at least thrice a week. It may include progressive resistive exercise and/or aerobic exercise. The exercise schedules can be taught and practiced (depending on the preference) individually or in group session.

2. The subjects should be trained to use relaxation technique (progressive muscular relaxation or any other form of relaxation), to use self-hypnosis, and guided imagery for immuno enhancement, immunocompetence. Depending on the patient profile, suggestions and metaphors can be added for symptom management, enhancing self-concept and self-esteem.

3. Designing Cognitive-Behavioural-Stress-Management programmes and training the PLWHA for coping effectively with the challenges of their life.

4. Designing and promoting training programmes to develop spiritual attitude towards life, by finding positive meaning in life, adopting a non-judgmental and altruistic frame-work, being optimistic and positive about life-experiences.

B. Intervention Programmes for Empowering the Important Dyadic Relationships in the Life of PLWHA:

The two important dyadic relationships important in the life of PLWHA are: Patient-provider relationship plays an important role in adherence to medical regimen and empowering the responsibility taking behaviour in the PLWHA. It can be achieved by appointing specialized doctors for dealing with problems HIV/AIDS patient. A study by Schneider et al., (2006), presented at the 44th annual meeting of the Infectious Diseases Society of America has shown that doctors with more experience treating HIV are able to provide better outcomes of care for HIV positive
hospital inpatients, and may do so at less cost and use of resources. The researchers concluded, “Physician experience may effect cost and length of hospital stay in patients without opportunistic infections (OI), but not mortality. Providers with increased experience taking care of HIV+ patients may decrease resource utilization irrespective of provider type.”

Moreover, intervention package can be developed and doctors and paramedics can be trained with specific counseling and other skills to handle the stress and trauma management. Mental health needs of the HIV positive people remain largely unattended. Scofield (1995), based on his research, propose a preventive psychosocial care structure that allows hospital social workers to intervene early, carryout comprehensive assessments and follow a person with HIV disease throughout the illness. In this model, the medical focus is changed from intervention primarily in acute medical crisis to prevention and outpatient monitoring for people with HIV/AIDS. A preventive psychosocial care for people with HIV disease is presented, with particular attention to the use of a specialized assessment. Early intervention, a thoughtful baseline assessment and continued follow-up by mental health professional can help prevent the psychosocial crises inherent in an illness such as HIV/AIDS.

Care-giver-patient relationship, which is of vital importance to the existence and sustenance of HIV positive people. By developing training programmers for the primary caregivers of PLWHA to handle their depression, and self-enhancing life-skills. Pakenham, Dadds and Lennon (2002) examined the comparative efficacy of intervening at the caregiver/ care recipient dyadic level, versus the individual caregiver level, for caregivers and their care-recipients with HIV/AIDS. Results reported that, caregivers in the dyad intervention group showed greater improvement from pre to post treatment on global distress, dyadic adjustment, and the target problems than the caregiver intervention
group. Care-recipients in the dyadic intervention group improved significantly from pre-to post treatment on dyadic adjustment, social adjustment, knowledge, subjective health status and targeted problems, whereas; the caregiver intervention and waiting list control care recipients failed to improve on any of these measures. The treatment gains made by the DI care givers and care-recipients on most dependent variables were maintained at a four-month follow-up.

These findings suggest a reciprocal determinism approach to the process of dyadic adjustment and implies that intervening at the care-giver/ care-recipient level may produce better out-comes for both the caregiver and care-recipient than intervening at the individual care-giver level.

C. Community Matters: Enabling Communities through Local Governance, Public Health Care System

The capital ‘C’ suggested by Kobassa, et al., (1983) long back is the important linking chain to make all interventions feasible and possible. The Community matters, to help, enable, support and sustain any intervention programmes and also to see the long-term impacts in its beneficiaries. Although, the last decade has witnessed concerns of research with PLWHA making an important shift from the models or paradigms to develop understanding and response to HIV/AIDS epidemic and bring changes in individual risk behaviour to models aimed at community mobilization (Parker, 1996; Trickett, 2005). An earlier emphasis on information based educational campaigns has given way to intervention programs aimed at enablement and empowerment in the face of the epidemic. As Parker (1996) observed that these developments have been linked to a new awareness of the fundamental connection between public health and human rights and to a new understanding of the fight against AIDS as part of a much broader process of social change aimed at redressing structures of inequality, intolerance, and injustice.
The community has to be made resourceful enough (specifically the communities of high risk groups, e.g.; CSWs, MSMs, migrant labourers, etc.) to create an enabling environment to help the PLWHA take responsibility for their health, by disciplined practice of healthy life style and bio-behavioural interventions along with adherence to medical regimens. The different community based organizations (CBOs) should work hand in hand with public health care systems to develop logical strategic steps to implement these bio-behavioural modules for the PLWHA, and to make the programmes sustainable.

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