Chapter - II

Review of Literature
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REVIEW OF LITERATURE

A literature review is a description of the literature relevant to a particular field or topic. A critical literature review is a critical assessment of the relevant literature. ‘Literature’ covers everything relevant that is written on a topic: books, journal articles, newspaper articles, historical records, government reports, theses and dissertations, etc. A literature review gives an overview of the field of inquiry: what has already been said on the topic, who the key writers are, what the prevailing theories and hypotheses are, what questions are being asked, and what methodologies and methods are appropriate and useful.

To find out what has been written and relevant on the selected subject as many bibliographical sources are used as possible. The likely sources used for writing review are bibliographies and references in key textbooks and recent journal articles. Abstracting journals, such as APAIS, Psychological Abstracts, Library and Information Science Abstracts, etc. Electronic databases, e.g. Electronic Reference Library (ERL), First Search, or Expanded Academic.

This chapter will deal with review of literature available on different aspects of HIV patients like adherence to antiretroviral treatment, mental health, death anxiety and cognitive behavior interventions.

Since the introduction of antiretroviral treatment, HIV- and AIDS-related mortality has declined tremendously. The continuous, lifelong treatment with
antiretroviral therapy has significantly improved life expectancy and turned HIV from a terminal infection into a chronic disease. In antiretroviral treatment, adherence is of utmost importance. Poor adherence may lead to medication failure, viral mutations and development of drug resistance. Future treatment options become limited because of cross-resistance. The risk of transmission of resistant viruses makes adherence a public health concern. Research and daily practice have shown that strict adherence is difficult to achieve for many of the HIV-infected patients treated with antiretroviral therapy. Adherence to antiretroviral treatment requires patients to behave in a way that cannot easily be incorporated into daily life.

On the basis of earlier studies on adherence, a level of 95% or more seems to be required to prevent the development of resistant viruses. In more recent studies, it has been shown that durable viral suppression can be achieved by using antiretroviral treatment regimens that require lower adherence than 95%. Other studies suggest that the relationship between adherence and the development of resistance differs by drug class. The prevalence of resistance to non-nucleoside reverse transcriptase inhibitors is significantly higher at low levels of adherence than that to protease inhibitors.

To attain the benefits of antiretroviral treatment, there is a strong need for effective adherence interventions in the care of HIV-infected patients.
2.1 Adherence to antiretroviral treatment

On review of literature, there are number of studies done all over the world to find out the rate of adherence to antiretroviral treatment and different factors influencing on it. Most of these studies were done in private sector where patients needed to buy Medicines, very few studies are found in free ART programs. In a multicentric study “Adherence to Antiretroviral Therapy and Virologic Suppression among HIV-Infected Persons Receiving Care in Private Clinics in Mumbai, India” by Bijal Shah and Louise Walshe et al, (2007) of 279 participants, 73% reported 95% adherence to ART. Adherence was positively associated with age 50 years (adjusted odds ratio [aOR], 3.90), presence of comorbid conditions (aOR, 1.92), medication self-efficacy (aOR, 4.01), absence of pain in the past month (aOR, 2.14), and support from family and friends (aOR, 2.57). Lack of reminders from family members to take medication (aOR, 0.27) was negatively associated with adherence. Of 200 participants, 127 (63.5%) had virologic suppression (RNA level, <400 copies/mL). Independent correlates of suppression were a regimen containing 3 ART drugs (aOR, 5.52), first ART regimen (aOR, 3.28), adherence to therapy 95% (aOR, 5.70), female sex (aOR, 3.19), and a physical component score 50 (aOR, 1.07).

In a study of adherence to antiretroviral therapy among HIV-infected subjects in a resource - limited setting in the Niger Delta of Nigeria done by Chijioke Adonye Nwauche, Osaro Erhabor Oseikhuemen Adebayo et al (July-December2006) on 187 HIV infected adults more than 6 months of
antiretroviral treatment., they observed a low adherence rate of 49.2%. The exorbitant cost of antiretrovirals in Nigeria a country with a very low per capita income may have been responsible for the low adherence rate observed in this study. The experience in South Africa a country where reduction in the prices of antiretrovirals has greatly improved adherence brings to bear the potential benefits that prize reduction may have on adherence to therapy particularly in resource-poor settings in sub Saharan Africa. Non-adherence was significantly higher among unemployed respondents compared to other groups. Also the adherence was significantly higher in patients on the highly subsidized Federal government initiative compared to the more expensive hospital initiative. Cost constraints were the major reason for non-adherence in 55.8% of non-adherent patients. Unavailability of drugs was the observed reason for non-adherence to antiretroviral therapy among (18.9%) of non-adherent respondents. Adverse events associated with medication were the cited reason for non-adherence in (17.9%) of non-adherent respondents. Non-adherence was relatively higher among less educated respondents compared to better educate (secondary and tertiary).

A study “Adherence to antiretroviral treatment in patients with HIV in the UK “ by Lorraine Sherr; Fiona Lampe; Sally Norwood et al (2008) included total of 502 consecutive attendees’ at HIV clinics in the UK (80.5% response rate) provided detailed measurement on adherence in the preceding 7 days, setting out dose adherence, as well as measures of timing and dietary conditions. In addition,
a range of psychological, demographic and relationship data were gathered to understand predictors of full and partial adherence. 79.1% reported dose adherence in the previous 7 days, 42.8% had not taken the dose at the correct time, and 27.2% had not taken the dose under the correct circumstances. Those that were fully adherent were significantly more likely to be older ($F=7.8$, $p<0.001$), UK born ($F=6.8$, $p=0.03$), code ethnicity as white ($F=5.3$, $p=0.07$), record higher quality of life ($\chi^2=8.7$, $p=0.01$), lower psychological symptoms ($\chi^2=15.2$, $p=0.001$) and lower global distress symptoms ($\chi^2=6.9$, $p=0.03$). There were no differences according to education, behavioral and attitudinal variables (disclosure, stable relationship, STI diagnosed, number of sexual partners, unprotected sex, optimism or treatment switching). Fully adherent groups were significantly more likely to be in agreement with their doctor on treatment initiation ($\chi^2=6.2$, $p=0.045$), satisfied with the amount of involvement in the decision-making process ($\chi^2=7.3$, $p=.026$), their wishes were considered ($\chi^2=12.5$, $p=0.002$) and had monitoring of their condition ($\chi^2=7.1$, $p=0.028$).

In a cross-sectional anonymous questionnaire survey of 60 patients, adherence to anti-retroviral therapy among HIV patients in attending HIV outpatient services at two centers: The Chest and Maternity Centre, Rajajinagar, and Wockhardt Hospital and Heart Institute Bangalore, India was assessed by Mary B Cauldbeck, Catherine O'Connor, Mortimer B O'Connor, Jean A Saunders, Bhimasena Rao et al (28 April, 2009) the mean patient age was 39.98 years, with 50% aged 30–40, and 73.6% of participants were male. 60% reported
to be fully adherent. Adherence was statistically significantly related to regular follow-up attendance (70.5%, $p = 0.002$). 100% adherence trends were seen in older patients, male gender, those from larger families, those who had a previous AIDS defining illness, those taking fewer tablets, and without food restrictions. Common side-effects causing non-adherence were- metabolic reasons (66%) and GI symptoms (50%). No trends were seen for education level, family income, distance travelled to clinic, time since diagnosis, or time on ART.

Valentina Cambiano and colleagues (March 17, 2010) from the U.K. looked at long-term trends in adherence to combination ART, aiming to identify the main predictors of good adherence and to evaluate whether patients typically experience periods of low adherence, defined as taking prescribed medications 60% of the time or less. The study included 2060 participants in the Royal Free Clinic Cohort in London who were followed from the date they started combination ART until the end of the last recorded ART prescription or death. Most (78%) were men, 66% were white, and 79% maintained undetectable viral load on ART throughout the follow-up period. Follow-up continued for up to 13 years (median 4.5 years), divided into 6-month periods. For each period, the researchers calculated the proportion of days during which a patient was "covered" by a valid prescription for at least 3 antiretroviral drugs. They observed overall level of ART coverage was 92%, during the follow-up period there was evidence of a slight increase in adherence over time, the likelihood of achieving $> 95\%$ adherence increased by 2% per year (adjusted odds ratio [OR] 1.02 per year),
a change that was of borderline statistical significance (P = 0.053), nearly half of participants (48%) experienced at least 1 -- and often only 1 -- period of poor adherence. Independent predictors of sustained adherence were Older age; ART regimen used (better adherence with more modern drugs) and history of previous virological failures. Participants with poor adherence were significantly more likely to be lost to follow-up. Based on these findings, the study authors concluded that adherence, as measured by drug coverage, does not decrease on average over more than a decade from start of HAART.

The level of adherence in the HIV population is higher than in most other chronic diseases. In international literature the percentage of HAART doses taken as prescribed varies between 53-93% according to different assessments.

In a multicentric study conducted by Sarna A, Pujari S et al, India (Jan 2008) mean 4-day adherence was 93.4 per cent. Adherence was lower over longer periods of recall: 20 per cent reported missed doses over the past 7 days; 33 per cent reported ever missing a full day’s medications and 16 per cent had a treatment interruption of more than 7-days at least once. Mean 4-day adherence was significantly lower among patients receiving free ARVs through insurance programs compared to patients paying out-of-pocket (81 percent versus 96 percent). In this study most commonly cited reasons for missing doses over the past week were forgetting to take the medicine (38 percent), being away from home (34 percent), and running out of pills (26 percent). Other reasons for missing doses included financial restrictions (5 percent), lack of understanding of
dosing instructions (4 percent), feeling ill (4 percent), high pill burden (2 percent), side effects (2 percent), and depression (2 percent). Significant depression and obtaining free ARV’s were found to be significantly associated with non adherence to treatment.

Wanchu A, Kaur R et. Al (2007) in their study in a tertiary center in North India found adherence rate of 73.5 % amongst population of 200 patients. Financial reasons, fear of side effects and ‘running out of pills were the main causes of not taking medications.

In another study conducted in South Ethiopia published in Ethiopian Journal of Health Development by Markos E, Worku A, Davey G.(2006) prevalence of adherence was 74.2 %. The main reason for missing medications in this study was forgetting (51 %). Other reasons were change in daily routine (10 %) and being away from home (8 %). Adverse effects of medications distance of ART clinic from residence and presence of dependents had significant independent association with treatment adherence.

In a study conducted in Sweden by Sodergard B, Halvarsson M et al (2006) proportion of patients classified as adherent was 63 %. 73 % of the study population had family support, where as 23 % was categorized as not having any family support.

Adherent patients were more likely to have good relationship with health care professionals and not have problems with drugs or alcohol. Being older and
having shorter time on current treatment and on treatment in total were also associated with good adherence.

Adherence in 66 HIV patients was studied by J.B.Nachega, Stein DM et al (2004) in Soweto, South Africa. The adherence rate to ART was 88% in their study. Fear of being stigmatized was a major factor associated with non-adherence. The three main reasons given by the patients for missing doses were being away from home (30%), difficulty with the meal requirements and dosing schedule of two or more doses per day (23%), and running out of pills (12%).

Depression and anxiety are common among HIV-infected people and rank among the strongest predictors of non-adherence to ART. In a longitudinal study aimed to assess whether symptoms of anxiety and depression are predictors of non-adherence among patients initiating ART at two public referral centers (n = 293) in Belo Horizonte, Brazil Lorenza Nogueira Campos, Mark Drew Crosland Guimaraes et al (April 2010), prevalence of severe anxiety and depression symptoms before starting ART was 12.6% and 5.8%, respectively. Severe anxiety was a predictor of non-adherence to ART during follow-up period (RH = 1.87; 95% CI = 1.14-3.06) adjusted for low education, unemployment, alcohol use in the last month and symptoms of AIDS; while a history of injection drug use had borderline statistical significance with non-adherence. These findings suggest that using a brief screening procedure to assess anxiety and depression symptoms before initiating ART help identify individuals for interventions to improve adherence and quality of life.
In a retrospective, observational study, Dr. Horberg and colleagues (Doc Guide.com Louise Gagnon) stratified 1,470 patients into 3 arms: those with a diagnosis of depression who were not on selective serotonin reuptake inhibitors (SSRIs, 1,053); those with depression who were on SSRIs (348); and those without a diagnosis of depression who were on SSRIs (69). The control group consisted of 1,961 patients who had never been diagnosed with depression or been prescribed SSRIs. Most patients (83%) were men, and the median age was 41. A total of 40.8% had a diagnosis of depression/anxiety, and 13.1% of the total population used SSRIs. A total of 24.8% with a diagnosis of depression were taking SSRIs. Adherence amongst all the patients at 12 months was 80.9%. Depression reduced adherence (P< .05) in all statistical analyses.

A study of factors affecting patient adherence to highly active antiretroviral therapy by Ismael Escobar, Mercedes Campo, et al (2003) of University Hospital Doce de Octubre, showed significant nonadherence for patients with low level of education, unemployed, emotional situation, and abuse of substances including intravenous drugs. All significant variables were included in a logistic regression model to optimize the results. This model considered 4 variables: age (95% CI 0.89 to 0.99), number of antiretroviral drugs (95% CI 1.05 to 2.11), STAI Anxiety/Trait test (95% CI 2.02 to 6.02), and abuse of drugs (95% CI 1.20 to 3.95). They recommended special intervention to reinforce adherence for younger patients, patients taking a high number of antiretroviral drugs, those who have a history of intravenous drug use, and those with high anxiety status.
2.2  Cognitive behavioral interventions and adherence to ART

Cognitive Behavior Therapy (CBT) is one of the major orientations of psychotherapy (Roth & Fonagy, 2005) and represents a unique category of psychological intervention because it derives from cognitive and behavioral psychological models of human behavior that include for instance, theories of normal and abnormal development, and theories of emotion and psychopathology.

Haddad and colleagues reviewed controlled research studies published from January 1996 to April 1999 on interventions offering patient support and education to promote antiretroviral therapy. They identified only one intervention (by Knobel and colleagues in a Spanish-language publication) that met the strict selection criteria. Another review of the field through April 1999 identified interventions designed to enhance HIV medication adherence, of which were reported in conference abstracts and in published articles. The interventions incorporated strategies that were cognitive (ie, designed to teach, clarify, or instruct); behavioral (ie, designed to shape, reinforce, or influence behavior); or affective (ie, designed to optimize social and emotional support). Of the 16 reports, only 11 included data on intervention efficacy, and the effects of these interventions were generally weak. Among these, only 5 were RCTs, with a mean sample size of 58. Four of these reported no treatment effect between the intervention and control groups, and the fifth, a DOT study, reported temporary effects that disappeared after the intervention ended. A third review focused on reports of RCTs of interventions to enhance adherence to antiretroviral therapy
that were published or presented at the International AIDS Conference in Barcelona in July, 2002. The authors cited published reports of 2 promising interventions by Tuldra and colleagues and Rigsby and colleagues, as well as the Knobel and colleagues study cited above. From the AIDS Conference presentations, the authors cited 2 successful RCTs, one involving an internet based paging system and the other using continuous and personalized counseling. However, 2 other RCTs that were presented, 1 assessing a problem-solving and enhanced support intervention and the other based on motivational interviewing, showed no intervention effects.

In a randomized, multi-site, controlled trial of a cognitive-behavioral adherence intervention for patients initiating or changing an antiretroviral (ART) regimen conducted by Wagner GJ, Kanouse DE, et al (2006) a 3 x 2 factorial design was used with the primary randomization assigning patients (1: 1: 1) to one of two adherence interventions or usual care. The five-session adherence interventions consisted of cognitive-behavioral and motivational components, with or without a 2-week pre-treatment placebo practice trial. A total of 230 patients were randomized; 199 started ART, of whom 74% completed the 48-week study. Electronic monitored adherence outcomes between the two intervention groups did not differ significantly and were thus pooled in analyses. At week 4, 82% of intervention patients had taken at least 90% of their prescribed ART doses, compared with 65% of controls (P < 0.01); this group difference dropped to 12% at week 12 (72 versus 60%; P = 0.15) and 11% at week 24 (66
versus 55%; P = 0.28). Mean adherence in the intervention group was significantly higher than the control group at week 24 (89 versus 81%; P < 0.05) only. There were no group differences with respect to HIV-1 RNA throughout the study. The effects of the cognitive-behavioral intervention on adherence were modest and transient, and no effects were observed on viral load or CD4 cell count. Authors concluded that more robust effects may require a more intense intervention that combines ongoing adherence monitoring and individualized intervention "dosage" that matches the need and performance of each patient.

Golin CE, Earp JA, Howie L, et al (2002) conducted a study to find out effective adherence interventions. Based on a conceptual model, they designed a cognitive-behavioral (CB) audiotape, workbook and motivational interview (MI) to enhance pts' motivation and self-efficacy to take ART. To pilot the CB intervention, they administered it to 2 groups each of 20 HIV+ pts, interviewed them about their experience with it, and content-analyzed the MI. Then, in a 12 week randomized trial of 56 pts failing current ART, they compared the knowledge and health behavior of CB pts with controls receiving an informational (INF) tape/booklet/session. They asked pts, every 4 weeks, to free list: 1) what can happen from missing ART doses; 2) changes they had made in their life since their last visit. They compared proportions of pts listing specific factors using chi square statistics. Mean age of the 97 pts in all groups was 40 with: 80% African-American. In the pilot, 95% found the intervention very helpful/enjoyable; 80% felt more confident to take ART and more likely to take it exactly; 75% planned
to use a medicine calendar. In MI, most pts chose to discuss taking ART. In the main study, at wk 4, 10/28 CB pts (36%) reported an improvement in ART medication-taking compared with 1/28 INF pts (4%) (p < 0.025). At week 12, among the 37 completing the study to date, although more INF than CB pts knew that nonadherence can increase viral load (26% vs 10%, p < 0.05) and 50% in both groups reported setting a goal, 8/19 CB pts reported specific medication-taking strategies that they used to achieve goals compared with only 1/18 INF pts (p < 0.025). Among those setting goals, 83% of CB pts' goals were related to taking ART vs 40% of INF pts' (p < 0.05). They concluded that user-friendly, pt-acceptable audiotape-based tool to improve ART adherence warrants testing of its effect on objectively measured adherence.

Pradier C, Bentz L, Spire B, Tourette-Turgis C, et al (2002) conducted a study to evaluate the impact of an intervention for improving adherence to highly active antiretroviral therapies in HIV-infected patients. 244 patients were included in a prospective, controlled, randomized trial comparing a group who received a counseling intervention in addition to ordinary clinical follow-up (n=123) vs a control (n=121). Inclusion criteria were patients receiving HAART for at least 1 month who attended a medical follow-up consultation between September and December 1999. Patients in the intervention group received 3 individual counseling sessions about HAART regimens by specially trained nurses. The main outcome measures were proportions of patients achieving 100% adherence at 6-month follow-up and evolution in viral load between on inclusion
and after 6 months. HIV-1 RNA of group after 6 months significantly decreased in the 123 patients of the intervention group (mean difference = -0.22 log[I; 0.86], p=0.013) while it increased (+0.12 log[I; 0.90], p=0.14) in the 121 patients of the control. However, the proportion of patients with HIV-1 RNA < 40 copies/mL remained similar in both groups. Among the 202 patients with available data on adherence, the proportion of 100% adherent patients was similar in both groups at Month 0 (58% vs 63%, p=0.59) but became higher in the intervention group at Month 6 (75% vs 61%, p=0.04). This study brings evidence of the feasibility and efficacy of a counseling intervention to increase adherence to HAART that could be easily implemented in most clinical settings.

2.3 Mental health and adherence

Research shows that psychological, psychosocial and psychiatric factors play a significant role in how well PLWHA comply with treatment. According to Singh et al (Oct 1999), variables such as satisfaction with social support and ability to cope are significantly correlated with treatment adherence, while dimensions like hopelessness, loss of motivation and poor coping skills are indicative of noncompliance. Additional research has found that “age, education, employment, religious support, and perceived quality of life” are not specifically correlated with adherence to drug treatments, but adaptive coping ability and level of depression are. According to Gordillo et al (1999), depressed subjects with poor support adhere to drug treatments only about half as frequently as non-depressed subjects with good social support. These factors make interventions that
focus specifically on mental health a prime avenue for improving treatment compliance. In a follow-up evaluation six months after their initial study, Singh et al. discovered that the HIV/AIDS virus progressed significantly faster (as measured by CD4 cell counts) for individuals who did not adhere to the drug treatments. As maintained by Chesney et al., “While combination therapy is known to be effective in slowing disease progression, the long-term benefit of these therapies can only be sustained if resistant strains of HIV do not emerge.” Once HIV/AIDS drug treatments are started, strict adherence is critical in order to ensure that resistant strains of HIV do not develop. Because of the strong correlation between mental health disorders and noncompliance with treatments, addressing mental disorders within the HIV pandemic is critical for preventing drug-resistance.

The relation between HIV and mental illness has been studied by examining HIV infection in those with mental illness and mental illness in those with HIV. However, there are many common factors in both, such as homelessness, incarceration, poverty and substance misuse. There is some evidence to suggest that HIV risk in people with severe mental illness is mediated through substance misuse. In addition to this avenue of investigation, there has been exploration of the impact of psychological morbidity on disease progression, response to treatment and outcome of treatment.

In India, significant cognitive deficits are reported in advanced HIV disease in patients not receiving HAART. In one study done by Yepthomi T,
Paul R, Vallabhaneni S, et al (2006), 56% of PLWHA were demonstrated to have impairment in at least two cognitive domains. Between 60-90% of asymptomatic subjects with HIV have been reported to have cognitive deficits by Gupta JD, Satishchandra P et al and Chittiprol S, Kumar AM, et al (2007).

Emotional problems are among the most common symptoms in HIV patients with up to 98.6% prevalence as reported by Wig N, Sakhuja A, Agarwal SK, et al (2008) in a cross-sectional design with convenient sampling of 138 HIV-positive patients of North India. A structured questionnaire was used to collect information about health-related problems.

Dr. John Anderson,( Psychology International | January 2008) Senior Director of the American Psychological Association Office on AIDS, along with 23 other leaders from different specialties within the AIDS and mental health fields, explored mental health needs for all aspects of the AIDS response with particular attention focused on the needs of caregivers, people living with HIV, and vulnerable children - groups identified as often experiencing the most significant mental health challenges as a result of AIDS. Research presented by the South African Depression and Anxiety Group and Wits University, Johannesburg South Africa, found that 89% of home based care workers in North West Province and Mpumalanga were depressed or showed signs of depression. Psychologist and World Health Organization (WHO) consultant Melvyn Freeman described a study in Zambia that showed 85% of pregnant HIV+ women had episodes of major depression with suicidal ideation as well as other studies in East
and Southern Africa revealing dramatically increased depression and suicide among AIDS orphans.

Among those with HIV, up to 28% may have adjustment disorder as reported by Ahuja AS, Parkar SR (1998), 25-36% may suffer from anxiety and there is a higher prevalence of PTSD scores among people living with HIV/AIDS. Anxiety is also prevalent among children with HIV (18%).

Thomason et al. (1996) emphasized the role of dysfunctional cognitions that characterize psychopathology in the HIV and AIDS population. These researchers indicate that feelings of worthlessness, excessive guilt and rumination over past behavior are frequently reported.

Treisman, Fishman, & Lyketsos (1994) reported that lack of hope in finding a cure and feelings of helplessness in coping with the disease is the predominant self-defeating thought patterns reported by HIV-positive individuals (Treisman et al. 1994). Marzuk, Tierney, Tardiff, Morgan, Hsu, & Marin (1988) reported that the risk of suicide among persons infected with HIV may be up to 66 times greater than that of the general population. Forstein (1992) reported that suicidal ideation might be higher in the HIV population when compared to other chronic illness populations. Despite these aforementioned studies reviewing dysfunctional cognition, an investigation of irrational beliefs in the HIV population has not yet been conducted. Previous research has suggested that a positive correlation exists between irrational beliefs and anxiety and depression (Bernard, 1998; Warren & Zgourides, 1989). Anxiety is the result
of future-oriented cognition (Walen, DiGiuseppe, & Wessler, 1992). Situations in the “here-and-now” rarely elicit excessive anxiety. Catastrophizing and awfulizing are common irrational beliefs that cause anxiety. Fears of rejection, failure, and the fear of being afraid are the most common fears associated with anxiety.

Morelli & Andrews (1980) have found a positive correlation between irrational beliefs and neuroticism and extraversion. Irrational beliefs were strongly related to test anxiety and trait anxiety (Rohsenow & Smith, 1982) and to the fear of flying (Moller, Nortje, & Holders, 1998). Type A behavior has been shown to be related to irrational beliefs reflecting an inordinate need for competence and concern about control issues (Hamberger & Hastings, 1986). Irrational beliefs were also found to be related to negative emotionality (Nottingham, 1992). Measures of irrational beliefs correlate more highly with each other than with accepted measures of depression, hopelessness, and anxiety, suggesting that instruments used to detect irrational beliefs do not just measure general distress or emotionality (Nottingham, 1992).

In a review of 30 quantitative and qualitative studies, that described the mental health consequences of HIV infection conducted in different parts of the world used a validated screening instrument, diagnostic instrument, or clinical interview to ascertain rates of depression, anxiety or other mental illness; one study tested the validity of a screening instrument; eight examined quality of life or other psychosocial variables and mental health; four explored psychological
predictors of adherence to antiretroviral therapy (ART); and four reported on cognitive and neuropsychological findings. Study participants were recruited in Brazil, China, Costa Rica, India, Kenya, Nepal, Russia, Rwanda, South Africa, Taiwan, Tanzania, Thailand, Uganda, Zaire, and Zimbabwe. Psychosocial correlates that were significantly related to mental health outcomes included family relationships and social support, coping styles, and HIV-related worry and stressors. **Chandra et al (2003)** observed that poor family relationships, AIDS in a spouse, and current alcohol abuse or dependence were related to elevated depression and anxiety. Anxiety and depression scores, in turn, were related to suicidal ideation. Lack of a relationship with a partner or having a partner who was ill was associated with high depression scores for women who had recently given birth in Thailand. Depression was associated with being in a serodiscordant partnership in a Russian sample. Among those with serodiscordant partners, more than half reported some unprotected vaginal or anal sex. Three studies demonstrated a relationship between participants' coping styles and depressive symptoms. HIV-related stress was also related to elevated depression and anxiety in a Hong Kong sample. The main stressors endorsed by the population were disclosing HIV status, financial stressors, and problems with family. Perceived stress among Nepali former commercial sex workers was also correlated with anxiety and depression.

Depression also predicted health behaviors among pregnant Thai women with and without HIV. Poorer self-care practices were associated with depression, and this relationship was mediated by learned resourcefulness, the personal skills
that enable women to manage depressive symptoms and care for themselves adequately.

North American and European studies suggest that people with HIV often suffer from depression and anxiety disorders as they adjust to the diagnosis, struggle with the meaning of a positive HIV test result, adapt to life with a chronic, life-threatening illness, anticipate and receive news of the disease's advance, and witness the death of friends and family. Bing et al found a 36% 1-year prevalence of depression and 16% prevalence of anxiety among a large national sample of HIV-positive men and women in the United States. A meta-analysis of studies comparing HIV-positive and HIV-negative samples showed that major depressive disorder occurred nearly twice as often among HIV-positive than HIV-negative patients. (Am. J. Psychiatry 2001;158:725–30) Depression can reduce the motivation to seek health care, impair adherence to treatment, decrease quality of life, and increase mortality. The neuropsychiatric effects of the virus can lead to dementia and motor disorders that further affect quality of life.

Mental illness can also be a risk factor for HIV infection. Certain psychiatric disorders, including substance abuse, increase vulnerability to HIV infection. In North America, HIV risk among people with serious mental illness has been associated with lack of condom use, multiple sexual partners, and injection drug use. The social exclusion that often accompanies life with a severe mental illness may also increase vulnerability to infection, leading to exchange of sex for money or goods and an increase in coercive sexual encounters. Cognitive
deficits associated with certain mental disorders may impair judgment and the ability to negotiate safe sexual encounters.

Psychiatric illness can be an important factor determining the adherence to treatment of HIV infection. Those with mental illness can have difficulty in adhering to the medication routine. Negative attitudes from health professionals may lead the patient to disengage from treatment as observed by Krishna V, Bhatti R, Chandra P (2005). In a sample of 310 patients on HAART, Sarna et al (2008) found that patients with severe depression were four times more likely to report lower adherence to treatment.

2.4 Cognitive Behavior Intervention therapy and mental health

Modern behavioral and cognitive-behavioral interventions emphasize the role of learning and adaptation to the environment both in shaping and maintaining normal life functions and in the emergence of maladaptive symptomatology. In essence, these approaches focus on behavior as important in its own right and often seek to change instances of disordered behavior via the application of clearly articulated basic principles of learning. Three basic, interrelated perspectives exist: classical conditioning, which emphasizes the learning of associations between classes of stimuli; operant conditioning, which emphasizes the learning of relations between behaviors and their consequences; and the cognitive perspective, which emphasizes the role of idiosyncratic beliefs and misconceptions in coloring each of the two earlier perspectives.
CBT was primarily developed through a merging of behavior therapy with cognitive therapy. While rooted in rather different theories, these two traditions found common ground in focusing on the "here and now", and on alleviating symptoms (Rachman, S 1997). Many CBT treatment programs for specific disorders have been evaluated for efficacy and effectiveness; the health-care trend of evidence-based treatment, where specific treatments for symptom-based diagnoses are recommended, has favored CBT over other approaches such as psychodynamic treatments (Abramowitz, J. S2001, Lambert et al 2004). In the United Kingdom, the National Institute for Health and Clinical Excellence recommends CBT as the treatment of choice for a number of mental health difficulties, including post-traumatic stress disorder, OCD, bulimia nervosa, and clinical depression.

A basic concept in CBT treatment of anxiety disorders is in vivo exposure—a gradual exposure to the actual, feared stimulus. This treatment is based on the theory that the fear response has been classically conditioned and that avoidance negatively reinforces and maintains that fear. This "two-factor" model is credited to O. Hobart Mowrer. Through exposure to the stimulus, this conditioning can be unlearned; this is referred to as extinction and habituation. CBT also affects an individual's way of thinking and the way that they react to certain habits or behaviors. A specific phobia, such as fear of spiders, can often be treated with in vivo exposure and therapist modeling in one session.
Social phobia, also known as social anxiety has often been treated with exposure coupled with cognitive restructuring, such as in Heimberg's group therapy protocol. Evidence suggests that cognitive interventions improve the result of social phobia treatment.

CBT has been shown to be effective in the treatment of generalized anxiety disorder, and possibly more effective than pharmacological treatments in the long term. In fact, one study of patients undergoing benzodiazepine withdrawal who had a diagnosis of generalized anxiety disorder showed that those who received CBT had a very high success rate of discontinuing benzodiazepines compared to those who did not receive CBT. This success rate was maintained at 12-month follow up. Furthermore in patients who had discontinued benzodiazepines it was found that they no longer met the diagnosis of general anxiety disorder and that patients no longer meeting the diagnosis of general anxiety disorder was higher in the group who received CBT. Thus CBT can be an effective tool to add to a gradual benzodiazepine dosage reduction program leading to improved and sustained mental health benefits.

**Mood disorders**

One etiological theory of depression is Aaron Beck's cognitive theory of depression. His theory states that depressed people think the way they do because their thinking is biased towards negative interpretations. According to this theory, depressed people acquire a negative schema of the world in childhood and adolescence as an effect of stressful life events. When the person with such
schemata encounters a situation that in some way resembles the conditions in which the original schema was learned, the negative schemata of the person are activated.

Beck also described a negative cognitive triad, made up of the negative schemata and cognitive biases of the person; Beck theorized that depressed individuals make negative evaluations of themselves, the world, and the future. Depressed people, according to this theory, have views such as, "I never do a good job", "It is impossible to have a good day", and "things will never get better." A negative schema helps give rise to the cognitive bias, and the cognitive bias helps fuel the negative schema. This is the negative triad. Also, Beck proposed that depressed people often have the following cognitive biases: arbitrary inference, selective abstraction, over-generalization, magnification and minimization. These cognitive biases are quick to make negative, generalized, and personal inferences of the self, thus fueling the negative schema.

Cognitive behavioral therapy has been shown as an effective treatment for clinical depression. A large-scale study in 2000 showed substantially higher results of response and remission (73% for combined therapy vs. 48% for either CBT or the antidepressant Nefazodone alone) when a form of cognitive behavior therapy and that particular discontinued anti-depressant drug were combined than when either modality was used alone.

The American Psychiatric Association Practice Guidelines (April 2000) indicated that among psychotherapeutic approaches, cognitive behavioral therapy
and interpersonal psychotherapy had the best-documented efficacy for treatment of major depressive disorder.

Recently some CBT practitioners have returned to more behavioral approaches to the treatment of depression such as behavioral activation. A large-scale treatment study found behavioral activation to be more effective than cognitive therapy and on a par with medication for treating depression (Dimidjian, S., et al. 2006).


Meta-analytic approaches like comprehensive searches of electronic databases from 1988 to 2005, hand searches of journals, reference lists of articles, and contacts with researchers were used in synthesizing findings. Their main outcome measures were Intervention effects on symptoms of depression, anxiety, and anger, stress, and CD4 cell counts. Data from 15 controlled trials were analyzed. Significant intervention effects were observed for improving symptoms of depression (d = 0.33), anxiety (d = 0.30), anger (d = 1.00), and stress (d = 0.43). There is limited evidence suggesting intervention effects on CD4 cell counts (d = 0.08). The aggregated effect size estimates for depression and anxiety
were statistically significant in trials that provided stress management skills training and had more than 10 intervention sessions. They concluded that CBIs are efficacious in improving various psychological states of PLWH. This study recommended future research to examine the relationship among interventions, psychological states, medication adherence, and immune functions, and identify other relevant factors associated with intervention effects.

In a study by Matthijs W. Beltman, MSc, Richard C. Oude Voshaar, et al (2010) cognitive–behavioral therapy for depression in people with a somatic disease a meta-analysis of randomized controlled trials was evaluated. In this research they examined the effectiveness of cognitive–behavioral therapy (CBT) for depression in people with a diversity of somatic diseases. Severity of depressive symptoms was pooled using the standardized mean difference (SMD). They observed that twenty-nine papers met inclusion criteria. Cognitive–behavioral therapy was superior to control conditions with larger effects in studies restricted to participants with depressive disorder (SMD = –0.83, 95% CI –1.36 to –0.31, P<0.001) than in studies of participants with depressive symptoms (SMD = –0.16, 95% CI –0.27 to –0.06, P = 0.001). Subgroup analyses showed that CBT was not superior to other psychotherapies. Conclusion of the research was cognitive–behavioral therapy significantly reduces depressive symptoms in people with a somatic disease, especially in those who meet the criteria for a depressive disorder.
In a study by Molassiotis, P. Callaghan, S.F (July 5, 2004), Twinn, forty-six Chinese patients with symptomatic human immunodeficiency virus (HIV) were assessed for the effectiveness of cognitive-behavioral group therapy (CBT) and peer support/counseling group therapy (PSC) in relation to improving mood and quality of life and decreasing uncertainty in illness as compared to a group receiving routine treatment with no formal psychosocial intervention. The CBT group consisted of 10 subjects, the PSC group of 10 subjects, and the comparison group of 26 subjects. There was a 24% attrition rate. The intervention groups received 12 weekly sessions of therapy over 3 months. Assessment of mood states was carried out before randomization (baseline data), immediately post-intervention (3-month time point) and followed-up 3 months later (6-month time point). Assessment of quality of life and uncertainty in illness was carried out before randomization and at the 6-month follow-up time point. Results indicated that the mood of the participants in the CBT group improved in terms of anger, tension-anxiety, depression, confusion, and overall mood. The quality of life in this group was significantly improved compared to the other two groups, as was uncertainty in illness. In the PSC group a worsening of psychological functioning was observed immediately post-intervention, but this picture dramatically improved at the follow-up assessment with improvements of up to 34%. Quality of life also improved over time in this group by almost 5%, but results did not reach statistical significance. This study demonstrated that psychological interventions could decrease psychological distress and improve quality of life in
symptomatic HIV patients, indicating their use should be incorporated in the management of care of people living with HIV/AIDS.

One study assessed a cognitive-behavioral group program (CBP) for HIV-positive Chinese men in Hong Kong Chan I, Kong P, Leung P, Au A, Li P et al (2005). They randomized 16 patients from a general hospital AIDS service to CBP or a wait-list control. The treatment group attended seven weekly sessions of cognitive behavioral therapy focused on AIDS-specific concerns. Post-treatment, this group showed significant reduction in depressive symptoms as assessed by the Medical Outcomes Study 36-item short form health study (SF-36) mental health subscale ($F = 8.28, P < 0.05$) and the CES-D ($F = 12.18, P < 0.01$).

Rosenberg SD, Goodman LA, Osher FC et al (2001), tested the efficacy of group interpersonal psychotherapy (IPT) in rural Ugandan communities with high HIV prevalence and high HIV-related mortality, and showed that the intervention was effective in reducing depressive symptoms and feasible in a community setting. They randomized 30 villages to receive sixteen weekly sessions IPT or to a control arm. The mean reduction in depression severity was 17.47 points for the intervention groups and 3.55 points for controls ($P < 0.001$).

In a study of Outcome of cognitive-behavioral and support group brief therapies for depressed, HIV-infected persons by JA Kelly, DA Murphy, GR Bahr, et al (1993) researchers evaluated the effects of brief cognitive-behavioral or social support group therapy with this population. Sixty-eight depressed men with HIV infection were randomly assigned to one of three conditions: eight-session
cognitive-behavioral groups, eight-session social support groups, or a comparison condition. Before and after intervention and at 3-month follow-up, all participants were individually assessed by using measures of symptoms of distress as well as substance use and sexual practices. Relative to the comparison group, both the cognitive-behavioral and social support group therapies produced reductions in depression, hostility, and somatization. The social support intervention also produced reductions in overall psychiatric symptoms and tended to reduce maladaptive interpersonal sensitivity, anxiety, and frequency of unprotected receptive anal intercourse, while the cognitive-behavioral intervention resulted in less frequent illicit drug use during the follow-up period. Tests for clinical significance of change particularly underscored benefits of the social support group intervention both at post-intervention and at long-term follow-up. They concluded that brief group therapy for depressed persons with HIV infection produced reductions in symptoms of distress. The two forms of therapy resulted in shared and unique improvements in functioning, although social support groups focused on emotional coping presented greater evidence of clinically significant change. As more persons contract HIV infection and live longer with HIV disease, further research is needed to evaluate outcomes of mental health services with these individuals.

2.5 DEATH ANXIETY

The prevalence rate of anxiety disorders among HIV-infected patients has been estimated to be as high as 38%. Symptoms of anxiety, especially anxiety
around death, have been noted to significantly impede antiretroviral adherence in various studies. Death anxiety is common among HIV-infected patients, and has been associated with symptoms of post-traumatic stress disorder (PTSD). Along with PTSD, panic disorder has also been frequently observed among HIV-infected patients. Although there are exceptions, it is possible to summarize the association between death anxiety and several demographic and experiential factors. Both gender and age are often related to death anxiety. Females tend to report higher death anxiety than males, and a negative relationship is often seen between age and death anxiety. Younger populations (primarily high school and college age students) tend to report higher levels of death anxiety than elderly persons. The reasons for these differences are not clear.

Religion and death have often been studied together. Belief in an afterlife or having a religious affiliation seems to have no specific effect on death anxiety, however, though one's religious orientation is important. Individuals whose religious and spiritual beliefs have been internalized, and therefore have an influence on their general behavior, values, and personal world view (a construct often identified as intrinsic religiosity) tend to report less death anxiety, while those whose religion serves a more social than ideological function (called extrinsic religiosity) report greater death anxiety.

Assessing death anxiety

The most common method used to assess death anxiety is the self-report questionnaire, which has been employed in over 95 percent of all studies. Several
of the more carefully validated measures, including those assessing positive feelings about death are reviewed in Robert Neimeyer's Death Anxiety Handbook (1994). Projective instruments (e.g., the Rorschach inkblot test or Thematic Apperception Test), which were once popular assessment methods, are no longer in favor due to the inability of researchers to document the reliability and validity of projective techniques.

There is information about two types of events: near-death experiences and death-education programs. Near-death experiences are situations in which individuals feel their death is imminent as a result of an accident, a near-accident, a medical condition, or some other event. Near-death experiences often have a salutary effect by reducing negative feelings and increasing positive feelings about death.

Death education can also influence death anxieties, but it depends on the type of program. Experiential death education refers to classes or workshops that help participants examine and discuss their personal views and feelings about death. This is usually achieved through a combination of readings, movies, videos, experiential exercises, and frank discussions. In contrast, didactic death education is primarily educational in nature and tends to include lectures and readings, but little or no exploration and disclosure of personal feelings. Whereas experiential death education significantly reduces death anxiety, didactic programs have no significant impact.
Death anxiety and behavior

Anxiety and depression are the most frequently identified psychological symptoms reported by persons with HIV (Kalichman & Sikkema, 1994). Empirical evidence has shown that the HIV population as a whole suffers from a high level of subjective distress such as anxiety, fear, depression, hopelessness, suicidal ideation, and guilt (Baer & Lewitter, 1989; Berube, 1989; Dilley, Pies & Helquist, 1989; Hintze, Templer, Cappelletty, & Frederick, 1993; Kooner et al. 1989).

A review of the literature demonstrates frequent contradictions in the severity of emotional disturbances in subjects at different stages of HIV illness. Many studies examining psychological disturbances in the HIV population have failed to utilize appropriate controls, classify symptomatic patients by severity of illness, and provide asymptomatic comparison groups (Green & Hedge, 1991). The overlap between neurological, somatic, and vegetative symptoms of AIDS and symptoms defining various depressive disorders poses a problem when assessing the prevalence of depression (Belkin, Fleishman, Stein, Peitte, & Mor, 1992; Drebing et al. 1994; Ostrow, 1990). A failure to control for pre-existing psychopathology, cohort effects, as well as sampling bias has further questioned the validity of past research exploring the emotional functioning of this population (Kalichman & Sikkema, 1994).

Perry et al. (1990) reported that both seropositive and seronegative participants demonstrated high levels of psychological disturbances prior to
notification of HIV status. After receiving their results, the seronegative population experienced a decrease of symptomatology, but the seropositive group remained at high elevations of emotional distress when measured 10 weeks after notification. In contrast to these findings, Jadresic, Riccio, Hawkins, & Wilson (1994) reported that subjects testing positive initially reported increased psychopathology but experienced a significant reduction of symptoms after six months. Chuang, Devins, Hunsley, & Gill (1989) found that AIDS Related Complex (ARC) and asymptomatic patients experienced greater psychological disturbances than patients diagnosed with AIDS, with all group demonstrating increased psychopathology, but they did not utilize seronegative controls.

**Death Anxiety in the HIV Population**

The Two-Factor Model of Death Anxiety (Lester & Templer, 1993, Lonetto & Templer, 1986) posits that death anxiety is composed of two factors. The first factor, overall psychological health, reflects general psychopathology such as depression and anxiety. The second factor reflects a person’s life experiences concerning the topic of death and subsequent fear of death. This second factor is primarily based on learning principals and environmental influences. A third “factor” of an existential nature (e.g. death’s effect on the perception of life’s meaning) has been suggested, encompassing variables not currently accounted for by the first two factors (Lonetto & Templer, 1986; Templer, 1976). Death Anxiety appears to be positively correlated with general
anxiety (Gilliland, 1982; Kuperman & Golden, 1978; Lucas, 1974; Smith, 1977).

Past research has provided evidence for the existence of death anxiety in the HIV population but has demonstrated frequent contradictions in its severity at different stages of the illness (Catania, Turner, Choi, & Coates, 1992; Franks, Templer, Cappelletty, & Kauffman, 1990; Hayslip, Luhr, & Beyerlein, 1991; Hintze, Templer, Cappelletty, & Frederick, 1993). Many of these results contradict past literature concerning the relationship between death anxiety and physical well being (Blakely, 1975; Dougherty, Templer, & Brown, 1986; Gibbs & Achterberg-Lewis, 1978; Gielen & Roche, 1979-1980; Lonetto & Templer, 1986; Lucas, 1974; Myska & Pasework, 1978; Neustadt, 1982; Templer, 1971).

Franks et al. (1990) studied males afflicted with AIDS, and found greater death anxiety among person with AIDS when compared to HIV negative controls. ARC and asymptomatic patients were not represented in this study. Kurdek & Siesky (1990) were the first to utilize seronegative controls, reporting that asymptomatic subjects demonstrated worse psychological functioning when compared to symptomatic and seronegative controls. These asymptomatic subjects reported greater death anxiety, psychological distress and lower optimism despite the worse health profile exhibited by the symptomatic group. Data from symptomatic patients in this study were analyzed as a whole and were not classified into AIDS or ARC groups and utilized a small sample size.
Hintze et al. (1993) reported positive correlations of seriousness of medical and HIV status with death anxiety but did not utilize healthy controls. Results from a pilot study conducted by Hayslip et al. (1991) could not differentiate men with AIDS and those who were healthy using the Templer Death Anxiety Scale, but found higher total scores for males with AIDS than controls on the Incomplete Sentence Blank task. Asymptomatic and ARC groups were not included in this study. Catania et al. (1992) reported that HIV positive symptomatic men exhibited significantly higher levels of death anxiety than both asymptomatic and HIV negative participants. This study also combined ARC and AIDS participants into one group. These inconsistent findings within the death anxiety literature, investigating the relationship between somatic integrity and emotional functioning, could be due to the aforementioned methodological flaws. They concluded that an investigation of death anxiety in the HIV population, with improved methodology and additional controls, may yield results more consistent with past death anxiety literature.

In a study the relationship of irrational beliefs and death anxiety as a function of Human Immunodeficiency Virus (HIV) status in homosexual and bisexual men was investigated. This study utilized an instrument that measured only attitudes and beliefs (excluding references to emotional distress or behavioral consequences) and accounted for the revisions to REBT theory. The connection between irrational beliefs and anxiety has been well established by, (Hamberger & Hastings, 1986; Morelli & Andrews, 1980; Rohsenow & Smith, 1982;
It was predicted that HIV positive asymptomatic and symptomatic groups will exhibit more death anxiety and total irrational beliefs than seronegative controls and participants with AIDS. This hypothesis was based on previous literature on death anxiety and terminal illness (Blakely, 1975; Dougherty et al. 1986; Gibbs & Achterberg-Lewis, 1978; Gielen & Roche, 1979-1980; Lonetto & Templer, 1986; Lucas, 1974; Myska & Pasewark, 1978; Neustadt, 1982; Templer, 1971). Cognitive-behavioral theory (Ellis, 1994, 1989; Ellis & Dryden, 1987; Walen, et al. 1992), which claims that anxiety is the result of future-oriented cognition, also supports this prediction. It was hypothesized that irrational beliefs in general will be positively correlated with death anxiety. In addition, it was hypothesized that the specific irrational belief demandingness will be correlated positively with death anxiety. These hypotheses were based on literature demonstrating a positive correlation between irrational beliefs and generalized anxiety (Hamberger & Hastings, 1986; Morelli and Andrews, 1980; Nottingham, 1992; Rohsenow & Smith, 1982; Walen et al. 1992; Warren & Zgourides, 1989). In addition, revisions in the REBT model of psychopathology, (Ellis, 1994, 1989; Ellis & Dryden, 1987), which suggests that demandingness is the superordinate irrational belief, supports these hypotheses.

In a study conducted by Hiebert, Furer, McPhail, & Walker, 2005, 39 adults with DSM-IV hypochondriasis were studied who completed questionnaires regarding illness and death concerns and then were randomized either to a group CBT condition or to a 4-month wait-list condition. The group CBT approach (14
weekly sessions) included in vivo and imaginal exposure to illness-related situations, reduction of bodily checking and reassurance seeking, and cognitive reappraisal. Death concerns were addressed via exposure to death-related situations and worries, increasing acceptance of the reality of death, enhancing life satisfaction, and cognitive reappraisal with regard to beliefs about death and dying. Death anxiety was measured with the Thanatophobia subscale of the IAS (Kellner, 1986) and the Death Anxiety Scale (DAS; Templer, 1970). Health anxiety was measured with the IAS and the Whiteley Index (Pilowsky, 1967). Participants reported very high levels of death anxiety. Results from the IAS Thanatophobia subscale and the DAS revealed that 93% of respondents were very much afraid to die, 87% were afraid of dying a painful death, 84% often thought about how short life really is, and 75% were afraid of news that reminded them of death. Only 3% said they were not at all afraid to die, and 7% said they were not particularly afraid of getting cancer. Mean scores on the death anxiety measures were compared to mean scores reported in the literature, revealing higher scores among individuals with hypochondriasis, than for other samples with panic disorder, healthy control groups, and HIV-positive males (Furer et al., 1997; Hintze, Templer, & Cappelletty, 1993; Templer, Ruff, & Franks, 1971). Positive correlations were found between the IAS (without Thanatophobia subscale) and the measures of death anxiety (IAS Thanatophobia subscale: r = .62; DAS: r = .51). The analysis found significant decreases in death anxiety and hypochondriacal symptoms for the group CBT condition. There were no significant pre-post differences for the wait-list condition.
The few studies relating death anxiety and behavior suggest that caregivers who are comfortable with death are more likely to interact positively with the terminally ill, to speak directly and honestly about death, and to be emotionally comforting and supportive to others in need. In contrast, high levels of death anxiety may influence people to avoid seeking needed medical attention or to plan appropriately for their own and others' medical care (e.g., by refusing to consider or execute advanced directives, which are documents such as living wills or a Durable Power of Attorney for Health Care that provide a person some control about how terminal features of their medical care should be handled). High death anxiety can also create missed opportunities to help others, such as someone who is bereaved and needs to speak about their feelings or children struggling to understand and cope with death-related experiences. (Joseph A. Durlak 1987).

Social support and death anxiety

In a study of coping with death anxiety: help-seeking and social support among gay men with various HIV diagnoses, Catania, Joseph A.; Turner, Heather A.; et al (1987) examined sources of help-seeking related to worries or concerns about death and dying and the effects of social support on death anxiety in a longitudinal sample of gay men (n = 52). Friends and primary sexual partners were the most frequent sources sought in dealing with death concerns for all groups of respondents (HIV-negative, HIV-positive asymptomatic, and HIV-positive symptomatic). Men experiencing HIV symptoms were more likely than HIV-negative and asymptomatic men to use formal sources of support (medical,
Although HIV-positive symptomatic men did not differ from HIV-negative men in terms of help-seeking from family sources, they were significantly more likely to seek the help of family members than HIV-positive asymptomatic men. All three HIV groups showed significantly different mean levels of death anxiety, with HIV-negative men reporting the lowest level and HIV-positive symptomatic men the highest. Among HIV-negative men, only mental health sources of support (psychologists and clergy) were significantly related to death anxiety, measured 1 year later ([\(\beta\) = -0.35]). These sources of support were also associated with death anxiety among HIV-positive asymptomatic men, but in the opposite direction ([\(\beta\) = 0.26]). Contrary to expectations, men experiencing HIV symptoms benefited most from family support ([\(\beta\) = -0.31], although peer ([\(\beta\) = -0.19]) and medical ([\(\beta\) = -0.28]) support sources were also prominent. This study suggested that obtaining support from family may become particularly important as one approaches death. The effectiveness of social support in reducing death anxiety appears to vary over the course of the disease from asymptomatic to symptomatic. HIV-symptomatic men obtain support from a wide range of helpers, including medical and peer supports and family.

### 2.6 Cognitive behavior therapy

Cognitive Behavior Therapy (CBT) is one of the major orientations of psychotherapy (Roth & Fonagy, 2005) and represents a unique category of psychological intervention because it derives from cognitive and behavioral
psychological models of human behavior that include for instance, theories of normal and abnormal development, and theories of emotion and psychopathology.

Behavior therapy, the earliest of the cognitive and behavioral psychotherapies, is based on the clinical application of extensively researched theories of behavior, such as learning theory (in which the role of classical and operant conditioning are seen as primary). Early behavioral approaches did not directly investigate the role of cognition and cognitive processes in the development or maintenance of emotional disorders. Cognitive therapy is based on the clinical application of the more recent, but now also extensive research into the prominent role of cognitions in the development of emotional disorders.

The term ‘Cognitive-Behavioral Therapy’ (CBT) is variously used to refer to behavior therapy, cognitive therapy, and to therapy based on the pragmatic combination of principles of behavioral and cognitive theories.

New CBT interventions are keeping pace with developments in the academic discipline of psychology in areas such as attention, perception, reasoning, decision making etc.

**The Evidence Base for CBT :**

Treatment interventions are predicated on a robust evidence base derived from studies utilizing randomized controlled and single-case methodologies that have demonstrated the efficacy and effectiveness of cognitive and behavioral psychotherapies in the treatment of common mental health problems, including the anxiety disorders, generalised anxiety, panic, phobias, obsessive-compulsive
disorder, posttraumatic stress disorder, bulimia and depression as identified by a host of recent reviews by NICE, SIGN and other review bodies. CBT models have also been developed for use in an increasing range of mental health and health difficulties including severe and enduring mental health problems, such as psychosis, schizophrenia, bi-polar disorder, anger control, pain, adjustment to physical health problems, insomnia and organic syndromes, such as early stage dementia. There is an extensive research base around behavioral approaches in working with children and people with learning disabilities, severe and enduring mental health problems and “challenging behavior” generally. More recently CT and CBT have become the treatments of choice for adolescent depression, and for use with children and in intellectual disability (learning disability). Research into the contribution of psychological factors to physical health problems (such as low back pain, chronic fatigue, recovery from surgery for example) is growing and has led to the development of CB approaches in these areas.

Developments in cognitive therapy, cognitive-behavioral therapy and/or behavior therapy research, theory and practice (particularly in the development, or refinement, of clinical techniques/methods) are occurring rapidly. So are developments in cognitive and behavioral psychological perspectives of normal and abnormal psychological processes such as human development and emotion. The application of cognitive, behavioral and cognitive-behavioral theory and approaches is happening in many fields other than mental health, eg. Education
and training, public health, organizational psychology, forensic psychology, management consultancy, sports psychology for instance.

**Key Concepts in Cognitive-Behavioral Therapy (CBT)**

The cognitive component in the cognitive-behavioral psychotherapies refers to how people think about and create meaning about situations, symptoms and events in their lives and develop beliefs about themselves, others and the world. Cognitive therapy uses techniques to help people become more aware of how they reason, and the kinds of automatic thought that spring to mind and give meaning to things.

Cognitive interventions use a style of questioning to probe for peoples’ meanings and use this to stimulate alternative viewpoints or ideas. This is called ‘guided discovery’, and involves exploring and reflecting on the style of reasoning and thinking, and possibilities to think differently and more helpfully. On the basis of these alternatives people carry out behavioral experiments to test out the accuracy of these alternatives, and thus adopt new ways of perceiving and acting. Overall the intention is to move away from more extreme and unhelpful ways of seeing things to more helpful and balanced conclusions.

The behavioral component in the cognitive-behavioral psychotherapies refers to the way in which people respond when distressed. Responses such as avoidance, reduced activity and unhelpful behaviors can act to keep the problems going or worsen how the person feels. CBT practitioners aim to help the person feel safe enough to gradually test out their assumptions and fears and change their
behaviors. For example this might include helping people to gradually face feared or avoided situations as a means to reducing anxiety and learning new behavioral skills to tackle problems.

Importantly the cognitive and behavioral psychotherapies aim to directly target distressing symptoms, reduce distress, re-evaluate thinking and promote helpful behavioral responses by offering problem-focused skills-based treatment interventions.

**CBT Compared to other Modalities and Myths about CBT:**

- The cognitive and behavioral psychotherapies target problems in the here and now with much less therapeutic time devoted to experiences in early life.

- The therapeutic relationship is seen as an essential ingredient but unlike other psychotherapies is not viewed as the main vehicle of change. Instead the focus is in collaborative working on jointly agreed problems.

- The effectiveness of CBT is supported by evidence from randomised controlled trials (RCTs), uncontrolled trials, case series and case studies.

- It is both highly structured (although always based on a formulation of the relationship between the client’s presenting problems and underlying cognitive and/or behavioral processes) and flexible due to the constant evaluation of the outcome of the interventions.
- Cognitive therapists do not usually interpret or seek for unconscious motivations but bring cognitions and beliefs into the current focus of attention (consciousness) and through guided discovery encourage clients to gently re-evaluate their thinking.

- It is a form of therapy that addresses problems in a direct and targeted way.

- It focuses on a shared model of understanding, using a psycho-educational approach, open sharing of the formulation and teaching of self-evaluation and management skills.

- Its potency as a model is shown by its increasing use and accumulating recommendation by a range of evidence-based guidelines.

### 2.7 Cognitive restructuring

Cognitive restructuring is the process of replacing maladaptive thought patterns with constructive thoughts and beliefs. These techniques were pioneered by Albert Ellis and Aaron Beck, among others. Ellis and Aaron T. Beck were initially trained in psychoanalysis. Beck was researching depression under the psychoanalytical understanding that depression resulted from anger turned against the self and was examining dream content in order to find this ‘retroflexed anger’ ([Corey, 1996: 338](#)). He observed that depressed clients had a pronounced negative bias in their Interpretations of themselves leading to strong self-disparagement. He came to believe that systematic errors in logical thinking caused depression. These thoughts were understood to be ‘automatic’, derived from generalizations of past experience.
Ellis explained that ‘self-talk’ was not only a behavior but a behavior one could infer from what a person was experiencing following a particular ‘activating event’. Ellis had put forward an ABC model to explain his ideas where A represents an activating event. B represents his beliefs about the event and C represents the emotional and behavioral consequences following the beliefs. For Ellis, we are what we think and we disturb ourselves when we tell ourselves repeatedly irrational sentences that we have learned from our backgrounds or devised ourselves.

Activating event ----→ Beliefs about event ----→ Consequences

Ellis and Beck both had similar perspective of cognitive restructuring. In an interview at the American Psychological Association in 2000, Beck and Ellis were interviewed together and asked about any differences they had. They commented that the differences were ‘slight’ being ‘mostly in technique and style, more than in perspective’ (American Psychological Association, 2000-2002).

Beck believed that distortions in thinking cause disordered emotional and behavioral consequences. Hence, we need to identify not only the automatic thoughts (e.g., I’m a failure) but the type of distortion that displayed in the automatic thought. Leahy (2003: 19) has presented the following table illustrating this relationship between automatic thought and thinking distortion.
<table>
<thead>
<tr>
<th>AUTOMATIC THOUGHTS</th>
<th>THINKING DISTORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I’m a failure</td>
<td>Mislabling</td>
</tr>
<tr>
<td>She thinks I’m unattractive</td>
<td>Mind reading</td>
</tr>
<tr>
<td>Nothing I do works out</td>
<td>All-or-nothing thinking</td>
</tr>
<tr>
<td>Anyone can do this job – it doesn’t mean anything</td>
<td>Discounting positives</td>
</tr>
</tbody>
</table>

These automatically occurring thoughts have great impact on patients’ lives by lowering their self-esteem, encouraging self-blame and encouraging self-blame.

Beck’s in his cognitive therapy proposed that people with emotional disorders engage successfully in aberrant, dysfunctional thinking which causes the problem. Different types of dysfunctional thought are Dichotomous thinking (absolutes), Arbitrary inference – inadequate evidence, Overgeneralization – conclusions based on too few instances, Magnification – exaggerating the meaning of an event which are responsible for irrational believes. Beck devised his cognitive therapy to stop these thoughts and manage psychological disorders.

Different techniques of cognitive restructuring

In cognitive restructuring goals are to first teach clients to identify and evaluate automatic thoughts, the actual words or images that go through a person’s mind at the most superficial level of cognition) that lead to distress and/or dysfunctional behaviors. Dysfunctional core beliefs and assumptions are
also identified. Core beliefs are deeply held beliefs that we have about ourselves and the world around us. Through the treatment process, clients are guided to discuss problems that are the most distressing and recurrent and to first evaluate and modify their automatic thoughts. Following accomplishment of this aspect, clients are assisted in modifying their core beliefs and assumptions. Modification occurs through examining the evidence and looking for alternative explanations (Beck, 1998).

The basic idea of cognitive restructuring is that people's emotions and behavior can be greatly affected by what they think. If people can consciously change their habits of what they say to themselves and what mental images they present to themselves, they can make themselves happier or kinder or more productive or can accomplish any of several other positive changes. (Joseph Strayhorn).

All stimuli received by the brain are processed through interpretation and classified as negative, neutral, or positive; this process is called perception. Albert Ellis’s work explained that stress-related behaviors are initiated by perceptions and that these self-defeating perceptions can be changed. Cognitive restructuring means changing a perception from a negative interpretation to a neutral or positive one, making it less stressful. This process is also called reappraisal, relabeling, reframing, and attitude adjustment. Negative thoughts are often called toxic thoughts.
Research has now substantiated the hypothesis that negative thoughts can suppress the immune system. Negative thoughts or self-talk can inhibit our energies and keep us from taking steps to achieve our goals. Conversely, positive thoughts and self-talk can activate our energies and help us take steps toward our goals.

Cognitive restructuring aims to promote behavioral change through restructuring of thoughts. This is termed the “self talk” or the internal dialogue we conduct with ourselves in order to interrupt the world. Positive self-talk leads to achievement and increased confidence. Negative self-talk leads to feeling of defeat and loss of control.

**BECK’S COGNITIVE THERAPY MODEL (1976)**

Beck’s process involves emphasis on reality based interpretations of information and actively seeks to minimise the many ifs, buts, ands and maybes that may haunt the stressed individual. The approach developed by Beck aims to facilitate the client in focusing on reality based data to interpret environmental transactions.

This is a technical way of saying that it is important to make sure that the client is interpreting what is going on around them accurately. People under stress tend to be focused on a negative issue, they may not be thinking properly. They can also ‘read into’ situations things which in reality are not there, it is their own interpretations which are faulty.
Common situations could include a stressed person’s partner asking a simple question and having it interpreted and responded to as a criticism. This is a regular occurrence, stressed individuals can become very defensive and see criticisms and sources of non-existent contention everywhere. They need to be made aware of this so that they can start the process of regaining control. (www.health-concern.com).

The aim is to move the client away from negative cognitive (thought) processes and towards positive cognition. It often surprises people just how much control/influence they can exercise over their thought patterns, the breakthrough comes when it is realised how much of our cognition is the result of conditioning and habit.

According to **Beck and Emery (1985)**, they state that "Anxious patients in the simplest terms believe that something bad is going to happen that they won’t be able to deal with."

They advanced 3 basic strategic questions detailing how a process of cognitive restructuring could be achieved in this case.

- What is the evidence supporting the conclusion currently held by the client?
- What is another way of looking at the same situation but reaching another conclusion?
- What will happen if, indeed, the current conclusion/opinion is correct?
• What is the evidence supporting the conclusion currently held by the client?

By employing questioning techniques a client can be helped to identify and discover ways of coping with and correcting patterns of negative cognition and of faulty reasoning.

• You’ve reached a conclusion, and the evidence to support this conclusion is?

• What evidence is there against this conclusion?

• Could you be reading into situation’s things that are not there?

• Are habits being confused with fact?

• Are generally held opinions being confused with fact?

• Could your interpretations be on the negative side because of the stress you are under?

• If you were under less stress would you see this exact same situation in the same way?

• Are you seeing this situation in ‘all or nothing’ terms? In other words have you convinced yourself that there are only a very limited number of outcomes to the present situation?

• Could your conclusions be extreme or exaggerated?
- Are you emphasising certain parts of your experience and taking them out of context?
- You are emphasising certain parts of your experience because?
- Is the information you are depending on reliable?
- You know that the information is reliable because?
- Are you thinking ‘this IS going to happen, rather than, ‘this MAY happen’?
- Are you confusing high probability events with low probability events?
- Are your conclusions based on feelings rather than facts?
- Have you made a value judgment rather than evaluate the facts?
- Are you concentrating on small irrelevant details?
- Are you failing to take into account the main picture?
- Are you forming conclusions, or a series of different conclusions?
- Is your thinking clear or do you find yourself thinking of a number of things simultaneously?

**What is another way of looking at the same situation but reaching another conclusion?**

The aim of this questioning approach is to help the client to open up their options and move them away from closed thinking processes.
This also comes specifically under the banner of developing a client’s coping skills. Positive outcomes here would include the client developing alternative ways of looking at things, learning to differentiate between fixed (things you have no control over) and floating (things that you can exercise some or total control over) aspects of their experience. Another goal here should be to help the client to find the positive side to their experience.

This can be difficult sometimes but is generally beneficial and is worth developing. Questions such as, ‘And what good has come of this?’ or ‘what have you learned from this experience?’ are possible starting points.

**What will happen if, indeed, the current conclusion/opinion is correct?**

‘And if it happens, what then?’ The aim of this strategy is to get the client to have a good look at the whole or as large a part of the picture as is possible in order to bring the approaching ‘disaster’ into perspective. This strategy brings together coping skills and problem-solving strategies. This is not a license to tell a client what to do; therapist must continue to help them develop their own skills and processes. Beck and Emery suggested that the client and therapist work together to develop a variety of strategies that the client can use.

There are numerous cognitive restructuring techniques, including cost-benefit analyses (e.g., "what are the costs and benefits of this belief?")}, semantic techniques (e.g., defining vague words such as "good" or "bad" in concrete terms with clear methods of evaluation rather than making broad unfalsifiable negative statements), and double-standard techniques (e.g., "would you view a friend the
same way you view yourself if your friend committed this same supposed offense?”). Different types of these techniques are used to manage different kind of psychiatric disorders like depression, generalized anxiety disorder, posttraumatic stress disorder etc. Particular thoughts are connected to other thoughts. A web of thoughts and beliefs swirl around the rejection situation.

I’ll get rejected → I must be a loser → I’ll never find anyone for a relationship → I’ll always be alone → I can’t be happy if I’m alone → I’d always be miserable → I need other people to be happy.

In this treatment approach there are different phases:

1. Education of awareness of thought, feelings, sensations and behaviors

2. Restructure of the self talk from negative to positive alongside coping skills such as relaxation are learnt

3. The new responses are applied to events through mental rehearsal, role playing and graded exposure

Gillian Webb. Dip Phys Dip MT ADP (OMT) (www.physio.co.nz) has structured self-awareness in different ways. The model (above) consists of the inner world of thoughts and emotions and body sensations (relating to stress) and the outer world relating to people and the environment. The intermediately world of the senses are in between.

Relaxation Methods utilize your senses (through imagery and physical relaxation) to restore positive self talk and allow a state in which we can “re-play”
situations which counteract stress. There is an important difference between self consciousness which leads to embarrassment and self awareness which leads to knowledge about oneself. Increased self-awareness comes from listening to ourselves: the key questions are:

**Exercise in self awareness**

1. **Attempt to answer the key questions:**
   - Am I the person I want to be?
   - What is stopping me becoming that person?
   - Why don’t I allow myself to develop to the fullest?

2. **Spend a few minutes writing** down your thoughts three times in a day and examining them. Often on examination these thoughts can reveal a low self-esteem and a feeling of loss of control over circumstances.

3. **Focus on your “gut feeling”** each time you practice the relaxation method and write it down.

4. **Identifying your emotional patterns;** e.g.
   - Do you express yourself spontaneously or with controlled emotions?
   - How well do you share your feelings?
   - How well do you release your emotions in order to move forwards. How do you do this?
5  **Awareness of the body comes** through recognizing where tension is stored in the body (muscles and organs): where do you store your tension?

  Borysenko calls creating negative thoughts awfulizing, and explains that the way to change these thoughts is through reframing.

  A Four-Stage Process for Cognitive Restructuring

  - Awareness

  - Reappraisal of the situation

  - Adoption and substitution

  - Evaluation

**American community corrections Institute (ACCI’s) Cognitive restructuring curriculum** incorporates the following concepts that are proven to successfully change lives:

  - Each person has two minds; the conscious and the subconscious. The conscious mind belongs to you, but your subconscious belongs to your early environment and those who raised you.

  - Much of who you are hasn't much to do with you. **Negative programming** is the major cause of low self respect, distorted thinking and self defeating thoughts and behaviors.

  - The negative circumstances in your life are not all your fault. **You are responsible for your actions**, but others must take responsibility for some of your bad programming.
• You may not have control over your subconscious mind, but you do your conscious mind. Each accountable person knows right from wrong. Not everyone who comes from a dysfunctional home becomes a criminal. **To become a criminal is a conscious choice.**

• Life isn't fair. You didn't get to choose your parents or early environment. You didn't have control over your beginnings, but you do have control over your endings. **There is no wrong you can do that is worth the price you have to pay for it.**

• If you keep on doing what you have been doing, you will keep on getting what you have been getting. If you want to stop what you are getting, you will have to stop what you are doing. If you don't stop what you are doing, life will get harder and harder.

• Much of life is based on perception or belief and not necessarily the truth. You are not your bad memories or what other people say you are. The truth is you are many times better than you think you are. **The more you find the truth about yourself the happier you will be.**

• You can change who you are by changing what you are doing. You can change from doing wrong to right as soon as you want to. Excuses are only reasons why you don't want to change. **You can change regardless of your circumstances.** Life is what you make of it. If you are not successful and happy in this life, it is your fault.
2.8 Structured relapse prevention

Relapse Prevention Therapy (RPT) is a cognitive-behavioral approach to the treatment of addictive behaviors that specifically addresses the nature of the relapse process and suggest coping strategies useful in maintaining change (Marlatt & Gordon, 1985; Parks, Marlatt, & Anderson, 2001).

Structured Relapse Prevention (SRP) is an approach to outpatient counselling that uses cognitive-behavioral treatment to help clients learn the coping skills they need to deal effectively with day-to-day substance use triggers and risk situations. It was developed starting in the late 1980s at the Addiction Research Foundation, one of the founding organizations of the Centre for Addiction and Mental Health (CAMH).

SRP has been used as a stand-alone, outpatient intervention of eight to 12 sessions, as an aftercare component to inpatient treatment, and as a set of tools to be used as needed when working with clients who are ambivalent about changing their substance use. SRP has also been used with individuals or groups in a variety of service contexts, including substance use treatment services, employee assistance programs, probation and parole settings, and mental health settings. SRP is a flexible program, designed to accommodate clients’ different needs and treatment goals.

A Cognitive Behavioral Model of Relapse

RPT is based on a cognitive-behavioral model of the relapse process developed over the past 30 years by Marlatt and his colleagues (Marlatt and
Gordon, 1985; Parks, Anderson, & Marlatt, 2001). This model of relapse addresses several key questions about relapse both as a process and as an event:

1. Are there specific situational events that serve as triggers for relapse?

2. Are the determinants of the first lapse the same as those that cause a total relapse to occur, if not, how can they be distinguished from one another?

3. How does an individual react to and conceptualize the events preceding and following a lapse and how do these reactions affect the person’s subsequent behavior regarding the probability of full-blown relapse?

4. Is it possible for an individual to covertly plan a relapse by setting up a situation in which it is virtually impossible to resist temptation?

5. At which points in the relapse process is it possible to intervene and alter the course of events so as to prevent a return to the addictive habit pattern?

6. Is it possible to prepare individuals during treatment to anticipate the likelihood of relapse and to teach them coping behaviors that might reduce the likelihood of lapses and the probability of subsequent relapse?

In order to investigate these key questions about relapse, it is helpful to engage in a microanalysis of the relapse process. This approach focuses on the immediate precipitating circumstances of relapse as well as on the chain of events that may precede and set-up a relapse. In this analysis, particular attention is paid to situational, interpersonal, and psychological factors that precede a relapse and to the individual’s expectations and attributions in reaction to a lapse. This
analysis is consistent with the view that the maintenance stage of habit change is a
time when mistakes are expected, but can be overcome with renewed effort. As
the old adage goes, we can learn much from our mistakes. In this sense, a lapse
can be seen as a crisis involving both the dangers of full-blown relapse and the
opportunity for new learning to occur from the slip to avoid a future relapse.

2.9 **Structured problem solving**

Humans have been solving problems from the beginning of their existence,
usually by trial and error. However, effective and reliable problem origination,
prevention, solution, and challenge of solution did not begin until our scientists
recognized and developed the experimental method, the method of science, most
commonly called the scientific method or scientific method. *(Norm W.Edmund
2006-2007)*. Many books on problem solving by well-known authors fail to
acknowledge the scientific method as a general problem-solving method and
guide. However, they do contain valuable knowledge about problem solving in
general and about many of the creative, non-logical, logical, and technical
methods and techniques, procedural principles and theories, attributes and
thinking skills that are needed at the various stages of the scientific method of
problem solving.

Problem solving is one of several cognitive behavioral intervention
approaches used to frame stressful events and drive positive behavioral changes
*(Nezu et al., 1999)*.
The nature of human problem solving methods has been studied by psychologists over the past hundred years. There are several methods of studying problem solving, including; introspection, behaviorism, simulation, computer modeling and experiment.

D'Zurilla, Thomas J.; Goldfried, et al(Aug 1971) selectively reviewed problem-solving theory and research for possible applications in behavior modification. Problem solving was defined as a behavioral process which (a) makes available a variety of response alternatives for dealing with a problematic situation, and (b) increases the probability of selecting the most effective response from among these alternatives. 5 stages of problem solving were identified: (a) general orientation or "set," (b) problem definition and formulation, (c) generation of alternatives, (d) decision making, and (e) verification. Training in problem solving was conceptualized as a form of self-control training, i.e., the individual "learns how to solve problems" and thus discovers for himself the most effective way of responding. General guidelines are presented for clinical application with cases characterized by a deficit in effective behavior and its emotional consequences.

Theories of problem-solving are dominated by the work of Newell and Simon(1959) on General Problem Solver. This work established the information processing paradigm for the study of problem-solving and the concepts of "means-ends-analysis" and "problem space". According to the GPS framework, problem-solving involves the identification of subgoals and the use of methods
especially heuristics) to satisfy the subgoals. Humans are representable as information processing systems. IPS consists of an active processor, input (sensory) and output (motor) systems, and internal Long Term Memory and Short Term Memory, and External Memory. How much processing and IPS can accomplish per unit of time depends on three parameters.

1. The number of processes it can do simultaneously

2. The time it takes to do each process

3. The amount of work done by each individual process

As per Newell and Simon problem solving in human is goal-directed. It takes place by search in a problem space i.e., by considering one knowledge state after another until a desired knowledge state is reached. The search may involve backup (return to old knowledge states).

The Gestalt psychologist Wertheimer (1968) also conducted research on problem-solving and emphasized the importance of understanding the structure (i.e., the relationship among parts) of the problem. In his lateral thinking theory, Along with Kohler and Koffka, Max Wertheimer was one of the principal proponents of Gestalt theory which emphasized higher-order cognitive processes in the midst of behaviorism. Wertheimer was especially concerned with problem-solving. Wertheimer (1959) provides a Gestalt interpretation of problem-solving episodes of famous scientists (e.g., Galileo, Einstein) as well as children presented with mathematical problems. The essence of successful problem-solving behavior according to Wertheimer is being able to see the overall structure of the problem:
"A certain region in the field becomes crucial, is focused; but it does not become isolated. A new, deeper structural view of the situation develops, involving changes in functional meaning, the grouping, etc. of the items. Directed by what is required by the structure of a situation for a crucial region, one is led to a reasonable prediction, which like the other parts of the structure, calls for verification, direct or indirect. (Ellis, W.D. (1938).

The principles suggested by Wertheimer for problem solving are

1. The learner should be encouraged to discover the underlying nature of a topic or problem (i.e., the relationship among the elements).

2. Gaps, incongruities, or disturbances are an important stimulus for learning

3. Instruction should be based upon the laws of organization: proximity, closure, similarity and simplicity.

DeBono stressed the importance of looking at a problem with a fresh perspective. The term lateral thinking was coined by Edward de Bono in the book New Think: The Use of Lateral Thinking published in 1967. Lateral thinking is solving problems through an indirect and creative approach, using reasoning that is not immediately obvious and involving ideas that may not be obtainable by using only traditional step-by-step logic. When something creates a problem, the performance or the status quo of the situation drops. Problem solving deals with finding out what caused the problem and then figuring out ways to fix the problem. The objective is to get the situation to where it should be. In
Creative Problem Solving by creativity, one must solve a problem in an indirect and unconventional manner.

Schoenfeld (1985) presents a theory of problem-solving in mathematics that involves four aspects: resources, heuristics, control, and beliefs. Although this framework was specifically developed for mathematical problem-solving, it seems more generally applicable.

Bransford et al (1986) present a problem-solving approach to the use of hypermedia in their anchored instructional theory.

Problem-solving skills appear to be related to many other aspects of cognition (Frederiksen, 1984) such as schema (the ability to remember similar problems), pattern recognition (recognizing familiar problem elements) and creativity (developing new solutions). The issue of transfer is highly relevant to problem solving. A good summary of problem-solving research as it applies to instruction is provided by Tuma & Rief (1980). Problem-solving skills are fundamental to many professional domains such as engineering or medicine.

There are plenty of different approaches to problem solving in different fields with the help of number of steps from 4 to 8.

- Abstraction: solving the problem in a model of the system before applying it to the real system
- Analogy: using a solution that solved an analogous problem
Brainstorming: (especially among groups of people) suggesting a large number of solutions or ideas and combining and developing them until an optimum is found

Divide and conquer: breaking down a large, complex problem into smaller, solvable problems

Hypothesis testing: assuming a possible explanation to the problem and trying to prove (or, in some contexts, disprove) the assumption

Lateral thinking: approaching solutions indirectly and creatively

Means-ends analysis: choosing an action at each step to move closer to the goal

Method of focal objects: synthesizing seemingly non-matching characteristics of different objects into something new

Morphological analysis: assessing the output and interactions of an entire system

Reduction: transforming the problem into another problem for which solutions exist

Research: employing existing ideas or adapting existing solutions to similar problems

Root cause analysis: eliminating the cause of the problem

Trial-and-error: testing possible solutions until the right one is found.

(Wikipedia)
Szuy Chen, Cathleen Jordan et al (2006) studied the effect of cognitive behavioral therapy on depression: the role of problem-solving appraisal. A one-group pretest-posttest design was used. Results were based on the responses of 30 depressed individuals in an intensive outpatient program. Findings supported the research hypothesis that the more individuals improved their problem-solving appraisal, the more their depression decreased. Additionally, it was discovered that the poorer individuals’ problem-solving appraisal before the CBT, the more improvement they had on depression and problem solving appraisal after the CBT. They concluded that problem-solving appraisal might play an important part in CBT for depression reduction and CBT seemed to have a ceiling effect on improving individuals’ problem-solving appraisal.

Ardith doorenbos, barbara given, charles given, et al (2005 July) studied a cognitive behavioral intervention randomized trial on reducing symptom limitations. In which they examined how problem-solving therapy organizes an intervention to decrease symptom limitations. This randomized control trial was conducted in two comprehensive and four community cancer centers. Two hundred thirty-seven individuals, aged 31–87, newly diagnosed with solid tumor cancers, participated. The experimental group (118 individuals) received a 10-contact, 18-week problem solving approach as a cognitive behavioral intervention focused on cancer- and chemotherapy-related symptoms. The control group (119 individuals) received conventional care. Participants receiving the cognitive
behavioral intervention had lower scores of symptom limitation than did participants in the control group. The cognitive behavioral intervention problem solving was key to decreasing symptom limitations. Findings also suggest that nursing interventions may be particularly helpful to younger individuals in managing cancer-related symptom limitations.