Chapter II

REVIEW OF LITERATURE

Literature review helps to develop a strong knowledge base to carry out research in educational, clinical practice settings, and for future development of knowledge in nursing science. Information from the literature that provide a foundation for research and enhanced practice is analysed in terms of the model used, the relevance of the particular opinion or data, and the logic or methods used to examine the conclusions.

The literature relevant for this study had been organized into the following sections:

Section I : Studies Related to Epidemiological Aspects of Depression.

Section II : Studies Related to the Biofeedback Therapy.

Section III : Studies Related to Progressive Muscle Relaxation Exercise.

Section IV : Studies Related to Stressful Life Events and Depression.

Section V : Studies Related to Adherence to Treatment for Depression.
Section I: Studies Related to Epidemiological Aspects of Depression

Hilary Glover (2011) did a survey in conjunction with the World Health Organization and World Mental Health (WMH). Researchers from 20 centers collaborated to investigate the prevalence of depression around the globe. The study results showed that of the population from high-income countries (15%), low/middle-income countries (11%) were likely to get depression. Major Depressive Episodes (MDE) were elevated in high-income countries (28% compared to 20%) and were especially high (over 30%) in France, the Netherlands, and America. The country with the lowest incidence was China at 12%, but in contrast, Major Depressive Episodes (MDE) were very common in India (at almost 36%). Depression affects 121 million people worldwide. It can affect a person’s ability to work, form relationships, and destroy the quality of life. Most severe depression can lead to suicide and is responsible for 850,000 deaths every year. Women were twice as likely to suffer from depression as men due to the loss of a partner, whether from death, divorce or separation. However, the contribution of age varied from country to country. Age of onset of depression was almost two years earlier in low-income countries when compared to people from high-income countries.
Goldney, Eckert, Hawthorne, and Taylor. (2010) did a survey to identify changes in the prevalence of major depression between 1998, 2004, and 2008 in South Australia. The result indicated that there was a significant increase in the prevalence of major depression in 2004 and 2008 (P <0.001). Significant increase was observed among males aged 15-29 and females aged 30-49 years. The authors concluded that the prevalence of major depression increased significantly in South Australia over the last decade and there was a reduction in mental health status and an increase in persons reporting poor health.

Assies, et al. (2010) conducted a longitudinal study to assess the health related quality of life among 450 patients with recurrent depression. The result indicated that both physical and mental Health Related Quality of Life (HRQoL) was lower for female patients than the male patients. The authors concluded that recurrent remitted Major Depression Disorder (MDD) was associated with a lower Health Related Quality of Life (HRQoL).

Feldman, Greeson, and Senville. (2010) conducted a study among 190 female undergraduate students to determine the differential effects of mindful breathing, progressive muscle relaxation, and meditation on decentering and negative reactions to repetitive thoughts. The result indicated that there was an association between frequency of repetitive negative thoughts, and
the practice of the progressive muscle relaxation exercise and meditation in which, these two variables were strongly and positively correlated. The authors concluded that mindful breathing may help to reduce reactivity to repetitive thoughts.

**Vitor, et al. (2010)** conducted a cross-sectional analytical study to evaluate Health Related Quality of Life (HRQoL) and depression among 36 older patients with pressure ulcers. The result indicated that the patients with pressure ulcers had significantly lower Health Related Quality of Life (HRQoL) scores than controls. Seventeen (80.9%) of the patients in the study group were identified as having depression (P<0.002). The authors concluded that a high rate of depression was found in the elderly patients with pressure ulcers, who also reported lower Health Related Quality of Life.

**Chowdhury, et al. (2005)** collected the epidemiological data on psychiatric morbidity in the Sundarban region of West Bengal. A total of 26 clinics were conducted in Sagar, Kakdwip, Canning, and Gosaba block of the Sundarban region during the period from 1998 to 2000. The findings of the study indicated that a total of 451 psychiatric cases with diagnostic categories (male 239, female 212) and 215 non-psychiatric cases (male 107 and female 108) were seen in these clinics. The authors concluded that both non
psychiatric cases and psychiatric cases with psychological problems were attending the clinics.

Chiu. (2004) did an epidemiological study to assess the rates of depression for the general population and older samples and suicide in the Asia Pacific region from 1994-2004. The results indicated that in the Asia Pacific region, rates of major depression ranged from 1.3% to 5.5%, and rates of major depression in the previous year ranged from 1.7% to 6.7% and lifetime rates ranged from 1.1% to 19.9%. Rates of suicide in the Asia Pacific region are now similar to those in Europe and America. The authors concluded that it is important that Asian countries should have the human and financial resources to conduct large scale epidemiological surveys not only in the area of depression, but also in the broader field of mental disorders.

Donna Steward, Enza Gucciardi, and Sherry Grace. (2004) did a population health survey to assess the rate and risk of depression among Canadian women in 1999. The result indicated annual self-reported incidence of 5.7% compared with 2.9% in men. The highest rates of depression were seen among the women of reproductive age. Although depression is treatable, only 43% of the depressed women had consulted a health professional in 1998-1999, and among these, 32.4% were taking antidepressant medication. The authors concluded that people with lower
education, inadequate income, and fewer contacts with health professionals were less likely to receive treatment for depression.

**Lustman and Clouse. (2004)** conducted a prospective cross-sectional study to explore the depression among the diabetic patients and the relationship between mood and glycemic control. The result indicated that concurrent depression is associated with a decrease in metabolic control. The author concluded that depression is common in patients with both type 1 and type 2 diabetes and has significant effects on the course and outcome of their medical illness. Conventional antidepressant management strategies are effective and the regimen should be tailored to the individual patient.

**Vikram. (2001)** has done a meta-analysis study to investigate the influence of culture on the epidemiology of depression. The findings of the study inferred that the clinical presentation of depression in all cultures is associated with multiple somatic symptoms. Other factors, such as gender and income inequality, are the major risk factors for depression. The author suggested focus on the intervention studies including cost-effectiveness outcomes, to bridge the gap between general health and the mental health.
Weissman, Bland, and Faravelli. (1996) conducted a cross-sectional epidemiological survey to estimate the rates and patterns of major depression and bipolar disorder in 10 countries including the United States, Canada, Puerto Rico, France, West Germany, Italy, Lebanon, Taiwan, Korea, and New Zealand. The results indicated that the lifetime rates for major depression vary widely across the countries, ranging from 1.5 cases per 100 adults in the sample in Taiwan to 19.0 cases per 100 adults in Beirut. The annual rates ranged from 0.8 cases per 100 adults in Taiwan to 5.8 cases per 100 adults in New Zealand. In every country, the rates of major depression were higher for women than for men. The lifetime rates of bipolar disorder are more consistent across countries (0.3/100 in Taiwan to 1.5/100 in New Zealand); the sex ratios are nearly equal. Persons with major depression were also at increased risk for comorbidity with substance abuse and anxiety disorders at all sites. Persons who were separated or divorced had significantly higher rates of major depression than married persons in most of the countries, and the risk was somewhat greater for divorced or separated men than the women in most countries. The author concluded that the differences in rates for major depression across countries suggested that cultural differences or different risk factors affect the expression of the disorder.
Katon, Wayne, Schulberg, and Herbert. (1992) described the epidemiologic findings in journals published between 1975 and 1990 regarding the prevalence of depression among the medical patients. Depression is estimated to occur in 2-4% of persons in the community, in 5-20% of primary care patients, and in 6-24% of medical inpatients. In each setting, there are 2 to 3 times as many persons with depressive symptoms that fall short of major depression, criteria. In 33-50% of patients with depression the symptoms persist over 6-22 months. The author concluded that majority of longitudinal studies have shown the severity of initial depressive symptoms and the presence of co morbid medical illnesses were the predictors of persistence of depression.

Weissman. (1992) did an epidemiologic survey to assess the rates and risks for major depression. The results indicated that the psychiatric disorders in five urban communities in the United States and from family genetic studies suggested that major depression is a highly prevalent disorder. It occurs in adults and children, and there is evidence for an increased rate in younger people. The author concluded that there is a two to three-fold increased risk for major depression, if there is a family history of depressive disorder.

Patel and Prince. (1992) conducted a qualitative study to investigate the status of older people and concepts of late-life
mental health conditions, particularly dementia and depression, in Goa and India. The findings suggested that dementia was construed as a normal part of ageing and was not perceived as requiring medical care. Depression was a common presentation in primary care, but infrequently diagnosed. The author concluded that there is a need to raise awareness about mental disorders in late-life in the community and among the health professionals, and to improve access to appropriate health care for the elderly with mental illnesses.

**Section II: Studies Related to the Biofeedback Therapy**

**Wheat and Larkin. (2010)** stated in a journal article about a biofeedback of Heart Rate Variability and Related Physiology on bororeflex. The results revealed that Heart Rate Variability (HRV) biofeedback consistently effectuates acute improvements in bororefelex during biofeedback practice. The authors concluded that understanding of the way in which HRV biofeedback may improve physiological and clinical outcomes.

**Zhu, Lin, Wang, and Zhou. (2010)** conducted a study to explore the effects of biofeedback training on clinical symptoms, among 49 patients with Functional Constipation. The result indicated that after biofeedback training, clinical symptom of patients with Functional Constipation was greatly improved. The authors concluded that the Biofeedback training can improve
clinical symptom, psychological status, and quality of life in patients with Functional Constipation.

**Heinecke, et al. (2010)** conducted an experimental study to examine the benefits of psychotherapy and biofeedback therapy among 95 patients with tinnitus. The results indicated that more than 80% of the subjects significantly improved. If the patients suffered from depressive disorder, outcome was slightly reduced. The authors concluded that most tinnitus patients benefit from psychotherapy than biofeedback therapy.

**Bertisch, Wee, Phillips, and McCarthy. (2009)** conducted national health interview survey and alternative mind body therapies used by adults with medical conditions. The results inferred a positive association between mind body therapies and several medical conditions including various pain syndromes and anxiety/depression.

**Hu Li Za Zhi. (2009)** reported on a nurse’s experience on the actions which helped to alleviate depressive symptoms among the depressive patients in the psychiatric outpatient department. It was found that the outpatients had been suffering from depression as well as long-time tension and pain. The author employed relaxation techniques and biofeedback therapy, for 45-60 minutes per time for 8 times. After the therapy, the patient's self-
control over relaxation had improved considerably and care problems were resolved satisfactorily.

Servant, et al. (2009) wrote in an article about heart rate variability and its application in psychiatric field. The autonomic nervous system is highly adaptable and allows the organism to maintain its balance when experiencing strain or stress. Recent, studies indicated that patients with depression and anxiety disorders exhibit abnormally low Heart Rate Variability (HRV), compared with non-psychiatric controls. This review suggested that the use of biofeedback with relaxation and meditation approaches may result in increased HRV and parasympathetic activity.

Siepmann, et al. (2008) did a pilot study to assess the feasibility of using Heart Rate Variability (HRV) biofeedback among 14 patients aged 30 years with different levels of depression. The study findings showed that there was significant decrease in the level of depression, anxiety, decreased heart rate, and increased Heart Rate Variability (HRV) after conduction of biofeedback (P<0.05). The authors concluded that Heart Rate Variability (HRV) biofeedback appears to be a useful adjunct for the treatment of depression.
Ronald, et al. (2008) have done a randomized control study to determine the effects of bio feedback and relaxation on blood glucose and HbA1C among 39 patients with type 2 diabetes. The study findings revealed that biofeedback and relaxation were associated with significant decreases in average blood glucose, HbA1C, and had significant reduction in the level of anxiety and depression. The authors concluded that the use of biofeedback and relaxation in patients with type 2 diabetes for a period of 3 months after treatment was very effective.

Kayiran, et al. (2007) have done a case study to assess the effectiveness of neuro feedback with Fibro Myalgia Syndrome. The findings indicated that most of the symptoms decreased after ten sessions. The authors concluded that feedback training as a novel treatment method for Fibro Myalgia Syndrome.

Stevens, et al. (2007) did a meta-analysis of 26 studies to assess the effectiveness of psychotherapies with biofeedback, and progressive muscle relaxation, or both. The study finding showed that there was significant improvement over biofeedback and progressive muscle relaxation.

Pilu's, et al. (2007) found that women in the exercise group showed marked improvements in their depressive symptoms, while those on medication alone made only modest gains. The study
findings revealed that exercise could be an effective additional treatment for depression over the long term practice.

**McGinnis, et al. (2005)** conducted a randomized control study to determine the effects of biofeedback and relaxation on blood glucose level among 39 patients with type 2 diabetes. The study findings revealed that there was significant decrease in blood glucose and decreased scores on the depression and anxiety when compared with the control group.

**Nolan, et al. (2005)** have done a randomized control trial study among 46 patients with coronary heart disease to determine the heart rate variability biofeedback as a behavioral neuro cardiac intervention to enhance vagal heart rate control. The study results revealed that the stress and depression was reduced and the heart rate was enhanced. The authors concluded that heart rate variability biofeedback is a novel behavioral neuro cardiac intervention.

**Elkins and Rajab. (2005)** interviewed 82 psychiatric inpatients about the use of complementary and alternative medicine for the treatment of depression and anxiety. The findings of the study indicated that the most frequently used modality was herbal therapies (44%) followed by mind-body therapies such as relaxation, hypnosis, meditation, biofeedback (30%), and spiritual
healing by other 30%, and physical modalities such as massage acupuncture and yoga, were used by 21%. The authors concluded that complementary and alternative medicine plays a vital role for the management of psychiatric disorder.

Hammand. (2005) has conducted a study to investigate the effectiveness of neuro feedback for patients with anxiety and affective disorders. The author concluded that neuro feedback is more effective than pharmacological method for retraining abnormal brain wave patterns.

Giardino, Chan, and Borson. (2004) examined the feasibility of Heart Rate Variability and pulseoximetry biofeedback for 20 patients with chronic obstructive pulmonary disease. After training, subjects showed significant improvements on quality of life, statistically and clinically.

Hanmich, et al. (2004) used biofeedback as a supportive method in weaning long term critically ill patients. The study findings concluded that the paradigm of biofeedback is regarded as a suited approach to strengthen the psychological factors of chronic patients.

Norton, et al. (2004) conducted a randomized controlled trial of biofeedback for fecal incontinence among 171 patients with fecal incontinence. The study findings showed that there was
no difference between the groups on the episodes of incontinence, but at the same time there was a significant reduction in hospital anxiety and depression.

**McGrady, et al. (2003)** explored the effects of biofeedback assisted relaxation among 20 neurocardiogenic syncope patients. The study finding showed significant decrease of anxiety level and depression.

**Murphy, et al. (2003)** have conducted a study to find out the effects of feedback on task performance among 60 patients with major depressive disorder. The authors concluded that feedback can have different efforts in different contexts. Negative feedback appears to disrupt the performance of depressed patients.

**Mason. (2002)** has done a study to find out the psychological state and quality of life among 31 patients aged 34 years who received biofeedback training for idiopathic constipation. The study results showed decrease in the level of depression (p<0.05), anxiety (p<0.05), somatic symptoms (p<0.01), and improved general health status (p<0.05). The author concluded that the symptomatic improvement produced by biofeedback in constipated patients is associated with improved psychological state and quality of life.
Pop Jordanova and Pop Jordanova. (2002) investigated the stress related psycho physiological disorders among 18 patients dependent on haemodialysis and insulin. They concluded that the application of biofeedback as a complementary cost effective and non-invasive psycho physiological measures to improve the quality of life of these patients.

Pages, et al. (2001) conducted a randomized study to compare the effectiveness of physical therapy program with individual biofeedback training among 85 female patients with urinary stress incontinence. The study results showed that in the physical therapy group, the day time urination frequency decreased (22%) after 4 weeks of therapy and (19%) after 3 months (P<0.001). In the biofeedback group, the daily urination frequency decreased (10%) after 4 weeks of therapy and (5%) after 3 months (P>0.01). The nocturnal urination frequency declined (36%) after 4 weeks and (66%) after 3 months (P<0.05). The authors concluded that 4 weeks of intensive training resulted in reduced daytime urinary frequency.

Araujo, Durate, and Amdio. (2000) conducted a study to evaluate the variability of the surface EMG biofeedback of the same muscle in health subjects. The results showed an EMG co-efficient of variability of 21.61% and considered in experiments with an
inappropriate condition for normalization procedures for isometric voluntary contraction.

**Airazyan, et al. (1998)** have conducted a comparative study to find out the efficacy of relaxation techniques among 117 outpatients with mild hypertension. The study result showed that there was a significant reduction in stress and anxiety, depression, and blood pressure. The authors concluded that biofeedback therapy and meditation are effective to control hypertension.

**Spence, Sherp, Newton, and Champion. (1995)** have examined the effectiveness of EMG biofeedback, applied relaxation training, and a combined procedure among 48 patients with chronic upper extremity cumulative trauma disorder. The study results showed that patients in all 3 treatment conditions showed significant short term reductions in pain, anxiety, and depression. The authors concluded that applied relaxation training on measures of pain, distress, depression, and anxiety were effective for the patients with extremity traumas.

**Saxby and Peniston. (1995)** conducted an experimental study to test the alpha theta brain wave, neuro feedback training among 59 alcoholic patients with depressive symptoms. The study
results showed significant reductions in depression among the alcoholic patients.

**Siver, Brooks and Obenchain. (1995)** have done a comparative study to measure the effects of eye movements desensitization and reprocessing, biofeedback, and relaxation training among 100 Vietnam War veterans with post traumatic stress disorder. The study findings suggested that there was a significant improvement in the area of anxiety, anger, and depression. The authors concluded that the relative effects of the eye movement’s desensitization and reprocessing, relaxation training, and biofeedback was found to be the most effective treatment for post traumatic stress related disorders.

**Devaney, Hughey, and Osborne. (1994)** conducted a comparative study among 57 subjects to assess the effects of exercise reduction and biofeedback training on mood states. The analysis showed statistically significant differences in anxiety score and depression score.

**Mcgrady. (1994)** conducted an experimental study to determine the effects of group relaxation training and thermal biofeedback on blood pressure and related physiological and psychological variables in essential hypertension. The study findings showed that there was significant reduction of forehead
tension, anxiety, and depression. The authors concluded that long term training can be more beneficial for adjunctive treatment of essential hypertension.

Nicassio, Boylan, and McCabe. (1992) did a controlled clinical trial study on EMG biofeedback, biofeedback placebo, and progressive muscle relaxation among 40 patients with sleep onset insomnia. The study results did not show any improvement for insomnia but it was found to be statistically significant P <0.05 for the sleep onset latency measure and depressive symptomatology.

Platannia-Solazzo, et al. (1992) conducted an experimental study to find out the effects of relaxation therapy in reducing the anxiety and depression among children and adolescents with diagnoses of adjustment disorder and depression. The results showed significant reduction in depression and cortical levels when compared with the control group.

Schneider, et al. (1992) conducted an experimental study to assess the self-regulation of slow cortical potentials in psychiatric patients. In biofeedback experiment 30 medicated male inpatients with major depression and bipolar depressive psychosis were demonstrated. The result revealed that there was no impairment in the self-regulation of slow cortical potentials in comparison to schizophrenic patients.
McGrady and Gerstenmaier. (1990) did a case study to assess the effect of biofeedback assisted relaxation training on blood glucose levels in unstable type 1 insulin dependent female clients. They concluded that blood glucose values decreased during treatment and improvements were maintained at one year follow up with slightly decreased insulin dosage.

Watson and Herder. (1990) assessed the utility of alpha biofeedback training among 660 psychiatric patients. The study findings were compared with the earlier studies and suggested that clinical improvement in alpha biofeedback treatment may be the result of the special verbal instructions often incorporated in the alpha training.

Fried, Fox, and Carlton. (1990) conducted a study to determine the effects of diaphragmatic respiration with end – tidal CO₂ biofeedback on respiration among subjects with seizure, anxiety, panic, phobia, depression, and migraine. The results showed that after training normalized respiration and altered their mood status. Electro Encephalograms (EEGs) and seizure frequency compared with non-control subjects and they had severe hyperventilation with EEG dysrhythmia.

Peniston and Kelkosky. (1990) conducted an experimental study to assess the effect of Alpha–theta brainwave training and
beta endorphin levels in alcoholics. The study findings revealed that alcoholics receiving brain wave training showed a gradual increase in alpha, theta brain rhythms after 15 experimental sessions. The experimental subjects also showed significant reductions in self assessed depression compared to the control groups. The authors concluded that the application of brain wave treatment, a relaxation therapy, appears to counteract the increase in circulating beta-endorphins level in the control group.

**Section III : Studies Related to Progressive Muscle Relaxation Exercise**

**Chan, et al. (2011)** conducted a randomized control study to investigate whether the effectiveness of Shaolin Dan Tian Breathing (DTB) technique which consists of the passive and active relaxation exercise. The findings of the study indicated that after one-month of the intervention, the subjects in the experimental group showed enhanced positive mood, improved attention and concentration, and alertness than the control group. The authors suggested a positive effect of the Shaolin DTB technique on enhancing human neural activity and connectivity, which may possibly enhance mood state and cognitive functions.

**Somayeh Ghatari, et al. (2009)** have done a quasi-experimental study to identity the effects of applying progressive muscle relaxation technique on the quality of life of 66 patients
with multiple sclerosis. The study results showed that there was a significant difference between the two groups in the mean scores of health related quality of life (P<0.05). The authors concluded that this study provided moderate support for the effectiveness of progressive muscle relaxation technique on the quality of life of the patients with multiple sclerosis.

Dehdari, et al. (2009) conducted a trial study to assess the effects of progressive muscle relaxation training on quality of life among 110 anxious patients after coronary artery by-pass graft surgery. The study findings showed that there were no significant differences in over-all quality of life, state, and trait anxiety scores between the two groups before intervention. There was significant reductions in state anxiety (P<0.01) and trait anxiety (P<0.01) in experimental group after the intervention. The authors concluded that progressive muscle relaxation training may be an effective therapy for improving psychological health and quality of life in anxious cardiac patients.

Singh and Rao. (2009) conducted a randomized control trial study to compare the effectiveness of music and progressive muscle relaxation to reduce anxiety among 16 patients with chronic respiratory problems. The result depicted that there was statistically significant main effect across the sessions for state anxiety (p< 0.000), and trait anxiety (p < 0.000). The authors
concluded that music and progressive muscle relaxation are effective in reducing anxiety and dyspnoea.

Chen et al. (2009) conducted an experimental randomized controlled trial study, using repeated measures to examine the efficacy of progressive muscle relaxation training in reducing anxiety among 18 patients with acute schizophrenia. The result indicated that there was significant reduction in anxiety in the experimental group. The authors concluded that progressive muscle relaxation training can effectively alleviate anxiety in patients with schizophrenia.

Agee, Danoff-Burg, and Grant. (2009) conducted a study to compare the brief stress management courses on mindfulness skills and progressive muscle relaxation among 40 subjects. The study result showed that mindfulness meditation subjects practiced meditation significantly more often than progressive muscle relaxation subjects. The authors concluded that a brief mindfulness skill course may be effective for stress management.

Mackereth, Booth, Hillier, and Caress. (2009) conducted a cross-over design to compare the effects of reflexology and progressive muscle relaxation training for 50 patients with multiple sclerosis. The results depicted that there was a significant difference in the way the treatments affected the changes in
systolic blood pressure following sessions; this favored progressive muscle relaxation training (p<0.002). The authors concluded that the regular practice of progressive muscle relaxation exercises help to prevent the complications of multiple sclerosis.

Sermsak, et al. (2008) conducted a prospective, randomized controlled trial study to examine the effect of Progressive Muscle Relaxation training on anxiety and depression among 83 patients with chronic breathing disorders receiving Pulmonary Rehabilitation. The study results showed that there was an overall significant reduction in depression. The authors concluded that the Progressive Muscle Relaxation is effective in reducing the anxiety and depressive level for patients with chronic breathing disorders.

Holland, et al. (2008) have done a randomized non-blinded study to test the efficacy of alprazolam versus progressive muscle relaxation among 147 cancer patients with anxiety and depressive symptoms. The study results showed that both types of treatment were significantly effective (P < 0.001). The authors concluded that both the interventions are safe, inexpensive and effective in treating cancer patients experiencing anxiety and depressive symptoms.
Jorm, Morgan, and Hetrick. (2008) conducted a meta-analysis studies related to progressive muscle relaxation exercise. Autogenic training and other techniques were used for the management of depression. The authors concluded that relaxation techniques were more effective at reducing self-rated depressive symptoms than no or minimal treatment.

Dittrich, et al. (2008) investigated the effectiveness of aerobic exercise with relaxation on pain and psychological well-being among 30 female patients with migraine. The result indicated that the programme had a significant reduction of self-rated migraine pain intensity. There was significant reduction in depression related symptoms among the aerobic group participants.

Ziv, Rotem, Arnon, and Haimov. (2008) conducted an experimental study to test the effects of Music Relaxation versus Progressive Muscular Relaxation on insomnia in 50 older people and their relationship to personality traits. The results showed that music relaxation was more efficient in improving sleep. Sleep efficiency was higher after music relaxation than after progressive muscular relaxation. The authors concluded that between the relaxation techniques, extroverts seemed to benefit more from both music and progressive muscular relaxation.
Kim. (2008) has done a pre and post-test method to investigate the effect of improvisation-assisted desensitization, and music-assisted progressive muscle relaxation and imagery on reducing pianists' music performance anxiety among 30 female college students. The result indicated that there was no significant difference between the two groups. The author concluded that music-assisted PMR and imagery condition resulted in greater mean differences from pre-test to post-test than the improvisation-assisted desensitization condition.

Shapiro, et al. (2008) conducted a study to explore the impact of Progressive Muscle Relaxation (PMR), Guided Imagery (GI), Self-directed Relaxation (SR), and control (C) on reducing postprandial anxiety among 64 antenatal women. The results showed that all conditions improved relaxation and decreased anxiety; feelings of fullness, and thoughts about weight, the three active conditions significantly reduced anxiety and increased relaxation (p < .0001). The authors concluded that the relaxation may be a valuable component for reducing postprandial anxiety.

Conrad and Roth. (2007) stated in an article that Muscle Relaxation Therapy (MRT) has continued to play an important role in the modern treatment of anxiety disorders. Progressive relaxation have been found to be effective in Panic Disorder (PD) and Generalized Anxiety Disorder (GAD). The authors concluded
that although Panic Disorder (PD) and Generalized Anxiety Disorder (GAD) patients may exhibit elevated muscle tension and abnormal autonomic and respiratory measures, the practice of muscle relaxation therapy helps to control the anxiety.

**Cerstin, et al. (2006)** conducted a randomized, prospective, controlled study to determine the efficacy of Progressive Muscle Relaxation (PMR) on change in blood pressure, lung parameters, heart rate, anger, and health related quality of life among 32 pregnant women with bronchial asthma. The study results showed that there was a significant reduction in systolic blood pressure, and a significant increase in both forced expiratory volume in the first, second, and peak expiratory flow was observed after progressive muscle relaxation. The authors concluded that progressive muscle relaxation appears to be an effective method to improve blood pressure, lung parameters, and heart rate and to decrease anger levels, thus enhancing health related quality of life in pregnant women with bronchial asthma.

**Yildirim and Fadiloglu. (2006)** conducted a study to determine the effect of Progressive Muscle Relaxation Training (PMRT) on anxiety and depression levels and Quality of Life (QoL) among 46 patients who had been treated with dialysis. The result indicated that mean state-anxiety and trait anxiety score before and after progressive muscle relaxation was found to be significant
(P<0.001). The Quality of Life was improved (P<0.01). The authors concluded that progressive muscle relaxation for dialysis patients helps to decrease the state- and trait-anxiety levels and has a positive impact on Quality of Life.

**Pawlow and Jones. (2005)** examined the effects of relaxation training on salivary cortisol and salivary immunoglobulin (IgA) among 40 undergraduate students. The result showed that the subjects in the experimental group had significantly lower levels of post-intervention salivary cortisol (p<0.036) and significantly higher levels of post-intervention IgA concentration (p<0.001) and secretion rate (p<.001) than the subjects in control group. The authors concluded that relaxation training may play a role in immuno enhancement.

**Wachelka and Katz. (1999)** conducted a randomized pre-test-post-test control group design to examine the effectiveness of a cognitive-behavioral treatment for reducing test anxiety and improving academic self-esteem among 27 high school and college students with Learning Disabilities (LD). The results showed significant improvement in the treated group compared to the control group. The authors suggested that relief from test anxiety can be expected fairly quickly when cognitive-behavioral methods are used.
Stephen, et al. (1997) assessed the affective response (positive and negative) of 13 trained and 14 untrained male subjects during and after aerobic exercise. The study results indicated that heart rate was similar at all exercise intensities for both trained and untrained subjects. No change in uni-dimensional affect was found between the two groups during or after exercise. In contrast, when compared to baseline, trained subjects showed increased positive affect during moderate and hard intensity exercise, whereas the untrained subjects showed decreased positive affect after exercise.

Section IV: Studies Related to Stressful Life Events and Depression

Nam, Kim, Lee, and Kim. (2011) conducted a cross-sectional study, and data were collected from 767 employed women in Korea over a 2-month period in 2006. Of these respondents, 286 depressed participants' data was analyzed to test the moderating effects of the three resources on depression. The regression results revealed that stressful life events directly affected depression. However, after including the product terms of the three resources (i.e. regular exercise, self-efficacy, and closeness) and stressful life events, the main effect of stressful life events disappeared, confirming significant moderating effects of the resources. The authors concluded that the findings would contribute to the
development of a body of culturally sensitive knowledge for clinical practice with depressed employed Korean women.

**Gourion. (2009)** stated in his article that stressful life events have a substantial causal association with depression, and there is now compelling evidence that even early life stress constitutes a major risk factor for the subsequent development of depression. In old age, depression mainly affects those with chronic medical illness, severe disability or mental decline. Depression in elderly worsens the outcomes of many medical illness and increases mortality. Environmental factors such as isolation, care giving, and bereavement, contribute to further increase the susceptibility to depression or triggering depression in already vulnerable elderly people. The author concluded that suitable treatment of depression in elderly reduces the symptoms, prevents suicidal ideation, and improves cognitive and functional status in order to improve the recovery of a good quality of life, as well as the mortality risk.

**Xie, et al. (2009)** conducted a cross sectional study to assess the interactive effect of stressful life events and the serotonin transporter, genotype of Post Traumatic Stress Disorder (PTSD). Five hundred and eighty two European Americans and 670 African Americans reported experiences of childhood adversity, adult traumatic events or both. The study results revealed that childhood adversity and adult traumatic events both predicted
PTSD. The authors concluded that the subjects who had both childhood adversity and adult traumatic events were more likely to develop lifetime PTSD, compared with those who experienced either type of adverse event and also the PTSD is influenced by the interactive effect of environmental and genetic factors.

Horesh, Nachshoni, Wolmer, and Toren. (2009) did a retrospective study to assess the correlations between various types of Stressful Life Events (SLE) in suicidal and non-suicidal adolescents and young adults with major depression and borderline personality disorder. The study results showed that the suicidal subjects experienced a greater number of total life time negative events compared with non suicidal group subjects with major depression reported more life time negative events than the subjects with borderline personality disorders. The authors concluded that the complexity of the relationship between stressful life events suicidality and underlying pathology if treated with relevant treatment, depression can be prevented.

Chessick, et al. (2009) conducted an observational study to assess suicidal ideation and depression symptoms among the caregivers of 500 bipolar patients. The study findings showed that caregivers of patients who had more suicidal ideation and depressive symptoms, reported more depressed mood, than the caregivers with less suicidal ideation or depression. The authors
concluded that caregivers concerned about patients become suicidal or depressed and may try to care for the patient at the expenses of their own health and well being.

Monore, et al. (2007) conducted a study to test the associations between major life events and major difficulties in relation to life time history of depressive episodes among 96 individuals diagnosed with depression. The study findings concluded that changing role of major life stress causes successive recurrence of depression.

Corruble. (2006) did a survey to identify the recurrent depression and life events among 13,377 depressed patients. The study findings proved that the increasing number of previous depressive episodes was significantly associated with increase in age, severity of depression, female gender, and family history of depression.

Corruble, Falissard, and Gorwood. (2006) conducted a cross sectional survey study to investigate the relationship between the number of previous depressive episodes and life events among 13,000 depressive patients. They have observed that the life events were more frequent with past episodes.

Leskela, et al. (2006) conducted a study to measure the influence of adversity and perceived social support on the outcome
of major depressive disorder among 68 subjects with full remission, 75 subjects with partial recovery, and 50 subjects with major depressive episodes. The study results showed that the severity of life events and perceived social support influenced the outcome of depression. The authors concluded that the partial remission group only had the severity of life events and in the major depressive group, the levels of social support were significant predictors.

Mayer, et al. (2006) analyzed the prevalence of depressive symptoms and the importance of stressful life events as risk factors of depression among 2652 students. The findings of the study showed that there was significant positive correlation between depressive symptoms and stressful life events. The authors concluded that the risk of depression increases in parallel with the number of stressful life events experienced by the child.

Joan, et al. (2006) identified the risk factors for preschool depression and the mediating role of early stressful life events. The study results showed that both family history and stressful life events predicted depression 6 months later. Regression analysis revealed the influence of family history of mood disorders and stressful life events on preschoolers’ depression and seventy subjects demonstrated that stressful life events mediated the relationship between family history and preschoolers’ depression.
The authors concluded that psychosocial factors were considered as key factors to the targets for early intervention in depression.

**Ranfanelli, et al. (2005)** conducted a descriptive study regarding stressful life events, depression, and demoralization as risk factors among 96 patients with acute coronary heart disease. The results showed that the patients with acute coronary heart disease reported significantly more life events than the control subjects. (P<0.001) and 30% of the patients were identified as suffering from a major depressive disorder, 9% were suffering from minor depression, 20% from demoralization. The authors concluded that the relationship between life events, depression, and acute myocardial infarction which decline the quality of life.

**Kishi and Urata. (2005)** conducted a longitudinal study to assess the effects of stressful life events which cause depression in the elderly and the role of the social support network. The study findings showed that male's health condition was significantly increased with the level of depression. In females, when the number of experienced life events were large, the level of depression higher even when adjusted for the subjective health condition. The authors suggested that having adequate measures for evaluation of social support networks and preventive actions in each community with validated scales for stressful life events are important.
Kenneth, et al. (2005) examined the relationship between stressful life events and genetic liability to major depression genetic control of exposure to the environment among 2164 female twins. The study findings revealed that genetic liability to major depression was associated with a significantly increased risk for six personal stressful life events such as serious mental problems, assault, divorce, breakup, job loss, serious illness, and major financial problems. The authors concluded that in women, genetic risk factors for major depression increase the probability of experiencing stressful life events in the interpersonal and occupational financial domains.

Kenneth, et al. (2004) have done a follow up study to investigate the genetic risk, number of previous depressive episodes, and stressful life events in predicting onset of major depression, among 92,521 patients and interviewed four times over a 9 years of period. The authors concluded that the genetic risk factors for depression produce a “pre kindling” effect rather than increase the speed of kindling.

Mitchell, et al. (2003) did a study to assess the severity of stressful life events in the first and subsequent episodes of depression among 270 patients. The study results showed that severe stressful life events (both acute & chronic) as defined by DSM-IV, were more likely to occur prior to first rather than
subsequent episodes particularly for those with non-melancholic depression.

**Bal, et al. (2003)** investigated the role of social support in well being and coping with self reported stressful events among 820 adolescents between 12 and 18 years. The study results revealed that 42% of adolescents reported a stressful experience, and 4.4% reported sexual abuse. Sexually abused adolescents reported more stress related symptoms and used more avoidance and fewer support seeking coping strategies than the other adolescents. The authors concluded that a highly perceived availability of social-support was directly associated with fewer trauma related symptoms in adolescents who were not sexually abused.

**Avshlom, et al. (2003)** did a prospective longitudinal cohort study to investigate the influence of life stress on depression moderation by a polymorphism in the 5 HTT genes. The study results indicated that a functional polymorphism in the promoter region of the serotonin transporter (5 HTT) genes was found to moderate the influence of stressful life events on depression. Individuals with one or two copies of the short allele of the 5 HTT promoter polymorphism exhibited more depression symptoms, diagnosable depression, and sociality in relation to stressful events than individuals homozygous for the long allele. The authors
concluded that the environment gene interaction, in which an individual’s response to environmental insults is moderated, by his or her genetic makeup which give rise to increase the stress reaction and cause depression.

**Friis, Wittchen, and Pfister. (2002)** examined the impact of life events, life conditions, and life changes on the course of depression. The study results emphasized that the younger age, low social class, negative and stressful life events linked to the family were associated with increased risk of new onset of depression. The authors concluded that the association between the life events and course of depression varies with different clusters of life events.

**Brilman and Ormel. (2001)** conducted a prospective case control study to explore the life events difficulties and onset of depressive episodes in later life among 83 patients. The analysis showed that the risk of onset increased 22-fold by severe events and three fold by ongoing difficulties of moderate severity. Severe events accounted for 21% of all episodes, but on going difficulties accounted for 45%. The authors concluded that severe events with onset of depression tend to be stronger in first than in recurrent episodes.

**Kendler, Thornton, and Gardner. (2001)** examined the interaction between genetic risk, number of previous depressive
episodes, and life events exposure, in the prediction of episodes of major depression in female-female twin pairs using discrete time survival analysis. The study results showed that there was a significant association between stressful life events and risk for major depression.

**Ormel, et al. (2001)** have done a prospective study to assess the stressful life events, long term difficulties, and high neuroticism and its role in late life of 83 depressive patients. The study results revealed that the stressful events did not mediate the effects of high neuroticism and difficulties at onset possibility because of the uncontrollable nature of common stressful life events in later life. The authors concluded that the usefulness of a dynamic stress vulnerability model for understanding late life depression is very much important.

**Takakura and Sakihara. (2001)** conducted a study to determine the psychosocial factors associated with the presence and persistence of depressive symptoms among 3202 high school students. The study results showed that presence of depressive symptoms were positively associated with life stressors in the domains of friends, family, and teachers and also depressive symptoms were negatively associated with positive health practices, more social-support, high self esteem, and internal locus of control.
**Mundt, et al. (2000)** conducted a prospective study to assess the role of life events for the timing of depressive episode, among 50 in-patients with neurotic depression. The study findings revealed that three months prior to the index of hospitalization, patients were more often affected with stressful life events.

**Moerk and Klein. (2000)** conducted a longitudinal, retrospective study to assess the development of major depressive episodes among 67 out patients. The study results showed that in dysthymic patients there was a significant association between major depression episodes and with a new life event in the context of ongoing chronic stressors.

**Kenneth, et al. (1999)** conducted a study to identify the causal relationship between stressful life events and the onset of major depression among 24,648 persons. The study results showed that independent stressful life events were significantly associated with onsets of depression, when the level of threat was controlled, and the association was significantly stronger for dependent events. The authors concluded that stressful life events have a substantial causal relationship with the onset of depression.

**Kenneth, Laura, and Carol. (1997)** conducted a study to identify the gender differences in the rates of exposure to stressful life events and sensitivity to their depressogenic effects. Male –
male, female and male, female twin pairs from 9 population based registry were interviewed. The study results showed that women consistently reported higher rates of housing problems, loss of confidence, crisis and problems in getting along with the individuals in their proximal network, and illness of individuals, within their distal network. Men reported higher rates of job loss, legal problems, robbery, and work problems. The findings also indicated consistent sex differences in the depressogenic effects of stressful life events for three event categories. Men were more sensitive to the depressogenic effects of divorce or separation and work problems; women were more sensitive to the depressogenic effects of problems in getting along with the individuals in their proximal network. The authors concluded that women reported more interpersonal problems, whereas men reported more legal and work related stressful life events.

Ronald. (1997) examined the relationship between stressful life experiences and depression. He also made a distinction between the effects of life stress on the first onset of depression. The authors suggested that acute stressful life events can lead to the recurrence of episodes of major depression.

Cauce, Hannan, and Sargeart. (1992) examined the relationships between negative events, locus of control, social support, and psychological adjustment among 70 early
adolescents. The study findings concluded that family support was positively related to several domains, whereas school support was only related to school competence, and peer support was positively related to peer competence. The authors concluded that school support buffered number of negative events best for those individuals with an internal locus of control.

Puskar and Wamb. (1991) have done a pilot study to explore the life events, problems, stressful situations, and coping methods used by 69 volunteer adolescents aged between 16-18 years. The result revealed that the most frequent life event listed was breaking up with a friend (boy/girl) and the most frequent problems were related to adjustment to school, and the most common stress situations were related to family. The coping method commonly adopted was self-control. The authors suggested to have psychiatric mental health nurse specialist in all schools to help the students, teachers and parents, to promote mental health through guidance and counseling.

Section V: Studies Related to Adherence of Treatment for Depression

Eva, Glenys and Catherine. (2011) have investigated the effectiveness of Computerised Cognitive–Behavioural Therapy (CCBT) for depression among 110 patients. The result indicated that there is some evidence to support the effectiveness of
Computerised Cognitive–Behavioural Therapy for the treatment of depression. The authors concluded that more research is needed to determine the place of Computerised Cognitive–Behavioural Therapy in the potential range of treatment options offered to the individuals with depression.

Schuurmans and Van Balkom. (2011) have reviewed the late-life anxiety disorders. Anxiety disorders are a major clinical problem in late life. The estimated prevalence rates vary from 6% to 10%, and the disease impact is considerable and equal to that of depression. Because anxiety disorders usually have an age at onset earlier in life, patients and mental health professionals may be inclined to attribute the anxiety and avoidance symptoms to personality factors instead of a treatable syndrome. Co-morbidity with other psychiatric disorders, such as depressive disorder, may complicate the appropriate diagnosis. The authors concluded that, based on the available data, anxiety and depression have high dropout rates, from the well-educated population.

Sajatovic and Gildengers. (2011) have done a prospective study to assess the effectiveness of lamotrigine for geriatric bipolar depression among 57 elderly patients. The result indicated that in spite of significant improvement, 19/57 (33.3%) dropped out of the study prematurely, with 6 dropouts due to adverse events.
**Kay-Lambkin, Baker, Lewin, and Carr. (2011)** conducted a randomized controlled trial study to assess the acceptability of a clinician-assisted computerized psychological intervention for co-morbid mental health and substance problems among 97 alcoholic patients with depression. The authors concluded that the participants were equally able to engage, bond, and commit to treatment, despite co-morbidity typically being associated with increased treatment dropout, problematic engagement, and complexities in treatment planning.

**Wells, Palinkas, Qiu. and Ell. (2011)** conducted a qualitative study by using grounded theory methodology to identify the adherence of cancer patients' perspectives on discontinuing depression treatment: the "drop out" phenomenon among 20 cancer patients. The result indicated that most of the patients (12/20) acknowledged that they had dropped out of treatment for a variety of reasons, including dissatisfaction with treatment, poor patient-provider relations, logistical and financial barriers, cancer treatment commitments, and language barriers. However, other patients (8/20) denied, they had dropped out of treatment and/or became confused about being labelled as a "dropout". A substantial percentage of low-income, ethnic minority patients who dropped out of treatment for depression appear not to realize that they have dropped out of treatment.
Shane, Gabrielle, and Garth. (2011) conducted a prospective longitudinal follow up study to assess the treatment admissions, retention, early dropout and treatment completion among 191 admissions. The findings suggested that a total of 17% of treatment entrants dropped out in the first week, and 34% successfully completed the treatment program. The authors concluded the fact that neither psychopathology nor drug was related to treatment indicates that these should not be seen as poor prognostic indicators for treatment success in a drug free treatment setting.

Gregory, and Evette. (2010) have conducted a study to assess the Predictors of Early Dropout From Psychotherapy for Depression in Community Practice among 238 depressed patients. The results indicated that the dropout rates before the first therapy visit were somewhat higher among the women (p=.041) and younger members (p=.017) and moderately higher among those with lower depression severity (p=.012). Only 55% of the adults starting psychotherapy for depression continued for at least four visits. The authors concluded that the rate of treatment for depression has doubled over the past 15 years. Dropout was strongly related to severity of depression at the time of the screening, but the use of psychotherapy has remained flat or
decreased due to the dropout, disparity between the need, preference, and actual use.

**Armando, Bensi, Brandizzi, Censi, Lindau, and Fiori. (2010)** have assessed the drop-out risk factors in mood disorder among 90 depressed patients. The result that 42% of the patients were drop-outs, of which 89% by the third session. The authors concluded that the drop-out rate in depressive patients turned out to be frequent. The patient’s resources in terms of relationship, self-perception, and object’s perception are strongly related to the drop-out risk. These results were suggestive that the evaluation of drop-out risk in psychiatric patients must consider the subjective aspects of the patients besides the clinical features.

**Stranieri. (2010)** investigated the Psychopharmacology of depression and sexual disorders among 40 depressed patients. The result indicated that Sexual dysfunctions as side effects of antidepressant treatments are being reported more and more frequently: they are one of the main reasons of dropout from therapy. These side effects are reported in between 20% and 40% of cases. The author concluded that careful clinical interview about the sexual behaviour of the patients allows psychotherapy to interact with pharmacotherapy, in order to reduce the drug dosage, and also careful clinical interview about the sexual behaviour of the patients will more clearly determine the
percentages of sexual dysfunction side effects, and also avoid drop-out from antidepressant therapy.

**Smith, Harvey, Battersby, Pols, Oakes, and Baigent. (2010)** have done a cohort study to identify the prevalence rate of treatment outcomes and predictors of drop-out among 127 problem gamblers in South Australia. The results depicted that 69 (54%) were males with a mean age of 43.09 years and with 65 (52%) reporting a duration of the problem gambling greater than 5 years. Follow up time for 50% of the participants was greater than 8.9 months and, overall, 41 (32%) participants were classified as treatment drop-outs. The authors concluded that future treatment plans and service delivery, and research into the problem of gambling should be most important aspects of treatment for drop-out.

**Le Pen, Levy, Ravily, Beuzen, and Meurgey. (2010)** conducted a cost benefit study to assess the cost of treatment dropout in depression. The result indicated that the treatment dropout, especially at an early stage of the therapy, can have profound consequences, including excessive lengthening of the depressive episode, symptomatic relapse, increase of repeated days out of work, even suicides or suicide attempts.