CHAPTER 2

LITERATURE REVIEW

This literature reviews focus on various aspects of adolescent's depression. Topics discussed include: definition; epidemiology; risk factors; sign and symptoms; assessment; etiology; problems associated with; and intervention of depression in adolescent.

Definition of Depression in Adolescent

Definition of Depression

Depression has been categorized in one of three constructs, including depressed mood, depressive syndromes, and depressive disorders (Cicchetti & Toth, 1998; National Health and Medical Research Council, 2004). Depressed mood is delimited by a single symptom or group of symptoms that involve dysphoric affect. Most commonly, self-report measures have been used to identify depressed mood. Depressive syndromes involve sets of symptoms that have been shown to co-occur empirically. Depressive disorders are reflected by categorical diagnoses, such as those proffered in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR; American Psychiatric Association [APA], 2000) or in the International Classification of Diseases (ICD-IO; World Health Organization [WHO], 2010) (Cicchetti & Toth, 1998).

Depression as depressed mood is a term refers to sadness or unhappiness independent of any other symptoms of depressive disorder or depressive syndrome (National Health and Medical Research Council, 2004). Depressed mood is not classified as a clinical disorder but depressed mood is a risk factor for the development of depressive syndrome and depressive disorder and a risk of long term social problems (National Health and Medical Research Council, 2004). Assessment of depressed mood based on self or close informant reports (National Health and Medical Research Council, 2004).

Depression as depressive syndromes is empirically derived groups of related depressive symptoms which derived from factor analyses from large samples (Modenhauer, 2004). These groups of depressive symptoms are abnormally dejected mood persistent over time that interferes with daily functioning (Coleman, 1986). Depression exists and emerges as a part of development that is a reason why their daily functioning is affected (Rice & Mclaughlin, 2001). Symptoms of depression fall under four major categories: emotional and affective symptoms, cognitive symptoms, motivational symptoms, and physical symptoms (Coleman, 1986). Emotional and affective symptoms include dysphoric mood and inability to experience enjoyment in previously pleasing activities (Coleman, 1986). Cognitive symptoms are those individuals that negatively evaluate themselves or have feelings of guilt and hopelessness (Coleman, 1986). These symptoms include pessimism, negative self-evaluation, expectation of failure, self-blame, learned helplessness, disturbed thought processes and ability to concentrate, and impaired decision-making (Zauszniewski, 1992). Motivational symptoms range from social withdrawal to feeling suicide. These symptoms include inability to complete even simple tasks, and psychomotor

retardation or agitation (Zauszniewski, 1992). Physical symptoms of depression include loss of appetite, sleep disturbance, loss of libido, fatigue, and diffuse aches and pains (Zauszniewski, 1992). Depressive syndrome is assessed by parent, teacher, and adolescent responses on checklists and questionnaires (National Health and Medical Research Council, 2004). Depressive syndrome is a condition of clinical significance (National Health and Medical Research Council, 2004).

Depression as depressive disorders is depressive symptoms that meet diagnostic criteria. According to the DSM-IV-TR classification, criteria for diagnosing major depressive disorders includes significant or impairment manifested by five of the nine of the following criteria, occurring nearly every day for two weeks: (a) depressed or irritable mood; (b) diminished interest or pleasure; (c) weight gain or loss; (d) insomnia or hypersomnia; (e) psychomotor agitation or retardation; (f) fatigue or energy loss; (g) feelings of worthlessness; (h) diminished ability to think or concentrate; and (i) recurrent thoughts of death and suicide ideation (Ferro, Carlson, Grayson, & McIntosh, 1994; Kovacs & Gatsonis, 1994). Symptoms must represent a change from previous functioning.

These vary operationalized definitions are often amalgamated group of symptoms or depressive symptoms under the general term “depression” (Modenhauer, 2004). Nonetheless, depressive symptoms can detect into syndromal which meets diagnostic criteria of depressive disorder, and subsyndromal which does not meet diagnostic criteria but experience current depression based on self-reported elevated levels of depressive symptoms (Kowalenko et al., 2005).

In this study defined depression as a combination of depressed mood and depressive syndromes that affects individuals. Depression exhibits depressive

symptoms that do not meet diagnostic criteria but currently experience depressive symptoms by individual. Symptoms of depression fall under four major categories: negative affect (i.e., blues, depressed, lonely, cry, sad); positive affect (i.e., good, hopeful, happy, enjoy); somatic complaints (i.e., appetite, sleep); and interpersonal difficulty (unfriendly, dislike) (Radloff, 1977).

Definition of Depression in Adolescents

Depression in adolescents is under diagnosed and treated because the symptoms can be difficult to recognize (Department of Mental Health, Ministry of Public Health, Thailand, 2006; Rice & McLaughlin, 2001). From a growing of evidence has confirmed that adolescents can experience depression and suffer from the significant morbidity and mortality associated with its symptoms (Son & Kirchner, 2000). Depressed adolescents can have a number of symptoms such as sadness, irritability, difficulty at school, changes in sleep habits, and/or feeling of worthlessness (Birmahir et al., 2007;m Sabetes, 2004).

Adolescence is defined by WHO as a person between 10-19 years of age (WHO, 2008). Adolescence period is the time of life transition from childhood to adulthood and increased physical growth, beginning of secondary sexual characteristics, and emotional changes are initiated (Modenhauer, 2004). Besides physical changes, this period is important by expansive psychosocial, emotional, and cognitive development (Erikson, 1959; Steinberg, 1999; Steinberg & Morris, 2001).

Adolescents who fail to cope well with their growth and development as well as fail to accomplish their developmental tasks have intense of emotional and

behavioral problems (Rutter, 1980; Steinberg, 1999). Bogenschneider (1994); Lewinsohn et. al. (1994) and Rutter (1997) explained some reasons that depression increases in adolescence include: (a) genetics determination and these genes may not be triggered until adolescence; (b) sex hormones may increase susceptibility to depression, and these hormones may not be active until puberty; (c) life stresses may increase during this time which, in turn, may be associated with higher levels of depression; (d) protective factors, such as family support, may be reduced or less available during this time of independence-seeking; and (e) the cognitive advances of adolescence may lead to thoughts and feelings associated with increased risk of depression. In addition, adolescents in schools face tremendous pressure for academic achievement (Hoagwood et al., 2007). Greenberger (2000) found that grades in school had significantly strong association with depression. Adolescents may be more concerned about how they are evaluated by their families and peers, and about their academic performance, and this may be reflected in their manifestations of depression (Kleinman & Good, 1985). This finding is keeping with the study of Woo and colleagues (2004) who found that the quality of family relationships and grades in school had significantly stronger associations with depressive symptoms among Chinese adolescents than among adolescents in the United States.

Studies of depression in Thai adolescents are keeping with other countries that adolescents who cope with their growth and development inefficiently have intense of depression (Trangkasombat & Likanapichitkul, 1996). Aekwarangkoon (2005) explored factors associated with increased risk of depression in 42 depressed and 43 non-depressed Thai adolescents. Results revealed that a) the changes of transition from childhood to adulthood influence their self-confidence and lead to

depression; b) a lack of respect from parents, friends, and teachers creates emotional suffering leading to low self-esteem, loss of power, or hopelessness that leads to depression; c) conflicts from the rules of culture influence, adolescents who do not follow the rules to be a good person will be blamed and stigmatized by society and lead to depression; d) the changing of Thai family structure from large family to a smaller unit leading to less social support and inappropriate thought and behavior; e) conflicts with school environment such as peer groups, teachers, rules of the school, adolescents who can not follow school rules by being attentive to lessons, not opposing school regulations, suppressing inappropriate emotions, not arguing with adults, develop internal conflicts that lead to depression; and f) applying inappropriate defense mechanism, most depressed adolescents often repress the conflicts and frustrations by using repression, isolation, and/or introjection so that they can not manage their depressive symptoms.

Definition of depression in adolescent has been conceptualized as in adult but depression in adolescents may be expressed differently from that in adults, with manifest behavioral disorders (e.g. irritability, verbal aggression and misconduct), substance abuse and/or concurrent psychiatric problems (Beck, 1979). In addition, adolescents may have feeling of anger and self-depreciation, feeling unloved, somatic complaints, anxiety, and disobedience (Ferro, Carlson, Grayson, & McIntosh, 1994; Kovacs & Gatsonis, 1994). Moreover, adolescents who are depressed tend to avoid social interactions, loss of interest or pleasure, and often face feelings of worthlessness (Bhatia & Bhatia, 2007; Coleman, 1986).

Depression in adolescents, as a disorder, usually starts in adolescents, with likely recurrences. An episode may be characterized by sadness, indifference or

apathy, or irritability. It is usually associated with change in a number of neuro-vegetative functions, including sleep patterns and appetite and weight, motor agitation or retardation, fatigue, impaired concentration and decision-making, feelings of shame or guilt, and thoughts of death or dying. A small proportion of depressed adolescents will experience psychotic symptoms. The duration of an untreated crisis ranges from 9 months to several years. Fifty to sixty per cent of depressed adolescents will have at least one more episode in their lifetime (Sabates, 2004). Depression is diagnosed when depressed mood or anhedonia (lack of ability to enjoy or experience pleasure) has been present for more than 2 weeks and is associated with at least five of the following symptoms: loss of interest, fatigue or loss of energy, insomnia or hypersomnia, feelings of worthlessness or excessive guilt, decreased concentration, significant weight loss or gain, and recurrent suicidal ideation. Correspondingly, adolescents with depressive symptoms that do not meet diagnostic criteria for a mood disorder have shown higher rates of early adulthood depression, adverse psychological and social functioning, and substance abuse (Aalto-Setala, Marttunen, Tuulio-Henriksson, Poikolainen, & Lonngvist, 2002).

In this study defined adolescent depression as a combination of depressed mood and depressive syndromes that affects adolescents. Depression leads to depressive symptoms that do not meet diagnostic criteria but currently experience depressive symptoms by individual. Symptoms of depression fall under four major categories: negative affect (i.e., blues, depressed, lonely, cry, sad); positive affect (i.e., good, hopeful, happy, enjoy); somatic complaints (i.e., appetite, sleep); and interpersonal difficulty (unfriendly, dislike) (Radloff, 1977).

Epidemiology of Depression in Adolescents

Incidence of Depression in Adolescents

The incidence of depression in adolescents, as a disorder, thought to be due to a combination of biological, psychosocial, and cognitive factors (Modenhauer, 2004). Farmer (2002) cited the incidence of severe depression at 3-8% and mild to moderate depression at 10-40% of all adolescents in the United States. Lewinsohn et al. (1999) reported the incidence of major depressive disorders ranges from 4 to 8% of adolescents in the United States (Lewinsohn et al., 1999). Incidence of depression is equal in boys and girls before puberty, girls more than boys in a ratio of 2 to 1 in adolescents (Modenhauer, 2004).

Prevalence of Depression in Adolescents

The prevalence of depression assessed by diagnostic criteria in adolescents has similarly high in all studied countries across the world. Rates were reported in developing countries, Asia and some Western European countries, with prevalence rates between 2.5% and 10% (Chen, Wong, Lee, Chan-Ho Lau, & Fung, 1993; Demyttenaere et al., 2004; Dong, Yang, & Ollendick, 1994; Kawakami, Shimizu, Haratani, Iwata, & Kitamura, 2004). Rates were reported in developed countries such as the United States with prevalence rates ranges from 4 to 8% (Birmahir et al., 2007; Sabates, 2004), the United Kingdom with prevalence rates 3.6%, and New Zealand with prevalence rates 3.4% (National Health and Medical Research Council, 2004).

Trangkasombat and Likanapichitkul (1997) reported the prevalence of 3.7% in Thai depressed adolescents. While the prevalence of depressive symptoms assessed by instrument in combination with other symptomatology such as the Center or Epidemiologic Studies Depression Scale (CES-D) or the Beck Depression Inventory (BDI) ranges from 12 to 60% in the United States (Modenhauer, 2004) and 10 to 25% in Canada (Sear & Armstrong, 1998). The study of Trangkasombat and Likanapichitkul (1997) represented the prevalence of depressive symptoms of 40.8% in Thai adolescents in Bangkok. Boonyamalik, Saosarn, and Chutha (2006) reported the country prevalence rates of depressive symptoms in Thai adolescents of 16.4%.

Epidemiology of clinical manifestation of depression in adolescents has reported that approximately 90% of depression has remitted (Modenhauer, 2004). Once depression presented, the relapsed rates occurred at 12% within a year and 33% within 4 years after the onset of depression, and by the age of 18 years, some 30% of adolescents will have met criteria for a diagnosis of major depressive disorder (Weisz & McCarty, 2006). There was a report that adults who have depression as adolescents have a 5-fold increased risk for a first suicide attempt, an increased risk of psychiatric and medical hospitalization, and more impaired functioning in work, social and family life, than adults without the history of depression (Modenhauer, 2004).

Risk Factors Associated with the Development of Adolescent Depression

An understanding of risk factors in depression is important for adolescents at risks in the management of depression and in the prevention of further depression (National Health and Medical Research Council, 2004). Risk factors are associated

with the disorder and are usually present before the disorder emerges (National Health and Medical Research Council, 2004). Depression appears to be affected by such a wide variety of factors from the biological to psychosocial factors (Bhatia & Bhatia, 2007; National Health and Medical Research Council, 2004). Biological risk factors are age, gender, genes, having a depressed parent, neurobiology, and psychosocial risk factors are anxiety, negative cognitions, stressful life events, and interpersonal relationship.

Biological Risk Factors

Age

Depression increases from childhood to adolescence (Lewinsohn et al., 1994). Explanation for age factors was that development from children to adolescence increased triggered genes, susceptible sex hormones, and life stress levels to depression, decreased protective factors during time of independence seeking, and increased thoughts and feelings associated with risks of depression (Modenhauer, 2004). Studies confirmed that adolescents are at greater risk of depression between the ages of 15 to 18, in some studies it was lower than in the 14 to 17 year age group (Aalto-Setala et al., 2002; National Health and Medical Research Council, 2004).

Gender

During pre-adolescence (12 years of age or younger), it found no gender difference in rates of depression, the rate of depressive symptoms and disorders in girls rises to two times that of boys for adolescents age from 14 to 18 (Lewinsohn, Rohde, & Seeley, 1998). Explanations for this gender differences have included hormonal changes, increased stresses, differences in interpersonal orientation, tendencies toward rumination and other maladaptive responses to stress, and different socialization experiences (Modenhauer, 2004). Thus, females are at greater risk for depression than males, the conclusion that being female is a confirmed risk factors for adolescent depression (Aalto-Setala et al., 2002; Garber, 2006; National Health and Medical Research Council, 2004; Son & Kirchner, 2000).

Genes and Having a Depressed Parent

Genes likely contribute to neurobiology, personality, and self-regulation, which then interact with the environment to produce symptoms. For example, genes may indirectly affect depression through influencing children's sensitivity to negative life events (Modenhauer, 2004). Thus, when confronted with stress, an individual's inherited level of reactivity likely will contribute to the extent of their distress (Modenhauer, 2004). Dopheide (2010) showed that a functional polymorphism in the promoter region of the serotonin transporter (5-HTT) gene moderated the effect of stress on depression. Depression was significantly more likely to occur after experiencing stressful life events for individuals with one or two copies of the short

allele of the 5-HTT promoter polymorphism compared to those who were homozygous for the long allele (Dopheide, 2010).

Offspring of depressed parents also concluded as one of the strongest risk factors for depression in children, which likely is the result of both genetic and environmental influences (Kramer et al., 1998; Warner, Mufson, & Weissman, 1995). Compared to children of nondepressed parents, offspring of depressed parents are about three to four times more likely to develop a mood disorder, and are at increased risk for high levels of medical utilization, other internalizing disorders, behavior and school problems, suicide attempts, substance abuse disorders, and lower overall functioning (Kramer et al., 1998; Warner, Mufson, & Weissman, 1995). Reinherz and colleagues (2003) concluded in their study that family history of depression was a predictive factor to develop depression. This conclusion was congruent with a study of Trangkasombat and Likanapichitkul (1997) that found family history of depression or anxiety were risk factors to depression in Thai adolescents. Thus, children of parents with affective disorders are a logical and critical population to target for prevention (Weissman et al., 1999).

Neurobiology

Neurobiological studies of depression in adolescents have focused on dysregulation in neuroendocrine and neurochemical systems, sensitization of biological stress mechanisms, and disturbances in sleep architecture (National Health and Medical Research Council, 2004; WHO, 2010). Studies of growth hormone, prolactin, and cortisol levels after pharmacologic stimulation in currently depressed,

remitted, and at-risk youth have shown in all three groups abnormalities in the secretion of these hormones, such as blunted growth-hormone secretion after the administration of growth-hormone–releasing hormone (Modenhauer, 2004; WHO, 2010). Thus, alteration in certain hormonal systems may be trait markers for depression.

Psychosocial Risk Factors

Anxiety

Anxiety is the most common comorbid disorder with depression, with estimates between 25% and 50% in adolescents (Modenhauer, 2004). There also is increasing evidence that anxiety precedes the onset of mood disorders and thus might be a risk factor for depression (National Health and Medical Research Council, 2004). Reinherz and colleagues (2003) concluded in their study that adolescents who reported self-rated anxiety were significant to predict depression. Therefore, children with anxiety also should be targeted for depression-prevention programs.

Negative Thoughts

Cognitive theories of depression assert that when confronted with stressful life events, individuals who have negative beliefs about the self, world, and future, and make global, stable, and internal attributions for negative events will appraise stressors and their consequences negatively, and hence are more likely to become

depressed than are individuals who do not have such cognitive styles (Beck, 1979). A growing convergence of evidence from correlational, predictive, and offspring studies supports the idea that negative cognitions may be a vulnerability to depression (Birmahir et al., 2007; Modenhauer, 2004). Trangkasombat and Likanapichitkul (1997) found negative thought about self and the future, and see self as inefficiency were risk factors to depression in Thai adolescents.

Prospective studies in children and adolescents have shown that a range of negative cognitions including low global self-worth, perceived incompetence, and negative explanatory and inferential style predict increases in depressive symptoms, often in interaction with negative life events (Modenhauer, 2004; National Health and Medical Research Council, 2004). Developmental theorists have suggested that negative cognitions emerge over time and their relation with depression increases with development. Indeed, the association between negative cognitions and depressive symptoms has not been found to be as strong in young children as it is in older children and adolescents (Bhatia & Bhatia, 2004).

Stressful Life Events

Considerable empirical evidence exists of a link between stressful life events and depression in children and adolescents (National Health and Medical Research Council, 2004). The stress exposure model posits that individuals who have experienced stress will be more likely to become depressed than those who have not. Support for this model has been provided by prospective studies showing that stress temporally precedes increases in depressive symptoms (Modenhauer, 2004),

Trangkasombat and Likanapichitkul (1997) showed stresses especially from family stresses such as family disorganized, low socio-economic, and poor family relationship were risks to develop depression in Thai adolescents.

Deficits Social and Adaptive Functioning

Studies documented significant negative correlations between increased severity of depression and decreased social and adaptive functions (Zauszniewski, 1994). Zauszniewski (1994) cited that a reduction in positive social and adaptive functions such as social relationship played a role in the etiology and maintenance of depression. Maladaptive responses to peer stress such as avoidance, inaction, rumination rather than engaging in active efforts to solve problems, adolescents may generate additional stress, which in turns promote depression (Hammen, 2006). Birmahir and colleagues (2004) concluded in their study that depressed youths had significant interpersonal problems with their peers as well as behavior and academic problems at school beyond the presence of parental psychopathology predict increased rates of depression. In addition, perceived rejection by peers, family, and teachers predicts increases in depressive symptoms in children and adolescents (Reijntjes, Stegge, & Terwogt, 2006). Thus, depression in youth is associated with high levels of interpersonal conflict and rejection from various members in their social domain.

Findings emerge regarding the link between interpersonal vulnerability and depression (Modenhauer, 2004). Adolescents who have families with characterized by problems with attachment, communication, cohesion, social support, childrearing

practices, chronic criticism, harsh discipline, and inappropriately peer-like relationships. Moreover, low levels of parental warmth, high levels of maternal hostility, and escalating parent–adolescent conflict significantly predict increased in adolescents' internalizing and depressive symptoms (Modenhauer, 2004).

Signs and Symptoms of Depression in Adolescents

Clinical depression manifests as a spectrum with symptoms ranging from subsyndromal or mild depression to syndromal or depressive disorder (Birmahir et al., 2007; Lewinsohn, Rohde, & Seeley, 1998). Subsyndromal is characterized by depressive symptoms that are not severe enough or meeting for diagnosis as a clinically syndrome but elevated on multiple markers of adverse functioning (Lewinsohn, Rohde, & Seeley, 1998). To be diagnosed with syndromal depressive disorders, adolescents must have depressive symptoms that meet diagnostic criteria of DSM-IV-TR or ICD-10. To meet the DSM-IV-TR classification adolescents must have at least 2 weeks of persistent change in mood manifested by either depressed or irritable mood and/or loss of interest and pleasure plus a group of other symptoms including wishing to be dead, suicidal ideation or attempts; increased or decreased appetite, weight, or sleep; and decreased activity, concentration, energy, or self-worth or exaggerated guilt (APA, 2000). To meet the ICD-10 classification adolescents must have at least 2 weeks of suffering from depressed mood, losing of interest and enjoyment, and reduced energy leading to increased fatigue ability and diminished activity. Marked tiredness after only slight effort is common (WHO, 2010).

Signs and symptoms of depression in children and adolescents is similar to the signs and symptoms in adults, but there are some differences that can be attributed to the child's physical, emotional, cognitive, and social developmental stages (Birmaher et al., 2007; Sabetes, 2004). The differences are that children may have mood lability, irritability, low frustration tolerance, temper tantrums, somatic complaints, and/or social withdrawal instead of verbalizing feelings of depression (Birmaher et al., 2007; Sabetes, 2004). Additionally, children tend to have fewer melancholic symptoms, delusions, and suicide attempts than depressed adults. Birmahir, Rohde, and Seeley (1998) reported in his study that adolescents with depressive disorder were more to report worthlessness/guilt, weight/appetite changes and thoughts of death or suicide than adult with depressive disorders. For gender differences in symptoms presentation, it found that female with depressive disorder more often reported weight/appetite disturbance, and worthlessness/guilt compared to depressed boys (Lewinsohn, Rohde, & Seeley, 1998).

Depression has three levels of depressive symptoms severity as follows (National Institute of Mental Health [NIMH], 2008; Lewinsohn, Munoz, Youngren, & Zeiss, 1992):

1. Severe depression has depressive symptoms that markedly interfere with normal functioning such as the ability to work, study, sleep, eat, and enjoy once pleasurable activities.

2. Moderate depression has depressive symptoms that impair functioning between mild and severe depression.

3. Mild depression has depressive symptoms that mildly impair normal functioning.

Assessment of Adolescent Depression

The assessment of adolescent depression includes the use of interviews and self-report scales. The interviews aim to diagnose depressive disorders and are usually administered by psychologists, psychiatrists, or other specially trained interviewers, while self-report scales aim to measure elevated depressive symptoms that do not meet diagnostic criteria of depressive disorder and can be administered by non-psychologists (Modenhauer, 2004).

This study chose self-report instruments for assessing depressive symptoms. The most wildly used self-report depression rating scales for adolescents including the Children's Depression Inventory (CDI; Kovacs, 1992), Children's Depression Rating Scale-Revised (CDRS-R) (Posnanski & Mokros, 1996), Beck Depression Inventory (BDI) (Beck, Streer, Ball, & Ranieri, 1996), Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977); and Reynolds Adolescent Depression Scale (Reynolds, 1990). Self report rating scales are excellent at screening for depressive symptoms, assessing severity of symptoms, and for monitoring improvement (AACAP, 2007; Hamrin & Pachler, 2005). In addition, these instruments are most commonly used in practice, clinical, and research setting and can be administered by non-psychologists. Experts declare that adolescents are usually reliable sources of psychological information and give a better account of their internalizing symptoms, including suicidal ideation (Lewinsohn et.al., 1994).

This study selected a standard self-report questionnaire of CES-D for assessing the levels of adolescent depression because it is the most common measure effectively used with high-school-aged samples (Lewinsohn, Rohde, & Seeley, 1998).

CES-D has been shown to be reliable (both internally consistent and adequate test-retest reliability) and valid (concurrent correlation with the Hamilton Depression Rating Scale) (Hamilton, 1960). Sensitivity for identifying clinical depression for CES-D was 84%, with specificity of 75% or greater (Lewinsohn et.al., 1998). In addition, CES-D focuses on current depressive symptoms and valuable for rating change during the intervention process as well as monitoring change and identifying specific problem areas that need attention (Lewinsohn et.al., 1998). It has been used in cross-cultural research (Iwata, & Buka, 2002; McDowell, & Newell, 2006).

Etiology of Depression in Adolescents

There are a number of models and theories explained how depression is developed in adolescents (Rice & McLaughlin, 2001). These theories are derived from pre-existing adult models (Rice & McLaughlin, 2001). Nonetheless, from adolescents' studies, it has been hypothesized that depression results from the interaction between a person's biological, psychological vulnerabilities, and environmental such as a stressful life event (Cicchetti & Toth, 1999). It is difficult to separate the impact of one factor because they partner together in the etiology of depressive disorder (Watts & Markham, 2005). Beck (2008) explained in his report that interaction of genetic, neurochemical, cognitive factors, and social factors are involved in the development of depression. Lewinsohn, Rohde, and Seeley (1998) proposed in their study that depression is conceptualized as the result of antecedent risk factors initiated changes in behavior, affect, and cognitions. These risk factors

are assumed to trigger the depressogenic process by disrupting important social adaptive behavior patterns. These disruptions lead to increased aversive experiences so that adolescents change their life to the direction of more negative and fewer positive interactions. The person's inability to reverse this disruption process is hypothesized to lead to increase dysphoria which in turn leads to the many negative cognitive and behavioral changes associated with clinical depression (Lewinsohn, Rohde, & Seeley, 1998). The present review examines models and theories that frequently explained the development of depression including biological, psychosocial models, and environmental views.

Biological Model

New investigations were conducted in systematic clinical and biological research leaded more understanding of advancement in biological model and depression (Beck, 2008). This model consists of neurochemical and phenotypic variations, and hormonal changes.

Neurochemical and Phenotypic Variations

Substantial evidence from neuroscience, genetics, and clinical investigation show that depression is disorders of the brain (NIMH, 2008). The biological model of depression is the biochemical view and the genetic view. In the biochemical view, theorists focus mostly on chemicals in the brain (neurotransmitters) that transmit of neural impulses (Rice & McLaughlin, 2001). The two most frequently targeted

neurotransmitters are norepinephrine and serotonin (Coleman, 1986). Many researchers supported that depression occurred due to excess neurotransmitters or an imbalance of neurotransmitters. Furthermore, deficiencies in these neurotransmitters would be reflected in deficiencies in hormonal responses. This indicates that individuals experiencing these deficiencies show a change in behavior such as balances in mood, sleep, appetite, and activity (Rice & McLaughlin, 2001). Furthermore, modern brain imaging technologies reveal that, in depression, neural circuits responsible for the regulation of moods, thinking, sleep, appetite, and behavior fail to function properly, and critical neurotransmitter-chemicals that brain cells use to communicate are out of balance (WHO, 2008).

The genetic view is an important view because it states that close relatives of persons with depression are more likely to have depression than are unrelated persons (Birmahir et.al., 1996). Research has shown that parents who are depressed are more likely than non-depressed parents to have children at three time's greater risk for developing depression (Birmaher et.al., 1996). The lifetime risk in children of depressed parents has been estimated to range from 15 to 45 percent, with the highest risk factors being early-onset and recurrent depression in parents, and when both parents have mood disorders (Birmaher et.al., 1996; Warner, Mufson, & Weissman, 1995; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997). Studies have shown that depressed children regard their families as being more negative and spend less time doing recreational activities when compared with normal individuals their age (Rice & McLaughlin, 1986).

From the neurogenetic studies, there is additional evidence for the biological basis of depression that researchers found a functional polymorphism in the promoter

region of the serotonin transporter (5-HTT) gene. This gene moderates the influence of stressful life events on the development of depression (Dopheide, 2010). The study of serotonin linked promoter region (5-HTTLPR) genotype revealed that individuals who carry S allele phenotype (S/S homozygotes) have significantly stronger impact of life events on depressive symptoms than among the L allele (L/L homozygotes) (Dopheide, 2010). Polymorphisms in the 5-HTT protein can affect the serotonin dysregulation in the pathophysiology of depression in adolescents.

Hormonal Changes

There are evidences that sex hormones that occur in adolescence are associated for the increase in depression (Harrington, 1993). This conclusion is keeping with the study of Patton, Hibbert and Bowes (1995) cited in National Health and Medical Research Council (2004) that depressive symptoms associated with menarche and was mediated with social and other factors. Besides sex hormones, some endocrine and sleep changes marked depression in adolescents due to an impairment in sleep onset mechanism as evidenced by increasing growth hormone secretion, increasing cortisol and increasing time until sleep (National Health and Medical Research Council, 2004).

In summary, the biology of depression includes neurochemicals and phenotypic variations and hormonal changes. Neurochemicals that associate with clinical depression are serotonin, norepinephrine and dopamine. Phenotypic variations depend on S allele phenotype (S/S homozygotes) variations of the serotonin transportor-linked promoter region that associate with stressful life events and

depression, and hormonal changes that associate with sex hormones, growth hormones, and cortisol.

Psychosocial Model

Approaches to development of depression focused on cognitive, behavioral, and social phenomena (Rice & McLaughlin, 2001). This present review examines psychosocial model of depression based on cognitive, behavioral, and socio-environmental theories.

Cognitive Theories

Persons' emotional reactions and behaviors are strongly influenced by cognitions. Cognitions are thoughts, beliefs, and interpretations about themselves or the situations in which they give meaning to the events in their lives (Westbrook, Kennerley, & Kirk, 2007). Abramson, Seligman, and Teasdale (2002) concluded that depressed persons have negatively biases of thoughts, interpretations, and recall of events. They are more likely to notice information which is consistent with their negative view, more likely to interpret any information negatively, and more likely to remember negative events.

Beck (1967) explained negative automatic thought is the main cause of depression. Depressed persons verbalized their negativity with specific cognitive distortions which he labeled negative automatic thoughts. Depressed persons were conscious reports that negative automatic thoughts came spontaneously and seemed

plausible and true to them. These automatic thoughts were the basis of the depressive style of thinking which for Beck, became the major focus of inquiry and change (Leahy, 1996). Beck (1967, 1976) indicated negative automatic thoughts that they are negative appraisals or interpretations happening automatically, specific to events and situation, and immediate effect on emotion (Westbrook, Kennerley, & Kirk, 2007). Beck described these negative automatic thoughts in his negative cognitive triads which are the negative view of the self, the world, and the future. Beck Rush, Shaw and Emery (1979) called the negative cognitive triads that the schemas. The term 'schema' refers to the idea that 'Relatively stable cognitive patterns from the basis for the regularity of interpretations of a particular set of situations.' (Beck, Rush, Shaw, & Emery, 1979)

There are three components of negative cognitive triads. The first component involves a negative view of the self as inadequate, undesirable, and worthless. Further, depressed people devalue themselves and magnify their deficiencies that make negative attributions to the self (Ettelson, 2002). The second component involves a negative view of the world as negative interpretation of depressed person actions with their environment, resulting extremely sensitive to defeat, failure, ridicule or humiliation. Through this negative view of the world, they distort experiences and display information processing errors such as overgeneralizing predictions of negative outcomes, catastrophising the consequences of negative events, and selectively attending to the negative features of the events (Evans & Murphy, 1997; Flannery-Schroeder, Henin, & Kendall, 1996).

The third component of the triads, negative view of the future, is manifested as hopelessness and negative expectations of the future. This Beck's proposal was

tested in depressed adolescents and concluded that there was significantly negative views of themselves, the world, and the future than non-symptomatic depressed peers (Kaslow & Rehm, 1993). Additionally, Stark, Humphrey, Laurent, Livingston, and Christopher (1993) found that depressed adolescents have negative automatic views about themselves, the world and their future, and receive messages from their families supporting the negative cognitive triad. Because families serve as the developmental basis for social interactions, parents who reinforce their child's negative view of the world may influence the way their child processes information (Stark, Swearer, Kurowski, Sommer, & Bowen, 1996).

Weersing and Brent (2006) noted that negative cognitive triads or schemas which formed from stressful experiences in early life. When depressogenic schema was produced under stressful circumstances, vulnerable individuals engage in irrational and overly negative thinking. Weersing and Brent (2006) also stated that "As a result of these negative automatic thoughts, feeling of depression build and deepen, and individuals engage in various maladaptive behaviors." Depressed adolescents engage in negative automatic thoughts such as thought distortions (e.g., personification, over-generalizations, and all-or-nothing thinking) (Kendall, Stark, & Adam, 1989; Lewinsohn et.al., 1997). According to Beck's (1967), a central feature of Beck's theory is that the depressed individual's negative view is usually a distortion of reality. Thought distortions which Beck's (1967) labeled negative automatic thoughts have three common types. One common thought distortion of depressed persons, involves drawing a conclusion in the absence of evidence or when evidence contradicts the conclusion. A second type of thought distortion, selective abstraction is the tendency to focus on negative details in a situation and to

conceptualize the entire experience on the basis of this negative evaluation (Beck, 1967). Overgeneralization, a third common thought distortion is the tendency to draw a general conclusion on the basis of a single incident and to apply the concept indiscriminately to both related and unrelated situations (Beck, 1967).

From negative automatic thought view, Becker, Sanchez, Curry, Silva, and Tonev (2008) suggested that reducing negative automatic thinking was the primary mechanism for helping adolescents with depression. Research studies provided evidence that the change of negative automatic thoughts were the strongest mediators of reductions in depressive symptoms following intervention of CBT (Allart-Van Dam, et.al., 2003; Becker, Sanchez, Curry, Silva, & Tonev, 2008; Munoz, et.al., 1995). Consequently, Beck's model moved from the emphasis on unconscious conflict to a model of rational and empirical testing of negative thoughts (Leahy, 1996).

Behavioral Theories

These theories emphasized depression as a function of positive reinforcement deprivation, either in terms of low intensity of positive reinforcement or low rates of response contingent positive reinforcement (Kanter, Cautilli, Busch, & Busch, 2005). In these theories, deficits in behavior are a function of reinforcement deprivation or punishment, emotional behavior seen as respondent, and additional behavior, including thinking and feeling, described as adjunctive behavior (schedule induced) (Kanter, Cautilli, Busch, & Busch, 2005).

Skinner's (1953) theory suggests that unexpected environmental changes, punishment and aversive control, and shifts in reinforcement contingencies may all contribute to diminished rate of behavior seen in depressed persons. Lewinsohn (1974) stressed the causal impact of a lack of positive reinforcement from pleasurable activities, especially the lack of reinforcement that is dependent on responses by the individual. Deficit social skills and a high rate of aversive experiences are assumed antecedents to the low rate of positive reinforcement. Specifically, the depressive episode is sustained by negative reactions to the depressed person's behavior by significant others (Lewinsohn, 1974; Lewinsohn, Clarke, & Rohde, 1994). Behavior theorists suggest that adolescents with depression may lack: (a) environments with sufficient positive reinforcements, (b) skills to elicit positive reinforcement from important others, and (c) skills to terminate negative reactions from others (Coleman, 1986). Westbrook, Kennerley and Kirk (2007) stated that "Behavioral therapists constructed procedures, based on learning theory, which they believed would help people learn new ways of responding."

An extension of behavioral theory for the mediating role of cognitive processes was proposed by Albert Bandura with the development of social cognitive learning theory (Stallard, 2002). According to Bandura (1998), social cognitive learning theory suggested that people are shaped by the interactions between their behaviors, thoughts, and environmental events. Human behavior is a product of learning through direct experience or occurring vicariously (e.g. by way of observation). According to social learning theory, depression is caused and maintained by the disruptions in social and adaptive behavior (weak in self-regulation

skills eg. using pleasant activities to elevate mood) caused by stressful life events (Weersing & Brent, 2006). Depressed individuals tend to hold themselves solely responsible for bad things in their lives and are full of self-recrimination and self-blame. In addition, depressed individuals also have a flawed judgmental process, they tend to set their personal goals too high, and then fall short of reaching them. Repeated failure further reduces feelings of self- efficacy and leads to depression. Cognitive and behavioral theories of depression are sometimes closely related, especially in cases where thought processes are instrumental in self-reinforcing or self-evaluating activities hypothesized to cause or maintain depression (Zauszniewski, 1992).

The relationship between social role and adaptive functioning has been more widely researched (Price, Spence, Sheffield, & Donovan, 2002). Lewinsohn and Clarke (1999) reported psychosocial deficits in adolescence have negative effects on social and adaptive functioning.

In summary, behavior is crucial in maintaining or changing depression. It has a strong impact on thought and emotion and changing behavior is a powerful way of changing thoughts and emotions (Westbrook, Kenerly, & Kirk, 2007).

Socio-environmental Views

The socio-environmental view focuses on the life events that influence the emergence of symptoms of depression (Rice & McLaughlin, 2001). Research supports the idea that many individuals expressing depressive symptoms often report

that stressful life experiences have lead to these symptoms (Rice & McLaughlin, 2001). Research has also been done to show that stressful events appear to precede the onset of depressive symptoms (Brown & Harris, 1978).

From a variety of etiology views of depression, in this study depression is the development of more negative automatic thoughts about the self, the world, and the future. These negative automatic thoughts caused adolescents to conduct negative attributions to the self, negatively interpret their actions with the environment, and expect hopeless to the future (Beck, 1976). In addition, deficit social and adaptive skills and a high rate of aversive experiences as well as repeated failure and low self efficacy lead to depression (Bandura, 1998; Lewinsohn, 1974; Lewinsohn, Clarke, & Rohde, 1994). Consequently, depressed adolescents experience problems of mood, somatic complaints, interpersonal difficulties, and impair their social and adaptive functioning. Thus, reducing negative automatic thoughts and enhance social and adaptive functions could improve adolescents from depression as recommended by research studies (Becker, Sanchez, Curry, Silva, & Tonev, 2008; Price, Spence, Sheffield, & Donovan, 2002).

Researchers in Thailand studied factors associating the development of depression in adolescents included: (a) age (Boonchoo, 2000); (b) female gender (Boonchoo, 2000; Singthong, 2003); (c) poorer socioeconomic status (Boonchoo, 2000; Ridhitrairatana, 2001; Trangkasombat & Likanapichitkul, 1996); (d) adverse familial environment (e.g. broken family, poor parent child or family relationship, separation of parents, or divorce, parents with mental health problems) (Ridhitrairatana, 2001; Thiam-kaew, 2004; Trangkasombat & Likanapichitkul, 1996); (e) psychopathology (negative cognitive style) (Charoensuk, 2005; Sanseeha, 1994;

Wichaiwong, 2003); (f) psychosocial factors (e.g., poor support, poor academic achievement) (Kaew-in, 2002; Ridhitrairatana, 2001; Trangkasombat & Likanapichitkul, 1996); (g) stressful life events (Ridhitrairatana, 2001; Kaew-in, 2002; Trangkasombat & Likanapichitkul, 1996). Several factors in Thai studies were also similarly reported in the Western studies that they were the causes of depression such as negative cognitive style, psychosocial problems, adverse familial environment, and stressful life events. The understanding of factors influencing the causes of depression is very important to decide interventions that suite to be with adolescent's cognitive style, psychosocial problems, and familial environment. Thus, intervention that might be appropriate to Thai depressed adolescent should focus on the improvement of negative cognitions and psychosocial problems.

Problems Associated with Depression in Adolescents

Depression is a serious condition that affects the body, mood, and thoughts. It causes a substantial burden of morbidity, disability and mortality (National Health and Medical Health Research, 2004). Problems from depressive symptoms can become chronic or recurrent and lead to substantial impairments in an individual's social and functions to take care of his or her everyday responsibilities. At its worst, depression can lead to suicide, a tragic fatality associated with the loss of about 850,000 thousand lives every year (WHO, 2008).

Depression in adolescents is associated with a range of serious consequences and impacts both on individual and on adolescent's family, friends, and colleagues, and society (Essan & Chang, 2009; National Health and Medical Research Council,

2004). These consequences also associated with severe psychosocial impairments including problems with poor academic achievement, health-related risk behaviors, psychosocial problems and interpersonal conflicts, environmental factors, and risks of suicide, which related to a major developmental transition point in adolescence (Rao et al., 1999; Weissman et al., 1999).

Academic Achievement

Many studies demonstrated poor academic achievement is an antecedent or a consequence of depression (Clarke, Lewinsohn, & Hops, 1990). Evans, Van Velsor, and Schumacher (2002) noted that depression in adolescent interferes with the ability to concentrate and think quickly caused school performance to decline and possibly dropping. Studies of psychosocial problems associated with adolescents' depression in Thailand also found that depressed adolescents had higher rates of psychosocial stressors such as low academic achievement (Kaew-in, 2002; Meemarayat, 2000; Trangkasombat & Likanapichitkul, 1997).

Health-related Risk Behaviors

It was found that depression linked with health risks which include tobacco use, illicit drug use, alcohol misuse and dependence, eating disorder and obesity (National Health and Medical Research Council, 2004). Patton and colleagues (1996) revealed that adolescent depression predict subsequent smoking in adulthood. Jorm and colleagues (1999) found depressed adolescents with a number of common health

risks including smoking, alcohol use, trait of neuroticism, and socioeconomic disadvantage.

Increased in Psychosocial Problems and Interpersonal Conflicts

Lewinsohn et.al., 1994; Rao et.al., 1995; Weissman et.al., 1999 studied psychosocial outcomes in depressed adolescents found that they had impairment in social functioning and adjustment problems, impairment in the interpersonal relationships and greater conflict with parents. Depressed adolescents impaired in social functions to have sense of control their own lives that lead to more positive outcomes. They impair to carry out setting goals and plan to increase motivation for school attendance, satisfying pleasant/recreational activities, interaction with peers/family, and daily duties/self care (Children Mental Health Ontario, 2001). These results congruent with the study of Boonchoo (2000) found low social adjustment to friends and teachers in depressed Thai adolescents. In addition, many studies reported that depressed individuals engage in fewer pleasant activities and more unpleasant activities in their daily life (Curry et.al., 2000; Clarke, Lewinsohn, & Hops, 1990).

Lewinsohn, Gotlib, and Seeley (1997) observed the interactions among depressed persons compared to those of non-depressed persons and found that depressed individual engaged in fewer interpersonal behaviors and fewer reciprocal behaviors. Additionally, depressed individuals are themselves more interpersonally difficult, which results in greater problems in their social network. For example, depressed adolescents have poorer communication and problem-solving skills, and are

less supportive and assertive than non-depressed children (Harrington et al., 1994; Modenhauer, 2004). These results indicated that depressive symptoms can interfere with social interactions and problem solving which result in social withdrawal and failure to show initiative and reciprocity in social situations, which increase social isolation.

Studies of psychosocial problems associated with adolescents depression in Thailand also found that (a) depressed adolescents had higher rates of psychosocial stressors such as low academic achievement (Kaew-in, 2002; Meemarayat, 2000; Trangkasombat & Likanapichitkul, 1997); (b) broken family, poor parent-child relationship, and poor family relationship (Meemarayat, 2000; Ridhitrairatana, 2001; Trangkasombat & Likanapichitkul, 1997); (c) low social adjustment to friends and teachers (Boonchoo, 2000); substances used, school refusal, and abortion (Meemarayat, 2000); (d) low social support (Singthong, 2003); (e) suicidal ideation (Thiam-kaew, 2004); (f) low self-esteem (Charoensuk, 2005).

Environmental Factors

There are a number of environmental factors that are involved depression (Clarke, Lewinsohn, & Hops, 1990). These factors are stressors and social conflicts. Stressors compose of macro and micro stressors. Macro stressors are major life events such as the death of a loved one, being transferred to a new school, or failing a grade. Micro stressors are minor daily hassles that occur frequently and can lead to increase level of stress (Clarke, Lewinsohn, & Hops, 1990). Social conflicts occur frequently in family with depressed adolescents. For Thai adolescents, it found that

low parental caring attitudes and behaviors was reported a high level of depressive symptoms (Charoensuk, 2005). In addition, Charoensuk (2005) reported that everyday stressors were mediated by negative thinking effect on depressive symptoms in Thai adolescents.

Increased Risk of Suicide

Adolescents who suffer from depressive disorder have a risk of suicide 30 times that of the general adolescents' population (National Health and Medical Research Council, 2004). Lewinsohn, Rohde, and Seeley (1998) found that depressed adolescents had suicidal ideation 41% (43% female and 39% male). The highest risk is experienced by male adolescents with a diagnosis of major depressive disorder (National Health and Medical Research Council; WHO, 2008).

Interventions for Depression in Adolescents

There are two types of interventions for adolescent depression including treatment of adolescents diagnosed with depression, as well as prevention prior to onset of depression (Marchand, Ng, Rohde, & Stice, 2010). Many studies have been investigated various treatments and preventions for adolescents with depression. The widely used interventions are biological interventions and psychological interventions (Rice & McLaughlin, 2001). These separate interventions or combined biological and psychological interventions are employed in the management of major depression in adolescents (National Health and Medical Research Council, 2004). Nevertheless,

adolescents who showed subclinical or subsyndromal symptoms of depression, there is evidence of psychological interventions to prevent the development and reduce symptoms of depression (Spence, Sheffield, & Donovan, 2003).

Biological Interventions

Biological interventions are treatments that help to re-establish the normal balance of chemicals in the brain and affect brain functions. These interventions include pharmacotherapy and electro convulsive therapy (ECT)

Pharmacotherapy

Medications have been adopted on the basis of their effectiveness with adults (National Health and Medical Research Council, 2004). These medications in children and adolescents are fraught with controversy and limited information (American Academy of Family Physicians [AAFP], 2000). In some cases, Specifically for adolescents with psychosis, bipolar depression, and severe depression, antidepressant may be useful (American Academy of Child and Adolescent Psychiatry [AACAP], 2007). Medications for depression in children and adolescents under the age of 19 are as following:

Tricyclic Antidepressants: Tricyclic antidepressants are medications that alter levels of several different neurochemicals in the brain. Tricyclic antidepressants work by inhibiting the re-uptake of the neurotransmitters norepinephrine and serotonin by neurons and the dopamine system is nearly spared of their action.

Although the pharmacologic effect occurs immediately, often the patient's symptoms do not respond for 2 to 4 weeks (Hazell, O'Connell, Heathcote, Robertson, & Henry, 2002).

Subsequent randomized controlled trials, which accounted for the high placebo effect, have shown equivocal results of tricyclic antidepressant (AAFP, 2000). McCellan & Werry (2003) concluded from several studies that tricyclic antidepressants (TCAs) failed to find a positive response in the treatment of adolescent depression. Riddle, Geller, and Ryan (1993); Werry (1995); and Wilens et.al. (1996) as cited in Michael and Crowley (2002), concluded that there have also been some serious concerns raised about treating children and adolescents with tricyclic antidepressants (TCAs) because of potentially noxious or lethal side effects including serious cardiac effects and rapid dramatic swings in blood levels from toxic. Maneeton and Srisurapanont (2000) studied 9 RCTs on TCAs published from 1966-1999 concluded main findings that TCAs did not improve depressive symptoms and were frequently associated with side effects in children and adolescents. AACAP (2007) recommended that TCAs are contraindicated in adolescents due to the lack of research efficacy and the potential cardiac effects in overdose.

Selective Serotonin Reuptake Inhibitors (SSRIs): Selective Serotonin Reuptake Inhibitors (SSRIs) are a group of drugs that are used to treat depression. They work by blocking the uptake pump, SSRIs increases the amount of active serotonin that can be delivered to the "receiving" nerve cell. When the receiving cell becomes more sensitive to serotonin, this is the point at which the anti-depressant effect and helps relieve depression (AAFP, 2000). Three randomized, double-blind, placebo-controlled trials have demonstrated the effectiveness of a selective serotonin

reuptake inhibitors (SSRIs): (a) fluoxetine and (b) paroxetine over a placebo, for moderate to severe persistent depression (Emslie et.al., 1997; Emslie et.al., 2002; Keller et.al., 2001). Birmaher and colleagues (1996) as cited in Michael and Crowley (2002) reported that the advent of SSRIs are known to have less noxious side effect profiles (e.g., limited anticholinergic and sedative effects) and are easier to administer (i.e., once a day). However, AAFP (2000) cited that SSRIs have side effects, including mild gastrointestinal upset, sedation and activation symptoms. In addition, they may induce hypomanic or manic symptoms in vulnerable persons, unmasking bipolarity.

Antidepressants for children and adolescents have limitations of using because of their side effects and dosing data (AAFP, 2000). More recently, concerns have been raised about the emergence of suicidality during antidepressant treatment of pediatric and adolescents depression (Melvin et al., 2006).

Electroconvulsive Therapy (ECT)

ECT is commonly called shock treatment and is considered brain stimulation. An electrical current passed through the brain, triggering a generalized seizure that helps to restore the normal balance of neurochemicals in the brain during receiving CBT. Although children are not listed as a contraindication to ECT, the report of American Psychiatric Association [APA] task force on ECT cautioned that ECT in children should be served for instances where other viable treatments have not been effective or can not be safely administered (Thakur, Dutta, Jagadheesan, & Sinha, 2001). It has some reports that considered effective ECT intervention for

severe depression with suicidal ideation or attempt, experience of delusion and hallucination, or cannot take antidepressant drugs (Schneekloth, Rummans, & Logan, 1993; Moise, & Petrides, 1996). Side effects of this intervention include brief confusion and memory loss (Moise, & Petrides, 1996). Another main concern is that ECT may interfere with the brain's growth and maturation and inhibit normal development (Guttmacher, & Cretella, 1988).

Psychological Interventions

Psychological interventions are usually used for mild to moderate depression to treat clinical depression or to prevent onset of depression (Rice & McLaughlin, 2001). Research studies support that psychological interventions derived from those found to be successful in adult depression and demonstrated positive outcomes in adolescents with elevated depressive symptoms. These interventions including a combination of one or more of the following: (a) individual or group CBT (Clarke et.al., 1995); (b) interpersonal psychotherapy (Mufson, Moreau, & Weissman, 1996); (c) support group psychotherapy (Fine, Forth, Gilbert, & Harley, 1991); (d) family therapy (Brent et.al., 1997); (e) coping skills training (Fine et.al., 1991); (f) nondirective support (Brent et.al., 1997; and (g) psychoeducation (Brent, Poling, McKain, & Baugher, 1993). Within the field of adolescent depression, CBT is by far the most studied intervention for both intervention and treatment, and has well documented efficacy (Bru, 2010).

To treat clinical depression, Birmahir and colleagues (2000) reported a higher rate of remission (60%) in using CBT for depressed adolescents than either

systemic behavioral family therapy (29%) or nondirective supportive therapy (36%). Kahn, Kehle, Jensen, and Clark (1990) studied the effects of CBT, rational therapy, self-modeling, and wait list control groups evidenced a decrease in depression over the wait list control. Research studies support the opinion that psychosocial interventions for depressed adolescents show promising results, with several types of cognitive-behavioral therapies judged as "probable effective treatments" (Kaslow & Thompson, 1998; McCellen, & Werry, 2003). However, the Task Force on Promotions and Dissemination of Psychological Procedures Guidelines (1995) suggested of all the randomized, controlled clinical trials of psychosocial interventions for depressed adolescents, one clinical, CBT intervention for depressed adolescents which developed by Lewinsohn, Clarke and colleagues (1996), is rated as probably efficacious while the other studies do not meet the criteria for well-established interventions (Kaslow & Thompson, 1998).

To prevent onset of depression, prevention studies mostly used CBT-based approaches to attempt to reduce the onset of depression in adolescents (Hankin. 2006). A meta-analysis of Horowitz and Garber (2006) analyzed adolescents aged 5-19 prevention studies. The results showed that psychological interventions were effective when aimed at targeted, or at risk, adolescents, whereas universal prevention program were not effective.

In this study reviewed cognitive therapy (CT) and cognitive behavior therapy (CBT) because the foundation of CBT based on CT. The description of CT and CBT reviews are as below.

Cognitive Therapy (CT)

Cognitive therapy is a psychological intervention that helps client correct false self-beliefs that lead to certain moods and behaviors. The fundamental principle behind cognitive therapy is that a thought precedes a mood and that both interrelated with a person's environment, physical reaction, and subsequent behavior. Therefore, changing a thought that arises in a given situation will change mood, behavior, and physical reaction (Rupke, Blecke, Renfrow, 2006).

During cognitive therapy, a client accepts that his or her perceptions and interpretations of reality may be false (because of past experience or heredity or biological reasons) and that these interpretations lead to negative automatic thoughts. Next, the client learns to recognize the negative automatic thoughts and discovers alternative thoughts that reflect reality (Beck, 1976). The client then decides whether the evidence supports the negative thought or the alternative thought. Ideally, the client will recognize distorted thinking and "reframe" the situation. It is unclear who benefit most from cognitive therapy. It assumed that motivated client who has an internal locus of control and the capacity for introspection would benefit most (Rupke, Blecke, Renfrow, 2006). However, there are several studies supported the effects of CT that were superior to no treatment or to placebo (Dobson, 1989; Robinson, & Berman, 1990).

Cognitive Behavioral Therapy (CBT)

CBT for depression in adolescents refers to a psychological intervention that integrates both cognitive principles and behavioral principles. CBT for depression is based on the assumption that depression can be improved by a reduction in negative automatic thoughts that are maintaining the disorder (Kwon & Oei, 2003). The cognitive principles help the client similar to the processes in cognitive therapy. Behavior principles are used to overcome client's inertia and to reinforce positive activities by scheduling pleasurable activities, especially with others, that usually give positive reinforcement (Clarke et.al., 1999). These strategies help adolescents improve their social and adaptive functioning in school, home, and self-care (Bailey, 2001; Spence et al., 2002). Other techniques include assigning tasks and homework and acting out difficult behavioral situations (Westbrook, Kennerley, & Kirk, 2007). CBT involves more activity than does cognitive therapy. Thus, CBT gets some depressive symptoms relief by using strategies to reduce the impacts of negative automatic thoughts on mood by finding realistic thoughts and restructuring, modifying pattern of behavior skill deficits that are low levels involvement of pleasant activities, poor problem-solving and assertion skills, and failure to attribute positive outcomes to internal, stable, or global causes (Clarke, et.al., 1999; Westbrook, Kennerley, & Kirk, 2007). Required aspects of CBT include psycho-education about depression and its causes, goal setting with adolescent, mood monitoring, increasing pleasant activities, social problem-solving skills, cognitive restructuring, and social skills training (Treatment for Adolescents with Depression Study (TADS), 2004).

The efficacy of CBT in childhood and adolescent was revealed by Harrington et.al. (1998) in their systematic reviews of six studies: Brent et.al. (1997); Lewinsohn, Clarke, Hops, & Andrews (1990); Lewinsohn, Gotlib, & Seeley (1997); Reed (1994); Volstanis, Feehan, Grattan, & Bickerton (1996); and Wood, Harrington, & Moore (1996) with 191 mild to moderate depressed childhood and adolescents. The results were shown the efficacy of CBT over comparison groups (inactive interventions) of pooled odds ratio 3.2 (95% confidence interval 1.9 to 5.2) with the rate of improvement in the comparison groups (36%). This means that for every 100 patients who treated with CBT there were 36 extra patients who improved because of CBT effects (Harrington, Wood, & Verduyn, 1998).

Reinecke, Ryan, and DuBois (1997) conducted a meta-analysis of six controlled outcome research studies addressing the effectiveness of CBT in the treatment of adolescent depression published from 1970 to 1997. The interventions involved enhancing self-control, rational problem-solving, social skills training, and increased participation in pleasurable activities. The findings indicated that CBT was effective in reducing depression among adolescents. They reported effect size at post-treatment was -1.02 across studies. Treatment gains were maintained over time. However, the overall effect size decreased at follow-up (-.61). The authors concluded that CBT appears to be efficacious in reducing symptoms of depression in adolescents.

Lewinsohn and Clarke (1999) conducted a meta-analysis examining cognitive behavioral therapy studies. The reviewed studies were conducted in individual and group settings using adolescents between the ages of 8 and 18. The majority of the treatments were short-term, ranging between 5 and 16 treatment

sessions lasting 6 and 16 weeks. Lewinsohn and Clarke reported an overall effect size of 1.27. They found that approximately 63% of depressed adolescents showed significant improvement of depression upon completion of CBT. They concluded that CBT were effective psychosocial intervention.

Curry and colleagues (2003) developed CBT program to the study in the Treatment for Adolescents with Depression Study (TADS). The CBT program used in this study based on social cognitive learning theory and combined the skills training from the Lewinsohn's model embedded in psychotherapy sessions that followed a structure from the Beck model. The results from this TADS study supported the effectiveness of CBT superior to placebo at the end of 12 weeks of treatment. This CBT program specifies the cognitive behavior therapy techniques, methods, and procedures include: (a) learning the social learning view of depression; (b) mood self-monitoring; (c) identifying, challenging, and changing negative automatic thoughts; (d) social skills training including conversation techniques, planning social activities, and strategy for making friends; (e) learning communication, negotiation, and conflict resolution skills; (f) increasing pleasant activities; (g) setting realistic goals, developing plans and contracts for behavior change, and self-reinforcement for achieving the goals; (h) relaxation training; and (i) the development of life plan and goals (Curry et.al., 2003).

Components of CBT

Cognitive-behavioral therapy in youth is based on the idea that depressed adolescents are characterized by: (a) negative automatic cognitive processes; (b) a lack of important behavioral skills, particularly those needed for

social and adaptive function and for affective regulation (Curry et.al., 2000). The components of CBT for depression are derived from various cognitive and behavioral theories (Beck, 1967; Ellis, 1962; Rehm, 1977; Seligman, 1981; Skinner, 1953). Kazdin and Weisz (1998) and Kaslow and Thompson (1998) as cited in Curry et.al. (2000) pointed component of successful CBT for depression in adolescents include methods: (a) to directly restructure negative automatic thoughts; (b) to increase participation in pleasant, mood enhancing activities; (c) to increase and improve social interaction; (d) to improve conflict resolution and social problem-solving skills; and (e) to reduce physiological tension or excessive affective arousal. In addition, components from CBT programs of Brent et.al. (1997) and Lewinsohn et.al. (1990, 1999) as cited in Curry et.al. (2000) include: (a) mood monitoring; (b) goal-setting; (c) presentation of the clear treatment rationale and socialization of the adolescent to the treatment model based on this rationale.

In this study, investigator is interested to develop the school-based CBT for Thai adolescents with depression based on the literature review and the CBT program developed by Curry and colleagues (2000). This program is designed to alleviate the symptoms of depression by using techniques include: cognitive restructuring and problem-solving training are used in order to change the adolescent's negative automatic thoughts of self, the world, and the future. Social skills training including conversation techniques, planning social activities, strategies for making friends, and assertive and negotiate training are used to improve social interaction and functioning (Lewinsohn et.al., 1990, 1996). Self-monitoring, activity scheduling, and relaxation training are used to change the physiological symptoms, thoughts, and functioning associated with depression (Zarb, 1992). Further,

homework assignments are used to enhance learning through practice, to increase the meaningful of CBT, and to promote generalization (Stark et.al., 1990, 1991). The content and components of the School-based CBT for Thai Adolescent with Depression are described below (Clarke, Lewinsohn, & Hops, 1990; Curry et al., 2000; Lewinsohn et.al., 1990, 1996; Stark et.al., 1990, 1991).

The school-based CBT consists of 12 sessions, each session lasting 60 minutes-weekly. The sessions were delivered in order to fit within the school timetable. Each session was led by the investigator and a trained research assistant. The main components are as below.

Cognitive Components

Cognitive component was composed of explanation of adolescent depression and school-based CBT program including psychoeducation, goal-setting, cognitive restructuring, and problem-solving. The description of the cognitive component is presented as follow:

Psychoeducation: Psychoeducation was provided information about depression and the School-based CBT Program for Thai Adolescents with Depression at the beginning of the intervention. The content of depression included definition, symptoms, causes, pattern of thoughts, emotions, behavior, and biology in depression, and two main changes of thinking and behaving. The content of the school-based CBT program composed of the "triangle" model of thoughts, emotions, and behavior, the "downward spirals" and "upward spirals", testing thought, learning new skills, and goals for treatment. The duration of group session was 60 minutes.

Goals Setting: Goals setting are the process to set goals and work toward the goals by breaking down the goals into parts, by working toward specific, concrete smaller goals, and by learning new skills to reach the goals. In the program, participants will keep checking of how progress is being made toward their goals during the intervention program.

Cognitive Restructuring: The sessions incorporate elements of the interventions for identifying and challenging negative automatic thoughts and cognitive distortion. The steps of questioning and talking back the negative automatic thought, getting other people opinions, getting more information, and formulating realistic thoughts are employed to illustrate negative automatic thinking and the use of realistic or positive counterthoughts to dispute negative thoughts and irrational beliefs. Through a series of progressively more advanced exercises, adolescents learn how to apply cognitive techniques to their own personal thoughts.

Problem Solving: Problem solving is the process to find general ways in solving problems. This process consists of steps to solve problem such as relax, identify the problem, brainstorm, evaluate possible solutions, "yes" to the best option to solve problem, and encourage for working through the problem.

Behavioral Components

Behavioral components composed of rationale and practicing new skills that depressed adolescents lack, particularly adolescents needed for social support and for affect regulation. The description of the behavioral component is presented as follow:

Mood Monitoring: Mood monitoring is the skill to pay attention to participants feeling, to see what kinds of situations lead to them feeling more or less depressed, to see what kinds of negative thoughts connect to their emotions, and to see what situations and thoughts are connected with feeling better. Mood monitoring consisted of two tools the Emotions Thermometer and the Mood Monitor. The Emotion Thermometer helped depressed participants to understand how strong of both bad and good feeling. Then, they can know the learning skills and the changes they tried out were helping them feel better. The Mood Monitor is a form to see what situations, events, and thoughts are connected with feeling bad and feeling good. Participants are asked to record this Mood Monitor each day including rating number from the Emotion Thermometer.

Increasing Pleasants Activities: Pleasants activities is the behavioral strategy of helping depressed participants increase their levels of pleasant activities, while at the same time decreasing their levels of negative or punishing events. Adolescents learn several basic self-change skills during the pleasant activities sessions. These skills include monitoring specific behaviors that have been targeted for change, establishing a baseline, setting realistic goals, and developing a plan and a contract for making changes in their behavior.

Social Skills Training: Social skill is the behavioral work including skills that facilitate social interaction and involvement, skills that facilitate interpersonal communication, and skills that enhance assertive ness. Social interaction skills, such as skills for meeting others, joining a conversation, and leaving a conversation, may be helpful for isolated participants, or those who are socially anxious or awkward. Communication skills may be helpful for adolescents who have

communication conflicts within the family or the peer group. Assertiveness skills may be helpful for those who are more passive or socially anxious.

The lack of social skills may contribute to the onset of depressive episodes, and may also be involved in maintaining and prolonging them. To address these deficits, the social skills sessions give adolescents opportunities to learn and practice a variety of techniques such as active listening, planning social activities, and strategies for making friends.

Communication and Compromise as Problem-solving: This session focuses on basic communication, compromise, and conflict resolution skills as a form of problem-solving. According to depressed adolescent are inability to resolve issues leads to negative interactions which may in turn contribute to or maintain the adolescent's depression. Another aspect, the inability to compromise is costing depressed adolescent support, increasing family discord, peer conflict, or difficulty with teachers, and contributing to depression. Changing critical, argumentative communication to positive, constructive communication is one way to change behavior that can lead to positive changes in emotions.

The communication training involves feedback, modeling, and behavior rehearsal to correct negative behaviors such as accusations, interruptions, partial listening, lectures, and put-downs. These are replaced with positive behaviors such as paraphrasing, active listening, “I” messages, good eye contact, and appropriate body language.

Relaxation Training: Many depressed adolescents report experiencing tension and anxiety during social events and in other stressful situations. This anxiety often interferes with effective interpersonal functioning and reduces the

pleasure derived from potentially enjoyable activities. Training adolescents to relax in situations that are typically stressful enables them to implement the social skills they learn during the program and enjoy pleasant activities more (many of which are socially-oriented). Adolescents are taught methods of relaxation.

Taking Stock: Taking stock focuses on integrating the skills that have been learned, anticipating future problems, maintaining therapy gains, developing a Life Plan and associated goals, and preventing relapses. Participants also identify the skills that they have found to be most effective for controlling their moods. With the help of the group leader, each adolescent develops an "emergency plan" which describes the steps that will be taken to prevent depression in the future.

School-based Interventions

School-based interventions refer to interventions delivered as part of the school curriculum or as an after school endorsed activity targeted at school children to prevent or to treat an emotional or behavioral problem which persist to impair their functioning or daily interaction in a school setting (Calear & Christensen, 2010; Gottfredson, Gottfredson, & Skroban, 1996). Thus, school-based interventions for depression are used to prevent or treat children and adolescent suffering from depressive symptoms (Rice, & McLaughlin, 2001). Sandil (2009) noted that school-based programs are becoming popular for preventing or treating adolescent depression. Fischer and colleagues (2006) suggested that students who receive mental health interventions in the schools may be perceived as less stigmatizing than receive services to traditional clinic-based mental health services. For Asian countries that

conformity to norms is a revered cultural value in society. School-based interventions are beneficial because students know that their friends are also undergoing the same training might be encouraging and can help in normalising the experience (Sandil, 2006).

The school-based CBT has been rigorously tested and found to significantly reduce instances of depressive symptoms in participating students as well as reducing the number of students who had elevated levels of depressive symptoms who eventually needed more intensive intervention (Kratochwill, & Stoiber, 2002; Schaeffer, et.al., 2005). Clarke et al. (2000); Hannan, Rapee, and Hudson (2000); and Jaycox, Reivich, Gillham, and Seligman (1994) conducted studies utilized school-based CBT with students who reported elevated levels of depressive symptoms. These three studies demonstrated a significantly greater reduction in depressive symptoms. Calear and Christensen (2010) conducted a systematic review of school-based prevention and early intervention programs for depression. They found that a large proportion of the program were school-based CBT and delivered by a mental health professional or graduate student over 8-12 sessions. Indicated prevention programs which targeted students exhibiting elevated level of depressive symptoms, were found to be the most effective with effect sizes for all programs ranging from 0.21 to 1.40.

Fischer and colleagues (2006) recommended school-based CBT for depressed adolescents because the evidence-based practice has demonstrated effectiveness in working with children and adolescents experiencing depressive symptoms. CBT is particularly appropriate for use in schools because its format reflects the familiar structures of school, including: (a) the process of CBT involving

exploration, study, homework, and learning new information and skills; (b) the pattern of each CBT session with goal-setting, researching problems, and experimenting with new ideas; and (c) the collaborative style of CBT which can engage students, teachers, and parents (Platt, & Williamson, 2000). Moreover, the flexible application of CBT complements the developmental considerations of adolescents (Flannery-Schroeder, et.al., 1996). While problem-solving and social skills training can be effectively applied with large groups, a variety of CBT techniques (e.g., cognitive restructuring, activity scheduling) may help further deterioration in students with difficulties and prevent reoccurrence of symptoms in students depression.

Although "the effectiveness of CBT techniques delivered in schools for depressed adolescent has a cumulative base of support, more effort and research is needed to discern those particular strategies that really work in the school setting (Flannery-Schroeder, et.al., 1996; Hoagwood, & Erwin, 1997)." With appropriate preparation, school mental health personnel can learn and train to use CBT strategies involving both group and individual to relieve depressive symptoms, promote social and emotional growth, and enhance student's overall learning experience (Flannery-Schroeder, et.al., 1996; White, 1989).

From the health system of Thai school, found that students who have mental health problems including depression would receive the usual services provided by a school nurse or a guidance teacher (Aekwarangkoon, 2005). This study developed school-based CBT leader manual using CBT strategies in a structure of group setting that is practical and suited to the Thai students context to help mild to moderate depressed adolescents identify and correct negative automatic thoughts, enhance social and adaptive functions, and decrease depressive symptoms.

The contents of the School-based CBT for Thai Adolescent with Depression were organized into two major components comprising cognitive and behavioral components. Each component included various related topics which were administered in the sequence of the twelve intervention sessions. Through a program of 12 sessions, adolescents are presented with psycho-education to build their understanding depression and CBT program. Following psycho-education, adolescents are taught emotional regulation by learning to monitor mood and expand on their behaviors by increasing pleasant activities and social interactions. Adolescents practiced constructive thinking strategies to counteract negative automatic thoughts. This activity was followed by a discussion of activating events and asked to record them over the next week. They were also asked to list activities they found pleasurable and engage in. There was a discussion and interactive activity about increasing positive thinking. They were introduced to the concept of challenging negative cognitions, reducing negative thinking, and replacing them with positive thoughts. They are instructed to use logical problem solving skills before selecting a choice with the best possible outcome. To address social and adaptive functioning problems and skill deficit, adolescents are taught specific social skills (Gallagher, 2010). With this selected CBT methods, adolescents will benefit from the program and their depressive symptoms and negative automatic thoughts will reduce as well as their social and adaptive functioning will enhance.

In summary, from this review, there is no study and evidence of school-based cognitive behavior therapy for Thai adolescents with depression. Although many studies of school-based cognitive behavior therapy among Western adolescents with depression were effectively conducted, there is no evidence support for Thai

adolescents in schools. Thus, the school-based CBT intervention for Thai adolescents with depression may be questionable for its effectiveness. Furthermore, school-based CBT acknowledges

Conceptual Framework

The school-based CBT for Thai adolescents with depression program was developed by the investigator on the basis of Beck's cognitive theory of depression (1967, 1976), social cognitive learning theory of Bandura (1998), the CBT manual (original version) developed by Curry and colleagues (2000), and literature related to school-based CBT and adolescents' depression were used as a conceptual framework.

The school-based CBT for Thai adolescents with depression composes of behavioral and cognitive components. Behavioral component serve to mobilize participants to increase their experience of normal activities with family, peer, school, and to prevent the potentially adverse effects of opting out and avoidance for instance in school. Participants can gain some sense of achievement from behavioral tasks as well as potentially learning new skills (Verduyn, 2011). Behavioral strategies compose of mood monitoring, goal setting, increasing pleasant activities, and social skills training such as communication, compromising, and assertion. Role-play was introduced to participants so that they have a role. Each situation is role-played in several different ways, the emphasis being on noticing the verbal and non-verbal components of a successful social interaction. Participants learned with conflict resolutions and how helping to understand another person's perspective can lead to successful resolutions.

Teaching ways of behaving, modeling, role playing, feedback, and social reinforcement help adolescents to have adaptive functions of having sense of control of their own lives and correcting negative behaviors and replacing with positive behaviors lead to more positive outcomes in day to day, resolve issues lead to

negative social interaction, and correct negative social and adaptive functioning. Through these sessions adolescents learn how to apply behavioral techniques to their own personal situations and improve social and adaptive functioning contributes to their depression. To see intervention effect after completing the program at week 12, depressive symptoms scores, negative automatic thoughts, and social and adaptive functioning were measured.

The cognitive components work addresses more directly the negative elements of depressive thinking and assess participants in a more realistic of their experience (Verduyn, 2011). Cognitive strategies compose of identifying and managing emotions and cognitions, and the core skill of restructuring negative automatic thoughts with alternative, more realistic and helpful thoughts. Participants checked off their own negative thoughts from a list. Participants were asked to record negative thoughts and activating events. There was a discussion and interactive activities about increasing positive thinking. Participants were introduced to the concept of challenging negative automatic thought and use positive and realistic counter-thought to dispute irrational thought. For homework, participants identified negative thoughts once per day and replace them with realistic and positive thoughts. The group discussed how to plan ahead for negative events that might result in negative thinking and depressed mood. Participants were taught the concepts of problem solving and the development of a stepped approach to generate and evaluate possible solutions to challenges. Participants brainstormed how to avoid such situations and ways to cope with them. They developed a plan for how to use cognitive restructuring and other strategies for these sessions. Through these sessions adolescents learn how to apply cognitive techniques to their own personal thoughts by

improving ability of restructuring negative automatic thoughts, managing and reducing depressive symptoms (Stallard et al., 2010; Stice, Burton, Bearman, & Rohde, 2007; Vickers, 2002). To see intervention effect after completing cognitive component at week 6, depressive symptoms scores, negative automatic thoughts, and social and adaptive functioning were measured.

The theoretical framework for this study is shown in figure 1.

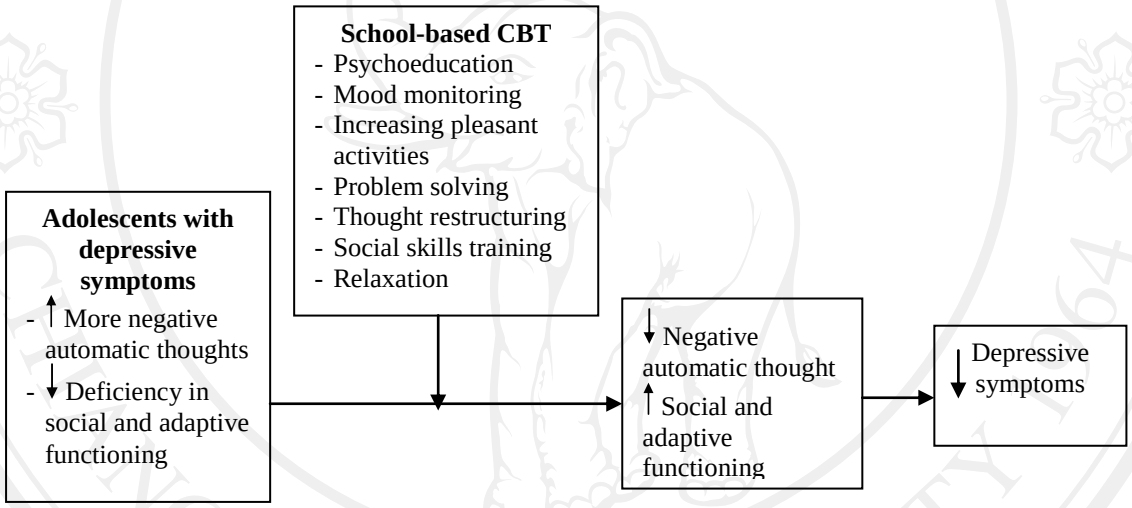

Figure 1 Conceptual Framework