Socioeconomic status and mental health in young adults

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the next.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Candidate

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Suwimol Densoontorn

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ABSTRACT

The recent economic crisis occurring in Thailand resulted in a number of Thai people experiencing socioeconomic problems, including those people living in Nakhon Si Thammarat, a province in the south of Thailand. This area is composed of three main geographical regions such as mountainous, coastal and city regions. The majority of people living in these regions rely on agriculture.

The aim of the study was to investigate mental health in young adults in three different geographical districts of Nakhon Si Thammarat, including Lan Saka, Pak Phanang, and Muang, as well as determining whether differences existed in the three regions and if mental health status was associated with socioeconomic factors. 1200 young adults aged between 18 and 25 years were randomly selected using the SCL-90-R to measure mental health symptoms in young adults living in the three diverse regions in Nakhon Si Thammarat.

The research results were as follow.

1. 45.5% of young people living in the coastal areas (Pak Phanang), 43.8% of youths living in the city (Muang) and 33.5% of young adults in the mountainous areas (Lan Saka)) were assessed as having mental heath difficulties (based on T>60 in the SCL-90-R).

The prevalence of a positive risk (any two primary symptoms scoring ≥ T63), was found to be greatest in those living in the coastal areas (20.8%), while 19.5% of young adults living in the city and 15% of the young people in the mountainous areas were found to be at risk. The GSI criteria (T ≥ 63**)** showed that 10% of young people in coastal regions were estimated to be a positive risk compared to 9.5% in the city and 8.8% in mountainous regions.

2. In the coastal areas (Pak Phanang), somatization was the most prevalent mental health symptom (20%) using the criteria of T > 60, while 17.5% and 17.3% reported paranoid ideation and hostility respectively. The clinical criteria (T score ≥

63) reported 12.5 % had somatization while 11.5% were assessed as paranoid and 11 % assessed as having psychotic symptoms

In the city (Muang), somatization was the most common mental health problem (17.3%), while 16.8% and 16.3% had problems with obsessive compulsiveness and hostility respectively (using T>60 criteria). The clinical criteria (T≥63), 13.3% reported hostility, 12.8% had somatization and 11.3% indicated paranoia.

In the mountainous areas (Lan Saka), obsessive-compulsive symptoms were found to be the most frequent health problem (16.8%) while 13.5% had problems with hostility and psychoticism. Using criteria at clinical level (T score ≥ 63), hostility was the most common problem (10.8%). Obsessive compulsiveness and depressive symptoms were the second most common mental health problems at a clinical level in the mountainous community (10.3%).

3. There were significant differences between the three areas on scores of somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, and paranoid ideation. Those living in coastal and city areas were found to have greater levels of somatization, obsessive-compulsive symptoms, interpersonal sensitive, depression, anxiety, hostility, and paranoid ideation than those living in mountainous areas.

4. Female young adults were more depressive, phobic, obsessive-compulsive, paranoid, and interpersonal sensitive than male youth.

5. No significant differences in mental health symptoms were found among the participants as a function of whether they were unemployed, employed or a student.

6. Youths with a Bachelor degree qualification were more likely to have symptoms of somatization, obsessive compulsiveness, interpersonal sensitivity, depressive mood, anxiety, phobic anxiety, and paranoid ideation than young adults with a secondary level of education. Furthermore, young people who had a diploma qualification were more likely to be anxious, obsessive compulsive and paranoid than young people who had a secondary education.

7. Young people whose income was less than 4500 Baht per month were less at risk of suffering somatization than those whose income was between 4501-6500 Baht per month. In addition, young people whose income was between 4501-6500 Baht per month were less at risk of suffering paranoid ideation than those whose income was greater than 6501 Baht.

8. A Bachelor degree qualification, marital status, and being a government officer were able to predict somatization, explaining about 1.6% of the variance in somatization.

9. Sex, tertiary qualification, and living in coastal areas were significant predictors of obsessive compulsiveness, with these three variables explaining only 2.4% of the variance in the obsessive-compulsive scores.

10. Being female, having a Bachelor degree qualification, living in the city and coastal areas were found to be significant though weak predictors of depressive mood, with the four variables explaining about 5.6% of the variance related to depression.

11. Living in city and coastal areas as well as being a blue-collar worker were significant though weak predictors of hostility, with the three variables explaining about 1.8% of the variance related to hostility.

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CHAPTER 1

1. INTRODUCTION

The economic crisis, which struck Thailand in July 1997, negatively affected business and the Thai people. Many firms have been closed or suffered a state of bankruptcy, resulting in a mass "lay off" of people. Consequently, many Thai people have become unemployed whilst some have had their salary decreased. The unemployment problem is believed to be related to the increased prevalence of social problems such as poverty, crime, drug addiction and mental health instability (World Bank's Thailand Office 1999). Some unemployed Thai workers returned to rural areas into the agricultural sector in order to work on their family fruit orchards and rubber plantations (World Bank's Thailand Office 1999).

1.1 The causes of the economic crisis

There are a number of known causes of this severe economic recession. The primary antecedent was that the previous government policy altered the economy of the country from one that was agriculture oriented to one that was oriented to industrialization (Bide 2001). Consequently, a number of mega industries were established such as petrochemical industries, cement industries, automobile industries, paper plants, as well as many large real estate projects. These projects required a large amount of foreign capital investments. Another cause of the economic downturn was the poor economic policies being implemented. For example, the policy of pegging the national currency to the US dollar, which was unrealistic, especially at a time when the dollar was very high causing a high price of Thai export products. Accordingly, Thai industry found it difficult to compete in the world markets and consumers began to look for the alternative source of supplies. In addition, the government implemented a policy of high domestic interest rates and financial liberalization without an efficient scrutiny of unregulated financial systems including banks, brokers, and stock exchanges. These policies aimed to attract local and foreign investors and to encourage foreign capital in order to enhance manufacturing

capability of the country. There were, therefore, large amounts of foreign capital flowing into and out of Thailand because of the lower overseas interest rates as well as investments of international banks. Many large conglomerates, medium and small business including financial institutes incurred vast foreign debts. These debts were in US dollars instead of Thai baht. Therefore, an enormous amount of money was not invested in productive transactions but into speculation sectors such as the stock market and real estate development (Bide 2001; Klein 1998).

The actual financial crisis started on the 2 July 1997, when the Thai government decided to float its currency on the foreign exchange in order to sustain the economic stability of the country. Additionally, the slow downturn in exports resulted in dramatic decreases in the annual economic growth from 7% to –1.7% in 1997 and –10.3% in 1998 (Office of National Economic and Social Development Board, 2001). This led to a substantially reduced GDP (gross domestic product) of 9.9 percent in 1998. Furthermore, there was an over supply of office buildings in the real estate industry and the Thai baht slumped by over 100 percent of its value; the stock market decreased from around 800 points to below 400, and excessive foreign debts built up to around US $89 billion. This economic collapse resulted in the flight of overseas capital causing fund deficits and then the bankruptcy of many firms (Bello et al. 1998; United Nation 2002).

It is clear that this economic distress resulted from enormous foreign capital dependence, nonproductive investments of private business, the real estate sector, automobile industries, petrochemical industries, fiscal liberation, as well as ineffective public administration policies (Ministry of Public Health, Bureau of Policy and Strategy 2002).

1.2 The impact of the economic crisis

The impact of the Thai economic collapse on the Thai people was severe. A large number of people experienced difficulties such as unemployment, reverse migration, and poverty. It is commonly believed the downturn caused many Thai people to

become anxious and depressed. The impact of this economic crisis will now be discussed in more detail.

1.2.1 Unemployment

As a result of economic downturn, many businesses were closed. Fifty-six financial institutes went bankrupt causing 50,000 staff to be unemployed (Bello 1998). The real estate sector experienced severe downturn due to an oversupply of buildings and lack of customers with adequate finances due to the laying off thousands of construction workers. The media business such as the newspapers also experienced difficulties as the majority of its revenues came from the real estate business. It has been shown that 1.2 million people lost their jobs (United Nation 2002).The unemployment rate increased from 2 percent in 1996 to 3.7 in 1997 and rose to 5.2 percent in 1998. Because of bankruptcy, GDP contraction, and unemployment, many professional people who lost their jobs were to work in non-professional careers resulting in lower pay. A number of unemployed returned to rural areas to work in agricultural sectors. Employment also decreased in the construction, manufacturing, and the financial sectors, while it increased in the agriculture sector (United Nations 2002).

1.2.2 Reverse migration

Prior to the economic recession, most of the manufacturing workforce in Thailand is known to have migrated from the countryside to work in industry (Robb 1998). It has been found that many who became unemployed in this industry returned to rural areas during the economic crisis because they were able to obtain agricultural work. The study in Sap poo pan, a sub district in the northeast of Thailand, by World Bank researchers (Robb 1998) found that 26,040 unemployed returned to the villages because of the economic difficulties. The reverse migration of workers increased competition not only in cities but also in rural areas. Additionally, migrants were more likely to have difficulties with assimilation in the rural societies causing isolation, which may have resulted in increased loneliness and an increased risk of suicide.

1.2.3 Poverty

1.2.3.1 Definitions of Poverty

The traditional definition of poverty was the "state of existence at, or below, physical subsistence", measured in terms of income and lack of basic requirements (Carbonaro 1991 cited by Ghellini et al. 1995). All traditional approaches defined poverty based on poverty lines requiring socioeconomic division between poor and not poor. The only indicator of poverty is income or consumption expenditures. It is argued that using income to assess poverty may lead to systematic assessment errors because the subjects are more likely to not reveal their income. In addition, income is occasionally changeable. However, the problems regarding income evaluation can be solved by using a relative multivariate approach, which are social indicators or deprivation indicators. For example, level of education, housing variables, health care, occupation, and other related variables. These variables represent various dimensions of the individuals' lifestyle. Income represents only one within the deprivation indicators of a state of poverty (Ghellini et al. 1995).

Using a multidimensional approach to define poverty, Townsend stated "Individuals, families can be said to be in poverty when they lack resources to obtain the type of diet, participate in the activities and have the living conditions and amenities which are customary, or at least encouraged or approved, in the societies to which they belong. Their resources are so seriously below those commanded by the average individual that they are, in effect, excluded from ordinary living patterns, customs, and activities" (Townsend 1979 cited by Ghellini et al. 1995 p,4).

This concept defined poverty as the deficiency of resources, activity participation, and facilities that assist the individual to survive in living standards in his or her community. Individual and families are in the state of considerably deprivation. Their resources are significantly lower than the average person, causing them to be unable to take part in customary social activities as the result of lower education and poor health. This can be called "marginalized, socially excluded". Nevertheless, individuals with material and financial deficiency will be termed as "poor" (Ghellini et al. 1995).

The World Bank (World Bank 2001) have defined poverty as “the inability of an individual to attain a minimal standard of living typically defined in terms of a food basket that delivers a biological calorie minimum (e.g. 2,100 calories of energy per person per day) and a small allowance for nonfood consumption such as clothing and shelter. This is the notion of absolute poverty” (p, 1).

Furthermore, the World Bank stated, “poverty can be defined not in term of income or consumption but instead in terms of deprivation of basic needs, such as primary schooling, nutrition, health care, safe drinking water, and housing” (p, 1).

A study by The World Bank (2000) revealed the major problems of the poor were as follow:

* Lack of the basic materials for wellbeing such as food, shelter, and land.

* Social exclusion, lack of voice and power, lack of confidence, lack of human dignity.

* Lack of economic and social basic infrastructure (rural roads, transport, water, health, and education).

* Higher risks of illness

* Lack of opportunities for education (especially writing and reading abilities).

* Lack of resources.

The Community Organization Development Institute (CODI) and the Thailand Development Research Institute (Jitsuchon 2001) produced a paper entitled “What is the poor and How to Measure IT?” by interviewing (a) socially disadvantaged people, (b) the academics and (c) the policy makers who defined the characteristics of poverty. The socially disadvantaged believed that poverty was a state of not enough to eat, low income, no land for agriculture, finance indebtedness, illness, poor general health, or disability. However, academics believed poverty involved income, assets, indebtedness, basic needs, health, and education. In the view of the policy makers, the poverty line

was used to define the poor. Income poverty means that people and their family are considered poor if their income and expenditure are lower than the poverty line.

1.2.3.2 Measurement of poverty

Poverty can be measured using the poverty line. In the midst of the 1970s and onward, the World Bank calculated two poverty lines, one for rural areas, and another for urban areas. These poverty lines had been used in poverty studies in Thailand (Krongkaew 1999). They reflected the structure of population in the 1960s, the nutritional requirements, habits, and patterns of consumption as well as the price for goods and services (Krongkaew 1999). Due to the demographic and economic conditions changing in Thai society in 1988, Krongkaew (1999) succeeded in calculating a new poverty line using a new set of nutritional requirements, population structure, consumption patterns, and newly existing prices of goods and services. In 1994, Kakwani and Krongkaew (Krongkaew 1999) recalculated the new poverty line for Thailand using the following steps. Firstly, the researchers established the minimum caloric requirements for all people of different ages and sexes. This information was obtained from the studies of nutrition by the Ministry of Public Health of Thailand in1982. Secondly, they found out the actual cost of the most efficient basket of food (basket that gives highest calories per baht of expense) by surveying the food consumption and the local people paid on food. Then, the research teams established total food expense for each food basket. After that, they estimated the total amount of calories of that food basket by multiplying the caloric content of each food item from the nutritional information. This information was provided by the Ministry of Public Health to arrive at the caloric cost of food per unit of expense (calories per baht). Thirdly, the calories per baht are used to calculate the amount of money needed to acquire the minimum amount of calories required by people of different age and sex. Family members of various size, age, and sex have different minimum income requirement for food. According to the above three steps, the food poverty lines for all families can be computed. The fourth step, the non-food expense was included in the food poverty line to derive the overall poverty line. The concept of the poverty line involved a minimum standard of living and varied according to time, regions, and areas (urban and rural). The International poverty line is $1 dollar a

day. This assumption meant that an at least one US dollar income was required to cover basic needs. Persons were considered poor, if their income was less than one dollar per day (Bevan 1999). In Thailand, the average poverty line is considered to be 880 baht (about $34 Aus) per capita per month (rural 823, urban 998). In Bangkok, it is 1065 baht (rural 885, urban 1,082) whilst an average of 838 baht is the poverty line in the south (rural 795, urban 998) (Jitsuchon 2001).

Job loss and reduction in wages and salaries can cause poverty. It has been found that the proportion of the poor has risen from 11.4 % in 1996 to 12.9% in 1998 and increased to 13% in 2001 mainly resulting from economic recession (World Bank 1999; Krongkaew 1999; Ministry of Public Health, Bureau of Policy and Strategy 2002; Office of National Economic and Social Development Board 2001). The Northeast was the poorest region in Thailand. There were 19.4 % of the poor in 1996 and this increased to 23.2% in 1998. This situation was relatively worse in the Central and Southern Thai regions. Between 1996 and 1998, the numbers of the poor in the central region increased from 6.3% to 7.7% while this figure went up from 11.5% to 14.8 % in the south. The poverty increased in these two regions because of the unemployment in the construction sector in the central regions, and the decrease of the rubber price in the South. In addition, the poor were found in farm enterprises and people with lower educational level. Furthermore, the population in rural areas experienced a greater increase in poverty than in urban areas. Wage reduction had considerably affected the welfare of the workforce than pure unemployment (World Bank's Thailand Office 1999). A Labor Force Survey by National Statistic Office between February 1997 and February 1998 found a decrease in the average wage in real terms of approximately 6%, across all worker categories and this was greater in urban areas (6%) than in rural areas (4.7%). Average real wages in urban areas were lower than those in rural areas (8.3% and 4.7% respectively).

It was found that because of the economic downturn, the population income decreased, particularly for people with primary and below primary education, production workers, and private employees, working groups aged 13-24, and small service facilities (World Bank's Thailand Office 1999). Additionally, there was evidence that many poor

students withdrew from school because their parents could no longer sustain their children in education. Poverty has been identified as an unpleasant situation that affects young people (Jessor 1993 cited by Bevan 2000). It is able to interact with other factors resulting in raised risks of mental disorders in young people (Saxe et al. 1988 cited by Bevan 2000). Poverty can also affect young people's ability to access sufficient basic material for surviving (such as food and housing), opportunities for education, employment and training as well as positive self-esteem development. A study in Western Australia found that children from low-income families (house income below Aus$20,000 per year) have an increase in the prevalence of mental health difficulties compared to children from high-income families. However, the researcher noted that there were other causes of mental health problems, which are more complex than family income. In the further analysis of Western Australian data, the researchers found that the ability of parents in providing security and stability to the children was more important than household income (Silburn et al. 1996 cited by Bevan 2000).

1.2.3.3 Social capital downward

Social capital is defined as trust, reciprocal and networks of support (Robb 1998). In Thailand, with existing social pressures, and increasing of economic uncertainty, levels of stress increased. Furthermore, there was a breakdown in community trust. For example, before the economic crisis, the urban slums in Khoan Kaen endeavored to connect with rural poor to obtain products, but during the crisis, the connection disappeared.

In a study in Taparak, Khon Kaen, Thailand by the researchers of the World Bank, it was found that an increase in distrust occurred, measured by increased competition for jobs, increased frustration and psychological stress, and this resulted in a rise in family and community tensions (Robb 1998). As the result of competition for jobs, neighbors who once were the cooperative were forced to be competitors. In addition, theft, crime, and violence increased causing insecurity in the Thai community (Robb 1998). Some parents forced their children to drop out of school to guard their home as their parents were working. Some distrusted their neighbors because it was believed that neighbors would steal.

1.2.4 Mental health problems

As a consequence of the 1997-1998 Thai economic recessions, the increased unemployment rate was believed to be related to an increase in the prevalence of mental health problems in the community (Ministry of Public Health 2000). Eight surveys of mental health status were conducted during the economic crisis between September 1997 and September 2000 by the Department of Mental Health (Department of Mental Health, Ministry of Public Health 2000). Samples were selected randomly from regional telephone books and were interviewed in 11 provinces (Bangkok and all surrounding provinces including the provinces in which psychiatric institutes are established). The Department of Mental Health disclosed that on six occasions, the unemployed had a significantly greater prevalence of stress and suicidal risks than the employed. The average percentage of stress experienced by the employed compared to the unemployed in six surveys was 58.4% to 66.8%. In addition, the average proportion of suicide of the unemployed was greater than the employed in eight surveys (7.44/4.01) (See table1).

Additionally, Sornpaisarn et al. (1998) studied the mental health status of the Thai people by the time of the economic crisis in Bangkok and all surrounding provinces using questionnaires prepared by the Department of Mental Health. Samples were divided into two groups, which were the general population and businesspersons. The first group randomly was selected from a telephone book while the second was purposively selected from 58 bankrupt financial institutes. Results showed 74.9 % of general population group experienced financial problems, 39.5% reported high stress and 4.6% had suicidal idea whereas in the business group, 69.2 % faced with financial problem, 36.2 % had high stress, and 2.1% reported suicidal ideas. A study of the prevalence of mental disorders among Thai people during the economic crisis (Department of Mental Health, MOPH and Department of Psychiatry, Faculty of Medicine, Chulalongkorn University 1999) revealed that 4.4 % of Thai people had problems with anxiety, and 1.8 percent had difficulties with mood disorder.

Suicide is a significant mental health problem in a period of economic downturn**.** For

example, Somboonyatanond et al. (2000) studied suicide factors and characteristics associated with suicide before and during economic crisis, and found that during the crisis, suicidal rates increased significantly compared with the period before the crisis. In addition, people are known to be at higher risk of committing suicide because of economic hardship and HIV affliction (Somboonyatanond et al. 2000). In addition, The Royal Thai Police Office (2000) reported that after economic distress, the suicide rate in males is 3.3 higher than the risks for females.

Table1. The percentage of mental health problems of the Thai public during the economic crisis by way of telephone interview from 1997 to 2000

Topics	Results							
	Survey1 Dec.97 N=1669	Survey2 Mar98 N=1672	Survey3 June98 N=1526	Survey4 Sep.98 N=1570	Survey5 Mar.99 N=1791	Survey6 Sep.99 N=1677	Survey7 Feb.20 N=1543	Survey8 Sep.20 N=1663
1.Stress								
Employed	65.8	46.9	60	60.7	57.2	58.0	56.9	57.7
Unemploy	62.0	44.2	70.7	73.0	59.3	74.4	63.6	59.8
2. Suicide								
Employed	4.0	3.9	2.9	4.3	3.8	5.3	4.7	3.8
Unemploy	6.9	5	6.8	8.8	5.6	10.0	9.1	7.3

Source: Planning Division, Department of Mental Health,
Ministry of Public Health

1.3 Definition of mental health

Mental health can be defined into two ways, (i) the absence of psychological, emotional, behavioral, and social problems and (ii) a state of well being involving appropriate psychological and social behaviors (Kazdin 1993). According to the World Health Organization (WHO 2000), “Health is a state of complete physical,

mental, and social well-being and not merely the absence of disease or infirmity" (p, 1). "Mental health is defined as a fundamental component of health through which the individual realizes one's own cognitive, affective, and relational abilities. A healthy mental disposition allows one to cope well with life's challenges, to work productively and to make a positive contribution to one's community" (WHO 2000, p. 1).

The WHO Secretariat of the Pacific Community stated that:

"Mental health is the foundation for the well-being and effective function of individuals. It is more than the absence of mental disorder. Mental health is the ability to think and learn, and ability to understand and live with one's own emotions and the reactions of others. It is a state of balance within a person and the environment" (The Secretariat of the Pacific Community, WHO 2006, p. 1).

" Mental health is defined by the Australian Health Minister as "the capacity of individuals with in groups and environment to interact with one another in ways that promote subjective wellbeing, the optimal development and use of cognitive, affective and relational abilities and achievement of individual and collective goals consistent with justice"(Australian Health Minister 1998, p. 20).

"Mental health relates to emotions, thoughts, and behaviors. A person with good mental health is generally able to handle day-to-day events and obstacles, work towards important goals and function effectively in society. However, even minor mental health problems may affect every day activities to the extent that individuals can not function as they would wish, or are expected to, within their family and community" (McLennan 1999, p. 1).

Mental health can be seen in increasing and developing potentialities of individual and interpersonal development. Kazdin (Kazdin 1993 cited by Bevan 2000) indicated that mental well-being could attract attention to competent development, practical interventions, and preventive interventions. However, concentrating on dysfunction emphasizes the classification and diagnosis of disorder. Mental health problems

hampered individual's cognitive, emotional, or social capability but not to meet the level of disorder. A mental disorder is a diagnosed illness that considerably encumbers cognition, emotion, and social aspects of an individual. Examples are depression, anxiety, substance abuse, bipolar disorder, and schizophrenia (Mrazek & Haggerty 1994; Commonwealth Department of Health and Age Care 1999 cited by Forero 2001).

1.4 Socioeconomic status

Generally, researchers have found that socioeconomic status is inversely associated to mental disorder. People from lower classes have experienced higher rates of disorder (Eaton & Muntaner 1999). There are two different ideas to understand the relationship between socioeconomic status and mental disorders. The first idea believed that individuals who are predisposed to mental disorder have lower education and occupation. The second framework considers those with mental disorders are likely to move steadily to lower points on the socioeconomic ladder (Eaton & Muntaner 1999).

1.5 Young adulthood

Young adulthood (age 18-25years) is typically an age in which physical energy, knowledge and ideas abound (Office of the Thai Prime Minister 1989). The young are physically strong and keen on learning. It is a time of life that they can develop their ultimate abilities and so face the complications and uncertainties of the world. They also have abilities to use their broad vision for judgment. In addition, it is an age in which the young are trying to understand themselves and are looking for meaning of life under the influence of diverse environmental factors (Office of the Prime Minister 1989). Furthermore, young people need to cope with many altering roles and tasks in their transitions of life such as members of families and peer groups, members of communities and the global society. These altering roles and tasks require a multiplicity of life skills. The complexities and broad visions of mental health, therefore, are used to help youth in adaptation to their transitional period (Bevan 2000). The 18-25 age group is the ending of adolescence that is often marked with the beginning of employment and occupational training. It is the second decade of life, in which some young people might be obstructed by the socioeconomic issues such as joblessness and cost of living (Forero 2001).

Youth is a valuable resource of any nation. While they are energetic in their physical strength, in their learning and their thinking they are susceptible to the negative influences of an economic downturn. In Thailand during the economic downturn, many young in the workforce were laid off. Simultaneously, new graduates were unable to find secure jobs. It is, therefore, very important that we understand better the influence of an economic crisis on the mental health status of young people in the community. This study was, therefore designed to investigate the impact of economic instability on young people aged 18-25 years.

1.6 Aims

The major aim of this research was to investigate the mental health status in young adults in three districts of Nakhon Si Thammarat in Thailand. Specially, the study was interested in determining the influence that socioeconomic variables might have on mental health status.

1.7 Outcome of this research

The outcome of this research should assist the health authorities in Thailand to address mental health problems in young people aged 18-25 years. For example, if the prevalence of mental health problems is greater than expected, mental health services may be established or may be included in general hospitals in Nakhon Si Thammarat. Furthermore, appropriate education regarding mental health should be provided to community leaders, monks, and teachers to help younger people in their communities to cope with the stress of economic hardships.

1.8 Area of study

1.8.1 THAILAND

The Kingdom of Thailand, formerly known as Siam, is an independent constitutional monarchy, situated in the Indochina Peninsula. It covers an area of approximately 513,115 square kilometers. Thailand is bordered by Myanmar and Laos in the north, Myanmar and Andaman Sea in the west, Myanmar and the Gulf of Thailand in the south, and Cambodia and Vietnam to the east. Thailand has four geographical regions:

the mountainous North, the fertile Central plains, the semi-arid plateau of the northeast, and the peninsula south, distinguished by its many beautiful tropical beaches and offshore islands.

The population of Thailand was estimated at 60 million in 2001. About 83% of the total population lives in rural areas. The remaining 17% are mainly in the National Capital, Bangkok. Bangkok is the main political, educational, and economic base of the country.

The country consists of 76 provinces. A provincial governor appointed by the Ministry of the Interior heads each province. A mayor who is selected by a municipal council heads the municipalities. A province is divided into districts, sub – districts and villages.

Figure 1 shows the map of Thailand including Nakhon Si Thammarat

(The Royal Thai Consulate 2001)

1.8.2 Nakhon Si Thammarat

1.8.2.1 Geographical location

Figure 2 shows the map of Nakhon Si Thammarat including the districts of Lan Saka, Pak Phanang, and Muang of Nakhon Si Thammarat (Tourism Authority of Thailand 1997).

Nakhon Si Thammarat, a province in the south of Thailand, is located at the eastern shore of the Gulf of Thailand. The province is 860 kilometers from Bangkok. The geographic features of Nakhon Si Thammarat include mountain ranges situated in the central part of the province along the peninsula creating the diverse geographical regions in the province which can be classified into three parts (Nakhon Si Thammarat provincial statistical office 2003).

The middle part of the mountain ranges area is from the north to the south of the province, or in the middle of Nakhon Si Thammarat mountain ranges. Khao Luang is the highest mountain in the ranges, at about 1,835 meters high from sea level. The areas include the districts of Muang, Sichon, Khanom, Tha Sala, Lan Saka, Phom Khiri, Ron

Phibun, and Cha-uart. Lan Saka is the representative of the mountainous areas in this current study.

Plain areas along the eastern seacoast are next to the middle part of the mountain ranges to the east until the seacoast of Gulf of Thailand, which can be divided into 2 parts. The first part is from Muang to the south, consisting of wide plain lands from the middle part of the mountain ranges to the seacoast. There are many headwaters from the middle part of the mountain ranges flowing into Gulf of Thailand. They are the economic base of the province. These areas comprise Muang, Pak Phanang, Chian Yai, Hua Sai, and Cha-uart. The second part is from Tha Sala to the north. The districts in the areas compose Khanom, Sichon, and Tha Sala. The representative district of coastal regions is Pak Phanang.

Plain areas in the west are the plain lands between Nakhon Si Thammarat mountain ranges and Phuket mountain ranges, with small hills in some parts. These areas cover Phibun, Thung Yai, Chawang, Na Bon District, and Thung Song. As a result of this area being similar to the area of mountain ranges in the middle of the province, these districts were not randomly selected.

Lan Saka is settled at the foot of the mountain ranges. Khoa Luang, the highest mountain in the south, is situated in this district. There are beautiful waterfalls such as Karom waterfall. The main occupation of the community is growing varieties of fruits, such as mangosteen, rambutan and durian. Some work as blue-collar workers in gardens. In November 1988, Khiri Wong, a peaceful village in this area was faced with flash flood disaster causing one hundred houses were swept away. Now, this village is the tourist attractions of the province because of peaceful surrounding and fantastic natural scenery.

Muang is divided into 16 subdistricts. Total population is approximately 270,647 persons which is the highest population density and a density of 438.33 persons/square kilometers Most geographical features of Muang are wide plain lands from the part of mountain ranges to the sea coast (around 95.06%). 4.31% is in the middle of Nakhon Si Thammarat mountain ranges. The rest of 0.63% is waterways. The main occupations of communities near the mountain range are fruit gardeners and

blue-collar workers. People living near the coast earn their living as fishermen and in the inner city; most of them are wholesalers, detail traders, service workers and government officers. Muangjum (1999) reported that the mangosteen growers in Muang Nakhon Si Thammarat have had the problems of mangosteen production including the quality of yield, uncertain price, water sources, water supply, weeds, insects, pest, fertilizer application, harvesting, pesticide, and being water-logged.

Pak Phanang, located at the mouth of the river, previously, provided a shelter for cargo and non-cargo boats from storms (Chaipattana Foundation 2001). This area was appropriate for rice growing, as there were many rice mills lining the banks of the rivers and its branches. This port town was a source for plenty of rice, fish, and fresh water leading to the prosperous economy in the past.

In 1989 to 1993, the topography of Pak Phanang river basin, on the eastern side of Nakhon Si Thammarat was composed of bays, sandy beaches, river mouth, dunes, and tidal flats (Wanpiyarat et al. 1995). The river mouth covered with mangrove forests while the rest was mostly composed of cultivated land. The land uses were categorized as rice fields, mixed fruit trees, prawn farms, urbanized built up land, mangrove forests, marshland and abandoned rice fields. Rice and mixed fruit trees were the major crops in the areas. Mixed fruit tree areas include crops such as coconuts, bananas, and oranges. Shrimp farms are found along the coasts, Pak Phanang River and in mangrove forests. The great changes of land use were the changes of rice fields and mangrove forests to shrimp ponds and abandoned land. During the year 1989 to 1991, paddy fields had changed to become shrimp ponds (about 9.1%). In 1991 to 1992, the shrimp farms expanded dramatically at an increased rate of 116%. Large amount of salt and wastewater from shrimp ponds were discharged into paddy fields and watercourse causing soil salinity and water pollution resulting in serious difficulties to rice farmers. They experienced substantial reductions in harvests (the rice products decreased more than half of the recent years).

A study of development guidelines for the coastal zone of Pak Phanang district by Ruanghirun (1997) reported that the area of Pak Panang is composed of the Pak Panang basin and coastal area with a diversity and abundance of natural resources. The land has been used for agriculture, industry, coastal farming, and fishing. Coastal

farming is the major cause of environmental change affecting the use of other resource and activities. The problems of Pak Phanang include physical aspects such as soil and water resources, ecology aspects such as mangrove forest destruction, human activities such as exploited land use and quality of life comprising economics, social development, and tourism. Generally, problems are related to physical aspects, regarding natural resources and environment deterioration. Lack of water resources in the north of the district and in the coastal zones is one of the principle problems of Pak Phanang.

Researchers have studied the order of importance of problems and peoples' needs in the Pak Phanang basin region. Choosamer et al. (2004) found that people living in the urban community of Pak Phanang basin region were experiencing a lack of a clean water supply, community, and shrimp farming wastewater problems, flooding, and economical/social problems.

As well, Jory et al. (2004) reported that the crucial problems experienced by people who relied on Nipa Palm living in the Pak Phanang basin region included a considerable decrease of Nipa Palm fruits due to the substantial changes in the quality of the water as a result of the implementation of the Pak Phanang Basin Development Project. In the zones designated "salt water" the water had become very salty, while in the "fresh water" designated zones the water had become fresh. This change apparently affected the health of Nipa Palm, which grows in the brackish water and was therefore preferably suited to the natural environment of Pak Phanang. There has also been a dramatic decrease in the marine life living around the Nipa Palm groves.

Direkbusrakom et al. (2004) found that shrimp farmers in Pak Phanang basin region have had economic problems due to low selling prices, as well as to the low quality of post larva and shrimp feed, poor operation, poor quality of water sources and lack of coordination between the farmers themselves.

Mikusol et al. (2004) studied the order of importance of problems in the mixed farming growers and found that farmers have had the following difficult situations. First, lacking of water because of very little rain, which led to insufficient water for growing rice. Second, uncertain and low prices for rice and agriculture products.

Third, the flow of salt water into fruit orchards as well as the use of chemicals in the paddy fields including vegetable or fruit led to toxic residues in crops. Fourth, problems relating to water-use between the shrimp farmers and fruit growers result in frequent social disputes. Finally, diseases disturbing fruit trees, as well as pest infestation such as insects and mice. Boonsuaykhwane et al. (2004) studied the problems and needs of rice farmer and found that a lack of water for rice production, the price of rice; and the use of inappropriate technology in the farming of rice were the crucial problems of rice farmers,

Thammachat et al. (2004) found that local fisheries in the Pak Panang basin region have had difficulties due to a substantial decrease of marine life, which has resulted in dramatic decreases in the amount of fish, affecting the economic of the communities. Issarkreisila et al. (2004) reported that fruit and rubber growers of the Pak Phanang basin region have had the following problems. First, farmers lacked sufficient knowledge to maximize the yield and quality. Second, diseases and pests was a common problem encountered by farmers, leading to decreases in quantity and quality of the crop, and required considerable use of chemicals. Finally, irrigation water from the Pak Phanang project in some areas was not enough, and in certain areas, the irrigation system that has been constructed was inappropriate for the needs of the farmers.

The varieties of geographical features in the province have resulted in a population with varied occupations. Communities situated at the foothills of the Nakhon Si Thammarat mountain range grow coffee, rice, and fruit. The eastern border is formed by The Gulf of Thailand. The people in this area depend mainly on the coastal resources for their livelihood. The western region is dominated by plains and communities who rely on fruit gardens and rubber plantations for their income (Central Police Bureau 1989)**.**

People working in various occupations within a certain geographical region have developed distinct characteristics (Central Police Bureau 1989). In Lan Saka, most people have fruit orchards or small rubber gardens. People in this area have distinct social characteristics including peacefulness. In the Muang district, the main occupations are rice farming, gardening, shrimp farming, fishing, and making handicrafts. The main characteristics of these people is that they are conservative and

enjoy having a higher level of social status (Central Police Bureau 1989). In the Pak Panang the principal occupation is rice farming. People in this district are known for becoming involved in disputes; however, they are also supportive of their own groups (Central Police Bureau 1989). These characteristics are most apparent in people involved in fishing. In Khanom, Sichon and Thasala districts most of the people work in fisheries, have fruit orchards or small rubber gardens. People in this area have distinct social characteristics including peacefulness, they are easily persuaded and they can be extravagant (Central Police Bureau 1989). In Chawang, Thung Yai, Phiboon, and Nabon the main occupation is rubber gardening, coffee farming, and fruit orchards. Their characteristics are complex, they are exploitative, competitive in education, and enjoy reading (Central Police Bureau 1989).

Nakhon Si Thammarat has fertile land and is rich in natural resources including forests, minerals, and coastal resources. The richness of the province has caused many disputes over land and many murders involving disputes over the use of agricultural land (Central Police Bureau 1989). There are both interpersonal and group conflicts. Because of a lack of trust in local police and the justice system, many people in Nakhon Si Thammarat take the law into their own hands resulting in a high murder rate. Gangster and mafia connections are not uncommon (Central Police Bureau 1989).

Because of the geographical location of Nakhon Si Thammarat, it is subject to frequent natural disasters, which destroy property, and takes many lives. Some of the more frequent disasters are landslides and floods. Most happen without any warning and devastate the lives of many people. Nakhon Si Thammarat is divided into 21 districts and 2 minor districts, 170 sub-districts, 1430 villages, 24 municipalities.

Table 2. Area, number of Municipalities, number of sub districts and number of villages in the districts of Muang, Lan Saka and Pak Phanang in Nakhon Si Thammarat (Source: Department of Local Administration, Ministration, Ministry of Interior)

District	Area (Sq.Km.)	Number of Municipalities	Numberof Subdistricts	Number of Villages
Muang	617	23	13	109
Lan Saka	343	-	5	41
Pak Phanang	422	3	17	137

Table 2: Shows a breakdown of the three districts involved in the study. In 1998, Nakhon Si Thammarat not only had an economic recession, but also experienced El Nino phenomena, causing every part of the province to have a long dry season and very little rain. Rubber plantations and fruit orchards were destroyed by drought. Today many agricultural earners also have experienced low prices for these products, reducing their income and causing them not to have enough income for their families. These people have faced economic, social, and environmental changes that could negatively influence their mental health. Mental health disorders are possibly increasing to the extent that without establishing immediate remedies to a major public health problem will occur. Mental health problems could reach a level where they could substantially negatively affect Thailand's human resources and national development.

According to the Labor Force Survey,Round 4, October-December 2001 by the Nation Statistical Office, Nakhon Si Thammarat ((Nakhon Si Thammarat Provincial Statistical Office 2005) revealed that most of the employment was in the sectors of agriculture, hunting and forestry, followed by the wholesale/retail and

manufacturing industry. Most employees were employed in private firms and household business.

Values and Characteristics of people in Nakhon Si Thammarat (Nakhon Si Thammarat Provincial Office 1984).

1. Independence: dislike order; dislike authority
2. Individuality: dislike working in groups
3. Strong social group: proud of birthplace: strong bond with family and relatives
4. Sincerity: direct in speech and actions
5. Generosity: respectful; generous; broadminded; obliging; helpful, these are typical characteristics of people involved in the mafia.
6. Extravagance: will spend a lot of money on social activities
7. Honor/dignity: will support relatives and friends
8. Status: like status and class
9. Love of birthplace: if working in another area will always come home for holiday social activities, proud of local dialect
10. Seniority system: respect of elders both in personal and work situations, believe senior have more experience
11. Love of life: enjoy fun at work and home; enjoy local forms of entertainment; enjoy nature, enjoy involvement in politics.
12. Social awareness: politically aware, democrats understand human rights of people.

1.9 Literature review

The following section presents a critical literature review regarding the epidemiology of mental health as well as relationships between socioeconomic status, sex, and health. This doctoral study will use educational attainment, income, and occupation including employment status to be the indices of socioeconomic status. Educational attainment is a major predictor of subsequent income and occupational prestige over the life course (Hauser 1994). It also represents knowledge, which might exert an influence over health behaviors and might increase the value of an individual's contribution to the productive process, which translates into greater social rewards (Hauser 1994). Occupation is associated with prestige, wealth, skills, and specific working conditions. The third index of SES is the assessment of a personal and household income and this can also be a measure of poverty or wealth ((Kessler et al. 1994 cited by Eaton & Muntaner 1999). Furthermore, this study will consider the mental health of the unemployed people as a result of the recession in 1997.

1.9.1 Epidemiology of mental health problems

Mental health problems, mental disorder and emotional and behavioral problems are usually described in terms of cognitive, mood and or behavior symptoms. Young adults are considered to have mental health problems if the numbers of emotional and behavioral problems of their answers are in clinical range (Sawyer et al. 2000).

An epidemiological study of psychiatric disorders in Thai communities, in 1982, by Otragoon et al. (1982), surveyed the mental health status of 1374 people in city areas using the Cornell Medical Index (CMI). Results showed 30.4% of males and 31.6% of females aged above 15 in inner Samsaen sub district, Bangkok, had mental health problems. In 1984, Jaisin et al. (1984) studied the mental health status of people living in Chonburi. A health opinion survey (HOS) was used to screen 4,114 people aged over 15 years and then the sample thought to have stress problems were measured with the Symptom Checklist 90 (SCL-90). Findings suggested that 28.65% of people reported mental health problems. Psychosis was found in 0.19% while 14.59% had anxiety problems, 15.5% were found to have symptoms of depression, and 26.3% reported psycho physiologic disorders. In 1987, Meksupa et al.

(1987) found that 48.7 % of people aged over 16 had psychiatric problems while 1.3% had problems with psychosis and 15.8 % had anxiety disorders. Furthermore, Tangsirimongkol (1987) using the SCL-90 and the Mooney problem checklist, examined mental health and adjustment of senior high school students in public schools in Bangkok. The study found that students had problems with symptoms such as somatization, obsessive compulsiveness, inter-personal sensitivity, depression, hostility, phobic anxiety, paranoid ideation, and psychoticism. In 1989, Charoensuksopon (1988) investigated the relationships between backgrounds, physical, psychological, and social factors, and mental health status of the people residing in industrial areas, (the provinces of Smutprakarn, Chachengsoa, Chonburi and Rayong in Eastern Thailand) using HOS. Results showed 27.2% of people had high levels of stress, and 25.6% reported low stress levels. In addition, Narintharangkoon Na Ayudthaya (1989) studied problems of‘adjustment and mental health of quota students at Srinakharinwirot University, Bangkhen Campus. Findings suggested that the students had problems with obsessive-compulsiveness, somatization, interpersonal-sensitivity, depression, hostility, phobic anxiety, paranoid-ideation, and psychoticism. Two years later, Towcomlue (1991) using the SCL-90, studied mental problems of Bangkok bus drivers, and found that 37% of bus drivers of Bangkok Mass Transit Authority (BMTA) had mental health problems and 21.1% had problems with somatization, which was the most prominent symptom. In 1992, Houythan (1992) studied personality and stress of nursing students in the College of Nursing, Ministry of Defense. Results showed 46.3% of nursing students had high levels of stress (Health Opinion Survey scores more than 34.54). As well, Jumruslertsumrit (1992) using SCL-90, surveyed mental health, and learning problems of Chulalongkorn medical students. Findings revealed that 15.20% of the medical students had at least one symptom of mental problems. Obsessive-complusiveness was the most prevalent mental health problem (9.12%) while depression and psychoticism were found in around 6%. Furthermore, Sinasa (1992) studied mental health problems of workers in intermediate factories in Nonthaburi using the CMI. While the findings showed that most of the workers had low levels of mental health problems (72.1%), at least 17% reported having symptoms of affective disorders. In 1995, a study of the mental health of public service motorcycle drivers

in Bangkok using the SCL-90 was conducted by Phapoom (1995), who found that 31.5% of the drivers had mental health problems. Somatization was the most prevalent of mental health difficulties (15.2%). Paranoid ideation, phobic anxiety, and depression were found in 11.9%, 10.4%, and 10% respectively.

In 1996, Nilchaikovit et al. (1996) studied demographic and psychosocial factors possibly associated with psychiatric illness in a Thai community in Bangkok using the GHQ60 (General Health Questionnaire60). Multistage random sampling was used to select 826 samples aged 20-65 in the Nonchok district, Bangkok. Findings suggested some groups of people were more likely to have higher prevalence of mental health problems. Examples were people with below primary education (35.6%), the unemployed (32.5%), and people with no income (29.1%) or income less than 2000 baht per month (22.0%). In 1998, a study by Chomdang (1998) using the GHQ28 studied the mental health of students receiving government funds of Naresuan University, Pitsanulok (a province in the North). Results showed that 37.5% of the students had mental health problems. In 1999, Choasin (1999) investigated some personality factors predicting mental health problems of people living in the metropolitan, suburban, and rural areas in Chiangmai, in the North of Thailand using the SCL-90 and EPPS (Edwards Personality Preference Scale). The sample included 619 adults randomly selected from the municipality of Muang district (metropolitan), all surrounding districts of Muang (suburban) and remote districts (rural). Finding showed that people living in rural areas had the least mental health difficulties, while 33% of people in municipal areas suffered from obsessive-compulsive symptoms, 15.4% were found to have symptoms of hostility, 11.1% had problems with interpersonal sensitivity, and 6.9% had problems with anxiety. In suburban people, 41.4 % had problems with somatization, 24.5% were found to have problems with phobias, 17.9% had symptoms of depression, 17.3% suffered from symptoms of paranoid ideation and 8.5% reported psychoticism. Furthermore, overall, people in the three living areas reported high levels of somatization (28.9%), obsessive-complusiveness (18.7%), phobia (18.3%), paranoid ideation (15.4%), depression (11.8%), hostility (6.9%), psychoticism (6.6%), interpersonal sensitivity (6.2%), and anxiety (3.8%). In addition, the results from a multiple regression analysis conducted

in this study found significant relationships between living areas and the nine symptoms.

In addition, Danpakdee (1999) studied mental health status of secondary school students in Chaiyaphum municipality using the SCL-90. Samples were 196 male and 195 female students aged 13-18 years**,** randomly selected from the senior secondary schools or equivalent levels in the municipality of Chaiyaphum, (the northeastern province of Thailand). When using T-score levels below 60 to be the criteria of normality, results showed that 15.6% of the students had mental health difficulties. Obsessive-compulsive symptoms were the most common mental health problem found in this study (17.9%). In addition, 17.39% of the students reported having symptoms of psychoses, while 16.62 % had symptoms of anxiety and phobia. However, when using the norm of the psychologists of the Somdejchoapaya Institute of Psychiatry, phobia was a predominant mental health problem (40.9%), while depressive mood was found in 35.5%, and 30.9% were found to have symptoms of psychosis. As well, Sangvipark (1999) used the GHQ-28 to survey mental health status in secondary school students in the municipality of Chaiyaphum aged 13-18, years, and found that 36.9% of the students had mental health problems.

In comparison, in the United States, it has been estimated that the prevalence of psychopathology among adolescents in the American communities was around 18.7% (Kashani et al. 1989 cited by Reed 1995). In Australia, around 50% of mental illness has been found to occur in young people aged 16-18 years. As well, around 15% of young people experienced mental health difficulties: 5% suffered from recognizable psychiatric conditions and at least 15% had severe psychiatric disorders, which necessitated professional intervention (Australian Youth Foundation 1994). In 1998, a National Survey of Mental Health and Well Being of adults in Australia revealed that young adults aged 18-24 had the highest prevalence of mental disorders 12 months prior to the survey (27%) (Australian Bureau of Statistics 1998). In addition, Sawyer et al. (2000) studied the mental health of young people in Australia, and found that 14% of Australian children and adolescents had mental health problems. In New South Wales, 17% of male adolescents and 21% of female adolescents aged 12-17 had one or more mental health problems (Forero et al. 1998

cited by Stephens 2000). Furthermore, Prado et al. (1999) studied the mental health status of Queensland adolescents: specifically the regional differences using the Symptom Distress Checklist 90- revised (SCL-90-R). Samples of 343 secondary school students aged 12-18 years were randomly selected from metropolitan, coastal, and country (inland) schools. Findings showed that 16% of adolescents met the criteria for a positive case as defined by T score ≥63 for the Global Severity Index (GSI) or ≥63 in two or more distress symptom dimensions. The prevalence of positive cases found in metropolitan was 12.4%, coastal regions 13.4% and in country schools it was (inland) 22.2%. In addition, there were noted differences between adolescents in private (19%) and public (13.6%) schools.

1.9.2 Unemployment and mental health problems

Psychological disorders including drug abuse, crime, depression, and suicidal behavior among young people have increased since World War II in almost all developed countries (Eckersley 2002). Rutter and Smith (1995 cited by Eckersley 2002) claimed that social disadvantage, inequality, and unemployment were associated with psychological disorder. Research investigating the relationship between socioeconomic status and mental health showed that unemployed people experience higher levels of depression, anxiety and distress as well as low self-esteem and confidence when compared to employed people (McClelland & Scotton 1998 cited by Rowling et al. 2002). This finding is supported by the studies of many researchers. For example, Wong (2000) examined the socioeconomic changes and mental health in Hong Kong, and found, as perhaps expected, that there were substantial increases in the percentage of depressed mood and interpersonal relationship problems among the users of a mental health telephone service. In addition, he found that while the unemployed callers experienced more depressed mood, the employed callers had higher anxiety levels. In Canada, Grayson (1989) studied the effect of the closure of a large business (the Toronto plant of Canadian General Electric) in 1984 among 400 laid off workers who had been highly skilled and well paid. Results showed that following dismissal 50% of these workers had severe levels of stress. In comparison with the Ontario respondents to the Canada Health Survey, the laid off workers reported greater frequency of “headaches, hay fever or allergy”, back, limb or joint disorders” and “arthritis”. A study

by D'Arcy and Siddique (1985) used the Canada Health Survey to investigate the relation of unemployment to physical or psychological health outcomes in comparison with employed people. They found that the unemployed people had greater levels of psychological distress and anxiety or depressive symptoms than the employed people did.

1.9.3 Educational attainment and mental health

In 1994, Silapabanleng (1994) studied mental health in people living in Thai villages at Chanthaburi and Trat Province border areas that were subject to high military alert. They found significant associations between higher risks of mental health problems and low levels of education. Furthermore, Nilchaikovit et al. (1996) reported a significant correlation between low education and psychiatric illness in Thai communities in Bangkok. As well as, Towcomlue (1991) claimed significant difference between mental health problems and educational levels in bus drivers employed by the Bangkok Mass Transit Authority. However, Research in 1989 by Charoensuksopon (1989) investigated the relationship between backgrounds, physical, psychological, and social factors, and mental health status in people residing in an industrial area of Eastern Thailand. The study found no significant differences between mental health status and sex, income and working status. However, the study found significant differences between mental health status and levels of education. In 1984, Jaisin et al. (1984) revealed that people with lower educational levels had higher stress than those with better qualification. In contrast, a study of mental health problems of workers in intermediate factories in Nontaburi by Sinasa (1992) found a significant difference in mental health problems among workers with different educational levels.

In Japan, the census of National Survey of Japanese Daily Living conducted by the Ministry of Health and Welfare in 2000 showed for both male and female persons aged 15 to 24 years, that studying was one of their main sources of anxiety and stress (43% and 34% respectively) (Ministry of Health and Welfare 2000 cited by Maruyama 2002).

1.9.4 Income and mental health

Epidemiological studies have found poverty and low income to be correlated with increased risks of mortality and morbidity in the socioeconomic disadvantaged. In a study of the mental health of young people in Australia, Sawyer et al. (2000) found that young people with low incomes had a higher prevalence of mental health problems than other groups. In Thailand, Jaisin et al. (1984) claimed that levels of stress were highest in people with incomes lower than 2000 baht per month. Furthermore, Towcomlue (1991) found mental health risks were raised in those with lower incomes. In addition, Phapoom (1995) studied the mental health of public service motorcycle drivers and found a significant negative influence of low income on mental health. As well, Nilchakovit et al. (1996) found that psychotic illness correlated strongly with income and people with no income or income less than 2000 bath per month were 3.67 times more likely to have psychiatric illness. As well, Dechkum (1998) showed that students from low-income families had significantly higher levels of stress than people with high-income families. However, Charoensuksopon (1988) found no significant relationship between income and mental health status in people in industrial areas of Eastern Thailand. In addition, no significant differences in mental health problems were found among workers who had different incomes in the intermediate factories in Nonthaburi (Sinasa 1992).

1.9.5 Sex and mental health

There has been a large body of research conducted on the differences between male and female in mental health. Examples are the higher rates of behavior disorder and suicide in males versus the higher occurrence of depression and anxiety in females (Rowling et al. 2002). Hilton et al. (1997) investigated the prevalence of psychiatric disorder in young adults, aged 18-21 years, in urban persons of mostly lower socioeconomic status, in the areas of Kingston, Jamaica. Results showed that 36% of females exhibited symptoms of anxiety and depression while 14% of males exhibited anxiety disorders. In addition, in Hong Kong, Chen et al. (1993) surveyed the mental health in the disadvantaged Shatin Community and found tobacco and alcohol dependence, pathological gambling, and antisocial personality were predominant in

males, while, anxiety disorder, phobia, dysthymia, major depression, and obsessive-compulsive disorder were more prevalent in females. In Pakistan, Najam and others (1996) suggested that males and females differed in rates of depression associated with unemployment.

In Thailand, Narintharangkoon Na Ayudthaya (1989) found significant differences in interpersonal sensitivity and phobic anxiety between males and females. In addition, Chichutvong and Boonruang (1992) studied child mental health in eastern seaboard provinces of Chachoengsao, Chonburi and Rayong, Thailand. Results showed higher mental health problems in males than females in the symptoms of interpersonal sensitivity, depression, anxiety, and phobia. As well, Jumruslertsumrit (1992) reported the male medical students had more psychoticism than female medical students. In addition, Sinasa (1992) found male workers in factories in Nonthaburi had higher mental health problems than females. In 1993, Kanchannachoti (1993) studied southern Srinakarinwirot University students' self-adjustment and mental health. Findings showed that the female students were more at risk of somatic problems, depressive mood, and anxiety than the male students. Additionally, Silapabanleng (1994) found significant differences between mental health problems and gender. In 1998, Dechkum (1998) claimed a significantly higher level of stress in females compared to males' senior high school students in Bangkok. As well as, Chomdang (1998) found females had higher levels of hypochondria than male students who received government funds of Naresuan University, Pitsanulok. However, Wongkhalaung (1987) using SCL-90, studied relationships between adjustment problems and the mental health of students and found no significant difference between mental health and sex. As well, Jaisin et al. (1984) revealed no significant difference between stress and sex. In addition, Charoensuksopon (1988) found no significant difference between sex and mental health status in people in industrial areas of Eastern Thailand. In summary, it is clear from many studies that mental health is affected by socioeconomic factors such as unemployment and income, as well as by factors such as gender and region. This doctoral thesis will investigate whether mental health symptoms in young adults are associated with socioeconomic problems in specific regional areas in Thailand.

CHAPTER 2
2. METHODOLOGY

In this chapter, the survey methods such as, sampling, instrumentation, reliability testing, validity, norms, psychological measures, and statistics used in this study will be described.

2.1 Participants

The study was conducted after ethics approval was obtained from The University of Technology, Sydney Human Research Ethics Committee. All subjects verbally consented to participate in the study willingly. Adequate information regarding the research was provided to the participants. Confidentiality of information as well as autonomy to withdrawal was assured. All questionnaires used in the research were anonymous, in order to protect the identities of the participants.

The research was designed to investigate mental health in 1200 young adults in the Lan Saka, Pak Phanang, and Muang of Nakhon Si Thammarat in Thailand (see Figure 1-2). These districts are representative of the mountainous areas, coastal areas, and cities in the province of Nakhon Si Thammarat. Furthermore, this study was designed to determine whether socioeconomic variables might contribute to mental health problems. The survey was undertaken in May to September 2004. The sample consisted of young adults in Nakhon Si Thammarat aged between 18 and 25 years. Approximately 1200 were randomly selected and stratified so that 50% were male and 50% were female. This involved randomly selecting 1200 participants from three diverse regions in Nakhon Si Thammarat that have known differences in socioeconomic status such as education attainment, occupation, employment status and income. The sample size was calculated using the calculator obtained from the referenced web page with an over 100,000 population size at the 95% confidence level 95% and P = .5 (Source: http://www.prm.nau.edu/prm447/sample_size.htm).

2.2 Aims

The general aim of this research was to investigate mental health in young adults in the different geographical districts of Nakhon Si Thammarat which are Lan Saka, Pak Phanang, and Muang. Specifically, it involved determining whether mental health status is associated with socioeconomic factors and whether differences existed in the three regions in Thailand.

2.3 Specific objectives

Specific objectives were

1. To estimate the percentage of young adults with mental health problems in the districts of Lan Ska, Pak Phanang, and Muang of Nakhon Si Thammarat.

2. To establish the percentage of young adults with specific symptoms, such as somatization, obsessive compulsiveness, depression and hostility, in the three districts.

3. To compare symptoms of mental health in different groups of young adults according to the following variables: (a) Area (mountainous, coastal and city areas), (b) Sex: (600 males and 600 females), (c) education (primary school, secondary school, technical or vocational college and tertiary), (d) Income level (high, moderate, and low incomes).

4. To determine if a relationship exists between variables such as sex, educational level, income, occupations, marital status, and the symptoms of mental health in the three regions.

2.4 Research questions

1. What is the percentage of mental health problems of young adults in the mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city (Muang) of Nakhon Si Thammarat?

2. What is the prevalence of mental health problems such as somatization, obsessive compulsiveness, depression, and hostility of young adults in Lan Saka, Pak Phanang and Muang of Nakhon Si Thammamarat?

3. Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression and hostility of young adults) as a factor of variables such as geographical region, sex, education (primary school, secondary school, technical or vocational college and tertiary levels), and income (low < 4500 Baht, moderate 4501-6500 Baht and high >6501Baht?

4. Is there a relationship between district, sex, educational level, income, occupations, marital status, and symptoms of mental health in the three regions?

2.5 Sampling

Stratified multistage random sampling was used in this research (Babbie 2004). The young adults' population in the province of Nakhon Si Thammarat was stratified into three geographical zones that typically involved mountainous, coastal or city dwelling. Each district was randomly selected from the geographical regions available. As stated above, the three areas chosen included Lan Saka in the mountainous area, Pak Phanang in the coastal area and Muang in the city area. We then randomly selected up to four representative sub-districts from each of these districts in Lan Saka, Pak Phanang and Muang, which resulted in a number of villages from the subdistricts being chosen. Participants were then recruited by selecting houses randomly from the streets in the villages and then interviewers went door-to-door requesting permission to interview people living in that house in the 18-25 age group. Each house in a street was be given a random number and these numbers are drawn from a hat until final numbers were achieved.

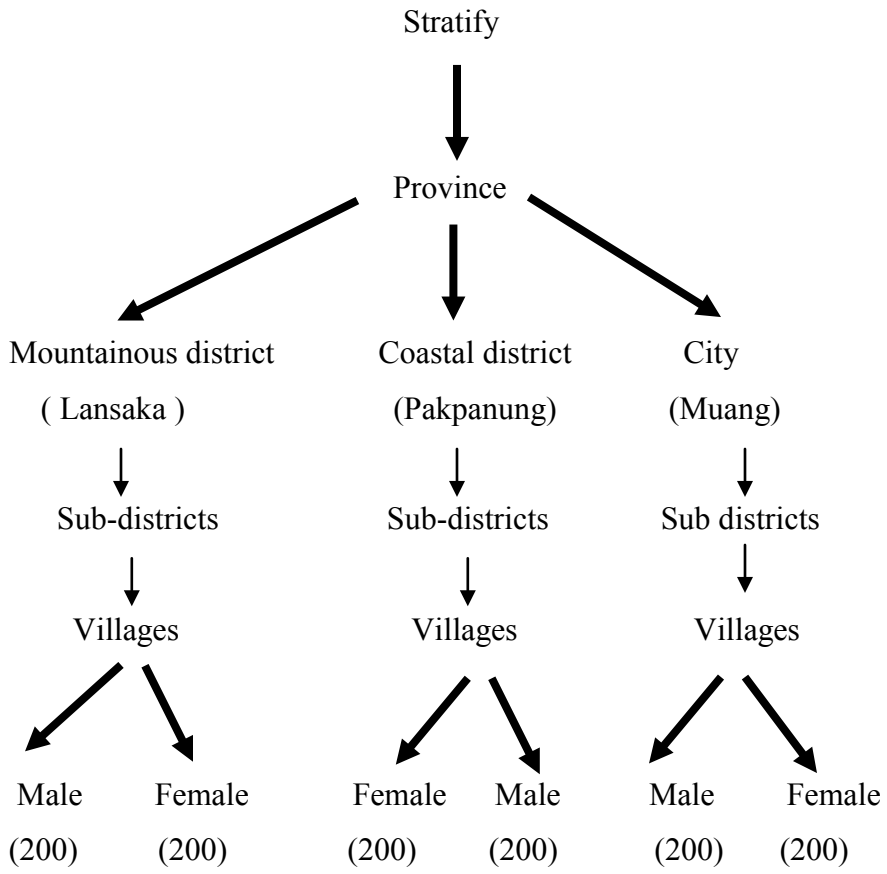

Figure 3 Stratified multistage random sampling procedure used in the study.

2.6 Instruments

The two psychological instruments or questionnaires employed in this doctoral study included the SCL-90-R (Symptom Checklist 90-Revised; Derogatis 1994) and a questionnaire containing socio-demographic items. The SCL-90-R is a 90-item self-report symptom inventory designed to assess nine psychological symptoms. It has been used as a psychiatric screening instrument for research and clinical diagnosis. Norms have been derived from psychiatric patients, medical patients and people in the community. It was developed from the Hopkins Symptom Checklist (HSCL) by Leonard

R Derogatis, Limo Covi at Johns Hopkins University, School of Medicine Baltimore, Maryland, and Ronald S. Lipman at Psychopharmacology Branch, National Institute of Mental Health, Rockville, Maryland (Derogatis 1983). The SCL-90-R inventory retained the important items of the five primary symptom dimensions of the HSCL and contained four new symptom dimensions. It is distinct from the original SCL 90, in that some ambiguous items in the Anxiety and Obsessive Compulsive dimensions were improved. The SCL-90-R checklist measured the following psychological symptoms:

1. Somatization measures bodily dysfunction that is believed arises due to stress. Single or multiple physical symptoms may occur, many of which have no medical explanation (Treatment Protocol Project, WHO 2000). People can complain about cardiovascular, gastrointestinal, respiratory and other symptoms including headaches, stomachaches, nausea, backaches, dizziness and breath trouble. Examples of somatization dimension symptoms are headaches, faintness or dizziness, pain of heart or chest, pain in lower back, nausea or upset stomach, soreness of your muscles, trouble getting your breath, hot or cold spells, numbness or tingling in parts of your body, a lump in your throat, feeling weak in parts of your body and heavy feelings in your arms or legs (Derogatis 1994).

2. The Obsessive Compulsive dimension measures distress related repetitive thoughts and behaviors. The obsessions involve unpleasant intrusive repetitive thoughts. The compulsions behaviors and serve to decrease anxiety. Examples include hand washing, double-checking and counting, repeated unpleasant thoughts that won't leave your mind, trouble remembering things, worried about sloppiness or carelessness, feeling blocked in getting things done, having to do things very slowly to insure correctness, your mind going blank, difficult making decision, trouble concentrating, having to repeat the same actions such as touching, counting, or washing (Foa & Franklin 2001; Derogatis 1994).

3. Interpersonal Sensitivity involves the feeling of inferiority and inadequacy when a person compares themselves with others. Individuals with these symptoms manifest self-disapproval, self-doubt, and feel significant discomfort whilst interacting with other people. Examples of interpersonal sensitivity dimension symptoms are feeling critical of others, feeling shy or uneasy with the opposite sex, your feeling being easily hurt, feeling others do not understand you or unsympathetic, feeling that people are unfriendly or dislike you, feeling inferior to others, feeling uneasy when people are watching or talking about you, feeling very self- conscious with others and feeling uncomfortable about eating or drinking in public (Derogatis 1994).

4. Depression involves the feeling of hopelessness, helplessness and sadness and may include thoughts of suicide. Symptoms include easily crying, lack of interest or enjoyment, feeling of worthlessness and ideas of self-harm (Treatment Protocol Project, WHO 2000). Examples of depression dimension symptoms are loss of sexual interest or pleasure, feeling low in energy or slowed down, though of ending your life, crying easily, feelings of being trapped or caught, blaming yourself for things, feeling lonely, feeling blue, worrying too much about things, feeling no interest in things, feeling hopeless about the future, feeling everything is an effort and feelings of worthlessness (Derogatis 1994).

5. Anxiety involves symptoms of fear and irrational worry. For example, individuals with high anxiety experience distress due to worries about their safety. Physiological changes may occur such as stomachaches, headaches, dizziness, shaking, muscle tension, and trembling when the clients feel strongly anxious (Andrews et al. 2003)**.** Examples of anxiety dimension symptoms are nervousness or shakiness inside, trembling, suddenly scare for no reason, feeling fearful, heart pounding or racing, feeling tense or key up, spells of terror or panic, feeling so restless you couldn't sit still, the feeling that something bad is going to happen to you, and thoughts and images of a frightening nature (Derogatis 1994).

6. Hostility involves thoughts, feelings, and actions that show negative state of anger such as aggression, irritability, and resentment. Examples of hostility dimension symptoms are feeling easily annoyed or irritated, temper outbursts that you could not

control, having desire to beat, injure, or harm someone, having urges to break or smash things, getting into frequent arguments and shouting or throwing thing (Derogatis 1994).

7. Phobic Anxiety is an irrational and disproportionate fear response to a specific person, place, object or situation and may lead to avoidance behavior. For example, individuals may feel over-anxious and try to avoid some situations such as being outside the home alone, traveling alone, being in tunnels and in open space (Andrews et al. 2003). Examples of phobic anxiety dimension symptoms are feeling afraid in open spaces or on the streets, feeling afraid to go out of your house alone, feeling afraid to travel on buses, subways, or trains, having to avoid certain things, places or activities because they frighten you, feeling uneasy in crowds such as shopping or at a movie, feeling nervous when you are left alone and feeling afraid you will faint in public (Derogatis 1994).

8. Paranoid Ideation involves hostile, suspicious and delusional characteristics including the fear of harm by others. Paranoid persons present with adversarial relationships. They are not able to trust others. Also, they believe that they have been taken advantage of. Examples of paranoid ideation dimension symptoms are feeling others are to blame for most of your troubles, feeling that most people cannot be trusted, feeling that you are watched or talked about by others, having ideas or beliefs that others do not share, others not giving you proper credit for your achievements and feeling that people will take advantage of you if you let them (Derogatis 1994).

9. Psychoticism involves having abnormal ideas and auditory hallucinations, and they might think that others could control their thoughts. (Treatment Protocol Project WHO, 2000). Examples of psychoticism dimension symptoms are the idea that someone else can control your thoughts, hearing voices that other people do not hear, other people being aware of your private thoughts, having thoughts that are not your own, feeling lonely even when you are with people, having thoughts about sex that bother you a lot, the idea that something serious is wrong with your body, never feeling close to another person and the idea that something is wrong with your mind (Derogatis 1994).

The SCL-90-R includes a list of 90 items that measure symptoms people might have. The respondents were asked to mark on the questionnaires how much their problems influenced them during the past 7 days. The following Likert Scales are given in order to describe the severity of the SCL-90-R symptoms:

0	=	Not at all
1	=	A little bit
2	=	Moderately
3	=	Quite a bit
4	=	Extremely

The demographic questionnaire was developed for this doctoral study in order to measure factors such as age, sex, educational levels, incomes, occupation, and employment status. A copy is found in Appendix 1.

2.7 Interviewers

Forty interviewers were trained by the chief investigator in this research to perform the study. Most of them were undergraduate students aged 19-22 of Nakhon Si Thammarat Rajabhat University in 2004 who collected data in the villages. Staff interviewers were also obtained from the following institutes:

Lan Saka Prachasun School, Informal education center at Lansaka district

Pak Phanang School, Informal education center, Boat Technology College at Pak Panung district

Benjamarachutit School, Informal education center, Sarapadchang technical College, and Nakhon Si Thammarat Rajabhat University at Muang district.

All of the interviewers were trained to conduct the interview with a gentle and tactful manner. Also, participants' data were treated with confidentiality, reducing risks of invasion of privacy. Subjects were sought by dropping letters in subjects' homes and asking their cooperation to participate in the study. An initial approach letter included an

information sheet providing some background and the usefulness of the research (such as for planning and providing mental health services in the community) including, a promise of confidentiality. Questionnaires solicited demographic information such as age, sex, salary, and employment details. The interview took around 30 minutes for each person. No names were requested.

2.8 Reliability and Validity of SCL-90-R

The SCL-90-R has demonstrated reliability and validity. It was tested for reliability using Cronbach's coefficient alpha (Anastasi 1988). Internal consistency coefficients for the nine symptoms found in this study ranged from a low of 0.69 for Phobic Anxiety to a high of 0.88 for Somatization. The reliability coefficients of SCL-90-R studied in a sample of 100 participants are shown in Table 3.

Table 3 Reliability coefficients of SCL-90-R studied in a sample of 100 participants in this doctoral study.

Symptoms	Reliability' values
TotalSCL-90-R	0.97
Somatization dimension	0.88
Obsessive-Compulsive dimension	0.84
Interpersonal Sensitivity dimension	0.81
Depression dimension	0.86
Anxiety dimension	0.84
Hostility dimension	0.79
Phobic Anxiety dimension	0.69
Paranoid Ideation dimension	0.77
Psychoticism dimension	0.84

The SCL-90-R used in this doctoral study has demonstrated reliability and validity (Derogatis 1994). It also has been shown to be reliable and valid in Thai samples. For example, in Thailand, the SCL-90-R checklist has been shown to have discriminant validity by evaluating differences in symptomology between 50 outpatients in Somdet Chaopraya Institute of Psychiatry and 50 non-psychiatrically disturbed controls in the general population (Chooprayoon 1978). In addition, as a result of social and environmental changes, it has been examined for validity by Towcomlue (1991) in the study of mental health problems of bus drivers in Bangkok. Thirty patients conscripted from the Chulalongkorn Hospital and 30 bus drivers were measured. Findings showed that psychiatric patients had higher SCL-90 scores than the bus drivers in every symptom. Silapabanleng (1994) also showed concurrent validity of SCL-90-R in a study of mental health of people in the border self defense villages in the Chanthaburi and Trat provinces. The study involved assessing 50 outpatients in the Somdejchoapraya Institute of Psychiatry and 50 people from the community. Results showed significant differences in the nine SCL-90-R symptoms between the outpatients and controls. Noh and Avison (Noh & Avison 1992 cited by Derogatis 1994) used the SCL-90-R (Korean version) to investigate psychopathology in psychiatric patients and control samples taken from the community of both native Koreans and North Americans. Results showed Korean community respondents had higher GSI scores than the North Americans (Derogatis 1994).

2.9 Criteria of Mental health problems

Mental health problems and mental health disorders are used to describe thought, mood, or behavior changes that are related with distress or impaired functioning (Sawyer et al., 2000). The nine symptoms measured by the SCL-90-R that provide an estimate of mental health status were used in this doctoral study, with each symptom comprised of a different combination of emotional and behavioral problems as assessed by the questionnaire (Derogatis 1994). The extent of mental health status in this study is based on scores obtained from the SCL-90-R. Young people (aged 18-25 years) who have T-

scores between 60 and 63 in each symptom of the SCL-90-R are considered more likely to have borderline mental health problems. Furthermore, young people who have either an SCL-90-R Global Severity Index (GSI) score of higher than or equal to a score of 63, or if a person has any two primary symptoms equal to or greater than a T score of 63 are considered a positive risk of psychiatric disease (Derogatis 1994). GSI is computed by summing the scores on the nine SCL-90-R symptoms and the additional items and then divided by the total number of responses (90 if there are no missing responses). In Australia, Prado et al. (1999) studied the mental health status of Queensland adolescents as a function of regional differences using the criteria outlined above (that is, a GSI T score $\geq$ 63 or a T score $\geq$ 63 in two or more symptoms). However, they found no significant differences between the GSI means of the participants and a normative referent sample (Prado et al. 1999).

2.10 Norms of the SCL-90-R

Derogatis (1994) provided norms for the SCL-90-R, consisting of adult psychiatric outpatients (Norm A), adult non-patients (Norm B), adult psychiatric inpatients (Norm C) and adolescent non-patients aged 13 to 15 years (Norm E). Each norm group is also divided into male and female scores. The gender specific norms provide greater reliability for the interpretation of psychological and mental health status.

Table 4 Norms of the SCL-90-R in adult non-patient male and females (Derogatis 1994) (T ≥ 60 is mental health difficulties; T63 ≥ is mental health problems at the clinical level.)

Symptoms	Male		Female	
	T60	T63	T60	T63
Somatization	.59	.71	.80	1.12
Obsessive-Complusive	.71	.96	.80	1.01
Interpersonal Sensitivity	.51	.68	.67	0.96
Depression	.55	.75	.88	1.16
Anxiety	.40	.55	.75	0.92
Hostility	.63	.60	.67	0.84
Phobic Anxiety	.15	.30	.43	0.59
Paranoid Ideation	.79	.96	.79	1.00
Psychoticism	.31	.47	.31	0.47
GSI	.50	.59	.63	0.84

Psychologists from the Somdet Chaopraya Institute of Psychiatry studied the SCL-90-R in order to establish Thai norms for this inventory. They found that the GSI mean for Thai people was in a T-score range of 40-60. These norms are shown below in Table 5 (Chooprayoon 1978).

Table 5 Thai norms for the SCL-90-R found by psychologists of the Somdet Chaopraya Institute of Psychiatry (source: Chooprayoon 1978).

Symptoms	Raw scores at T score 60	
	Normal	mental health problems
Somatization	0.02-1.30	1.31-2.97
Obsessive Compulsion	0.12-1.81	1.82-3.25
Interpersonal Sensitivity	0.05-1.79	1.80-3.01
Depression	0.10-1.43	1.44-2.71
Anxiety	0.04-1.91	1.92-3.37
Hostility	0.14-1.39	1.40-2.94
Phobic Anxiety	0.08-1.21	1.22-2.51
Paranoid Ideation	0.02-1.71	1.72-3.46
Psychoticism	0.03-1.28	1.29-2.67

Many Thai researchers have used the norms provided by the Somdet Choapraya Institute of Psychiatry study. For instance, the Towcomlue (1991) study of mental health problems of bus drivers in Bangkok. Also, Chichutvong and Boonruang (1992) used these norms to study the mental health of children in the Thai eastern seaboard. Silapabanleng (1994) employed these norms to study the mental health of people living in the border self-defense villages in the Chanthaburi and Trat provinces. Furthermore, Phapoom (1995) employed these norms to study the mental health status of public service motorcycle drivers. Choasin (1999) investigated whether certain personality factors predicted mental health status of people living in the metropolitan, suburban, and rural areas in the province of Chiangmai, in the North of Thailand. The SCL-90-R and the EPPS (Edwards Personality Preference Scale) were assessed in 619 adults. Standard scores of the SCL-90-R were used as the criteria of symptom severity. Subjects with a T-score of 60 or lower were identified as having normal mental health status and a T-score

over 60 was regarded as having a risk of mental health problems and disorder. In addition, Danpakdee (1999) studied the mental health status of secondary school students in the municipality of Chaiyaphum province in the northeastern part of Thailand. They used two types of criteria to establish mental health status using the SCL-90-R. The first converted raw scores to standard T-scores, which were broken down for sex and age (13-15 and 16-18 years). Those with T-scores higher than 60 were considered to be at risk of mental health problems. The second criteria Dampakdee (1999) used were the criteria provided by the Somdet Chaopraya Institute of Psychiatry study (Chooprayoon 1978). As described above, the norms used in this doctoral study consisted of a T score > 60 (borderline risk) on the nine primary SCL-90-R symptoms and a GSI T-score of ≥ 63, or T score ≥ 63 in two or more primary symptoms. The international norms developed by Derogatis were not employed in this Thai study due to potential cultural differences. The norms in the Dampakdee study are shown in Tables 6 and the norms used in this current study shown in Table 7.

Table 6 Norms of SCL-90-R in both genders, male and female cohorts aged 13-18 in the study of Danpakdee (1999)

Symptoms	Raw score at T > 60		
	Both sex	Male	Female
Somatization	1.50	1.5	1.42
Obsessive-Complusive	1.90	1.9	2.00
Interpersonal Sensitivity	2.00	1.78	2.11
Depression	1.85	1.77	2.00
Anxiety	1.71	1.70	1.80
Hostility	1.50	1.33	1.67
Phobic Anxiety	1.71	1.57	1.86
Paranoid Ideation	1.83	1.83	1.67
Psychoticism	1.63	1.60	1.60

Table 7 Norms of SCL-90-R in young adults aged 18-25 in this doctoral (2004) study

Symptoms	Both sex	Male	Female
	T60	T60	T60
Somatization	1.32	1.25	1.37
Obsessive-Compulsive	1.77	1.73	1.81
Interpersonal Sensitivity	1.90	1.62	1.75
Depression	1.56	1.41	1.67
Anxiety	1.43	1.36	1.44
Hostility	1.45	1.45	1.47
Phobic Anxiety	1.45	1.30	1.58
Paranoid Ideation	1.58	1.54	1.61
Psychoticism	1.34	1.36	1.34

In this study used T-score < 60 to be the criteria of normal mental health. T-score > 60-63 means mental health problems and T-score > 63 is mental health problems at clinical levels. Also, the numbers of normal mental health and mental health difficulties using the criteria of Thai psychologists were shown.

2.11 Statistical analysis

Statistical analyses were performed to determine the percentage of 18-25 year old participants who may be at risk of developing mental health problems as a function of geographical region in (three districts in Nakhon Si Thammarat), sex, income, employment status and so on. Furthermore, analyses were also performed to determine the difference of male and female youths with specific symptoms, including somatization, obsessive compulsiveness, depression, and hostility. MANOVA was used to test for differences in somatization, hostility, anxiety, and depression between the three districts

as well as to compare the mental health status of young adults as a function of sex, and socioeconomic status, including educational level, employment status, and income. Multiple regression was used to determine the unique contribution of socioeconomic variables to mental heath status as measured by the SCL-90-R. All of the analyses for this research were completed using SPSS (Statistic Package for Social Science).

2.12 Research Ethics Approval

Approval to conduct this study was obtained from the University of Technology, Sydney Human Research Ethics Committee. The participant letter and survey given to all participants can also be found in the Appendix 1. The research ethics approval letter is found in Appendix 2.

CHAPTER 3

3. RESULTS

Chapter 3 presents the results of the doctoral study that attempted to achieve the following objectives:

1. Estimate the mental health status of young adults living in mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city areas (Muang) of Nakhon Si Thammarat, Thailand.

2. Determine the occurrence of mental health symptoms such as somatization, obsessive-compulsion, depressive mood, and hostility of young adults living in Lan Saka, Pak Phanang and Muang of Nakhon Si Thammamarat, Thailand.

3. Determine whether significant differences of the mental health status of young adults exist (assessed by symptoms such as somatization, obsessive-compulsive symptoms, depressive mood and hostility) as a function of variables such as geographical region, sex, education (primary school, secondary school, technical or vocational college and tertiary levels), employment status (employed, unemployed and students), and income (low A$0-200, moderate A$201-400 and high A$>401)

4. Determine if a relationship exists between district, sex, educational level, income, occupation, marital status, and specific symptoms of mental health in the three regions.

Initially, the demographics of the three samples will be presented including a breakdown of sex, region, education, occupation, income, and marital status, and this will then be followed by:

1. The mental health status of the young adults living in mountainous areas (Lan Saka), coastal (Pak Phanang) and city areas (Muang) of Nakhon Si Thammarat, based on the criteria of $T > 60$ and positive risk ($T \geq 63$) and Thai SCL-90 criteria.

2. The prevalence of mental health symptoms such as somatization, obsessive compulsiveness, depressive mood, and hostility of young adults in Lan Saka, Pak Phanang and Muang districts of Nakhon Si Thammamarat.

3. A comparison of the nine symptoms of mental health in the young adults as a function of geographical area (that is, mountainous, coastal and city areas).

4. A comparison of the nine symptoms of mental health in the young adults in the young adults as a function of sex.

5. A comparison of the nine symptoms of mental health in the young adults as a function of employment status.

6. A comparison of the nine symptoms of mental health in the young adults in the young adults as a function of education level (primary school, secondary school, technical or vocational college and tertiary).

7. A comparison of the nine symptoms of mental health in the young adults as a function of income level (high, moderate, and low income).

8. A presentation of the relationship between educational level, income, and four specific symptoms of mental health in the three regions.

9. A presentation of the socioeconomic variables that were found to predict somatization, obsessive, depression, and hostility.

10. The predicted equation of mental health.

3.1 Demographic data

Table 8 shows relevant demographic information for the 1200 participants. In general, 72.8% of the sample came from rural areas and 27.3% came from urban areas in the three districts of Nakhon Si Thammarat (Lan Saka, Pak Phanang, and Muang). The majority of the respondents had secondary school qualifications (51.7%), 22.8 % had a diploma, while 21.0% had an undergraduate degree. Only 4.5% had a primary school level of education. Regarding occupation, 24% of youths were employed while 10.7% were unemployed. The majority of the samples (65.3%) were students. Furthermore, most of the employed youths were blue collar or trade workers (11.2%), 4.8% worked in clerical and service positions, and 4% earned their living in agriculture. Almost 3% worked in their own business (2.8%) while only 1.3% worked in government positions.

Concerning marital status, the majority (94.1%) of participants were single, 5.3% were married while those divorced (0.3%) and widowed were minorities (0.3%).

Table 8 Demographics on all subjects

Variables	N	%
District		
Mountain	400	33.3
Coastal	400	33.3
City	400	33.3
Area		
Urban	327	27.3
Rural	873	72.8
Sex		
Male	600	50.0
Female	600	50.0
Education level		
Primary	54	4.5
Secondary	621	51.7
Diploma	273	22.8
Bachelor	252	21.0
Occupation		
Student	784	65.3
Unemployment	128	10.7
Agriculture	48	4.0
Blue collar worker	134	11.2
Clerical sale & service worker	58	4.8
Business owner	34	2.8
Government officer	14	1.2
Marital status		
Single	1129	94.1
Married	64	5.3
Divorced	3	0.3
Widowed	4	0.3

Table 9 Descriptive statistics for age and income of the sample. Income is in Thai Baht

Variables	N	Mean	SD	Minimum	Maximum
Age	1200	20.1	2.21	18	25
Income per month	288	4648	1000	50,000	

As can be seen from Table 9, the mean age of the participants was 20.1 years ranging from 18-25 years and the mean income was 4648 Baht per month. The minimum and maximum values of income ranged from 1000-50,000 Baht.

Research question 1

What is the mental health status of young adults living in mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city areas (Muang) of Nakhon Si Thammarat?

Table 10 The percentage of mental health problems in the sample by geographical regions using the criteria of $T > 60$ and positive risk ($T \geq 63$).

Areas	T>60 Mental health problems		T ≥ 63 Positive risk		Total	
	N	%	N	%	N	%
Mountainous	134	33.5	60	15	194	48.5
Coastal areas	180	45.5	83	20.8	263	65.7
City	175	43.8	78	19.5	253	63.2
Total	489	40.8	221	18.4	710	59.2

Table 10 shows that the highest percentage of mental health problems was found in young people living in the coastal areas (45.5%), while 43.8% of youth living in the city and 33.5% of young adults in the mountainous areas were identified as having mental health problems. However, when the prevalence of a positive risk (that is, any two primary symptoms ≥ T63), those living in the coastal areas were again found to be at greatest risk (percentage of positive risk was 20.8%), while 19.5% of young adults living in the city and 15% of the young people in the mountainous areas were found to be at risk.

Table 11 The percentage of positive risk by geographical regions using the criteria of GSI ≥ 63

Areas	Positive risk		Non positive risk		Total	
	N	%	N	%	N	%
Mountainous areas	35	8.8	365	91.3	400	100
Coastal areas	40	10	360	90.0	400	100
City	38	9.5	362	90.5	400	100
Total	113	9.4	1087	90.6	1200	100

As can be seen from Table 11, the GSI criteria (≥ 63**)** showed that 10% of young people in coastal regions were estimated to be a positive risk of mental health problems compared to 9.5% in the city and 8.8% in mountainous regions.

Table 12 shows the estimated percentages of mental health problems of young adults in the mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city areas (Muang) of Nakhon Si Thammarat. Thai norms were used to calculate these percentages (Chooprayoon 1978). Young people living in city areas had the highest percentage of mental health difficulties (41.8%), while 40.8% of youth living in coastal areas exhibited

mental health problems. The lowest percentage of mental health problems was found in those living in mountainous areas (29%).

Table 12 The percentage of mental health problems among young people 18-25 year olds by geographical regions using Thai Standard Norms (Chooprayoon 1978).

Areas	Mental health problems		Normal		Total	
	N	%	N	%	N	%
Mountainous areas	116	29.0	284	71.0	400	100
Coastal areas	163	40.8	237	59.3	400	100
City areas	167	41.8	233	58.3	400	100
Total	446	37.2	754	62.8	1200	-

Research question 2:

What is the prevalence of the nine primary symptoms of young adults living in the mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city areas (Muang) of Nakhon Si Thammarat?

Using the T > 60 criteria, obsessive compulsive symptoms were the most common mental health difficulties found in young people living in mountainous areas (16.8%) while 13.5% had problems with hostility and psychoticism (see Table 13). Furthermore, using the percentage of mental health problems at a clinical level (T score ≥ 63), hostility was the highest in mountainous community (10.8%). Obsessive compulsive and depressive symptoms were the second most common mental health problem at a clinical level in the mountainous community (10.3%). In coastal areas, somatization was found to be the most frequent health problem (20%) while paranoid ideation and hostility were found to be 17.5% and 17.3% respectively. In addition, using the clinical criteria (T score ≥ 63), somatization was highest for those young adults who lived in coastal areas (12.5%),

while 11.5% were paranoid and 11 % had psychotic symptoms. In the city, somatization was found to be 17.3% as well as obsessive compulsive and hostility was reported to be 16.8% and 16.3% respectively using the T>60 criteria. Using the clinical criteria, 13.3% reported hostility, and 12.8% showed somatization as well as 11.3% were paranoid.

Table 13 The percentage of the nine primary symptoms by geographical regions using the T>60 and T≥ 63 criteria

Symptoms	Mountainous areas		Coastal areas		City	
	T > 60 N/%	T≥ 63 N/%	T > 60 N/%	T≥ 63 N/%	T > 60 N/%	T ≥ 63 N/%
Somatization	51/12.8	36/9.0	80/20.0	50/12.5	69/17.3	51/12.8
Obsessive-C	67/16.8	41/10.3	62/15.5	33/8.3	67/16.8	38/9.5
Interpersonal	49/12.3	33/8.3	63/15.8	43/10.8	54/13.5	44/11.0
Depression	51/12.8	41/10.3	59/14.8	42/10.5	54/13.5	38/9.5
Anxiety	53/13.3	34/8.5	57/14.3	27/6.8	61/15.3	38/9.5
Hostility	54/13.5	43/10.8	69/17.3	42/10.5	65/16.3	53/13.3
Phobic Anxie	52/13.0	36/9.0	58/14.5	42/10.5	55/13.8	44/11.0
Paranoid I	50/12.5	36/9.0	70/17.5	46/11.5	62/15.5	45/11.3
Psychoticism	54/13.5	38/9.5	64/16.0	44/11.0	63/15.8	39/9.8

As shown in Table 14, phobic anxiety was the most common mental health problems found in Thai young adults regardless of which area they lived in. In addition, almost 20% were found to have depressive symptoms across the three areas, while up to almost 20% were found to have psychotic symptoms.

Table 14 The percentage of the nine primary symptoms in young adults by geographical regions using the Thai standard norm (Chooprayoon 1978).

Symptoms	Mountainous		Coastal		City	
	N	%	N	%	N	%
Somatization	51	12.8	80	20.0	69	17.3
Obsessive-Compulsive	50	12.5	48	12.0	48	12.0
Interpersonal Sensitivity	41	10.3	51	12.8	52	13.0
Depressive symptoms	67	16.8	74	18.5	69	17.3
Anxiety	60	15.0	71	17.8	81	20.3
Hostility	54	13.5	69	17.3	65	17.3
Phobic Anxiety	96	24.0	98	24.5	104	26.0
Paranoid Ideation	36	9.0	46	11.5	45	11.3
Psychoticism	62	15.5	76	19.0	79	19.8

Research question 3

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression and hostility of young adults) according to variables such as, geographical regions, sex, education (secondary school or lower, technical or vocational college and tertiary levels), and income (low A$0-200, moderate A$201-400 and high A$>401)?

MANOVA was utilized in order to analyze whether any significant differences occurred in the nine primary symptoms of mental health problems between the mountainous, coastal and city areas. Initial descriptive analysis of the research data disclosed a high degree of positive skewness in asymmetrical distribution. In order to correct this skewness, logarithmic transformation was employed since it was able to transform the

data to a more normal distribution (that is, stretch small values and condense large values of the scores). In addition, transformation can reduce a long-tail distribution more than square root transformation (Afifi & Clark, 1996). As a result of the flat curves of the nine primary symptom scores (kurtosis was far higher than zero) and skewed right distribution, the majority of the primary symptom scores were transformed by using an inverse logarithm to the base 10 with an exception of the hostility' scores which were transformed to log (x+1.3) as shown in Table 15 (Reed 1995; Keeratipatrakan 1996; Wiratchai 1999).

Table 15 Method used to transform the nine primary symptoms

Symptoms	Transformed Score
Somatization	$\log_{10}$ 1/(x-.3)
Obsessive-Compulsive	$\log_{10}$ 1/ (x-.56)
Interpersonal Sensitivity	$\log_{10}$ 1/(x-.65)
Depression	$\log_{10}$ 1/(x-.5)
Anxiety	$\log_{10}$ 1/(x-.6)
Hostility	$\log_{10}$ (x +1.3)
Phobic Anxiety	$\log_{10}$ 1/(x-.2)
Paranoid Ideation	$\log_{10}$ 1 /(x-.5)
Psychoticism	$\log_{10}$ 1/(x-.35)

Research question 3.1

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression, and hostility of young adults) between young people living in different geographical regions?

Table 16 Means (SD) and details for the MANOVA results for the nine primary symptoms in young adults by region.

Symptoms	Mountainous areas Mean (SD)	Coastal areas Mean (SD)	City Mean (SD)	F (df)	P
Somatization	0.70±0.52	0.82±0.54	0.83±0.51	6.84(2)	.001
Obsessive-Co	1.13±0.63	1.23±0.54	1.21±0.57	6.15(2)	.002
Interpersonal Se	1.02±0.60	1.16±0.54	1.15±0.57	6.17(2)	.002
Depression	0.92±0.61	1.02±0.57	1.00±0.54	6.99(2)	.001
Anxiety	0.80±0.58	0.90±0.53	.94±0.54	11.04(2)	.000
Hostility	0.75±0.70	0.85±0.57	.89±0.62	8.71(2)	.000
Phobic Anxiety	0.82±0.59	0.90±0.57	0.92±0.55	1.20(2)	.30
Paranoid Ideat	0.90±0.61	1.03±0.55	1.06±0.56	11.54(2)	.000
Psychoticism	0.74±0.56	0.87±0.50	0.86±0.49	.56(2)	.57

Box's M = 117.46, F = 1.29, Significant = .033 (see Appendix 4)

Bartlett test of Sphericity = .000 (see Appendix 4)

Statistical Power of Multivariate Tests (see Appendix 4)

Pillai's trace	.998	Wilks' lambda	.998
Hotelling's trace	.998	Roy's Large Root	.999

As shown in Table 16, MANOVA analyses reveal significant differences between the three areas on the scores of somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility and paranoid ideation. Table 17 shows where the differences occur between the three areas. A protected "t" test procedure (or Fisher LSD) was used to determine where significant differences between areas occurred. Those living in city and coastal areas were found to have greater levels of symptoms in the following: somatization, obsessive compulsive, interpersonal sensitive**,** depression*,* anxiety, hostility and paranoid ideation than the youth living in mountainous areas.

Table 17 Differences between the areas for the nine symptoms using Fisher LSD protected t-tests. Multiple Comparisons and the probability levels are shown for those differences found.

		Mean Difference	p value
Somatization	Mountain-Coastal	-.08	.005
	Mountain- City	-.10	.001
Obsessive Compulsive	Mountain-Coastal	-.11	.001
	Mountain- City	-.07	.016
Interpersonal sensitivity	Mountain-Coastal	-.07	.024
	Mountain- City	-.11	.001
Depression	Mountain-Coastal	-.09	.004
	Mountains- City	-.11	**.**000
Anxiety	Mountain-Coastal	-.12	.001
	Mountain- City	-.16	.000
Hostility	Mountain-Coastal	-.03	.001
	Mountain- City	-.03	.000
Paranoid	Mountain-Coastal	-.13	.000
	Mountain- City	-.14	.000

Table 18 Mean (SD) for the total SCL 90-R scores across the three different regions as well as the ANOVA details.

	Mountain Mean (SD)	Coastal Mean (SD)	City Mean (SD)
Total SCL	78.49±46.96	88.66 ± 41.53	89.77 ± 40.81

$F = 8.32$, $df=2$, $p<0.01$

Significant differences in the total SCL-90-R scores occurred for the young adults living in the three areas (i.e. mountainous, coastal and city areas) and these are shown in Table 18. It is clear from the results of the multiple comparisons (shown in Table 19, using Fisher LSD technique) that young persons living in the city and coastal areas have higher risks of mental health difficulties than those living in mountainous areas. As well, young people living in the city have slightly higher (though the difference is not significant) risks of mental health difficulties than those living in coastal areas.

Table 19 Mean differences in the total SCL-90-R scores using Multiple Comparisons (LSD protected t-tests) between the three different regions

	Mean Difference	p value	
Mountain - Coastal	-10.17	0.004	
Mountain - City	- 11.31	0.001	
Coastal-City	-1.14	0.933	-

Research Question 3.2

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression, and hostility of young adults) between males and females?

Table 20 shows female young adults have higher risks of developing depressive symptoms, phobic anxiety and general anxiety symptoms, obsessive-compulsive symptoms, interpersonal sensitivity, paranoid and somatization symptoms than male youths.

Table 20. Mean (SD) comparison for the nine primary symptoms between males and females. MANOVA details are provided.

Symptoms	Male	Female	F (*df*)	P value
	Mean SD	Mean SD		
Somatization	0.74 ± 0.51	0.83± 0.54	4.86(1)	.028
Obsessive-Compulsive	1.13± 0.60	1.25± 0.56	12.35(1)	.000
Interpersonal Sensitivity	1.02 ± 0.60	1.20± 0.55	22.55(1)	.000
Depression	0.86 ± 0.55	1.10±0.58	51.85(1)	.000
Anxiety	0.81± 0.55	0.94±0.55	8.78(1)	.003
Hostility	0.81± 0.64	0.85± 0.61	2.71(1)	.100
Phobic Anxiety	0.76± 0.54	1.00±0.58	39.95(1)	.000
Paranoid Ideation	0.94± 0.60	1.05± 0.60	8.71(1)	.003
Psychoticism	0.81 0.55	0.84 0.50	.08(1)	.779

Box's M = 61.49, F = 1.36, Significant = .056

Bartlett test of Sphericity = .000

Statistical Power of Multivariate Tests

Pillai's trace	1.00	Wilks' lambda	1.00
Hotelling's trace	1.00	Roy's Large Root	1.00

Research question 3.3

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression, and hostility of young adults) as a function of employment status?

No significant differences in mental health symptoms were found among the participants as a function of whether they were unemployed, employed or a student at the time of the interview (see Table 21).

Table 21 Mean **(**SD) values for the nine primary symptoms among young adults as a function of employment status.

Symptoms	Unemployed N (128) Mean (SD)	Employed N (288) Mean (SD)	Students N (784) Mean (SD)	F (*df*)	P
Somatization	0.81±0.49	0.82±0.51	0.77±0.54	1.66(2)	.19
Obsessive-Comp	1.16±0.59	1.18±0.56	1.20±0.59	.65(2)	.52
Interpersonal Se	1.15±0.61	1.07±0.54	1.12±0.59	.78(2)	.46
Depression	1.01±0.57	0.94±0.53	0.99±0.59	.24(2)	.79
Anxiety	0.90±0.53	0.86±0.52	0.88±0.57	.15(2)	.86
Hostility	0.83±0.64	0.79±0.59	0.85±0.63	.83(2)	.44
Phobic Anxiety	0.92±0.62	0.84±0.53	0.89±0.58	.31(2)	.73
Paranoid Ideation	1.03±0.55	0.99±0.58	0.99±0.58	1.96(2)	.14
Psychoticism	0.84±0.51	0.80±0.51	0.83±0.53	.24(2)	.79

Box's M = 90.54, F = .99, Significant = .52

Bartlett test of Sphericity = .000

Statistical Power of Multivariate Tests

Pillai's trace	.831	Wilks' lambda	.830
Hotelling's trace	.831	Roy's Large Root	.708

Research question 3.4

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression, and hostility of young adults) in young people as a function of education level?

Significant differences occurred in a number of SCL-90-R symptoms, including anxiety, paranoid ideation, interpersonal sensitivity, obsessive compulsiveness, somatization, depression and phobic anxiety as a function of whether the participants had secondary school level, a diploma, or a bachelor degree. As can be seen in Table 23, post-hoc multiple comparisons suggest that young adults with secondary school were less likely to have higher levels of symptoms than youths with a bachelor degree qualification. Symptoms more likely to occur in those with a tertiary degree included somatization, obsessive compulsiveness, interpersonal sensitivity, depressive symptoms, anxiety, phobia, and paranoid ideation. Furthermore, young people who had tertiary degree were more likely to be anxious, obsessive compulsive and paranoid than young people who had a diploma education.

Table 22 Mean **(**SD) values for the nine primary symptoms among young adults by educational level. MANOVA details are shown.

Symptoms	secondary N (674) Mean(SD)	diploma N (274) Mean (SD)	bachelor degree N (252) Mean (SD)	F	P
Somatization	0.75±0.52	0.78±0.52	0.89±0.55	5.61(2)	.004
Obsessive-Com	1.15±0.56	1.18±0.59	1.32±0.61	5.73(2)	.003
Interpersonal Se	1.08±0.57	1.09±0.58	1.32±0.61	6.04(2)	.002
Depression	0.96±0.58	0.95±0.56	1.06±0.58	5.15(2)	.006
Anxiety	0.84±0.55	0.86±0.53	1.01±0.58	11.40(2)	.000
Hostility	0.81±0.61	0.82±0.59	0.90±0.68	1.86(2)	.156
Phobic Anxiety	0.85±0.57	0.86±0.54	0.98±0.60	4.22(2)	.015
Paranoid Ideat	0.95±0.56	0.98±0.60	1.14±0.59	7.35(2)	.001
Psychoticism	0.79±0.51	0.80±0.54	0.93±0.54	2.37(2)	.094

Box's M = 104.06, F = 1.14, Significant = .17

Bartlett test of Sphericity = .000

Statistical Power of Multivariate Tests

Pillai's trace	.944	Wilks' lambda	.945
Hotelling's trace	.946	Roy's Large Root	.971

Table 23 Mean differences using a post-hoc multiple comparisons tests for the SCL-90-R symptoms as a function of educational level.

		Mean Difference	p value
Somatization	Secondary-Bachelor	.10	.004
Obsessive Compul	Secondary-Bachelor	.11	.006
	Diploma-Bachelor	.11	.017
Interpersonal sens	Secondary-Bachelor	.12	.002
Depression	Secondary-Bachelor	.11	.006
Anxiety	Secondary-Bachelor	.18	.000
	Diploma-Bachelor	.13	.010
Phobic Anxiety	Secondary-Bachelor	.07	.015
Paranoid	Secondary-Bachelor	.13	.001
	Diploma-Bachelor	.11	.024

Research question 3.5

Are there significant differences in mental health problems (such as somatization, obsessive compulsiveness, depression, and hostility) in young people as a function of income?

Table 24 shows the significant differences in SCL-90-R symptoms as a function of income. The MANOVA results showed that the symptoms to reach significance were somatization and paranoid ideation as a factor of income. As can be seen from Table 24, the post-hoc test suggests that young people whose income is less than 4500 baht per month were less at risk of suffering somatization symptoms than those whose income is between 4501-6500 Baht per month. In addition, young people whose income is between

4501-6500 Baht per month were higher at risk of suffering paranoid ideation than those whose income is greater than 6501 Baht.

Table 24 Mean **(**SD) values for the nine primary symptoms among young adults by income. MANOVA details are shown.

Symptoms	< 4500 Mean (SD)	4501-6500 Mean (SD)	>6500 Mean (SD)	F	P
Somatization	0.76±0.49	0.95±0.50	0.73±0.49	5.96	.003
Obsessive-Comp	1.13±0.56	1.27±0.55	1.18±0.52	.51	.600
Interpersonal S	1.03±0.55	1.15±0.53	1.07±0.54	2.29	.103
Depression	0.93±0.55	1.03±0.56	0.84±0.41	1.32	.268
Anxiety	0.85±0.55	0.93±0.47	0.77±0.39	2.64	.073
Hostility	0.77±0.59	0.86±0.58	0.66±0.53	2.04	.132
Phobic Anxiety	0.81±0.52	0.89±0.51	0.84±0.58	0.50	.605
Paranoid Ideat	0.95±0.58	1.09±0.53	0.96±0.58	3.62	.028
Psychoticism	0.76±0.51	0.86±0.47	0.85±0.59	0.76	.468

Box's M = 119.80, F = 1.23, Significant = .067

Bartlett test of Sphericity = .000

Statistical Power of Multivariate Tests

Pillai's trace	.855	Wilks' lambda	.855
Hotelling's trace	.855	Roy's Large Root	.785

Table 25 Mean difference between groups using protected t-tests (Multiple Comparisons) of the symptom score as a function of income level.

	Mean Difference	p value
Somatization: income<4500 - income 4501-6500	.17	.004
Paranoid: income 4501-6500- income >6501	.15	.011

Research question 4

Is there a relationship between the socioeconomic variables and specific symptoms of mental health (such as somatization, obsessive compulsive, depressive mood, and hostility) and whether socioeconomic variables (such as districts, sex, educational levels, income, occupations, and marital status) are able to predict the four specific symptoms of mental health?

In relation to research question 4, multiple regressions were utilized to analyze the association between socioeconomic variables and mental health problems.

3.2 Steps of fitting the regression models

To perform the multiple regression analysis, it is necessary to satisfy the assumptions of multiple regression analyses. For example, normal distribution of Y/X variables, multicollinearity among predictor variables, linearity of the model predicting the dependent variables, homogeneity of variance and autocorrelation need to be evaluated.

1. Check normality by examining the normal distributions of somatization, obsessive compulsiveness, depression, and hostility. Calculating the summary statistics and graphically looking at the histograms, stem and leaf plots and box plots as well as the mean and median comparison (mean values close to medians). The distributions of the values should not be too skewed. Logarithmic transformations are used to induce

symmetry and reduce skewness. Transformations make skewed distribution more symmetrical, more normal, and easier to analyze. They sometimes reduce heteroscedasticity; also, a curvilinear relation can often be linearized by transforming Y or X. Therefore, transformations provide simple way both to fix statistical problems and to fit curvilinear regression (Hamilton 1992).

2. Check the severity of multicollinearity by examining the correlation matrix. The correlation of the predictors should not be strongly related to each other, in order to maximize their contribution to the prediction of the dependent variable (see Table 27).

3. Check linearity by examining the scatter plots of Y against each predictor X. If the relationships appear to nonlinear, appropriate transformations need to occur to optimize the linear regression.

4. Remove heteroscedasticity. In performing regression analysis, sometimes unequal variances are encountered. It has been found that transformed variables Y/X is adequate to have homoscedasticity (errors have constant variance) (Chatterjee & Hadi 2000).

5. Check autocorrelation by calculating the Durbin Watson statistic (*d*). This statistic describes the serial correlation among residuals. If successive residuals are uncorrelated, positive autocorrelation leads to $d < 2$, negative autocorrelation produce $d > 2$ (Hamilton 1992). The acceptable values of Durbin Watson statistic fall in between 1.5 and 2.5 (Shannon & Davenport 2001).

Table 26 List of the dependent variables and dummy coding for predictor variables

Variable	Definition	
Y_{som}	Somatization	
$Y_{obsessive}$	Obsessive compulsiveness	
$Y_{depress}$	Depression	
Y_{hos}	Hostility	
D_1, D_2	District	
	$D_1 = 0$, $D_2 = 0$	Mountainous area
	$D_1 = 1$, $D_2 = 0$	Coastal area
	$D_1 = 0$, $D_2 = 1$	City
Sex	Sex	
	Sex=0 Male, Sex=1 Female	
Ed_1, Ed_2, Ed_3	Educational level	
	$Ed_1 = 0$, $Ed_2 = 0$, $Ed_3 = 0$	Primary school
	$Ed_1 = 1$, $Ed_2 = 0$, $Ed_3 = 0$	Secondary school
	$Ed_1 = 0$, $Ed_2 = 1$, $Ed_3 = 0$	Diploma
	$Ed_1 = 0$, $Ed_2 = 0$, $Ed_3 = 1$	Bachelor
Inc	Income	
Oc_1, Oc_2, Oc_3, Oc_4, Oc_5, Oc_6, Oc_7	Occupations	
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 0$, $Oc_7 = 0$	student
	$Oc_1 = 1$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 0$, $Oc_7 = 0$	unemployed
	$Oc_1 = 0$, $Oc_2 = 1$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 0$, $Oc_7 = 0$	agriculture
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 0$, $Oc_7 = 0$	blue collar worker
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 1$, $Oc_5 = 0$, $Oc_5 = 0$, $Oc_7 = 0$	skilled worker
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 1$, $Oc_6 = 0$, $Oc_7 = 0$	clerical sales
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 1$, $Oc_7 = 0$	business owner
	$Oc_1 = 0$, $Oc_2 = 0$, $Oc_3 = 0$, $Oc_4 = 0$, $Oc_5 = 0$, $Oc_6 = 0$, $Oc_7 = 1$	gov't officer
Mar_1, Mar_2, Mar_3	Marital statuses	
	$Ma_1 = 0$, $Ma_2 = 0$, $Ma_3 = 0$	single
	$Ma_1 = 1$, $Ma_2 = 0$, $Ma_3 = 0$	married
	$Ma_1 = 0$, $Ma_2 = 1$, $Ma_3 = 0$	divorced
	$Ma_1 = 0$, $Ma_2 = 0$, $Ma_3 = 1$	widowed (Choopinit, 1997).

Table 27 Correlation matrix for the predictor variables

	Di_1	Di_2	Sex	Ed_1	Ed_2	Ed_3	Inc	Oc_1	Oc_2	Oc_3	Oc_4	Oc_5	Oc_6	Oc7	Ma_1
Di_1,	1.0	-.50*	.00	.03	.07*	-.06	-.14*	-.02	.00	-.11*	-.02	-.10*	-.06*	-.02	-.11*
Di_2		1.0	.00	-.11*	-.04	.16*	.17*	.11*	-.05	.14*	-.01	.17*	.14*	.03	.13*
Sex			1.0	.03	-.06*	.08*	-.04	.02	-.09*	-.10*	-.09*	.11*	.04	.04	.04
Ed1				1.0	-.56*	-.53*	-.06*	.21*	.11*	.06*	-.09*	-.10*	-.05	-.07*	.01
Ed2					1.0	-.28*	-.01	-.08*	-.10*	-.11*	-.10*	.07*	-.01	.01	-.08*
Ed_3						1.0	.04	.03	-.08*	-.06*	.01	.05	.06*	.09*	-.00
Inc							1.0	-.13*	.25*	.38*	.18*	.32*	.35*	.23*	.33*
Oc_1								1.0	-.07*	-.12*	-.04	-.07*	-.06*	-.04	-.03
Oc_2									1.0	-.08*	-.02	-.04	-.04	-.02	.18*
Oc_3										1.0	-.04	-.07*	-.06*	-.04	.20*
Oc_4											1.0	-.02	-.02	-.01	.01
Oc_5												1.0	-.03	-.02	.11
Oc_6													1.0	-.02	.14*
Oc_7														1.0	.07*
Ma_1															1.0

*p<.05

Table 27 shows the intercorrelations among the socioeconomic variables range from .00 to .56. There are no strong interrelationships (r > +/-.8) among the predictors that might contribute to the values of dependent variables. Therefore, multicollinearity among the predictors has not been found in the analysis. However, there were negatively moderate relationships between secondary school and diploma level (r = -.56), secondary school and bachelor degree (r = -.53), coastal area and city (-.50).

Table 28 Mean and standard deviation of the dependent variables and the predictor variables selected

Variables	Mean	S.D.	N
Somatization	.79	.53	1200
Obsessive compulsive	1.19	.58	1200
Depression	.98	.57	1200
Hostility	.83	.62	1200
Coastal area	.33	.47	1200
City	.33	.47	1200
Sex	.50	.50	1200
Secondary School	.52	.50	1200
Diploma	.23	.42	1200
Bachelor	.21	.41	1200
Income	1134.96	2561.45	1200
Unemployed	.11	.31	1200
Agriculture	.04	.20	1200
Blue collar worker	.11	.32	1200
Skilled worker	.01	.10	1200
Clerical sales	.03	.19	1200
Business owner	.02	.17	1200
Government officer	.01	.11	1200
Married	.05	.22	1200

Table 28 shows somatization, obsessive compulsiveness, depressive mood and hostility and these were selected as the criteria variables because they were the common mental health problems found in the three districts. In marital status variables, being divorced and widowed were excluded from the multiple regression analysis as a result of very low number of cases (n = 4 and n = 3 respectively). Substantial differences in the number of

cases are able to affect the results. The analysis include 1200 young people, the mean for somatization, obsessive compulsiveness, depression, and hostility are reported as .79, 1.19, .98, and .83 respectively.

Table 29 Correlation Coefficients between Socioeconomic variables and Somatization

Predictors	Correlation Coefficients
Di_1 Coastal area	.05*
Di_2 City	.06*
Sex Female	.08**
Ed_1 Secondary	-.07**
Ed_2 Diploma	-.005
Ed_3 Bachelor	.10***
Inc Income	.01
Oc_1 Unemployed	.01
Oc_2 Agriculture	.00
Oc_3 Blue collar worker	-.01
Oc_4 Skilled worker	-.01
Oc_5 Clerical sales	.03
Oc_6 Business owner	.01
Oc_7 Government officer	.07**
Ma_1 Married	.07**

*p<.05, ** p<.01, ***p<.001

Table 29 shows the small but positive relationships between somatization and bachelor degree qualifications, female, being a government officer, married status, living in city and coastal area with the correlation coefficients of .10, .08, .07, .07, .06 and .05 respectively. However, there appears to be a negative relationship between secondary school level and this symptom (r = -.07).

Table 30 Model summary of ANOVA results, stepwise regression predicting Somatization in log form

Source of Variance	SS	df	MS	F
Regression	3.341	3	1.114	6.436***
Residual	206.978	1196	.173	
Total	210.32	1199		

***p<.001

Table 30 shows the results of the F test are statistically significant (F value = 6.436, p<.001). Thus, a bachelor degree qualification, married status, and being a government officer can explain a significant amount of variance in the somatization variable.

Table 31 Multiple Regression predicting Somatization Score in log form

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Ed_3 Bachelor	-.08	.03	-.07	-2.99**
Ma_1 Married	-.11	.05	-.06	-2.13*
Oc_7 Government officer	-.22	.11	-.06	-2.01*

* p<.05, ** p<.01, ***p<.001

R = .126 R^2 = .016 Adjust R Square = .013

SE_{est} = .42 a = .09 Durbin Watson = 1.655

Table 31 shows that a bachelor degree qualification, married status, and being a government officer are able to predict somatization. The multiple correlation between somatization and the predictors is reported as .126 (R = .126) indicating a weak positive relationship. The value of the multiple correlations (R^2) is .016; therefore, 1.6% of the variation in somatization can be explained by bachelor degree qualification, married status and government officer occupation. The adjust R^2 is .013. When the adjusted R^2 is close to the R^2 reported from the sample, the fit between the sample and population is good.

Regression Equation details:

$\log_{10} 1/ (Y_{som} -.3) = .09 -.08\ Ed_3 - .11Ma_1 -.22Oc_7$

$$Y_{som} = \frac{1}{10^{.09-.08Ed_3-.11Ma_1-.22Oc_7}} + .3$$

Y_{som} Somatization Score

Ed_1, Ed_2, Ed_3 Educational level

$Ed_1 = 0, Ed_2 = 0, Ed_3 = 0$	Primary school
$Ed_1 = 1, Ed_2 = 0, Ed_3 = 0$	Secondary school
$Ed_1 = 0, Ed_2 = 1, Ed_3 = 0$	Diploma
$Ed_1 = 0, Ed_2 = 0, Ed_3 = 1$	Bachelor

$Oc_1, Oc_2, Oc_3, Oc_4, Oc_5, Oc_6, Oc_7$ Occupations

$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$	student
$Oc_1 = 1, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$	unemployed
$Oc_1 = 0, Oc_2 = 1, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$	agriculture
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$	blue collar worker
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 1, Oc_5 = 0, Oc_5 = 0, Oc_7 = 0$	skilled worker
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 1, Oc_6 = 0, Oc_7 = 0$	clerical sales
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 1, Oc_7 = 0$	business owner
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 1$	government officer

Mar_1, Mar_2, Mar_3 Marital statuses

$Ma_1 = 0, Ma_2 = 0, Ma_3 = 0$	single
$Ma_1 = 1, Ma_2 = 0, Ma_3 = 0$	married

For clearer interpretation, the results of the multiple regression predicting somatization (in original data) are presented in Table 32

Table 32 Multiple Regression predicting Somatization (in raw form)

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Ed_3 Bachelor	.10	.04	.08	2.76**
Sex Sex	.07	.03	.07	2.41*
Oc_7 Government officer	.30	.14	.06	-2.01*
Ma_1 Married	.13	.07	.06	1.95*
Di_1 Coastal area	.12	.04	.11	3.34***
Di_2 City	.11	.04	.10	2.88***

* p<.05, ** p<.01, ***p<.001

R = .183 R^2 = .034 Adjust R Square = .029

SE_{est} = .52 a = .64 Durbin Watson = 1.642

Table 32 indicates that a bachelor degree qualification, married status and being a government officer are able to predict somatization. An unstandardized coefficient value of .10 for bachelor degree suggests, other things being equal, that a bachelor degree qualification tends to increase the somatization score by .10 compared to other education levels. In addition, an unstandardized coefficients of .13 for marital status suggests that, other things being equal, that being married tends to increase somatization by .13

compared to other forms of marital status. In addition, an unstandardized coefficient of .30 for being a government officers tended to increase the somatization by .30 compared to other occupations. Therefore, we might conclude that somatization tends to increase in young people with a bachelor degree qualification, who are married and earn their living from government sources.

Regression Equation

Somatization $= .64 + .10\ Ed_3 + .13\ Ma_1 + .30Oc_7$

Table 33 Correlation coefficients between socioeconomic variables and obsessive compulsiveness

Predictors	Correlation Coefficients
Di_1 Coastal area	.04
Di_2 City	.03
Sex Female	.10***
Ed_1 Secondary	-.07**
Ed_2 Diploma	-.01
Ed_3 Bachelor	.12***
Inc Income	.01
Oc_1 Unemployed	-.02
Oc_2 Agriculture	-.06*
Oc_3 Blue collar worker	-.04
Oc_4 Skilled worker	-.03
Oc_5 Clerical sales	.03
Oc_6 Business owner	.03
Oc_7 Government officer	.04
Ma_1 Married	.01

* p<.05, ** p<.01, ***p<.001

Table 33 illustrates the correlation between the socioeconomic variables and obsessive-compulsive symptoms in the multiple regression analysis. Having a Bachelor degree qualification and being female were positively correlated with obsessive compulsiveness. The correlation coefficients were .12 and .10 respectively. However, a secondary school qualification and being involved in agriculture were negatively correlated with this symptom.

Table 34 Model summary of ANOVA results, predicting obsessive compulsive

Source of Variance	SS	df	MS	F
Regression	6.093	3	2.031	9.975***
Residual	243.542	1196	.204	
Total	249.635	1199		

***p<.001

Table 34 shows the results of the F test were statistically significant (F value = 9.975, p<.001). Therefore, sex, a tertiary qualification, and living in a coastal area explain a significant though small amount of the variance in obsessive compulsive symptoms.

Table 35 Multiple Regression predicting obsessive compulsive in log form

Predictors	Unstandardized Coefficients B Std. Error	Standardized Coefficients Beta	t
Sex Female	-.09 .03	-.09	-3.270***
Edu_3 Bachelor	-.11 .03	-.09	3.289***
Di_1 Coastal area	-.07 .03	-.08	-2.751**

* p<.05, ** p<.01, ***p<.001

R = .156	R^2 = .024	Adjust R Square = .022
SE_{est} = .451	a = -.328	Durbin Watson = 1.898

Table 35 showed the summary of the stepwise regression analysis for obsessive compulsiveness that sex, tertiary qualification**,** and living in coastal areas were significant predictors of obsessive compulsiveness and that the three variables explained only 2.4% of the variance in the obsessive-compulsive scores. These predictor variables contribute a small amount to the variation in predicting obsessive-compulsive symptoms.

Regression Equation details:

$\log_{10} 1/(Y_{obsessive} -.56) = -.33 - .09Sex - -.11\ Ed_3 -.07\ Di_1$

$$Y_{obsessive} = \frac{1}{10^{-.33-.09Sex-.11Ed_3-.07Di_1}} + .56$$

$Y_{obsessive}$	Obsessive Compulsive Score
Sex	Sex
	Sex=0 Male, Sex=1 Female

Ed_1, Ed_2, Ed_3 Educational level

$Ed_1 = 0, Ed_2 = 0, Ed_3 = 0$	Primary school
$Ed_1 = 1, Ed_2 = 0, Ed_3 = 0$	Secondary school
$Ed_1 = 0, Ed_2 = 1, Ed_3 = 0$	Diploma
$Ed_1 = 0, Ed_2 = 0, Ed_3 = 1$	Bachelor

Di_1, Di_2 District

$Di_1 = 0, Di_2 = 0$	Mountainous area
$Di_1 = 1, Di_2 = 0$	Coastal area
$Di_1 = 0, Di_2 = 1$	City

Table 36 Multiple Regression predicting obsessive compulsive (in raw form)

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Ed_3 Bachelor	.16	.04	.11	3.795***
Sex Female	.10	.03	.09	3.103***

***p<.001

R = .146	R^2 = .021	Adjust R Square = .020
SE_{est} = .58	a = 1.105	Durbin Watson = 1.504

Table 36 shows that having a tertiary qualification and being female explain about 2.1% of the variation in obsessive-compulsive symptoms. An unstandardized coefficient of .16 for tertiary qualification suggests, other things being equal, that having a Bachelor degree qualification tends to increase obsessive compulsiveness by .16 compared to other levels of education. Also, an unstandardized coefficient of .10 for being female suggests, other things being equal, that being female tends to increase obsessive compulsiveness by .10 compared to being male. Therefore, we might conclude that obsessive compulsive symptom tends to be higher in young people with a tertiary qualification and who are female.

Regression Equation

$Y_{\text{obsessive compulsive}} = 1.105 + .16\ Ed_3 + .10Sex$

Table 37 Correlation Coefficients between Socioeconomic variables and depressive mood

Predictors	Correlation Coefficients
Di_1 Coastal area	.05*
Di_2 City	.03
Sex Female	.21***
Ed_1 Secondary	-.02
Ed_2 Diploma	-.03
Ed_3 Bachelor	.07**
Inc Income	-.03
Oc_1 Unemployed	.02
Oc_2 Agriculture	-.03
Oc_3 Blue collar worker	-.07**
Oc_4 Skilled worker	-.02
Oc_5 Clerical sales	.06*
Oc_6 Business owner	.003
Oc_7 Government officer	.03
Ma_1 Married	.03

* p<.05, ** p<.01, ***p<.001

Table 37 shows the correlation between socioeconomic variables and depressive mood**.** Depressive mood was found to be positively correlated with being female, having a Bachelor degree qualification, clerical sales (r = .06) and living in coastal areas (r = .05) with the correlation coefficients of .21, .07, .06, .05 respectively. However, depressive symptom remains negatively correlated with blue-collar worker (r = -.07).

Table 38 Model summary of ANOVA results, predicting depressive mood in log form

Source of Variance	SS	df	MS	F
Regression	13.39	4	3.35	17.89***
Residual	223.65	1195	.19	
Total	237.04	1199		

***p<.001

Table 38 shows that the results of the F test (F value = 17.89, p<.001). Therefore, being female, having a Bachelor degree qualification, living in city and coastal areas can explain a significant amount of variance related to depression.

Table 39 Multiple Regression predicting depression in log form

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Sex Female	-.18	.03	-.20	-7.01***
Edu_3 Bachelor	-.06	.03	-.06	-2.10*
Di_2 City	-.09	.03	-.11	-3.21***
Di_1 Coastal area	-.08	.03	-.09	-2.90**

* p<.05, ** p<.01, ***p<.001

R = .238	R^2 = .056	Adjust R Square = .053
SE_{est} = .43	a = -.02	Durbin Watson = 1.730

Table 39 showed that being female, having Bachelor degree qualification, living in city and coastal areas were significant though weak predictors of depressive mood, with the

four variables explaining about 5.6% of the variance related to depressive mood. These predictor variables contribute small variation in predicting depressive mood.

Regression Equation details:

$\log_{10} 1/ (Y_{depress} -.5) = -.02 - .18Sex - .06\ Ed_3 - .09\ Di_2 - .08\ Di_1$

$$Y_{depress} = \frac{1}{10^{-.02-.18Sex-.06Ed_3-.09Di_2-.08Di_1}} + .5$$

$Y_{depress}$ Depression Score

Sex Sex
Sex=0 Male, Sex=1 Female

Ed_1, Ed_2, Ed_3 Educational level

$Ed_1 = 0, Ed_2 = 0, Ed_3 = 0$	Primary school
$Ed_1 = 1, Ed_2 = 0, Ed_3 = 0$	Secondary school
$Ed_1 = 0, Ed_2 = 1, Ed_3 = 0$	Diploma
$Ed_1 = 0, Ed_2 = 0, Ed_3 = 1$	Bachelor

Di_1, Di_2 District

$Di_1 = 0, Di_2 = 0$	Mountainous area
$Di_1 = 1, Di_2 = 0$	Coastal area
$Di_1 = 0, Di_2 = 1$	City

Table 40 Multiple Regression predicting depression (in raw form)

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Female	.24	.03	.21	7.304***

* p<.05, ** p<.01, ***p<.001

R = .206 R^2 = .043 Adjust R Square = .042

SE_{est} = .562 a = .862 Durbin Watson = 1.430

Table 40 shows that being female is the most significant predictor of depressive mood, explaining about 4.3% of the variation in depression.

Table 41 Correlation coefficients between socioeconomic variables and hostility

Predictors	Correlation Coefficients
Di_1 Coastal area	.03
Di_2 City	.07*
Sex Female	.04
Ed_1 Secondary	-.02
Ed_2 Diploma	-.01
Ed_3 Bachelor	.06*
Inc Income	-.05
Oc_1 Unemployed	.00
Oc_2 Agriculture	-.02
Oc_3 Blue collar worker	-.04
Oc_4 Skilled worker	-.01
Oc_5 Clerical sales	.02
Oc_6 Business owner	-.02
Oc_7 Government officer	-.01
Ma_1 Married	.02

Table 41 shows that hostility is positively correlated with living in the city (r = .07) and having a Bachelor degree qualification (r = .06).

Table 42 Multiple regression predicting hostility score

Source of Variance	SS	df	MS	F
Regression	.294	3	.097	7.143***
Residual	16.412	1196	.013	
Total	16.706	1199		

***p<.001

Table 42 shows the results of the F test are statistically significant (F value = 7.143, p<.001). Therefore, living in city and coastal areas as well as being a blue collar worker can explain a significant though small amount of variance in hostility.

Table 43 Summary of the stepwise multiple regressions with hostility as the dependent variable and socioeconomic variables as independent variables (in log form)

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Di_2 City	.03	.01	.14	4.11***
Di_1 Coastal area	.02	.01	.10	3.14**
Oc_3 Blue collar worker	-.02	.01	-.06	-1.99*

* p<.05, ** p<.01, ***p<.001

R = .29 R^2 = .018 Adjust R Square = .015

SE_{est} = .12 a = .75 Durbin Watson = 1.496

Table 43 showed that living in city and coastal areas as well as being a blue collar worker were significant though weak predictors of hostility with the three variables explaining about 1.8% of the variance related to hostility. These predictor variables contribute only a small amount of variation in predicting hostility.

Regression Equation details:

$\log_{10}(Y_{hos} + 1.3) = .27 + .03\ Di_2 + .02\ Di_1 - .02 Oc_3$

$$Y_{hos} = 1^{.27 + .03 Di_2 + .02 Di_1 - .02 Oc_3} - 1.3$$

Y_{hos} Hostility Score

Di_1, Di_2 District

$Di_1 = 0$, $Di_2 = 0$ Mountainous area
$Di_1 = 1$, $Di_2 = 0$ Coastal area
$Di_1 = 0$, $Di_2 = 1$ City

Oc_1, Oc_2, Oc_3, Oc_4, Oc_5, Oc_6, Oc_7 Occupations

$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$ student
$Oc_1 = 1, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$ unemployed
$Oc_1 = 0, Oc_2 = 1, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$ agriculture
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 0$ blue collar worker
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 1, Oc_5 = 0, Oc_5 = 0, Oc_7 = 0$ skilled worker
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 1, Oc_6 = 0, Oc_7 = 0$ clerical sales
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 1, Oc_7 = 0$ business owner
$Oc_1 = 0, Oc_2 = 0, Oc_3 = 0, Oc_4 = 0, Oc_5 = 0, Oc_6 = 0, Oc_7 = 1$ government officer

Table 44 Summary of the stepwise multiple regression with hostility as the dependent variable and socioeconomic variables as independent variables (in raw form)

Predictors	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t
Di_2 City	.14	.04	.11	3.17**
Di_1 Coastal area	.10	.04	.08	2.33*

* p<.05, ***p<.001

R = .094 R^2 = .009 Adjust R Square = .007

SE_{est} = .62 a = .75 Durbin Watson = 1.496

Table 44 indicates that living in city and coastal areas explain about 1% of the variation of hostility. An unstandardized coefficient of .14 for living in city suggests, other things being equal, that living in city tends to increase hostility by .14. Also, an unstandardized coefficient of .10 for living in coastal areas suggests, other things being equal, that living in coastal area tends to increase hostility by .01. Therefore, we are able to conclude that hostility tends to increase in young people who live in city and coastal areas.

Regression Equation details:

Hostility $= .75 + .14Di_2 + .10\ Di_1$

CHAPTER 4

4. DISCUSSION

The aim of the study was to investigate mental health in young adults in three different geographical districts of Nakhon Si Thammarat, including Lan Saka, Pak Phanang, and Muang. Specifically, it involved determining whether mental health status was associated with socioeconomic factors and whether differences existed in the three regions in Thailand.

Objectives

The objectives of the study included:

1. Evaluate the mental health status of young adults living in mountainous areas (Lan Saka), coastal areas (Pak Phanang), and city areas (Muang) of Nakhon Si Thammarat, Thailand.

2. Determine the occurrence of mental health symptoms such as somatization, obsessive-compulsive symptoms, depressive mood, and hostility of young adults living in Lan Saka, Pak Phanang and Muang of Nakhon Si Thammamarat, Thailand.

3. Determine whether significant differences in the mental health status of young adults exist (assessed by symptoms such as somatization, obsessive-compulsive symptoms, depressive mood and hostility) as a function of variables such as geographical region, sex, education (primary school, secondary school, technical or vocational college and tertiary levels), employment status (employed, unemployed and students), and income (low A$0-200, moderate A$201-400 and high A$>401)

4. Determine if a relationship exists between district, sex, educational level, income, occupation, employment status, marital status, and specific symptoms of mental health in the three regions.

A summary of the results follows:

1. 45.5% of young people living in the coastal areas (Pak Phanang), 43.8% of youths living in the city (Muang Nakhon Si Thammarat) and 33.5% of young adults in the mountainous areas (Lan Saka) were assessed as having mental heath difficulties (based on T>60 in the SCL-90-R).

The prevalence of a positive risk (that is, any two primary symptoms scoring ≥ T63), was found to be greatest in those living in the coastal areas (percentage of positive risk was 20.8%), while 19.5% of young adults living in the city and 15% of the young people in the mountainous areas were also found to be at risk. The GSI criteria (T ≥ 63**)** showed that 10% of young people in coastal regions were estimated to be a positive risk of mental health problems compared to 9.5% in the city and 8.8% in mountainous regions.

When Thai norms were used to calculate the percentages of mental health problems in the three geographical areas (Chuprayoon 1978), 41.8% of young people living in city areas, 40.9% of youth living in coastal areas and 29% of those living in mountainous areas were found to have mental health problems based on self-report (SCL-90).

2. In the coastal areas (Pak Phanang), 20% of young people had somatization which, was the most common mental health symptom found in the three areas (the T > 60 criteria) while 17.5% and 17.3% reported paranoid ideation and hostility respectively. In addition, using the clinical criteria (T score ≥ 63), 12.5 % had scores of somatization while 11.5% were assessed as paranoid and 11 % assessed as psychotic.

In the city (Muang), 17.3% was found to have high levels of somatization, while 16.8% and 16.3% were assessed as having high levels of obsessive compulsiveness and hostility respectively (using the SCL-90-R, T>60 criteria). Using the clinical criteria (T≥63), 13.3% self-reported a high level of hostility, 12.8% were found to

have high levels of somatization, and 11.3% were found to have high levels of paranoia.

In the mountainous areas (Lan Saka), obsessive-compulsive symptoms were found to be the most frequent health problem (16.8%) while 13.5% had problems with hostility and psychoticism. Furthermore, using the percentage of mental health problems at a clinical level (T score ≥ 63), hostility was found to be the most common problem (10.8%). Obsessive compulsiveness and depressive symptoms were the second most common mental health problems at a clinical level in the mountainous community (10.3%).

Using the Thai standard norms as the criteria, phobic anxiety was found to be the most common mental health problem found in Thai young adults regardless of which area they lived in. In addition, almost 20% were found to have depressive symptoms across the three areas, while up to 20% were found to have psychotic symptoms.

3. Mental health symptom comparisons were made between the young adults according to the area, employment status, sex, educational level, occupation, and income. The results are summarised below:

3.1 There were significant differences found between the three areas on scores of somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, and paranoid ideation. Those living in coastal and city areas were found to have greater levels of somatization, obsessive-compulsive symptoms, interpersonal sensitivity, depressive mood, anxiety, hostility, and paranoid ideation than those living in mountainous areas. As well, young people living in the city had higher risks of mental health difficulties than those living in coastal areas.

3.2 Female young adults were more likely to be at risk of depressive mood, phobic anxiety, anxious obsessive-compulsiveness, paranoid ideation, and interpersonal problems.

3.3 No significant differences in mental health symptoms were found among the participants as a function of whether they were unemployed, employed or a student at the time of the interview.

3.4 Young adults with a secondary school level of education were less likely to have higher levels of mental health symptoms than youths with a Bachelor degree qualification. Symptoms more likely to occur in those with a tertiary degree included somatization, obsessive compulsiveness, interpersonal sensitivity, depressive mood, anxiety, phobia, and paranoid ideation. Furthermore, young people who had a diploma qualification were more likely to be anxious, obsessive compulsive and paranoid than young people who just had a secondary education.

3.5 The results suggest that young adults who were earning higher wages had higher risks of mental health symptoms. Young people whose income was less than 4500 Baht per month were less at risk of suffering somatization symptoms than those whose income was between 4501-6500 Baht per month. In addition, young people whose income was between 4501-6500 Baht per month were less at risk of suffering paranoid ideation than those whose income was greater than 6501 Baht.

4. The study was also designed to determine whether a relationship existed between variables such as geographical area, sex, educational level, employment status, married status, income, and the symptoms of mental health. However, these variables were found to account for only small amounts of the variance in mental health problems.

4.1 A Bachelor degree qualification, marital status, and being a government officer were found to predict somatization, explaining about 1.6% of the variance in somatization.

4.2 Sex, tertiary qualification, and living in coastal areas were significant predictors of obsessive compulsiveness, with these three variables explaining only 2.4% of the variance in the obsessive-compulsive scores.

4.3 Being female, having a Bachelor degree qualification, living in city and coastal areas were found to be significant though weak predictors of depressive mood, with the four variables explaining about 5.6% of the variance related to depression.

4.4 Living in city and coastal areas as well as being a blue-collar worker were significant though weak predictors of hostility, with the three variables explaining about 1.8% of the variance related to hostility.

Geographical differences

Mental health problems were found to be most prevalent in young people living in coastal areas (Pak Phanang) (45.5%) compared to the city (43.8%) and the mountainous regions (33.5%). This finding may have been due to economic reasons as young people living in Pak Phanang have experienced many difficulties, for instance, physical problems involving water and soil resources, environmental deterioration, resulting in substantial socioeconomic problems. It has been suggested that many of these problems have resulted from poor management of shrimp farming (Chaipattana Foundation 2001, Ruanghirun 1997; Funge - Smith & Stewart 1996). Some of these possible problems will now be discussed.

Physical problems

Insufficient water is the principle problem of the local coastal people. The exploitation of natural resources such as the destruction of forests in watershed areas (due to pressures for land from fruit growing and rubber plantations) has led to the amount of water in the rivers being steadily reduced (Chaipattana Foundation 2001). As a result of these decreases in the quantity of fresh water, higher levels of seawater intrusions in the river occur, causing people to have experienced a shortage of fresh water for domestic uses and cultivation. (Chaipattana Foundation 2001; Ruanghirun 1997). In addition, almost every year, the people living in low lands in the Pak Phanang region are faced with annual flooding and high tides during the rainy season between November and December as well as storms occurring every year destroying houses and agriculture areas. It is possible that these problems result in

socioeconomic hardships, and that this is related in some way to the higher prevalence of mental health problems.

Environment deterioration

Rice farmers in Pak Phanang have experienced severe water and soil pollution because of discharged contaminated water from shrimp ponds to the river and the sea, and this is in addition to the paddy fields causing its own soil and water pollution, resulting in damage to paddy fields. Farmers are unable to use water in the river for agriculture and this has resulted in conflicts between rice farmers and shrimp farmers. Furthermore, rice farmers also have problems with soil salinity because seawater intrudes onto their land along the canals. These serious problems led to decreases in rice yields (Chaipattana Foundation 2001). Therefore, some farmers left their lands to find other alternative work such as factory workers. Those with enough funds have changed their careers from rice growing to prawn farming.

The release of wastewater directly into the sea has also caused sea pollution, resulting in reduced good quality seawater for shrimp farmers and for prawn nurseries. As well, the effect of disease on shrimp farming has caused loss of production causing shrimp farmers lost investment resulting in many of them abandoning their farms (Funge - Smith & Stewart 1996). There are many abandoned shrimp ponds along the coast of Pak Panang, which are also not able to grow rice and other crops because of soil pollution. In addition, the development of shrimp farming has caused substantial pollution in near shore water leading to fishermen having problems with considerable reduction in amounts of fish harvest as a result of water pollution released from shrimp ponds to the sea. This situation has forced the local fishermen to seek new sources of income. These environmental problems resulting from shrimp farms have resulted in many ecological, environmental, tourism, socioeconomic and health difficulties (Funge - Smith & Stewart 1996).

Mangrove forests can provide nutrients as well as being nursery grounds and shelter for young marine animals. They also filter nutrients and trap pollutants, which can improve water quality as well as protect the coastal areas from erosion and storm,

and also provide vital products such as charcoal and seafood. Substantial mangrove forests were destroyed resulting from shrimp farms expansion, agriculture, and community growth, leading to dramatic reduction in amount of marine animals (Ruanghirun 1997). Mangrove deforestation is one of the main ecology problems that can result in increased poverty and unemployment.

Health consequence also arise due to local people living near shrimp farms being exposed to a number of health risks resulting from contaminated water from the shrimp ponds, which often include high level of chemicals. Releasing pond wastewater without treatment of pond chemicals causes pollution. This situation can result in increased health risks to coastal people (Primavera 1998).

Socioeconomic impacts

Shrimp farm development has resulted in negative socioeconomic impacts on tourism, rice paddy farming, and mangrove forests. In addition, the economic values of marketed products such as the collection of wood fuel and fishing have been damaged (Tobey et al. 1998). Consequently, many farmers are unable to earn a basic living wage and are therefore forced to seek new sources of income in other places. Furthermore, rice farmers are currently faced with low prices for their products, high investment, lower yields, and drought has taken a heavy toll on outputs. The majority of people in Pak Phanang live with poverty (Chaipattana Foundation 2001). This socioeconomic strain may well impact on mental health.

Coastal scenery has been damaged due to shrimp farm expansion affecting tourism. For example, the construction of special roads, sludge piles, increased shrimp farm infrastructure and the shrimp ponds themselves. These together have negatively changed the scenery of coastal areas causing serious downturns in tourism (Fung- Smith & Stewart 1996).

Crime problems increase as a result of shrimp farms' business. The majority of shrimp farms are owned by small businesses, people from the cities, government officials, local influential people, and big companies. Frequency of crime has

increased due to land disputes, illegal farming, and clearing of mangrove forests. In addition, the high values of shrimp have resulted in shrimps being stolen (Funge-Smith & Stewart 1996).

In summary, the lack of fresh water, environmental deterioration, socioeconomic difficulties, health problems, increased crime, and related poverty are possible reasons why young people living in Pak Phanang were found to be exposed to higher risks of mental health problems than the other two geographical areas in Nakhon Si Thammarat. These doctoral findings are consistent with the findings of a study by Phapoom (1995) who reported the prevalence of mental health problems to be higher in populations under some form of stress, such as 31.5% of public service motorcycle drivers in Bangkok. Towcomlue (1991) also found 37 % of bus drivers working for the Bangkok Mass Transit Authority (BMTA) had mental health difficulties.

Findings from this doctoral study found that 43.8% of young people living in the Muang district (city) in Nakhon Si Thammarat reported a high level of mental health symptoms. Possible reasons for this are similar to those coastal community problems, that is, the city people of Muang have been exposed to higher risks of stressful difficulties. For instance, people living in the inner city have problems with environmental degradation such as air pollution, solid waste, garbage waste, wastewater, noise pollution, over-crowed residential areas, and traffic congestion. These major problems of urban communities may lead to mental health trouble of young people (Chaipipat et al. 1999; Nakhon Si Thammarat Provincial Statistical Office 2005). In the western districts of Muang, in the areas connected to the mountains, most people rely on fruit orchards such as mangosteen. They have had troubles with quality and quantity of yields, uncertainty of price, water sources, water supply, weeds, insects, fertilizer using, harvesting, and pesticides (Muangjum 2005). The east of the city is connected to coastal areas, where people earn their living on fishery and shrimp farming. They have problems with the reduction in yields because of water contamination due to shrimp ponds. Interestingly, the findings of this doctoral study are in contrast to the findings of mental health status of secondary school students in Chaiyaphum municipality by Danpakdee (1999), who found only

15.6% of city school students had a risk of suffering mental health problems assessed by the SCL-90. However, Sangvipark (1999**),** using the GHQ-28 (General Health Questionnaire), found 36.9% of secondary school city students in the municipality area in Chaiyaphum (city areas in northeastern province, Thailand) had mental health problems.

Furthermore, the scores of somatization in coastal areas and city were found to have significantly greater levels than those found in mountainous areas. The prevalence rate of physical complaint symptoms in coastal areas was 20% in Muang 17.3% and 12.8% in Lan Saka. The possible reasons may be that people in Pak Phanang have experienced chronic socioeconomic problems. Previously, Pak Panang exported rice to the neighbor countries such as Java and Malaysia and its economy in the past flourished. Now, the situation has changed substantially, and people in Pak Panang have faced economic hardship (Chaipattana Foundation 2001). Many employed people have had career troubles. A study of problems and needs of the rice farmer in the Pak Panang basin region by Boonsuaykhwane et al. (2004) reported that lack of water and the lower price of rice were the major problems of rice farmers. Direkbusrakom et al. (2004) studied the order of importance of problems and people' needs of shrimp farmers in Pak Panang basin region and revealed that low selling prices ranked the highest difficulty of the shrimp farmers**,** followed by low quality of post larva and shrimp feed, poor operation, and poor quality of water sources. Additionally, the incidence of disease and death in shrimps has caused widespread economic hardship to the shrimp farmers. Thammachat et al. (2004) studied the problems and needs of local fisheries in the Pak Panang basin region, and found that the major problems of local fisheries were the substantial decrease of marine life, affecting the economies of the coastal communities. Choosamer et al. (2004) reported that the significant difficulties of urban people in Pak Panang were a lack of clean water supply, lack of community support, shrimp farming wastewater, flooding, economic problems, natural resources, environmental management, and social problems. These socioeconomic hardships will most likely result in high levels of stress and this may well lead to the higher risk of mental health problems in the region.

Additionally, in the coastal region of Pak Phanang, the data found that somatization was the most common mental health problem (20%), while paranoid ideation and hostility were found to be 17.5% and 17.3% respectively. In addition, using the clinical criteria (T score ≥ 63), somatization was highest for those young adults who lived in coastal areas (12.5%), while 11.5% and 11% had symptoms of paranoia and psychoticism respectively. In the city, somatization was found to be 17.3%, while obsessive compulsive symptoms and hostility was reported to be 16.8% and 16.3% respectively using the T>60 criteria. Using the clinical criteria, 13.3% reported high levels of hostility, and 12.8% reported somatization symptoms while 11.3% were found to have a high level of paranoid symptoms.

As can be seen from the above discussion, somatization was found to be most common mental health problem found in young people living in coastal areas (Pak Phanang) and the city (Muang Nakhon Si Thammarat). This study suggests that the economic difficulties experienced in these areas may be somewhat responsible for this high prevalence of somatic symptoms compared to the mountain areas. It is also clear that other factors are responsible for mental health status given the low amount of variance explained by the socioeconomic factors. Obviously, research that is more conclusive would need to be conducted if direct links between economic difficulties and somatic complaints were to be established.

The high prevalence of somatic complaints may also be partly due to the influence of traditional child rearing that teaches female young people to over-inhibit emotions, feelings, inexpressiveness of sex and aggression. Females were found in this study to have a high proportion of somatization. Another possible reason is that somatization disorder is a more socially acceptable problem (Dejatiwong 1986). For example, Kleinman and his colleagues have stated in a study of mental health in the Chinese, that somatic complaints are an acceptable method to request help from others in Chinese society, while psychological problems are not. Complaints of sadness, loneliness, and anxiety are regarded as unimportant and not credited with needing serious attention, whereas headaches, fatigue, and abdominal discomfort are accepted as more serious symptoms (Bass 1990). In Arabic culture, physical symptoms are

more socially accepted than are psychological ones. Arabic public would accept, tolerate, and sympathize with suffering of somatic symptoms more than psychological complaints (Okasha & Okasha 1999). The findings are also consistent with the study by Phapoom (1995) who found, using the SCL-90, that somatization was highest in public service motorcycle drivers in Bangkok (15.2%). Silapabanleng (1994) using the SCL-90 found that 27.2 % of the people in the border area, self-defense villages of Chanthaburi and Trat (provinces in the eastern Thailand) had problems with somatization. Towcomlue (1991) using the SCL-90, studied mental problems of Bangkok bus drivers and found that 21.1% of the bus drivers of Bangkok Mass Transit Authority (BMTA) had problems with somatization.

The doctoral findings show that young people living in mountainous area of Lan Saka had the least mental health difficulties (33.5%) compared to coastal (Pak Phanang) and city areas. The percentage of somatic complaints was relatively low at 12.8%. The possible reasons for the lower level of mental health difficulties may include the relatively un-spoilt countryside compared to the other two regions. Lan Saka is located on the foothills of Nakhon Si Thammarat mountain ranges, which are dominated by evergreen rainforests, fruit orchards, and rubber plantations. These communities depend economically on fruit gardens and rubber plantations. While deforestation for fruit orchards and rubber plantations is a problem experienced in the area, there are strong social ties in these communities (Lertswicha 1994). For example, they may be more likely to have someone to talk with when they have problems. Sociologists have found that people with strong social ties have better mental health and lower rates of distress and mental illness than those who are more isolated (Horwiz, White, &Howell-White, 1996; Ross 1995; Waite 1995). In general, strong social relationships promote a sense of belonging and security and lead to more opportunities to develop a sense of efficacy and mastery. The more of these ties people have the greater their opportunities to receive social support (Scheid & Horwitz 1999). The prevalence of mental health problems in mountainous areas (Lan Saka) of this doctoral study are lower than a finding of Silapabanleng (1994), who reported that 41.87% of people living in the border villages in the Chunthaburi and Trat areas of eastern Thailand had mental health problems (Chunthaburi and Trat, the

villages selected in Chuntaburi were in Khoa Soi Doa National Park, and the villages selected in Trat were on the foothill of Buntud Mountain). Furthermore, Choasin (1999) found that 28.9% people in the three living areas of Chiengmai in the North of Thailand reported high levels of somatization. Explanations for these differences in findings to the present doctoral study will need further research.

An inspection of the prevalence of mental health problems in mountainous areas (Lan Saka) reveals that 16.8% of young adults reported high levels of obsessive-compulsive symptoms, while 13.5% reported having problems with hostility, and psychoticism. Furthermore, using the percentage of mental health problems at a clinical level (T score $\geq$ 63), hostility was found to be the most common symptom in the mountainous community (10.8%). Obsessive compulsive and depressive symptoms were the second most common mental health problem at a clinical level in the mountain community (10.3%).

The above results are similar to those by Danpakdee (1999) who found obsessive-compulsive symptoms to be the most common mental health problem in secondary school students in the Chaiyaphum municipality, though this area is a city areas in the Northeast of Thailand. However, the result was higher than that found by Jumruslertsumrit (1992) who reported a prevalence of obsessive-compulsive symptoms to be around 9% among Chulalongkorn medical students. In addition, Forero (2001), using self-report of Health Behaviors in School Student Surveys (HBSS), found the prevalence of depression among school students ranged between 8 to 13% (in a study of Australian School Students' Alcohol and Drugs Survey (ASSAD) and a study of European School Survey on Alcohol and Other Drugs (ESPAD). As well, the study of health behaviors in schoolchildren by Forero (2001) indicated that 12-16% of the young reported feeling low or depressed.

Depressive mood was found to be 10.3% of the sample in the mountain region, which was the second most common mental health symptom in the mountainous community (Lan Saka). This doctoral study has not provided data for providing definitive reasons why this should be the case, however, the local people do experience a degree of economic hardship and a depressive mood prevalence of

around 10% is not unusual. Obviously, there are also other factors operating that this study has not investigated that contribute to mental health. Their incomes very much rely on agriculture products, which depend on uncertain factors such as sufficient rain and robust prices. As well, they have to cope with difficulties such as weed and insect infestations and increased prices of fertilizer. Many people have significant debt. The provincial statistic reported that 16.67% of villages (that is, six villages of 42 villages) in Lan Saka seek Government help to solve their debt including problems with poverty (Nakhon Si Thammarat Provincial Statistic Office 2005). Due to seasonal work, many are not able to work full time, resulting in large amounts of free time. This may result in a preoccupation with their debts and negative thoughts about their future. These may well be precursors of depression. Depression has been linked to difficult living conditions in a predominantly low-income and poorly educated community (Urzua et al. 1995). The findings are consistent with various studies. For example, Jaisin et al. (1984) found that 15.5% of people in Chonburi (the province in the East of Thailand) reported high rates of depression. Jumruslertsumrit (1992) found 5.74% of the Chulalongkorn medical students had depression. Sinasa (1992) using CMI (Conell Medical Index) found 17.27% of workers in intermediate factories in Nonthaburi reported affective disorders and depression was found in 5.88%. Phapoom (1995) found 11.9% of public service motorcycle drivers in Bangkok had depression. Bouthgern (1995) using CDI (Children's Depression Inventory) found 49.8% of early adolescent students in Samut Prakan in central Thailand had depressive symptoms and 22.5 % reported marked depressive symptoms. Furthermore, Ridhitrairatana (2001), using the HRSR (Health-Related Self-Report), found 14.4% of high school students in Petchaburi in central Thailand reported significant levels of depressive symptoms.

While around 10% of young adults have depressive mood symptoms in the mountains areas, the prevalence was significantly higher in the coastal and city areas. Reasons for this have been discussed above, though again more definitive research would be needed to isolate causes. The prevalence rate of depressive mood in Pak Panang was 14.8%, Muang 13.5% and Lan Saka 10.3%. It is likely that the increased socioeconomic difficulties experienced in the coastal and city areas contribute to this

higher risk. This could also be the case for the higher rates of the other mental health symptoms such as hostility.

An additional explanation for the differences in mental health between the regions may be the differences in income inequalities between the areas (Wilkinson 1996; Haukkala 2000). In Pak Panang, 25.83% of households or 4342 of 16,809 households have yearly incomes less than 20,000 Baht (1 A$ = 25 Baht) while the average monthly income per household in Nakhon Si Thammarat is 14,079 Baht (Nakhon Si Thammarat Provincial Statistic Office 2005). In Muang 21.60% of households, (or 7290 of 33,746 households) were found to have yearly incomes of less than 20,000 Baht (Nakhon Si Thammarat Provincial Statistic Office 2005). In contrast, In Lan Saka, only 11.44% of households (or 949 of 8295 households) have yearly incomes less than 20,000 Baht (Nakhon Si Thammarat Provincial Statistic Office 2005). Furthermore, people in Muang and Pak Panang are more likely to have financial difficulties including losing their jobs. The situation is different in Lan Saka. Although, people in Lan Saka, have problems with uncertain prices of their crops, they have supplementary income from ecotourism with can mitigate economic suffering.

When Thai norms were used to calculate prevalence of mental health symptoms, (Chooprayoon 1978) the results did not change greatly. Young people living in city areas had a similar percentage of mental health difficulties (41.8%), as did those living in coastal areas (40.8%). The lowest percentage of mental health problems was still found in those youths living in mountainous areas (29%). Phobic anxiety was the most common mental health problems found in Thai young adults regardless of which area they lived in. In addition, almost 20% were found to have depressive symptoms across the three areas, while up to almost 20% were found to have psychotic symptoms. The results are similar to the findings of Danpakdee (1999) who found phobia was a predominant mental health problem (40.9%) of secondary school students in Chaiyaphum in the northeastern Thailand when using the norms provided by Somdejchoapaya Institute of Psychiatry.

Sex Differences

Sex differences were found in this study. Females were found to have higher rates of mental health symptoms than males. The doctoral study results showed that young women were more likely to have depressive mood, phobia, anxiety, obsessive-compulsiveness, interpersonal problems, paranoid and somatic complaints compared to the young men. A number of possible explanations may be considered for these findings. First, it may be that the SCL-90 R has a sex bias, causing women to score higher than men do. This is a possibility, though the SCL-90 R has a well-accepted scientific reliability and discriminate validity, and is used frequently internationally. Future research should consider such a source for sex differences. Perhaps the items of self-report are considered by clinicians to be more likely symptoms for women than for men (Anderson et al. 2001). Additionally, symptoms that are considered normal in females (stereotyped) may result in over diagnosis of mental health symptoms in women (Kaplan 1983). To correct a possible sex bias would be a complex issue. Perhaps raising awareness of such a potential bias is a first step in overcoming the problem (Millon et al. 2004).

Other possible causes include: (i) in Thai culture, women are expected to stay at home and help their parents do housework as well as raise the family. Consequently, females are more protected by the family than males (Meesup 1998). In contrast, males are allowed more freedom with their feelings and emotions as well as having less social restrictions. This difference may result in males having less risk of mental health problems. (ii) The majority of males are interested in exercise and enjoying sport as well as spending more time in outdoor activities, and this may also serve to reduce perceived difficulties (Department of Mental Health of Thailand 1998). (iii) Finally, in most cultures around the world, women have less power and status than men and control fewer resources. As women adapt to roles with less power and less status in society, they may be more susceptible to suffering from mental health problems (Eagly 2000).

These sex differences in mental health symptoms found in this doctoral study are consistent with the findings of other research. For example, Silapabanleng (1994) reported that females in Chanthaburi and Trat provinces in Thailand had greater problems with phobic anxiety, general anxiety symptoms, obsessive-compulsive symptoms, depression, somatization, interpersonal sensitivity, and paranoid ideation than males. As well, Jandung (1993) found that females were more likely to have interpersonal problems than males**,** though males were found to have higher levels of psychotic symptoms than females. In addition, Kanchanachoti (1993) found female students attending the Southern Srinakharinwirot University were more likely to have problems with depressive symptoms, phobic anxiety, and somatization than males. Additionally, Dechkum (1998) claimed that females experienced significantly higher levels of stress compared to male senior high school students in Bangkok. Furthermore, the results are relevant to the research in the National Comorbidity Survey (NCS) in the USA, where women were much more likely to have affective disorders and anxiety disorders than men, whereas men were much more likely to have addictive disorders and antisocial personality disorder than women (Kessler & Zhao 1999) were. Additionally, women appear to develop obsessive-compulsive disorder (OCD) a little more frequently than men do. In a DSM-IV (American Psychiatric Association 1994) field trial, it was reported that at least 51% of the 431 subjects with OCD were women (Foa et al. 1995).

Employment status

It was interesting that no significant differences in mental health symptoms between coastal, mountainous and city regions were found as a function of whether they were employed or a student at the time of the interview. Reasons for this are not known, however, it may be that the unemployed had more family support than the employed as they can go back home to work on the family farm or in their family business. The family relationship has the potential of supporting and enhancing a sense of competence and healthy function among young people (Brennan 1993; Erikson 1959 cited by Reed 1995). Garrison found that family support and family cohesion are important protective factors for adolescents' mental health (Garrison et al. 1997).

Social support is an important safeguard of social stress, protecting the individual from onset of depression and other types of psychopathology. It is able to protect people from stressful events by enhancing their coping ability (Garrison et al. 1997).

Education level

Young adults with Bachelor degree qualifications were more likely to have higher levels of somatization, obsessive-compulsive symptoms, interpersonal sensitive, depressive mood, anxiety, phobic anxiety, and paranoid ideation symptoms than youths with secondary school. Furthermore, young people who had a tertiary diploma were more likely to be anxious, obsessive compulsive and paranoid than young people who had a secondary education. Explanation for these results are not provided in this study. However, it may be that young people with higher education levels are more susceptible to the effects of economic downturn and recession. Many newspapers and television channels provided news regarding companies' bankruptcy; laying off of staff and increases in unemployment. Unemployed professionals were also likely to have been forced to work in non-professional positions, resulting in salary decreases and potential loss of self-esteem. This state of affairs would result in young people with Bachelor degree qualifications or diploma to find it difficult to acquire a professional salaried position. This may result in feelings of uncertainty and insecurity about their futures and may increase risks of mental health difficulties. Research has shown that young people with higher education such as a Bachelor degree or diploma are a vulnerable group in the time of economic recession (Ministry of Health and Welfare of Japan 2000 cited by Maruyama 2002). The census of National Survey of Japanese Daily Living by Ministry of Health and Welfare conducted in 2000 indicated that education and studying were the main source of anxiety and stress (43% and 34% respectively).

The results of the doctoral study are also consistent with results from the New Haven Study, undertaken by Hollingshead and colleagues, which studied social classes in the USA (Hollingshead & Redlich 1958 cited by Eaton and Muntaner 1999). This study found chronic neurosis was associated with higher-class status. Towcomlue (1991) found that bus drivers employed by the Bangkok Mass Transit

Authority who had a Bachelor degree or diploma had higher levels of anxiety, hostility, and interpersonal sensitivity than bus drivers with primary school levels. However, inconsistent findings have been found. For instance, Silapabanleng (1994) found that illiterate people are more prone to somatic complaints, trait anxiety, and higher levels of phobic anxiety than people with higher levels of education. People with only primary school education had higher levels of phobic anxiety than those with secondary levels and higher (Silapabanleng 1994). As well, Charoensuksopon (1989), using Health Opinion Survey (HOS), found illiterate people residing in industrial area of eastern Thailand had higher stress levels than people with primary, secondary, vocational, and tertiary education. Nilchakovit et al. (1996) also found 35.6% of people with below primary education had mental health problems. It is clear that further research is required on the protective influence of education against mental health problems.

Income

Young people whose income was less than 4500 baht per month were less at risk of suffering somatization symptoms than those whose income was between 4501-6500 baht per month. This doctoral study provides no data as to why this may be the case, however, it may be that young adults with incomes less than 4500 baht per month have increased family support. They are more likely to stay with their families and this could well be beneficial mental health wise. The finding is consistent with the study of clinical data in midtown Manhattan by Srole et al. (1962) who found higher rates of mental disorders in the upper socioeconomic groups. However, results of the present study are inconsistent with many studies. Jaisin et al. (1984) claimed that stress was highest in people with incomes lower than 2000 baht per month. Nilchaikovit et al. (1996) found people with no income or income less than 2000 baht per month were more likely to have higher prevalence of mental health problems (29.1% and 22% respectively). Dechkum (1998) found students from low-income families had significantly higher levels of stress than people with high-income families. However, Silapabanleng (1994), Charoensuksopon (1989), as well as Sinasa (1992) found no significant differences in mental health symptoms among the people

with different levels of income. Furthermore, the Baltimore ECA survey regarding social class found that low household income was related to major depression and anxiety disorders (Eaton & Muntaner 1999). It is clear that mental health may be negatively influenced by having a higher income and having a very low-income level, for perhaps very different reasons. However, it is also clear that further research is needed to clarify the relationship between income levels and mental health status.

Young people whose income was between 4501-6500 baht per month were higher at risk of suffering paranoid ideation than those whose income was greater than 6501 baht. The results are similar to the New Haven Study undertaken by Hollingshead & Redlich (1958) who studied clinical data based on a census of New Haven mental treatment centers. They found dramatically higher mental health disorder prevalence rates among those of lower socioeconomic status. They also found psychosis was strongly associated with socioeconomic level, showing more than eight times the prevalence in the lower levels compared to higher levels (Hollingshead & Redlich 1958 cited by Eaton & Muntaner 1999). An earlier study of the mental health of young people in Australia by Sawyer et al. (2000) found that young people with low income (eg. sole parent families) had a higher prevalence of mental health problems than other groups. These results are consistent with the studies by Jaisin et al. (1984); Nilchakovit et al. (1996) and Dechkum (1998).

Relationship of socioeconomic variables and the symptoms of mental health.

As can be seen from the regression results, the socioeconomic variables were able to explain only small amounts of variance in mental health symptoms such as somatization, obsessive-compulsive symptoms, hostility, and depressive mood. There are obviously additional variables that contribute strongly with mental health, and these could include genetic factors, personality factors, social support, fitness, weight and so on. The regression results will now be briefly discussed.

Somatization

Results of the multiple regression analysis showed that education level, marital status, and employment type (eg. being a government officer) were found to contribute to the variance in somatization, however, explaining only 1.6% of the variance. Somatic complaints are complex problems and obviously many additional factors must determine somatic outcomes. For example, genetic factors contribute (Guze et al. 1986; Hollifild 2005; Yutzy 2003) as do psychosocial factors such as stress, and culture might influence somatization, as for example, it has been found that somatizers have many social, interpersonal, and occupational problems (Cloninger 1978; Flor-Henry et al. 1981; Martin & Yutzy 1999).

Obsessive-compulsive symptoms

The multiple regression analysis found that three factors explained only a small amount of the obsessive-compulsive variance (2.4%). These included sex, tertiary qualification, and living in coastal areas. Again, additional factors that may determine obsessive-compulsive symptoms status could be genetic, neurobiological, and neurochemical characteristics (Pato et al. 2003). For example, in twin studies of OCD (obsessive-compulsive disorders) and related disorders, Inouye (1965) reported an obsessive-compulsive symptom concordance rate of 80% in monozygotic twin pairs compared with 50% in dizygotic twin pairs. Carey and Gottesman (1981) reported rates of 87% and 47% respectively (Rauch et al. 2002). Other twin studies have revealed a concordance rate of 63% in monozygotic twins (Rasmussen & Tsung 1986). Furthermore, dysregulation of serotonin and dopamine might be crucial contributors to OCD since medications treating OCD are known to involve these systems (Hollander, Simeon, & Gorman, 1999) and abnormalities in the frontal cortex, basal ganglia and thalamus are also known to exist in OCD patients (Insel 1992, Baxter 1992; Pato et al. 2003). Additional psychological factors may include sexual and aggressive impulses (Hollander et al. 1999), problems such as perfectionism, indecisiveness, and rigidity (Cohen et al. 1997), and anxiety reduction issues (Morer 1939 cited by Hollander et al. 1999).

Depressive mood

Being female, having a tertiary qualification, living in city and coastal areas were significant though weak predictors of depressive mood, with these four variables explaining about 5.6% of the variance. It has been repeatedly shown that both depression and suicidal behaviors among adolescents are associated with a variety of socioeconomic conditions. For example, unemployment and economic hardship, interpersonal difficulties resulting from parental discord and family conflicts, interpersonal losses or parental divorce, parental mental disorders such as depression and psychoactive substance abuse and physical and sexual abuse during childhood and /or adolescence (Petersen et al. 1993; Diekstra 1997). Epidemiologic research has documented a number of consistently significant correlates of major depression, including stressful life events, low social support, personality and a range of demographic variables such as low socioeconomic status and being female and young (Horwath & Weissman 1995).

However, the results showed that socioeconomic variables measured in the doctoral study could only account for a small amount of depressive mood variance. As this model explains only a small proportion of the variance for the occurrence of depression, other factors must contribute. Genetic factors have been found to be a risk of depression (Gershon 1990; Jamison 1996; Tsuang & Faraone 1996). Furthermore, twin studies support deficiencies of norepinephrine and serotonin in depressed patients (Dubovsky & Buzan 1999). Psychological factors may also be active, such as lack of affection and overprotective and controlling parents (Parker et al. 1995), sexual and physical abuse (Brown & Harris 1993; Goodwin 2004), stressful life events (Canetti et al. 2000; Kohn and Keller 2003), poor coping techniques (Agid et al. 1999; Kasantikul 2004) and personality type (Cloninger 1986).

Hostility

Living in city and coastal areas as well as being a blue-collar worker were significant though weak predictors of hostility with the three variables explaining about 1.8% of the variance related to hostility. Studies isolating potential

socioeconomic factors have been conducted. For example, interpersonal relationships in the early stages of life, parental incompatibility, broken homes, and alcoholism in one or both parents, and aggressive behaviors have been shown to be important factors contributing to hostility (Orenstein 1963; Stolten 1981). Some researchers using the Cook-Medley self-report assessment of hostility found a significant relationship between greater levels of hostility and lower socioeconomic status (Lynch et al; Salonen 1997; Scherwitz et al. 1991). Scherwitz and his colleague (1991) also reported that socioeconomic status was inversely associated with item subsets from the Cook-Medley, which assesses cynicism, hostile attributions, aggressive responding, and hostile affect. Therefore, socioeconomic status may be associated with the cognitive, behavioral, and affective components of the hostility construct. Another study showed that women who had lower education levels tended to score higher on a measure of anger suppression (Matthews et al. 1989). In addition, Mittleman and colleagues showed that persons with lower levels of educational attainment were more likely to experience hostility that was triggered by anger (Mittelman et al. 1997; Gallo and Matthews 1999).

4.1 Recommendations

The findings of the present study suggest there is a high rate of risk of mental problems reported by young people in southern areas of Thailand, namely Nakhon Si Thammarat (45.5% in Pak Phanang, 43.8% in Muang and 33.5% in Lan Saka). This information should alert Government authorities and other community stakeholders of the danger so that as early as possible primary prevention strategies are employed to lower risks. For example, public health campaigns could be mounted that educate the public about worrying symptoms like somatization, obsessive compulsiveness, depressive mood, anxiety and hostility, especially targeting young people in schools, tertiary institutions and in diverse regional communities. As well, the results suggest that programs that enhance and promote physical activity, coping capacities, and communication skills are needed. Monitoring of mental health problems is essential. People in the community as well as health and educational staff need to be concerned

about the prevalence of mental health symptoms and problems, in order to prevent these problems developing into complex clinical disorders in adulthood.

The results provide evidence that those living in Pak Phanang (coastal district) and Muang (city district) have higher risks of mental difficulties. Therefore, areas like these should be especially targeted for mental health promotion and prevention. Additionally, given the social and economic problems these types of areas are suffering, Government agencies should be also addressing the stresses and strains that communities are under. For example, improving environmental and ecological damage, and developing sustainable industry and tourism. Assistance for young adults living in city and coastal areas especially, during uncertain financial times, should also be a priority to the Government of Thailand. Even in areas where the communities are not under extreme social pressures, such as mountain areas, young people in these areas were found to have worrying high levels of hostility and somatization. The percentage of mental health problems at a clinical level (SCL-90 T>63) provides an estimate of the number of young adults potentially needing professional help.

Hostility and aggression symptoms found in all areas should be addressed. Causes of these symptoms are unknown from this study; however, it is possible that lifestyle issues such as interacting with violent computer games, watching too much television, or spending too many hours on the Internet are potential contributing factors (Campbell 1996). Given the prevalence of symptoms, it would be beneficial to employ programs that teach coping strategies to young adults in Thailand. These could include problem solving, relaxation and breathing techniques, and strategies for changing negative thinking. Given trends in increased weight in Western countries, additional life skills could also be encouraged such as exercise, recreational and activity programs in educational institutions and in regional communities. Such programs assist people to manage difficult situations better (Department of Mental Health 2003). Increased liaison in Thailand should occur between relevant health authorities in order for health programs targeted at adolescents and young adults to be successful. For example, there ought to be increased cooperation between psychiatric

hospitals, general hospitals, and educational institutes (Department of Mental Health 2003). In fact, a national action plan for mental health promotion, prevention, and initial intervention should be developed because of the high prevalence found in this study, especially concentrating on areas where greater risks exist.

4.2 Recommended further research

This study has isolated the prevalence of mental health problems in young adults in diverse geographical regions in Thailand, and explored associations between mental health and factors that have the potential to mediate risks (such as sex, employment, income etc.). However, while the percentage of people with mental health symptoms was achieved, many questions remain unanswered by this doctoral research. In-depth comprehensive research is now needed that explores possible connections between factors like education, gender, geographical region and the risk of mental health problems. This research should be conducted in diverse geographical areas and in additional areas of Thailand as well. This study was not designed as an epidemiological study. It has provided broad percentages that could only provide estimates of mental health problems. Further epidemiological research involving the study of mental problems should be also undertaken in different Thai geographical zones such as provinces in the North, Northeast, and the central parts in Thailand, so that a reliable national epidemiological picture can be achieved.

It was disappointing that only weak relationships were found between socioeconomic status and mental health problems (that is, R-values of around .13 to .29). Future research should investigate other variables that may contribute to mental health problems. This would mean studying large numbers of subjects with a comprehensive demographic, genetic, social, physical, and psychological assessment regimen, to ensure that the regression statistic would provide a more reliable and fuller account of potential mediating and contributing factors that determine mental health outcome. Such a study would provide information on factors that contribute variance to mental health problems. Whatever the case, this doctoral research has provided valuable preliminary data on the influence of factors such as geographical

region, sex, income and so on, that may determine mental health status in young adults in Thailand.

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APPENDICES

Appendix 1: Participant letter and survey

Nakhon Si Thammarat Rajabhat University

Muang, Nakhon Si Thammarat, 80280.

1 March 2004

Dear Participant

I am an Assistant Professor in the Department of Psychology, Nakhon Si Thammarat Rajabhat University. I am currently studying at the Faculty of Science, University of Technology, Sydney, Australia and I am conducting the research as the part of my doctoral dissertation. The topic of my research is "Socioeconomic status and mental health in young adults". It is being conducted under the principle supervision of Professor Ashley Craig.

This survey is designed to investigate the mental health status in young adults and its relationship to socioeconomic factors. The results of this study will assist the public health authorities to understand mental health problems as well as address mental health problems in our communities. There are two parts of questions

Part 1 Interview questions requested for demographic information.

Part 2 Symptom Checklist-90-R

Please answer all questions as realistically as possible and note that there are no right or wrong answers. Your answers to the questions will be kept anonymously, that is no one will be able to link your name to your results. Also your identity will remain strictly confidential. Data will reported only in groups.

Thank you for your cooperation.

Suwimol Densoontorn
Department of Psychology,
Nakhon Si Thammarat Rajabhat University
Muang, Nakhon Si Thammarat 80280.

Part 1: Please provide the information about yourself by checking the appropriate response and/ or entering needed data.

1. Area_____
2. Age_____
3. Sex_____
4. Education
   - ☐ Primary School
   - ☐ Secondary School
   - ☐ Technical or vocational college/ Deploma
   - ☐ Bachelor degree
   - ☐ Master degree
5. Income per month_____Baht
6. Occupation_____position_____level_____
   - ☐ Student
   - ☐ Unemployed
   - ☐ agriculture/fisherman
   - ☐ Blue collar worker
   - ☐ Clerical sales & service worker
   - ☐ Government officer
   - ☐ Others

Part 2 SCL-90-R

DIRECTIONS:

1. Use a lead pencil only and make a circle when responding to the items on pages 2 and 3.
2. If you want to change and answer, erase carefully and then fill in your new choice.

INSTRUCTIONS:

Below is a list of problems people sometimes have. Please read each one carefully, and blacken the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Blacken the circle for only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example before beginning, and if you have any questions please ask them now.

A LITTLE BIT	MO DERATE LY	QUITE A BIT	EXTREM LY	HOW MUCH WERE YOU DISTRESSED BY

1	2	3	4	1. Headaches
1	2	3	4	2. Nervousness or shakiness inside
				3. Repeated unpleasant thoughts that won't leave your mind
				4. Faintness or dizziness
				5. Loss of sexual interest or pleasure
				6. Feeling critical of others
				7. The idea that someone else can control your thoughts
				8. Feeling others are to blame for most of your troubles
				9. Trouble remembering things
				10. Worried about sloppiness or carelessness
				11. Feeling easily annoyed or irritated
				12. Pains in heart or chest
				13. Feeling afraid in open spaces or on the streets
				14. Feeling low in energy or slowed down
				15. Thoughts of ending your life
				16. Hearing voices that other people do not hear
				17. Trembling
				18. Feeling that most people cannot be trusted

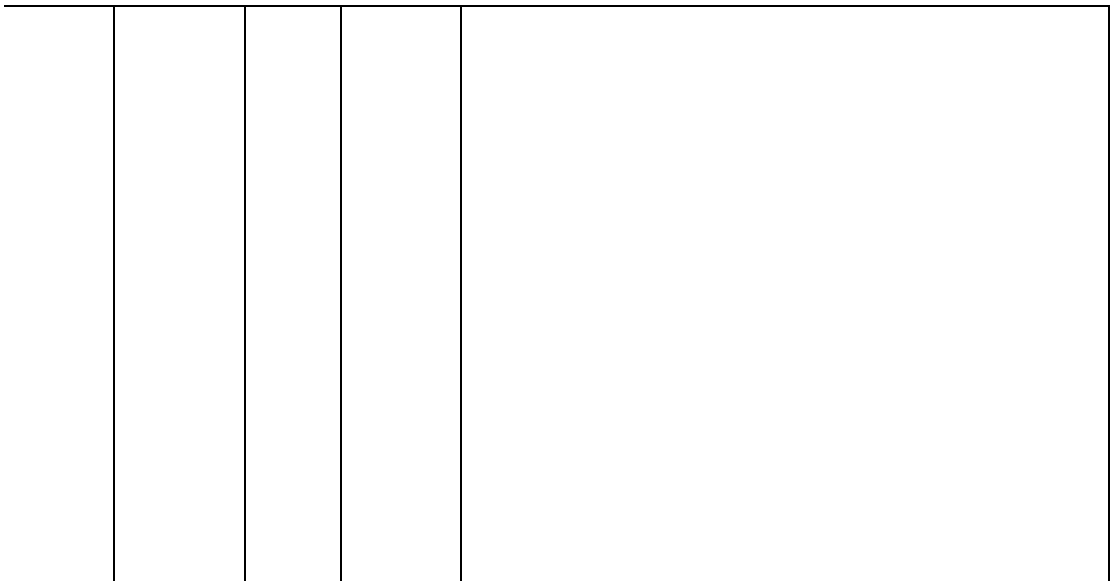
				19 . Poor appetite 20. Crying easily 21. Feeling shy or uneasy with the opposite sex 22. Feelings of being trapped or caught 23. Suddenly scared for no reason 24. Temper outbursts that you could not control 25. Feeling afraid to go out of your house alone 26. Blaming yourself for things 27. Pains in lower back 28. Feeling blocked in getting things done 29. Feeling lonely 30. Feeling blue 31. Worrying too much about things 32. Feeling no interest in things 33. Feeling fearful 34. Your feelings being easily hurt 35. Other people being aware of your private thoughts 36. Feeling others do not understand you or are

				unsympathetic 37. Feeling that people are unfriendly or dislike you 38. Having to do things very slowly to insure correctness 39. Heart pounding or racing 40. Nausea or upset stomach 41. Feeling inferior to others 42. Soreness of your muscles 43. Feeling that you are watched or talked about by others 44. Trouble falling asleep 45. Having to check and double-check what you do 46. Difficulty making decisions 47. Feeling afraid to travel on buses, subways, or trains 48. Trouble getting you breath 49. Hot or cold spells 50. Having to avoid certain things, places, or

				activities because they frighten you 51. Your mind going blank 52. Numbness or tingling in parts of your body 53. A lump in your throat 54. Feeling hopeless about the future 55. Trouble concentrating 56. Feeling weak in parts of your body 57. Feeling tense or keyed up 58. Heavy feelings in your arms or legs 59. Thoughts of death or dying 60. Overeating 61. Feeling uneasy when people are watching or talking about you 62. Having thoughts that are not your own 63. Having urges to beat, injure, or harm someone 64. Awakening in the early morning 65. Having to repeat the same actions such as

				touching, counting, or washing 66. Sleep that is restless of disturbed 67. Having urges to break or smash things 68. Having ideas or beliefs that others do not share 69. Feeling very self-conscious with others 70. Feeling uneasy in crowds, such as shopping or at movie 71. Feeling everything is an effort 72. Spells of terror or panic 73. Feeling uncomfortable about eating or drinking in public 74. Getting into frequent arguments 75. Feeling nervous when you are left alone 76. Others not giving your proper credit for your achievements 77. Feeling lonely even when you are with people

				78. Feeling so restless you couldn't sit still 79. Feelings of worthlessness 80. The feeling that something bad is going to happen to you 81. Shouting or throwing things 82. Feeling afraid you will faint in public 83. Feeling that people will take advantage of you if you let them 84. Having thoughts about sex that bother you a lot 85. The idea that you should be punished for your sins 86. Thoughts and images of a frightening nature 87. The idea that something serious is wrong with your body 88. Never feeling close to another person 89. Feelings of guilt 90. The idea that something is wrong with your mind



Appendix 2: Ethics approval letter (follows on page 145)

Appendix 3: Descriptive data for all symptoms

Table 45 Mean and SD of Somatisation effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.70	0.52	0.65-0.75
Coastal	400	0.82	0.54	0.77-0.88
City	400	0.83	0.51	0.78-0.88
Area				
Urban	327	0.83	0.56	
Rural	873	0.77	0.51	
Sex				
Male	600	0.74	0.51	
Female	600	0.83	0.54	
Education				
Primary	54	0.75	0.58	0.60-0.91
Secondary	621	0.75	0.51	0.71-0.79
Diploma	273	0.78	0.52	0.72-0.84
Bachelor	252	0.89	0.55	0.82-0.96
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.78	0.52	0.74-0.81
Married	64	0.93	0.53	0.80-1.06
Divorced	3	1.06	0.75	-0.80-2.91
Widowed	4	1.44	0.64	0.41-2.46

Table 46 Mean and SD of Compulsive Obsession effects

	N	Mean	SD	95% CI
District				
Mountain	400	1.13	0.63	1.07-1.19
Coastal	400	1.23	0.54	1.17-1.28
City	400	1.21	0.57	1.16-1.27
Area				
Urban	327	1.26	0.59	
Rural	873	1.17	0.58	
Sex				
Male	600	1.13	0.60	
Female	600	1.25	0.56	
Education				
Primary	54	1.06	0.73	0.87-1.26
Secondary	621	1.15	0.55	1.11-1.20
Diploma	273	1.18	0.59	1.11-1.25
Bachelor	252	1.32	0.61	1.24-1.40
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	1.19	0.58	1.15-1.22
Married	64	1.22	0.56	1.08-1.36
Divorced	3	1.50	0.87	-0.65-3.65
Widowed	4	1.43	0.30	0.95-1.90

Table 47 Mean and SD of Interpersonal sensitivity effects

	N	Mean	SD	95% CI
District				
Mountain	400	1.02	0.60	0.96-1.08
Coastal	400	1.16	0.56	1.11-1.22
City	400	1.15	0.57	1.10-1.21
Area				
Urban	327	1.17	0.61	
Rural	873	1.09	0.57	
Sex				
Male	600	1.02	0.60	
Female	600	1.20	0.55	
Education				
Primary	54	0.92	0.64	0.75-1.10
Secondary	621	1.10	0.57	1.05-1.14
Diploma	273	1.08	0.58	1.02-1.15
Bachelor	252	1.21	0.60	1.14-1.28
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	1.11	0.58	1.07-1.14
Married	64	1.19	0.56	1.05-1.33
Divorced	3	1.37	1.03	-1.18-3.92
Widowed	4	1.11	0.56	0.22-2.00

Table 48 Mean and SD of Depression effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.92	0.61	0.86-0.98
Coastal	400	1.02	0.57	0.97-1.08
City	400	1.00	0.54	0.95-1.05
Area				
Urban	327	1.06	0.61	
Rural	873	0.95	0.56	
Sex				
Male	600	0.86	0.55	
Female	600	1.10	0.58	
Education				
Primary	54	0.87	0.61	0.71-1.04
Secondary	621	0.97	0.57	0.93-1.02
Diploma	273	0.95	0.56	0.88-1.02
Bachelor	252	1.06	0.58	0.98-1.13
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.97	0.58	0.94-1.01
Married	64	1.04	0.59	0.89-1.19
Divorced	3	1.49	0.39	0.51-2.47
Widowed	4	1.16	0.13	0.90-1.33

Table 49 Mean and SD of Anxiety effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.80	0.58	0.74-0.85
Coastal	400	0.89	0.53	0.84-0.95
City	400	0.94	0.54	0.89-1.00
Area				
Urban	327	0.96	0.58	
Rural	873	0.85	0.54	
Sex				
Male	600	0.81	0.55	
Female	600	0.94	0.55	
Education				
Primary	54	0.79	0.63	0.62-0.96
Secondary	621	0.85	0.54	0.80-0.89
Diploma	273	0.85	0.53	0.79-0.92
Bachelor	252	1.01	0.58	0.93-1.08
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.87	0.56	0.84-0.90
Married	64	0.97	0.50	0.84-1.09
Divorced	3	1.00	0.70	-0.74-2.74
Widowed	4	1.18	0.45	0.46-1.89

Table 50 Mean and SD of Hostility effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.75	0.67	0.68-0.82
Coastal	400	0.85	0.57	0.80-0.91
City	400	0.89	0.61	0.83-0.95
Area				
Urban	327	0.93	0.68	
Rural	873	0.79	0.59	
Sex				
Male	600	0.81	0.64	
Female	600	0.85	0.61	
Education				
Primary	54	0.69	0.63	0.51-0.86
Secondary	621	0.82	0.61	0.77-0.87
Diploma	273	0.82	0.59	0.75-0.89
Bachelor	252	0.92	0.68	0.82-0.99
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.82	0.62	0.79-0.86
Married	64	0.89	0.55	0.76-1.03
Divorced	3	1.56	1.17	-1.35-4.46
Widowed	4	0.96	0.55	0.08-1.83

Table 51 Mean and SD of Phobia effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.82	0.59	0.76-0.88
Coastal	400	0.90	0.57	0.84-0.95
City	400	0.92	0.55	0.87-0.98
Area				
Urban	327	0.95	0.60	
Rural	873	0.85	0.56	
Sex				
Male	600	0.76	0.54	
Female	600	1.00	0.58	
Education				
Primary	54	0.76	0.66	0.58-0.94
Secondary	621	0.86	0.56	0.82-0.90
Diploma	273	0.86	0.54	0.80-0.93
Bachelor	252	0.98	0.60	0.90-1.05
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.88	0.57	0.84-0.91
Married	64	0.92	0.60	0.77-1.08
Divorced	3	1.29	0.65	-0.34-2.91
Widowed	4	1.25	0.82	0.01-2.55

Table 52 Mean and SD of Paranoid effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.89	0.61	0.83-0.95
Coastal	400	1.03	0.55	0.98-1.08
City	400	1.06	0.56	1.01-1.12
Area				
Urban	327	1.08	0.61	
Rural	873	0.97	0.56	
Sex				
Male	600	0.94	0.60	
Female	600	1.05	0.56	
Education				
Primary	54	0.91	0.67	0.73-1.10
Secondary	621	0.95	0.55	0.91-1.00
Diploma	273	0.98	0.60	0.91-1.05
Bachelor Degree	252	1.14	0.59	1.07-1.22
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.99	0.58	0.96-1.02
Married	64	1.11	0.55	0.98-1.25
Divorced	3	1.28	0.38	0.32-2.23
Widowed	4	1.13	0.60	0.17-2.08

Table 53 Mean and SD of Psychoses effects

	N	Mean	SD	95% CI
District				
Mountain	400	0.73	0.58	0.67-0.79
Coastal	400	0.87	0.52	0.82-0.92
City	400	0.87	0.51	0.82-0.92
Area				
Urban	327	0.92	0.56	
Rural	873	0.79	0.54	
Sex				
Male	600	0.80	0.56	
Female	600	0.84	0.53	
Education				
Primary	54	0.73	0.58	0.57-0.89
Secondary	621	0.80	0.53	0.76-0.84
Diploma	273	0.80	0.56	0.73-0.86
Bachelor	252	0.93	0.55	0.86-0.99
Occupation				
Student	784			
Unemployment	128			
Agriculture	48			
Worker	191			
Business owner	34			
Government officer	15			
Marital				
Single	1129	0.82	0.55	0.79-0.85
Married	64	0.87	0.46	0.75-0.98
Divorced	3	1.43	0.67	-0.22-3.08
Widowed	4	1.23	0.47	0.47-1.98

Appendix 4

Reliability of interviewers

Staff interviewers were trained by the chief investigator in this research to conduct the interview with a gentle and careful manner. Before seeking information, they established a friendly relationship of trust and confidence between interviewer and participant called rapport. Respondents were informed that the information will be kept confidential and the information cannot be released without their written consent. In addition, the researcher told participants how information would be useful to them. Therefore trust occurs. As the rapport develops, the interviewee is more likely to be relaxed and appreciable, to think, and talk about their problems. When trust occurred, participants are more likely to give reliable and valid information (Craig, 2004; Gaskell 2000). If participants feel distrustful and it has not been suitably addressed, the information they give may be imprecise. However, if participants feels that their interviewer is frank and sincere, they will provide more reliable information over time (Craig 2004). In addition, interviewers were trained to alert for inconsistencies in interviewee answers, when they occur, recheck the information in question. This rechecking is required to be handled competently and in neutral manner, not in an apparent or blaming manner. Avoid something like, "Earlier you said_____, and now you are saying_____. Which is it? (Shipley 1997).

Confidentiality of interviewers

At the stage of establishing rapport, participants were confirmed that all participant records involved in interview are confidential. In general, information may not be released without obtaining signed informed consents besides medical emergencies. The patients were also informed the right of their confidentiality prior to collecting information (Craig, 2004). In addition, an initial approach letter included an information sheet providing some background and the usefulness of the research (such as for planning and providing mental health services in the community) including, a promise of

confidentiality. When closing the interview, express gratitude the respondent and reassure them of confidentiality (Gaskell 2000).

Statistical Power

Many researchers consider statistical significance as the key concept when undertaking their studies causing them to have experience many difficulties. For example, spending a lot of time carrying out the study and not being bale to find anything or unable to find true difference between the null hypothesis and an alternative hypothesis. This is because they ignore another important type of error (Howell 2004).

Statistical decision	True state of null hypothesis	
	H_0 True	H_0 False
Reject H_0	Type I error α = significant level	Correct decision 1- β = statistical power
Accept H_0	Correct decision P = 1- α	Type II error P = β

There are two types of significance testing errors (Ruangpraphan 2000). Type I error is the error occurring when a true null hypothesis is rejected. Type II error happens when a false null hypothesis is accepted. Size of Type I error is the probability of occurring Type I error designated by the Greek letter alpha (α) and the size of Type II error is the probability of a Type II error designated by the Greek letter beta (β).

α = the probability of occurring Type I error

= P (reject H_0 when H_0 is true)

P (accept H_0 when H_0 is true) + P (reject H_0 when H_0 is true) = 1

P (accept H_0 when H_0 is true) = 1- P (reject H_0 when H_0 is true)

= 1- α

= the probability of correct decision

β = the probability of a Type II error

= P (accept H_0 when H_0 is false)

P (reject H_0 when H_0 is false) + P (accept H_0 when H_0 is false) = 1

P (reject H_0 when H_0 is false) = 1- P (accept H_0 when H_0 is false)

= 1- β

= Statistical Power

Statistical Power is the probability that will reject a false null hypothesis (reject H_0 when it is false). In other words, power is the probability that the test accepts a true research hypothesis (Rosenthal, 2001). Another concept of statistical power is its ability to avoid committing a Type II error (Weinbach & Grinnell 2004). Power is defined as 1- β where β is the Type II error. Beta is the probability of accepting H_0 when it is false. If the power is low, the study is more likely to be inconclusive. It is important to consider power before conducting the research. α and β are the probability of incorrect decision where 1- α and 1- β are the right decision. Researcher should decrease the two types of errors. Type I (α) and Type II (β) errors decrease when sample size increase.

Factors affecting Power

1. Sample size:

The law of averages states that larger samples result in less sampling error than smaller samples. Therefore, a large sample size is more likely to release sampling error. Increasing in samples will increase statistical power. Large sample causes statistical test powerful. With larger samples, researchers are more likely to find a true relationship. Sample size increase, sampling error tends to decrease. When sample size is small, a number of sampling error is more likely to be present causing the probability of an incorrect decision (type II error) is high and power is low. When sample size is small, although large associations or large differences are often not statistically significant. On the contrary, when sample size is very large, even small associations are often significant. A larger sample size, a lesser sampling error. Because sampling error is minimal, one can be confident that sample result is very similar to actual population condition (Rosenthal 2001; Weibach & Grinnell 2003).

2. Significance level

The probability of a type II error, beta, is lower when selecting the statistical significance of .05 than .01 because the rejection areas of the sampling distribution are larger. Using the choice of the .05 level rather than the .01 level, (other things being equal) can increase power. The selecting higher rejection level at the beginning of a study such as the significant level of .10 as the cutoff point instead of the traditional .05, .01 can reduce the likelihood of committing a Type II error and thus make the statistical analysis more powerful, however, the probability of Type I error tend to increase ((Rosenthal 2001; Weibach & Grinnell 2003).

3. Effect size

Effect size is the amount of influence that the independent variables associate with the dependent variables. If the independents and dependent variables are strongly related, it is assured that the relationship in the statistical analysis will occur. If the relationship is very weak but some weak relationships between variables is still interested, the likelihood of a Type II error is much greater (Weibach & Grinnell 2003).

4. Variability

The lower the variance and standard deviation, the greater the power. In studying the relationship between variables with larger standard deviations, it has a tendency to commit a Type II error. Examining relationships between variables with larger variability can cause a greater likelihood of sampling error resulting in unable to reject the null hypothesis, although, variables are really related. A higher risk of committing a Type II error occurs.

5. Directional hypotheses and one tail test

Theory, research, logic indicates that the population parameter differ in a particular direction from the value stated in the null hypothesis, power is increased by using a directional hypothesis pair which call one tail test. One-tailed research hypothesis will produce a single, larger rejection region than using a two-tailed research hypothesis and will thus decrease the chance of committing a Type II error. The rejection region will be twice as large as either of the two rejection regions when a two-tail research hypothesis is used (Weinbach & Grinbach 2003).

In conclusion, factors that influence statistical power are: (1) the larger sample is used rather than the smaller, (2) A higher rejection level is selected, (3) The strong relationship between variables is found rather than weak, (4) the small variability of the variables is small rather than large (5) A one-tail research hypothesis is used (Weinbach & Grinnell 2003).

How much power is enough?

Conventionally, the accepted standard for power is .80 or above and the traditional statistical significance level is 0.05. When power is .80, the probability of 80% of rejecting a false null hypothesis. In this condition, beta or the probability of a type II error is .20. At the statistical significant level of .05, the risk of type I error is .05. The traditional science accept a risk of type II error that is four time higher than that for type I error (.20/.05 = 4 time) (Rosenthal 2001).

Statistical Power of the Multivariate Tests

Statistical power in multivariate analysis is based on the alpha level, the effect size, and the sample size (Hair et al. 1998). If alpha increases, power will decrease. For example, selecting a significance level at .05 instead of .01 causes power to increase. Level of power in MANOVA is presented in the four statistical tests such as Roy's gcr, Wilks' lambda, Hotelling's trace, or Pillai's criterion. The other methods to increase power that are increasing effect size and sample size. Effect size is the differences in-group means divided by their standard deviation. The extent of the effect size has affected on the power of the test. It will be higher, if the effect size is large. Conversely, if an effect size is small, taking a larger sample size might increase the same power as having a large effect size.

Power in multiple regressions refers to the probability of detecting as statistically significant level for a specific level of R^2 or a regression coefficient at a specified significance level for a specific sample size (Hair et al. 1998). Sample size has direct and substantial impact on power. The researcher can also control the sample size needed to discover effects for independent variables given the expected effect size (correlation), the alpha level, and the power desired (Hair et al. 1998).

Box's M

Box's M is "statistical test for the homogeneity of variance/covariance matrices of the dependent variables across the groups (Haair et al. 1998).

Bartlett test of sphericity

Bartlett test of sphericity is used to examine the correlations among all dependent variables and assesses whether significant intercorrelaton exist.