

อุบัติการณ์และปัจจัยที่เกี่ยวข้อง ในการพยายามฆ่าตัวตาย  
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ประเทศศรีลังกา

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INCIDENCE OF SUICIDAL ATTEMPTS AND ITS ASSOCIATED  
FACTORS AT BADULLA PROVINCIAL GENERAL  
HOSPITAL, SRI LANKA

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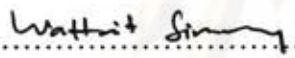
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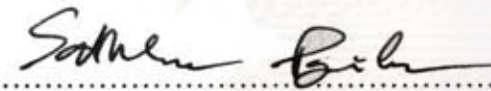
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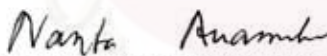
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อาชานกา วีตามูรา : อุบัติการณ์และปัจจัยที่เกี่ยวข้อง ในการพยายามฆ่าตัวตาย ณ  
โรงพยาบาลทั่วไป จังหวัดบาดุลลา ประเทศศรีลังกา (INCIDENCE OF SUICIDAL ATTEMPTS  
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ประเทศศรีลังกา เป็นประเทศที่มีอัตราการฆ่าตัวตายสูง โดยมีปัญหาการฆ่าตัวตายสูงถึง 40 คน / 100,000 คน เมื่อเปรียบเทียบกับประเทศที่พัฒนาแล้ว ในสัดส่วนที่ต่ำกว่าคือ 8 คน / 100,000 คน จากการศึกษาในอดีตสนับสนุนเช่นกันว่า อัตราการตายที่เกิดจากการฆ่าตัวตายในศรีลังกาสูง (12.7 %) เมื่อเปรียบเทียบกับประเทศอื่น (1-2%) การวางแผนและป้องกันการฆ่าตัวตายในศรีลังกาจึง เป็นสิ่งที่จำเป็น และสมควรเป็นนโยบายที่สำคัญของประเทศ การศึกษาเรื่องปัจจัยที่เกี่ยวข้องกับการ พยายามฆ่าตัวตายเป็นสิ่งสำคัญมาก และถึงแม้ว่าจะมีการศึกษาในเรื่องนี้ในบางพื้นที่ในศรีลังกา แต่ การศึกษานี้จะเป็นการศึกษาครั้งแรกที่ จังหวัดบาดุลลา ซึ่งอยู่ในภาคกลางของประเทศ เป้าหมายของ การวิจัยในครั้งนี้ เพื่อต้องการศึกษาปัจจัยที่เกี่ยวข้องกับการฆ่าตัวตายใน จังหวัดบาดุลลา ประเทศ ศรีลังกา ซึ่งเป็นการศึกษาย้อนหลัง ในระยะเวลาและช่วงเวลาเดียวกัน การศึกษานี้ดำเนินการที่ โรงพยาบาลทั่วไปของ จังหวัดบาดุลลา ประเทศศรีลังกา โดยใช้คนไข้ที่พยายามฆ่าตัวตายตั้งแต่วันที่ 1 มกราคม 2551 – 31 ธันวาคม 2551 จำนวน 391 คน ข้อมูลต่างๆเหล่านี้ ได้จาก การค้นคว้าจาก เวชระเบียนของโรงพยาบาล ผลการศึกษาพบว่า 2 ใน 3 ของผู้พยายามฆ่าตัวตายมีอายุต่ำกว่า 30 ปี ซึ่งส่วนใหญ่เป็นเพศชาย ชนกลุ่มน้อยคือ ทามิลอินเดียน เป็นกลุ่มที่มีความพยายามฆ่าตัวตายสูงสุด เมื่อเปรียบเทียบกับชนกลุ่มอื่นๆ 50% ของผู้ฆ่าตัวตาย เป็นคนโสด และคนส่วนใหญ่จาก 391 ราย มี จำนวนถึง 369 รายที่ฆ่าตัวตายโดยใช้สารพิษคือยาฆ่าแมลง การสังเกตความผิดปกติเบื้องต้นของผู้ พยายามฆ่าตัวตายจะเป็นมาตรการสำคัญที่มีประสิทธิภาพในการป้องกันการฆ่าตัวตายรวมทั้ง การ วิเคราะห์การพยายามและฆ่าตัวตายทางจุลภาค จะสามารถสืบหาผู้มีความเสี่ยงในการฆ่าตัวตายได้ดี ขึ้น นอกเหนือจากโปรแกรมการลดความจน ข้อมูลจากชุมชนด้านสังคม สุขภาพจิต และการพัฒนา ชุมชนด้านสุขภาพ และความร่วมมือ จากองค์กรที่ไม่หวังผลประโยชน์ต่าง สามารถช่วยในการลด จำนวนการฆ่าตัวตายลงไปได้ด้วย

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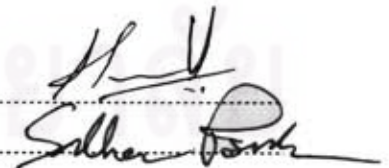
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ASANKA WEDAMULLA: INCIDENCE OF SUICIDAL ATTEMPTS AND ITS ASSOCIATED FACTORS AT BADULLA PROVINCIAL GENERAL SRI LANKA. ADVISOR: ASSOC.PROF.SATHIRAKORN PONGPANICH, Ph.D., 87 pp.

Suicide rate in Sri Lanka is higher compared to some countries. It is about 40 per 100,000 compared to 8 per 100,000 in developed countries (UK). According Eddleston et al (1998) mortality associated with suicide attempts is high (12.7%) in Sri Lanka compared to other countries (1-2% in UK). Therefore prevention of suicide and deliberate self-harm is a priority in the health services in Sri Lanka. It is important to recognize and understand factors associated with suicidal behaviour when planning interventions and preventive strategies. The goal of this research was to investigate factors associated with suicide in Badulla district in Sri Lanka. This study was a retrospective cross-sectional study. The study was carried out at the Provincial general hospital Badulla, Badulla district, Uva province, Sri Lanka. All patients who were admitted to Provincial general hospital Badulla, Sri Lanka, with suicide attempts between 1st January 2008 and 31st December 2008 were included in this study. There were 391 patients admitted with suicide attempts. Data was collected from patients' medical notes using a data collection tool. Results showed that about two third of the people who took an overdose was below the age of 30. More than 50% of suicide attempters were single. Out of the sample size of 391 patients, 369 patients who performed suicide attempts were by poisoning. Effective suicide preventive and control measures need to be taken in the form of early identification of suicide-prone individuals. Micro-level analysis of suicides and suicidal attempts are required to identify high risk population. Apart from strengthening poverty improvement programs, input from Department of Community Medicine in medical colleges are required in sociology, mental health and community health development.

Field of Study : Public health..... Student's Signature.....

Academic Year : 2009..... Advisor's Signature.....



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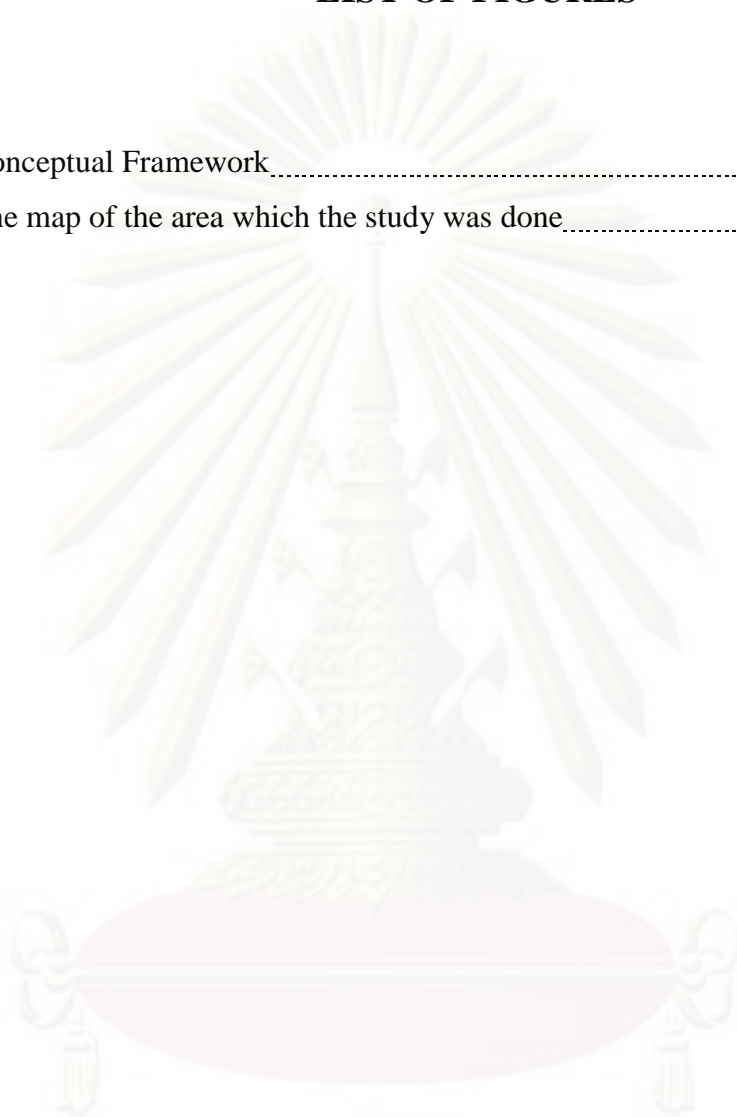
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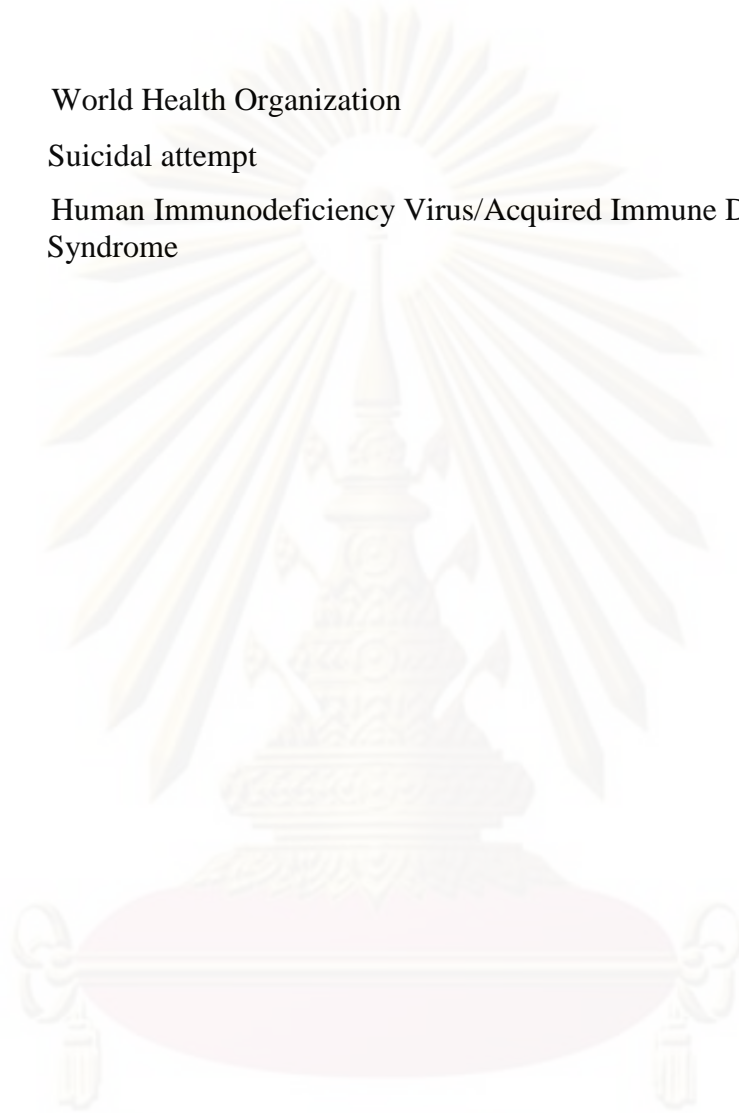
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## LIST OF ABBREVIATIONS

WHO	World Health Organization
SA	Suicidal attempt
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome



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# CHAPTER I

## INTRODUCTION

### 1.1 Background and rationale

In recent years there have been increased focuses on risk factors associated with self-harming behavior. There are many studies done in western world and South East Asia trying to explore various risk factors associated with self harming behavior and suicidal attempts. Main objective of all these studies is to develop strategies to minimize risk factors which would in turn leads to an reduction self harming and suicidal attempts Some of these efforts have lead to a decrease in overall suicidal rate. For an example in the UK, since 1998, pharmacies have not been permitted to see more than 32 tablets and other shops can sell only up to 16 tablets. This lead to a reduction in suicide rate from 212 per year to 154 per year over next 5 years (Hawton et al, 2004).

However still suicide remains one of the three leading causes of death among people aged 15-34 years (WHO, 1999). Until recently, suicide has been a main cause of death among the elderly, but it has now been predominating among younger people in a third of all countries (WHO, 1999).

Mental disorders (particularly depression and alcohol use disorders) are a major risk factor for suicide in Europe and North America; however, in Asian countries impulsiveness plays an important role. Suicide is complex with psychological, social, biological, cultural and environmental factors involved (WHO, 2008).

The WHO estimates, in the year 2000, approximately one million people died from suicide, and 10 to 20 times more people attempted suicide worldwide. This represents one death every 40 seconds and one attempt every 3 seconds, on average. In 2002, the WHO estimated that there will be approximately 1.53 million people who will die by suicide in the year 2020, according to current trends. Worldwide, suicide



attempts will be about 10-20 times more than deaths by suicide. This is an average of one suicide every 20 seconds and every 1-2 seconds, there will be a suicide attempt.

In addition, Asia accounts for 60 percent of the world's suicides, so at least 60 million people are affected by suicide or attempted suicide in Asia each year (Beautrais, 2006). Although, suicide has received relatively less attention in Asia than it has in Europe and North America, lack of resources and competing priorities in many Asian countries have contributed to this under-emphasis (Suicide and Suicide Prevention in Asia, 2008). Cultural influences, religious sanctions, stigmatization of the mentally ill, political imperatives, and socio-economic factors have also played a significant role. As a result, the magnitude of the problem is unknown in some Asian countries and – although there are some highlights in terms of preventive initiatives – overall efforts are uncoordinated, under-resourced, and generally unevaluated (Vijayakumar et al., 2005a; Vijayakumar et al., 2005b; Vijayakumar et al., 2005c; Beautrais, 2006; WHO, 2007).

Sri Lanka is an agricultural island in South Asia, located about 31 kilometers off the southern coast of India and consists of a population of 20.2 million. Ethnically, Sri Lanka's population is divided among Sinhalese 73.8%, Sri Lankan Moors 7.2%, Indian Tamil 4.6%, Sri Lankan Tamil 3.9%, other 0.5%, unspecified 10%.

In Sri Lanka with the improvement of socio-economic status, literacy, and health services, especially preventive health services, morbidity and mortality from communicable diseases have declined, while that of non communicable diseases such as coronary heart disease, diabetes mellitus, hypertension, trauma, accidents and suicide are increasing (Fernando, 2002).

In the 1950s, Sri Lanka had a low suicide rate of 6 per 100,000. This rate doubled to 12 per 100,000 by 1964 and increased to 19 per 100,000 by 1969. The overall suicide rate has registered a four-fold increase since 1950. The increase is still higher for males and is nearly five-fold, from 0.11/1,000 population to 0.51/1,000 population from 1950 to 1999. The corresponding rates for females are 0.06/1,000 population and 0.16/1,000 population respectively (Department of Census and Statistics Sri Lanka, 2006).

Recent statistics obtained from Sri Lanka police studies in the years 2005 to 2008 show a decrease in suicide rates (Srilanka police, 2008). However, gender differentials are discernible as suicide is seen as an easy way out of a problem by more men than women, at any particular time interval of the lifespan (Srilanka police data, 2006). The gender gap appears to have narrowed over the years, as reflected by the relative frequency of suicides. The probability of a man committing suicide was three times higher than that of a woman in 2005, whereas it is found to be almost four times higher in 2008.

The statistics also show a decrease in the total numbers of suicide for both males and females from the years 2005 to 2008. Drinking insecticides & pesticides as well as strangulation seems to be the most common modes of suicide, although other modes such as burning oneself and eating natural poisons have also been reported. However, burning oneself seems to be more common among women, whereas other modes seem to be more common among males when compared to the female victims.

Statistics for suicides among ethnicity and religion obtained from Sri Lanka police studies show a high prevalence of suicide among Sinhala Buddhists when compared with any other race and religion (Srilanka police, 2008). The suicide numbers seem to have decreased from 2005 to 2008 although; male victims continue to remain high when compared with female victims (Srilanka police, 2008).

Main reasons resulting in suicide from these statistics are economic problems, harassment by the husband & family disputes, addiction to narcotic drugs, chronic diseases & physical disabilities and mental disorders. However, no drastic fluctuations can be seen among the statistics reported for suicide reasons between 2005 to 2008 and the male victims continue to remain high compared to the females (Srilanka police, 2008).

As indicated in the statistics from the 2005 to 2008 police statistics, the occupations with the highest rates of suicide are agricultural, animal husbandry, fishing & related forestry work, unemployed persons, production process workers, craftsman, equipment operators & laborers with male victims contributing at a higher rate towards suicide (Srilanka police, 2008).

There are various measures taken by the government to reduce suicides in Sri Lanka. Ex-A special commission was set up by the Sri Lankan government in 1995 to provide advice to reduce the rising incidence of suicide and pesticide poisoning between the ages of 15-49. But suicide is still on the rise.

The goal of this research is to investigate factors associated with suicide in Sri Lanka thus determine ways to reduce suicides.

This study was conducted in Badulla, which is the capital of Uva Province, Sri Lanka consisting of an area of 2,861 km<sup>2</sup>. It is located about 230km away from Colombo (capital) towards the eastern slopes of central hills of Sri Lanka. The ethnic community of Badulla consists of Sinhalese (74 percent), Moors (14 percent), Tamils (11 percent) and other minorities (1 percent). The economy of this area is mainly based on agriculture, farming and livestock. Main agricultural products are tea, vegetable and rice Uva province consists of 2 districts with one hospital in each. Badulla provincial general hospital has been chosen to conduct this study, as the only psychiatrist available for the Uva region is based in this hospital. Badulla general hospital consists with 1300 beds. Patients are first admitted to Emergency treatment unit, then as per their condition the patients are transferred to medical, surgical and psychiatric ward. Doctors will be allocated in each department as follows: emergency treatment unit – 5 doctors, Medical – 16 doctors + 2 consultants, Surgical – 14 doctors + 2 consultants, Psychiatry – 3 doctors+ 1 consultant.

Even though there is a stigma attached to suicide, research efforts would definitely pave the way for possible suicide preventive strategies. From this research mental health professionals may get an insight into factors associated with suicidal behavior thus take actions to reduce the number of suicides.

These findings help in understanding the magnitude of the factors and especially psychological characteristics therefore, allowing prevention strategies to be developed. Also awareness programmes can be conducted for the potential groups, these in depth studies help in service planning by mental health professionals in Badulla district in order to prevent further suicidal behaviors.

## **1.2 Research Questions**

1. What are the socio-economic, demographic, and behavioral and Physical & Psychological factors of patients who have attempted suicide and have been admitted to Badulla General Hospital in Sri Lanka?
2. What is the incidence of suicidal attempts in Badulla General Hospital, Sri Lanka?
3. What is the association between these characteristics with attempted suicides in patients attending Provincial General Hospital, Badulla in Sri Lanka?

## **1.3 Research objective**

### **1.3.1 General objective**

To determine the factors that influence suicidal attempted in patients attending provincial General Hospital Badulla.

### **1.3.2 Specific objectives**

- i. To assess demographic factors which are related to suicidal attempts.
- ii. To identify socio-economic factors which are related to suicidal attempts.
- iii. To describe behavioral factors which are related to suicidal attempts.
- iv. To determine the different methods of committing suicides.
- v. To determine whether there is an association between demographic, socio-economic, behavioral, Physical & mental factors and suicidal attempts in patients admitted to Provincial General Hospital in Badulla.

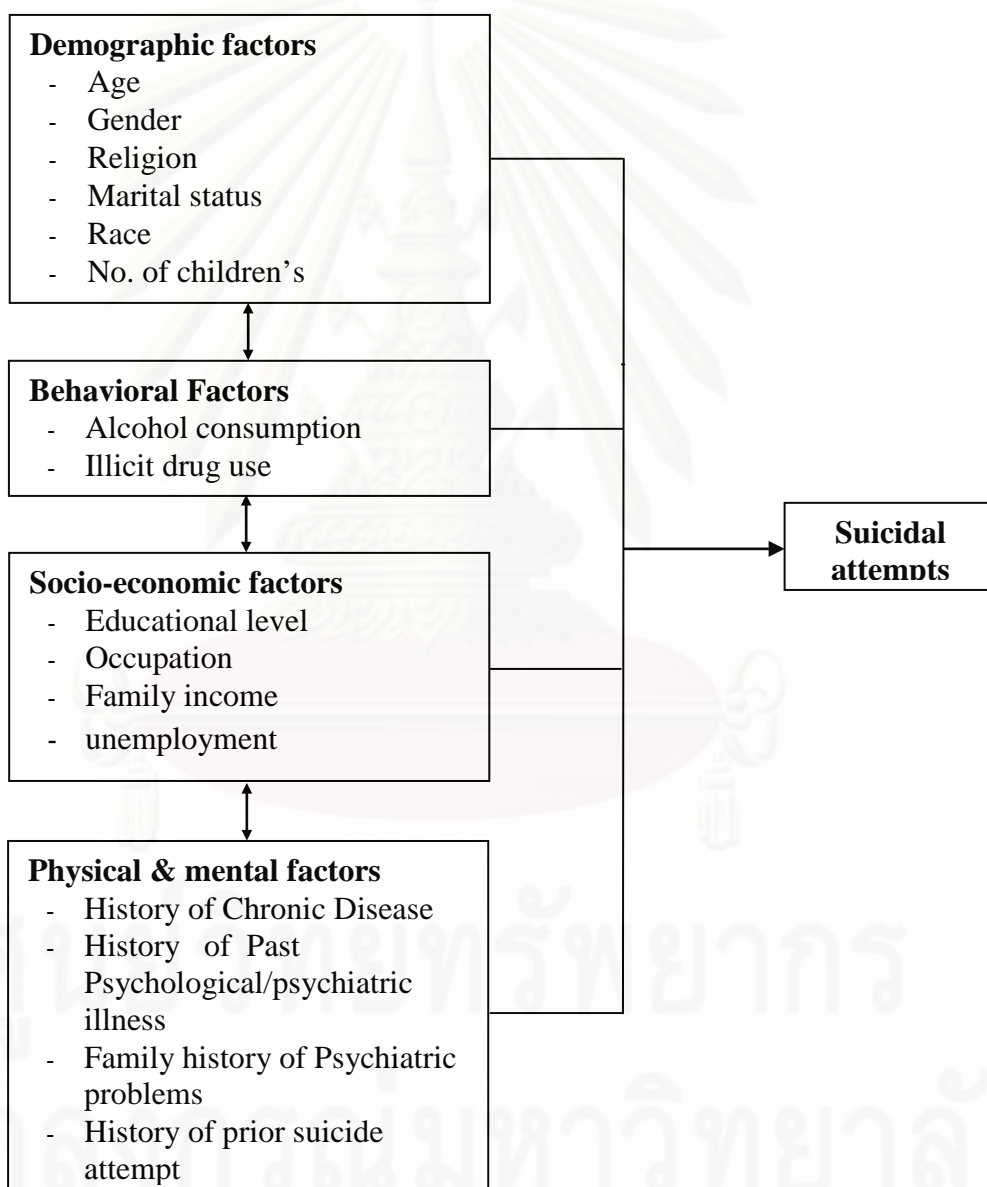
## **1.4 Hypotheses**

There is a relationship between demographic, socio-economic, behavioral, and Physical & mental factors in patients who have attempted suicide in provincial General Hospital Badulla.

## 1.5 Conceptual Framework of This study

### Independent Variables

### Dependent Variable



**Figure 1: Conceptual Framework**

## 1.6 Operational Definitions

In this study, there are both independent and dependent variables.

### 1.6.1 Independent Variables

#### 1.6.1.1 Demographic factors

Age - Age groups will be categorized from the ages of 10 or less, thereafter dividing age into groups every 9 years. For example: 10 years or less, 10 – 19 years, 20 – 29 years, up to 60 years above.

Gender refers to male and female.

Race - Race refers to which race does the patient belongs to and it is diversified into Sinhala , Lanka Tamil, Lanka Muslim, Indian Tamil, Indian Muslim ,Burger or Malays, Others.

Religion – Buddhism, Christianity, Islam, Hinduism and others.

Marital status –This is divided into married, single, widowed, divorced and separated.

Number of children's - Dependents under age of 18 years that patients financially and physically support.

#### 1.6.1.2 Behavioral Factors

Alcohol consumption – Two areas will be looked into under use of alcohol. Firstly the use of alcohol at the time of suicidal attempt. Secondly, we will look into their alcohol consumption in day to day life. Amount of alcohol consumed a week will be looked at.

Illicit drug use - The use of illicit drugs such as narcotics, stimulants, depressants (sedatives), hallucinogens, and cannabis and its affiliation with suicide.

### 1.6.1.3 Socio-economic factors

Educational level – The relationship between suicide and education level will be measured by categorizing people into the following groups:

- No school education
- School education (till grade 5)
- School education (grade 6 to Ordinary Levels)
- School education (above Ordinary Levels – Advanced Levels)
- Bachelors Degree & higher

Occupation – The relationship between suicide and occupation measured by the way a person earns a means of living. In this study focus on there occupation;

- Professional, Technical & related workers (Doctors/ Engineers/ Accountants/ Teachers/ Authors/ Photographers)
- Administrative, Executive, Managerial & related workers
- Clerical & related workers (Stenographers/Typists etc)
- Sales workers
- Service workers (Cooks/ Tailors/ Barbers/ etc)
- Agricultural, Animal Husbandry, Fisherman, & related Forestry workers
- Production process workers, Craftsman & related workers transport equipment operators & laborers
- Armed Services
- Police
- Security Personnel
- Pensioners
- Students

- Politicians
- Unemployed persons
- Workers not classified by occupation

Family income – Average family monthly income was calculated.

Then it divided in to five income groups to compare incidence of suicidal attempts among these groups. Income groups are

- I. Average monthly income less than 5,000 Rupees
- II. Average monthly income 5,001 to 10,000 Rupees
- III. Average monthly income between 10,001 to 15,000 Rupees
- IV. Average monthly income between above 15,001 to 20,000 Rupees
- V. Average monthly income more than 20,000 Rupees

#### **1.6.1.4 Medical outcome**

History Of Chronic Disease – disease is long lasting or recurrence (more than 6 months).

History of Past Psychological/psychiatric illness – History of Psychological and psychiatric problems of an individual. We will be looking at diagnosed mood disorders, psychotic disorders, organic brain diseases, anxiety disorders and personality disorders.

Psychiatric history in the Family – A family history of diagnosed psychiatric

Incidence of suicidal attempts – Incidence rate of suicidal attempts is the number of new cases of suicidal attempts in a year per 100,000 people.

Psychological patient – patients with a history of mental or emotional distress

Non-psychological patients – patients with no history of mental or emotional distress



## 1.6.2 Dependent Variables

### **Suicidal attempt (SA)**

Suicidal attempt in the present study, refers to an act by an individual carried out with the intention of ending or harming him or herself and, as reported by the casualty medical officer, medicine & surgical ward medical officer or psychiatis.



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## **CHAPTER II**

### **REVIEW OF LITERATURE**

This chapter contains theoretical aspects of suicide and suicidal behavior. A proper understanding of related theoretical concepts will form the foundation of a study like the present one.

#### **2.1 SUICIDE AND RELATED TERMS**

##### **2.1.1 Suicide**

WHO's definition, as many others, emphasizes both the intentional aspects and the medical lethality of a suicide. According to Silverman (2006), assigning weights to intent and lethality is often a balancing act, as one sometimes has to speculate about this part of the suicidal process, especially in cases where no personal note is left, and when there is no external information from reliable sources. This may explain why few studies of suicide measure either lethality or intent (Moscicki, 2001).

The sociologist Jack Douglas (1967) outlined some fundamental, micro sociological Dimensions of meanings that he believes are required in the formal definition of suicide. He describes these dimensions mainly as the initiation of an act that leads to the death of the initiator, the willing of self-destruction, the motivation to be dead, and finally, the knowledge of the actor that actions he initiates tend to produce the objective state of death.

Both the definitions of WHO (1986) and Douglas (1967) seem to highlight only the personal perspective. It seems as though the context of the subject is of no importance or interest. More contemporary suicidology emphasizes the dualistic dynamics between subject and context, in which the suicidal process is thought to be embedded.

### **2.1.2 Para suicide or Attempted Suicide.**

Para suicide or attempted suicide can be described as a self inflicted life-threatening act which does not result in death. Suicide attempt refers to cases in which people unsuccessfully try to kill themselves, and in which there is no intention of dying (Stengel, 1964). Hanmertine and Enersvedt (1988) defined attempted suicide as an activity which involves acts of intentional self-injury with the object of death. But where the result is not death, WHO (1986) proposes that “A non- habitual act with non – fatal outcome, that is deliberately initiated and performed by the individual involved, that causes self-harm , or without intervention from others will do so or consists of injecting a substance in excess of its generally recognized therapeune dosage.

According to Kreitman (1976) the term Para suicide means attempted suicide since most patents so designed are not attempting to kill themselves. The epidemiology of Para suicide is quite different from that of suicide and the clinical issues that arise in assessing and managing the Para suicidal patient are also different. Para suicidal patients include a small portion who either at the time or subsequently are motivated by death wishes and Para suicide carries the highest risk for subsequent suicide. The attempted suicide refers to deliberate self –injurious acts committed by a person with or without intention to die.

## 2.2 Risk Factors

Psychological factors may be related to suicidal behavior in any of the three ways. Firstly they may be related indirectly by either predisposing a person or mediating against suicidal behavior. Under certain conditions, early loss and certain personality characteristics such as neuroticism and impulsivity are generally viewed as predisposing factors. Social support and certain personality characteristics such as restraint and objectivity may be viewed as mediating or protective factors. Secondly psychological factors may act as precipitating or direct causal factors in suicidal behavior, and thirdly psycho-social factors may be epiphenomenal, or they may be related to phenomena like depression.

Family history and biological factors are associated with suicidal behavior. It is critical to consider the important role of the psycho-social environment and specific life events in refining the understanding of suicidal behavior.

Recent bereavement, separation or divorce, early loss, decreased social support, loss of job and significant humiliations are all potentially important factors that can affect the lethality of a suicidal attempt (Blumenthal and Kupfer, 1988). The presence of a chronic medical illness can have a devastating impact on a person's ability to deal with stress. Individual suffering from psychiatric illness may be more vulnerable to environmental stress or to a loss in social support system.

Suicidal behavior includes parasuicide or attempted suicide. Assessment and recording of suicidal ideation and parasuicide is difficult. About 50% of WHO's 186 member states, reports suicide as part of their mortality statistics. Although there is no uniformity in definitions of suicidal acts or in recording procedures, certain patterns of suicidal behaviors emerge across countries. The incidence of parasuicide is 10 to 20 times higher than that of completed suicide. The male/female ratios for suicide and attempted suicide are reciprocal; three times more men than women have committed suicide (Nishimura, 1999). From the public health point of view, suicide among adolescents and young adults is particularly important. Suicide in adolescence and young adulthood ranks among the 05 leading causes of death in many countries. There has been a clear increase in suicide rates in most WHO member states which report relevant data to the World Health Organization. This shows that suicide in old

age, particularly among men, is about two to three times more frequent than in younger age group (Diekstra and Gulbinet, 1993).

Although it is not surprising that mortality increase with age, death by suicide is considered in most cultures and by most people as particularly deplorable and unnecessary. The epidemiological analysis of suicidal behavior globally does not identify clear –cut risk factor that enables preventive programs (Hoek et al., 1998). It does however pin point with “unusual” suicide patterns which, it is hoped, will initiate country-specific research into cause of such behavior (Diekstra and Gulbinet, 1993). Particularly promising from the perspective of suicide prevention, seems to be research in to the methods of suicide, and the impact of publicity suicidal act as it had been shown repeatedly, that restricting access to the prevailing methods of suicide in a country will decrease suicide rates, while wide publicity about suicidal acts will increase them.

### **2.2.1 Age**

Studies from different have identified younger and (15-24) and elderly (65+) as two high risk suicide groups (Kar, 2010). It is important to mention that although these two age groups have been identified as high suicide risk groups, rates of completed suicide are higher for the elderly than for the youth (Centers for Disease Control and Prevention, 2005).

Centre for disease control and prevention (2005) reported that 14.3 elderly individuals per 100,000 died by suicide. Suicide rate for adolescents (ages 15 to 19) was reported as 8.2 and for young adults (ages 20 to 24) 12.5.

Various factors associated with suicide have been identified among youth. There are alcohol use beginning in preteens; social and educational disadvantage; childhood and family adversity; psychopathology; individual and personal vulnerabilities; exposure to stressful life events and circumstances; and adverse social, cultural and contextual factors have been identified as suicide risk factors (Beautrais, 2000). Presence of a physical illness (against psychiatric symptoms in young adults), physical pain,

depression, functional impairment, lack of future orientation, and the death of partner have been identified as risk factors in the elderly (Hirsch et al., 2007).

### **2.2.2 Marital status**

With regards to marital status, it has been consistently found that married persons have lower suicide rates than people who are single, widowed, or divorced (Yip and Thorburn, 2004).

### **2.2.3 Religion**

Religious affiliation and religious activity appear to protect against suicide with higher rates of suicide among those without religious affiliation (Maris, 1981). It is likely that religious affiliation and religious activity exert a protective effect in a number of ways, including proscribing against suicide and promoting social links, with these links and prohibitions also decreasing the risk of psychiatric disorders (including depression, substance abuse, offending and antisocial behaviors) with which suicide is associated.

### **2.2.4 Gender**

In terms of gender differences, men have a higher frequency of suicide and a greater overall mortality from suicide than women (Skogman, Alsen and Ojehagen, 2004).

The association between suicidal behavior and gender is thus paradoxical: although females show higher rates of suicidal behavior, males more frequently die by suicide. The key to this gender paradox probably lies, largely if not wholly, with gender differences in choice of method for suicide attempt. Traditionally there have been marked differences in male and female choices of method, with females more often choosing self-poisoning and males more often choosing the more lethal methods of hanging and vehicle exhaust gas (Beautrais, 2003c). These findings have potentially important implications given the increasing use by females of highly lethal methods such as hanging and vehicle exhaust gas. Given that young females are more likely than males to make suicide attempts, if the trend for females to use more lethal

methods continues there is the potential for female youth suicide rates to approach, or even exceed, those of males

### **2.2.5 Unemployment**

Recently, considerable attention has been given to the role of unemployment as a factor that provokes suicidal behavior. Strong claims have sometimes been made that changing employment patterns are responsible for changes in rates of suicide (Morrell et al., 1998). Both time-series analyses and case-control or longitudinal studies have tended to report associations between unemployment and suicide and attempted suicide with ORs for suicide and attempted suicide ranging from 3 to 29, and PARs ranging from 7 to 58 percent (Platt and Hawton, 2000).

The wide range in these estimates is likely to be accounted for by the extent to which individual studies controlled for the potentially confounding effects of psychiatric disorder and other factors.

In the prospective Christchurch Health and Development Study, unemployment was significantly related to increased risks of suicidal behavior. After adjustment for confounding and reverse causality, this association was substantially reduced but remained significant (Fergusson et al., 2001).

### **2.2.6 Alcohol**

The exact nature of alcohol's role in suicide is unclear. Many explanations have been proposed (Murphy et al., 1992). Nonetheless, a strong association exists between alcohol use and suicide:

- Between 18% and 66% of suicide victims have alcohol in their blood at the time of death (Welte et al., 1988).
- One study suggests that alcohol may be a factor in "impulsive" or "spontaneous" as opposed to "planned" suicides. Alcohol was found to be involved more frequently in suicides in which the victim left

no suicide note, had not made a prior suicide attempt, and had no long-standing physical or mental condition to which the suicide could be related.

- A recent study found that states in which more spirits are sold per capita have higher suicide rates, and concluded that a 10% increase in spirits sales would result in a 1.5% or 1.4% (two samples were used) increase in a state's suicide rate .

### **2.2.7 Occupational group**

A series of studies has identified particular occupational groups with increased risk of suicide. These groups include police, miners, those in the medical profession (doctors, nurses, pharmacists, and dentists), farmers and veterinarians (Kposowa, 1999).

However, not all studies identify the same occupational groups as having elevated risks and these differences may reflect differences in the extent to which studies controlled for the potentially confounding effects of age, gender, marital status and related factors. In part, the elevated risk of some occupational groups may reflect. Their ready access to highly lethal methods of suicide and/or the stressful nature of their work.

Nevertheless, the identification of high-risk occupations suggests that it might be possible to target suicide prevention efforts at those occupational or professional groups, or, at an organizational level, at companies employing large numbers of workers in high-risk occupations.



### **2.2.8 Level of education**

In general, risks of suicide and suicide attempt are elevated among individuals who have poor or limited education (Beautrais, 2001). It is likely that the major route by which poor education leads to suicidal behavior is as a result of links between socioeconomic factors and mental health (Fergusson and Lynskey, 1995). In males, risk of suicide has been found to be inversely and proportionately related to scores on intelligence tests conducted in early adulthood, with those individuals scoring low on such tests being at increased risk of subsequent suicide (Gunnell et al., 2005). This association might be mediated by educational attainment, which may influence occupational opportunities and income.

### **2.2.9 Socioeconomic status**

Both aggregate-level and individual-level studies in different countries have suggested that lower social class and/or socioeconomic disadvantage are risk factors for suicide and attempted suicide (Platt and Hawton, 2000). For example, recent research using the Danish longitudinal registers (Goldney, 2004) has shown that low income increases suicide risk, but that this risk is substantially attenuated when mental illness is taken into account. Low income has a stronger effect on male rather than female suicide risk, suggesting that males are more disadvantaged by poor economic conditions than females. The findings from this study clearly suggest that associations between measures of social class and suicide risk are likely to be substantially overestimated if they are not adjusted for potential confounding factors and for mental illness in particular.

### **2.2.10 Previous suicidal behavior**

Prior suicide attempts predict future suicidal behavior. A significant proportion (between 17 and 68 percent, median 25 percent) of those who die by suicide have made previous suicide attempts, with OR estimates ranging from 3.6 to 31.7 (median 5.8) (Appleby, Cooper, et al., 1999; Vijayakumar and Rajkumar, 1999). These findings have been reported for all ages and for both suicide and suicide attempt.

Older people who make suicide attempts are likely to have higher intent and to use methods of higher lethality, and are less likely to survive the physical sequelae of an attempt. As a consequence, the fraction of older people with histories of suicide attempt is likely to be smaller than for young and middle-aged populations. Nevertheless, a significant fraction of older people who die by suicide do have histories of suicide attempt (Rubenowitz et al., 2001).

Longitudinal follow-up studies of individuals who have made a suicide attempt suggest that those who make attempts have a 0.5 to 2.0 percent risk of suicide within one year of the attempt, a suicide risk in excess of 5 percent after nine years (Owens et al., 2002), and higher rates of death from other causes, including homicide, accidents and disease (Harris and Barraclough, 1998).

Two general conclusions can be drawn here. First, the repetition of suicide attempt is common and rates of suicide are high. Second, prediction, from baseline characteristics, of either suicide attempt or suicide is poor. A possible reason for this is that the factors that determine subsequent suicidality may relate to treatment, life events, changes in social circumstances and mental health, which occur after the index suicide attempt and which cannot be predicted from baseline characteristics.

### **2.2.11 Family history of suicidal behavior**

A family history of suicidal behavior is associated with risk of suicide and suicide attempt (Beautrais, 2003). Rates of suicide attempt are elevated in the family members of those who die by suicide, and in the families of those who make suicide attempts, after mental disorders are taken into account. These findings suggest that suicidality is transmitted within families, independently of psychiatric disorders (Brent and Mann, 2005). Impulsive aggression may play a role in the transmission of familial suicidal behavior since it is implicated in psychopathology, and in familiarly shared adverse environments (Brent and Mann, 2005).

### **2.2.12 Medical reasons**

#### **2.2.12.1 Mental disorders**

Mental disorders in particular, mood disorders, substance-use disorders and antisocial behaviors play the strongest role in the etiology of suicidal behavior. Psychological autopsy studies using youth, adult, all-ages, male and female samples have invariably shown high rates of mental disorder among those dying by suicide or making serious suicide attempts (Lonnqvist, 2000), ranging from 81 percent to 100 percent (median, 93 percent) (Lonnqvist, 2000). The approximately 10 percent of individuals who die by suicide without an axis I (Ernst et al., 2004) diagnosis appear to have sub-threshold psychopathology, and are more similar to those who die by suicide with an axis I mental diagnosis than a control group. In controlled studies the prevalence of mental disorder in those dying by suicide or making serious suicide attempts ranges from 63 to 98 percent (Appleby, Cooper, et al., 1999).

### 2.2.12.2. Mood disorders

Mood disorders (including major depression, bipolar disorder and dysthymia) are the mental disorders most commonly associated with suicide and serious suicide attempt. Between 25 and 90 percent of those who die by suicide or make serious suicide attempts have a mood disorder (Lonnqvist, 2000). With most studies reporting strong and significantly increased risks, with odds ratio (OR) estimates ranging from 11 to 41 (Molnar et al., 2001). The risk of suicide is increased 20-fold for those with major depression, 15-fold for those with bipolar disorder, and 12-fold for dysthymic individuals (Harris and Barraclough, 1997). The lifetime risk of suicide for those with mood disorder is estimated at 4 percent (Institute of Medicine, 2002).

The risk of suicide attempt or suicide depends on the severity of the depressive disorder. Suicidal ideation occurs in more than half of those with depression, and suicidal ideas, plans and attempts increase with the increasing severity of depression. The subjective (rather than objective) severity of current depression, together with higher levels of suicidal ideation and fewer reasons for living, has been shown to distinguish psychiatrically admitted patients who made suicide attempts from those who did not (Mann et al., 1999). The risk of suicide is increased in those with recurrent and/or chronic, compared to single-episode, depression (Goodwin and Jamison, 1990).

As noted above, the risk of suicide is increased 15-fold in people with bipolar disorder (Harris and Barraclough, 1997). From 25 to 50 percent of those with bipolar disorder make at least one suicide attempt (Goodwin and Jamison, 1990), and the risk of suicide increases with increasing severity of the illness (Hagnell et al., 1981), and appears to be higher in the first five years after diagnosis (Weeke, 1979). The risk of suicide for females and males with bipolar disorder is similar (Weeke, 1979). In contrast to the higher male risk for the general population.

### 2.2.12.3 Substance-use disorders

Substance-use disorders (including alcohol, cannabis and other drug abuse and dependency) are linked with suicidal behavior, with psychological autopsy studies suggesting that between 19 and 63 percent of those dying by suicide have a substance-use disorder, and controlled studies generating OR estimates ranging from 2.2 to 5.8 (Conner and Chiapella, 2004). Substance-use disorders frequently occur co morbidly, often with depression and/or anxiety or antisocial disorders (Murphy, 2000). Comorbidity is associated with increased suicide risk (Lonnqvist, 2000). Estimates suggest that the risk of suicide is increased six-fold for those with alcohol-use disorders (Harris and Barraclough, 1997). The disinheriting and facilitating effects of acute alcohol intoxication increase the likelihood of impulsive and aggressive suicide attempts. Population studies suggest that high national rates of alcohol consumption and low minimum legal drinking age are related to increased suicide risk (Wasserman et al., 1998). Risk factors for suicide and suicide attempt in alcoholics tend to be the same as those for general population samples of suicides and medically serious suicide attempters (Conner et al., 2003), implying that suicide prevention in alcoholics must include a focus on depression as well as substance abuse.

Substance-use disorders (predominantly alcoholism), although less common in older than younger suicide victims, nevertheless place older adults at increased risk of suicidal behavior (Waern et al., 2002). Estimates suggest that between one-quarter to one-third of older adult suicide victims have a substance-use disorder.

#### 2.2.12.4 Anxiety disorders

Anxiety disorders are found in 3 to 17 percent of those with serious suicidal behavior. However, these are likely to be lower-limit estimates of anxiety disorders, since many studies have failed to ask extensively about anxiety disorders (Molnar et al., 2001). Anxiety disorders often occur comorbidly with mood disorders and substance-use disorders. In some studies, when the association between anxiety disorders and suicide is controlled for mood disorder, anxiety disorders do not make a significant contribution to suicide, suggesting that the observed association between anxiety disorders and suicide may reflect mood disorders that are frequently comorbid with anxiety disorders. Findings from one series of studies suggest that anxiety disorders in older adults with suicidal behavior tend to occur secondary to mood disorders and do not make an independent contribution to suicide risk (Waern et al., 2002).

Panic disorder is associated with a 20-fold increase in risk of suicide attempt (Weissman et al., 1989), and it has been estimated that 20 percent of those who die by suicide have this disorder (Schmidt et al., 2000). Panic disorder that is comorbid with other mental disorders is associated with higher suicide risk than panic disorder alone (Warshaw et al., 2000). It often occurs comorbidly with depression, and it may be that depression develops as a response to panic disorder (Schmidt et al., 2000).

The risk of making a plan for suicide, making a suicide attempt, and making an impulsive suicide attempt are increased for individuals with Post Traumatic Stress Disorder (PTSD) (Molnar et al., 2001). PTSD usually occurs comorbidly with depression, alcohol and drug abuse, and other anxiety disorders (Kessler, 1995).

### 2.2.12.5 Schizophrenia

Controlled studies of suicide and attempted suicide suggest that between 6 and 19 percent (median 8 percent) of those with such behavior have schizophrenia (Pompili et al., 2004). While schizophrenia occurs infrequently (estimated at 1 percent) in the general population, and may not make a large contribution to total population rates of suicide, among the population of those with schizophrenia the lifetime risk of suicide is estimated to be 4 to 10 percent (Tsuang et al., 1992), and the suicide risk is 30–40 times higher than the risk in the general population (Harris and Barraclough, 1997). Between 25 and 50 percent of all those with schizophrenia will make a suicide attempt.

The risk factors for suicide in those with schizophrenia include a previous suicide attempt; significant depressive symptoms; hopelessness; alcohol or other substance abuse; male gender; command hallucinations; poor work and social functioning; social isolation; being unmarried; recent loss or rejection; a poor quality of life; and a deteriorating illness course in those with high pre morbid performance (Kaplan and Harrow, 1996).

### **2.2.13 Mental health factors**

In addition to the mental disorders associated with suicide and suicide attempt, there are a series of related factors that are linked to risk of suicide and suicide attempt. These factors are discussed below.

#### **2.2.13.1 Co morbidity**

High rates of co morbidity (co-occurrence of two or more mental disorders) are found among those making suicide attempts or dying by suicide, with co morbidity commonly occurring between mood and substance-use disorders, and, in males, between depression, substance-use disorders and antisocial behavior (Lonnqvist, 2000). More than half of those dying by suicide or making serious suicide attempts have comorbid disorders (Kessler et al., 1999). Suicide risk is also increased in those with co morbid mental disorders and somatic disorders (Lonnqvist, 2000), and (as noted above) in those with co morbid axis I disorders and personality disorders (Baud, 2005).

#### **2.2.13.2 Prior care for mental health problems**

A consequence of the link between mental disorder and suicidal behavior is that many people making suicide attempts or dying by suicide will have a history of contact with medical, welfare and related services for mental health problems (Appleby et al., 1999). These findings suggest that those who die by suicide and make serious suicide attempts are well known to services, and their attendance and admission provide opportunities for refining treatment and management approaches to minimize suicide risk. In particular, it has been estimated that more than 20 percent of suicides that occur shortly after people have been hospitalized with mental illness could be prevented (Appleby and Shaw, 1999).



#### 2.2.14 Psychological risk factors

Certain temperaments, personality traits, psychological vulnerabilities, and cognitive and coping styles may act as predisposing factors in suicidal behavior. The common thread in these psychological constructs linked with suicidal behavior is that they all predispose the individual to react in negative ways to perceived stressful situations.

In young people a wide range of psychological factors has been associated with increased risk of suicide and suicide attempt. These factors include low self-esteem, hopelessness, extraversion, neuroticism, locus of control, impulsivity and impulsive violent aggressiveness, self-consciousness, social disengagement and cognitive rigidity (Fergusson et al., 2000). Caspi et al. (1996) have reported that temperament in three-year-olds predicts suicide attempt. Those children assessed as inhibited at age three and those judged to be 'under-controlled' at three were at increased risk of later suicide attempts.

In adults, the personality traits that have been associated with suicidal behaviors include hopelessness, neuroticism, anxiety, timidity, cognitive rigidity, impulsivity, aggression and a strong sense of personal independence (Beautrais, 2002). For older adults, suicidal behavior tends to be characterized by such psychological traits as hopelessness, cognitive rigidity; poor adaptive functioning, low 'openness to experience' and a determinedly independent personal style (Clark, 1993). Such personality characteristics are generally regarded as 'fixed' attributes, which are relatively difficult to modify, implying that such traits may impede intervention efforts aimed at preventing suicide.

Hopelessness is strongly associated with suicidal ideation, suicide attempt and suicide, and has been reported to be more strongly associated with suicide than depression (Beck et al., 1993). Hopelessness is a strong predictor of suicide in follow-up studies of 5 to 10 years of inpatients, outpatients and suicide attempters (Beautrais, 2004a). Hopelessness appears to be a stable psychological trait, which may be independent of depression, may persist despite remission of depression (Brent et al., 1998) and may occur co

morbidly with a range of mental disorders (Joiner et al., 2001). High levels of hopelessness have also been shown to occur in successive episodes of depression (Beck et al., 1985). These observations suggest that the extent of hopelessness should be assessed, and treated, independently of mental disorders.

Two temperaments, in particular, appear to be associated with suicide and suicide attempt in both youth and adults (Brent et al., 1994). These are the type described as impulsive and/or aggressive, and the type described as 'neurotic', which includes depressive and withdrawn traits (Fergusson et al., 2000). Individuals with aggressive and impulsive temperaments are at increased risk of suicide and suicide attempt (Fergusson et al., 2000). In these individuals, suicidal behavior may occur in the absence of a mood disorder (Apter et al., 1995) and may be associated with antisocial behaviors and conduct disorder, alcohol and substance abuse, impulsive behavior, high scores on measures of novelty-seeking, and histories of childhood adversity (Fergusson et al., 2000).

#### **2.2.15 Neurobiological risk factors**

In current suicide research there is a strong focus on the role of genetic and biological factors in the etiology of suicidal behaviors (Brent and Mann, 2005). As noted above, higher rates of suicide and suicide attempt are found in the families of individuals with suicidal behavior than in the families of people without suicidal behavior (Brent and Mann, 2005). This finding suggests that genetic factors are involved in suicidal behavior.

This view is supported by adoption and twin studies. Adoption studies show an elevated risk of suicide in the biological relatives of adoptee who die by suicide compared with non-suicidal adopted. Twin studies have found higher rates of suicidal behaviors in monozygotic twins compared with dizygotic twins (Roy et al., 1991). Using twin designs, studies have suggested that up to 45 percent of the variance in suicidal behavior may be genetic in origin (Statham et al., 1998). These heritability estimates for suicidal behavior

are similar to those for major psychiatric illnesses such as schizophrenia and bipolar disorder.

Serotonin system deregulation is associated with increased risk of suicide and suicide attempt (independently of psychopathology), subjective severity of symptoms, and planned suicide attempts of high lethality (Institute of Medicine, 2002). Little is known, however, about the processes by which serotonin and suicidal behavior might be linked. Initially it was thought that impulsivity or aggressive behavior might be important intervening variables (Coccaro et al., 1989). However, recent work suggests that low levels of serotonin may be linked to planned, non-impulsive, potentially lethal suicide attempts (Mann, 1995).

Altered transmission in the noradrenergic, dopaminergic, GABAergic and glutamergic systems may be associated with suicidal behavior (Arango et al., 1996). These findings are consistent with suggestions that chronic exposure to stressful events and to psychological stress lead to deregulation of the norepinephrine-specific nucleus (Traskman-Bendz and Mann, 2000). In general, however, findings from these studies have been less consistent than those from studies of the serotonergic system. There is a need for further research of both the serotonergic system and the other neurotransmitter systems implicated in suicidal behavior.

#### **2.2.16 Situational Factors**

Most suicidal behaviors are triggered by an acute stressor. Suicidal individuals report experiencing high amounts of stress months prior to the attempt (Paykel et al., 1975). And their entire life spans (Cohen-Sandler, et al., 1982). Certain events (loss of an important relationship due to death, divorce, separation; interpersonal difficulties; financial constraints; legal issues) that either cause stress or dissipate the existing social support systems have been often associated with elevated suicide risk. For instance, Erlangsen et al. (2004) found that the elderly men are at an increased risk for suicide during the first year of their partner's death.

Ongoing pain has been shown to be one of the suicide risk factors (Fishbain, 1996). In this context, Edwards et al. (2006) explored factors associated with pain that increase suicidal risk and found that the presence and degree of suicidal ideation could be predicted from the magnitude of depressive symptoms and the degree of pain-related catastrophizing. This arena of investigation has also explored certain physical conditions that heighten suicide risk. Based on a review of research studies, Klepsies et al, (2000) found that patients with HIV/AIDS, cancers of the brain and nervous systems, and multiple sclerosis are overrepresented in the high suicide risk group.



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## CHAPTER III

### RESEARCH METHODOLOGY

#### 3.1 Research Design

This research is designed as a retrospective cross-sectional study.

#### 3.2 Research area

The study area is Provincial general hospital Badulla, badulla district, uva province, Sri Lanka. It is located about 230 km away from Colombo towards the eastern slopes of central hills of Sri Lanka.



Figure 2: This is the map of Srilanka showing the area which the study was done.

### **3.3 Study Period**

Ethics approval was granted by the research ethical committee Chulalongkorn University. Permission was obtained from the head of delivery department in the Badulla district hospital. Data was then collected in January 2010.

### **3.4 Study population**

All patients admitted with suicidal attempts to Provincial general hospital Badulla, Sri Lanka from 1<sup>st</sup> January 2008 to 31<sup>st</sup> December 2008.

### **3.5 Inclusion criteria**

- Resides in Badulla district, according to the address recorded in the patient history files.
- Admitted to the provincial general hospital Badulla with suicide attempts during the period of 1<sup>st</sup> January 2008 to 31<sup>st</sup> of December 2008.

### **3.6 Exclusion criteria**

Does not reside in Badulla district, according to the address recorded in the patient's history file.

### **3.7 Sampling technique**

During 1<sup>st</sup> January 2008 to 31<sup>st</sup> December 2008, all patients who were admitted to Provincial general hospital Badulla, Sri Lanka with suicidal attempts was included in this study.

### **3.8 The numbers of the study sample**

There were 391 patients who fit into the inclusion and exclusion criteria's.

### **3.9 Measurement tools**

A Structured data collection tool was used (Appendix A).

### **3.10 Data collection**

Data was collected from patients' medical notes using the data collection tool.

### **3.11 Data analysis**

Researcher checked data and coded it according to a Patient Data and Information, Sheet manual. It was then entered into SPSS v. 17. Chi-square tests were used to see the association between independent and dependent variables.

### **3.12 Ethical consideration**

The main ethical issue was confidentiality. However following steps were taken into consideration to ensure that patient confidentiality was not breached. Since patients history files will be used in this study, the permission on accessing to the records has to be obtained from the head of delivery department in the studied hospital. The letter to the authorize person is attached. Also have obtained the approval from the Research Ethical Committee Chulalongkong University. Information was only collected by the researcher (Dr. A. Wedamulla) No identifiable data will be collected or used at any stage. Only hospital number will be included into the data collection from for verifying purpose in case something may be unclear.

All of data will be kept confidential in locked filling cabinets. Codes will only be used to identify the data collection form. Only the researcher can access to the data. All data collection forms will be destroyed soon after analysis and publishing of data. We will not include any information that will make it possible to identify subjects if the study is published.

### **3.13 Limitations**

- Data are collected only from Badulla general hospital. There are other hospitals in the badulla area that provide medical services for people live in badulla area. However in this study, it only looked at data from Badulla hospital.
- This is a main limitation in calculating incidences in badulla area. However, majority of suicidal attempts are admitted to badulla hospital as the other hospitals do not have psychiatric services.
- In this study, we looked at factors mentioned in the history taken by the admitting medical doctor. Hence some factors which may be important for that particular patient that triggered the suicidal attempts may be missed.

### **3.12 Expected Benefit**

- Identifying factors associated with research and taking appropriate measures to reduce them have shown to prevent suicidal attempts in other countries.
- Preventive intervention programs run in Sri Lanka are based on those studies done in western world. This study will help to identify factors associated with suicide in Badulla area. Therefore it will help to recognize any factors associated with suicide and implement necessary intervention programs.
- This research will also create ideas for further research in this field; hence increase our understanding of reasons behind suicides in Badulla.
- Findings from this study can be used to create management guidelines for patients presenting with suicidal attempts. If a particular factor is found to be commonly associated with suicidal attempts, this can assessed and necessary arrangements can be taken as part of the overall management plan.



## CHAPTER IV

### RESULTS

The results were acquired by analyzing demographic, behavioral, Socio-economic, physical and mental factors related to suicidal attempts in a study sample consisted of 391 patients admitted to Badulla Provincial General Hospital in Sri Lanka. Data were gathered from patient history file records from 1<sup>st</sup> January 2008 to 31<sup>st</sup> December 2008.

#### 4.1 Analysis of Demographic Factors, Behavioral factors, Socio-economic factors and Physical & mental factors

##### 4.1.1 Demographic Factors

##### 4.1.1.1 Age Distribution

Table 1 summarizes the age distribution of the study group. A preponderance of younger age groups is noted in this study. 69% of suicidal attempts were by people between 10 to 29 years of age. Number of suicidal attempts decrease with increasing age.

The table 1 below indicates the age distribution of the study sample.

Age Distribution	Frequency	Percentage
10-19yrs	128	32.7
20-29yrs	143	36.6
30-39yrs	50	12.8
40-49yrs	47	12.0
50-59yrs	16	4.1
60 yrs and above	7	1.8
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.1.2 Gender Distribution

Male-female ratio was 1.34:1.

The table 2 below shows the distribution of gender in the study sample.

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
MALE	224	57.3
FEMALE	167	42.7
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.1.3 Ethnic Distribution

In terms of ethnic related suicide attempts, Sinhalese show the highest frequency of 245 (62.7%) where as other races such as Lankan Tamil, Lankan Muslim, Indian Tamil, Burgher and Malays show much lower frequencies

The table 3 below indicates the ethnic distribution of the study sample.

<b>Ethnicity</b>	<b>Frequency</b>	<b>Percentage</b>
Sinhala	245	62.7
Lanka Tamil	31	7.9
Lanka Muslim	28	7.2
Indian Tamil	73	18.7
Burger or Malays	14	3.6
<b>Total</b>	<b>391</b>	<b>100.0</b>

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#### 4.1.1.4 Religion Distribution

Buddhism and Hinduism show the highest rates in religion related suicide attempts with frequencies 230 (58.8%) and 99 (25.3%) respectively in comparison with Christianity and Islamism.

The table 4 below indicates the age distribution of the study sample.

<b>Religion</b>	<b>Frequency</b>	<b>Percentage</b>
Buddhism	230	58.8
Christianity	37	9.5
Hinduism	99	25.3
Islam	25	6.4
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.1.5 Marital Status

Suicide among single and married groups show comparatively high frequencies, 215 (55.0%) and 143 (36.6%) respectively, as opposed to divorced, separated or widowed group.

The table 5 below indicates the distribution of marital status.

<b>Marital Status</b>	<b>Frequency</b>	<b>Percentage</b>
Single	215	55.0
Married	143	36.6
Divorced	20	5.1
Separated	2	.5
Widowed	11	2.8
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.1.6 Number of children's per family

The data also shows a direct correlation between the number of children within a family and suicide attempts. Families with no children show the highest suicide frequency of 242(61.9%) when compared to families with 1, 2, 3, 4, 5 and 6 children. Therefore, it is evident that larger families (ie. 6 children) have lower suicide attempts as opposed to families with no children.

The table 6 below indicates the distribution of children per family

No. of Children	Frequency	Percentage
No children	242	61.9
1	33	8.4
2	43	11.0
3	40	10.2
4	17	4.3
5	13	3.3
6	3	0.8
<b>Total</b>	<b>391</b>	<b>100.0</b>

## 4.1.2 Data relating to Behavioral factors

### 4.1.2.1 Consuming Alcohol

The use of alcohol does not seem to directly influence the suicide attempts among the patients. In this case, patients who don't use alcohol show the highest frequency of 278 (71.1%) in suicide attempts when compared with patients who consume alcohol 113(28.9%).

The table 7 below indicates the alcohol intake of the study sample

Consuming Alcohol	Frequency	Percentage
YES	113	28.9
NO	278	71.1
<b>Total</b>	<b>391</b>	<b>100.0</b>

### 4.1.2.2 under influence of alcohol prior to the act of deliberate self-harm

The above data shows a high frequency of 280 patients (71.67%) attempting suicide while not being influenced by alcohol as opposed to patients under the influence of alcohol.

The table 8 below indicates those who were influenced by alcohol during the act.

Under the Influence by Alcohol	Frequency	Percentage
YES	111	28.4
NO	280	71.6
<b>Total</b>	<b>391</b>	<b>100.0</b>

### 4.1.2.3 Using Illicit Drugs

The above data obtained from patients using illicit drugs 56(14.3%) show a lower frequency of suicide attempts when compared to considerably high frequency of 335 (85.7%) patients who do not use illicit drug.

The table 9 below indicates illicit drug usage of the study sample

Using Illicit Drug	Frequency	Percentage
YES	56	14.3
NO	335	85.7
<b>Total</b>	<b>391</b>	<b>100.0</b>

### 4.1.3 Data relating to Socio-economic Factors

#### 4.1.3.1 Educational level

Patients who have had an average education level up to Ordinary Levels show the highest frequency of 148 (37.9%) suicide attempts. The second highest attempts of suicide can be seen among patients with no education with a frequency of 101(25.8%). It is apparent from the data, the decrease in suicide attempts associated with the increase in the level of education.

The table 10 below indicates educational level of the study sample

Level of Education	Frequency	Percentage
No school education	101	25.8
School education (till grade 5)	84	21.5
School education (above grade 5 to Ordinary Levels)	148	37.9
School education (above Ordinary Levels – Advanced Levels)	57	14.6
Bachelors Degree & higher	1	0.3
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.3.2 Employment status

As shown below, data on employment status concluded that suicide attempts were more common among the unemployed persons with a frequency of 244(62.4%) as opposed to employed persons with a frequency of 147 (37.6%).

The table 11 below indicates the distribution status of employment.

<b>Employment Status</b>	<b>Frequency</b>	<b>Percentage</b>
YES	147	37.6
NO	244	62.4
<b>Total</b>	<b>391</b>	<b>100.0</b>

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### 4.1.3.3 Occupation

In occupation related suicides, the highest attempts can be seen in unemployed persons with a frequency of 183 (46.8%) when compared to employed patients. However, persons involved in agricultural and clerical work along with students show the next highest frequencies of 73 (18.7%), 30(7.7%) and 61 (15.6%) respectively. The data also show low suicide frequencies among patients having high status occupations.

The table 12 below indicates the occupation of the study sample

<b>Profession</b>	<b>Frequency</b>	<b>Percentage</b>
Professional, Technical & related workers (Doctors /Engineers/Accountants/Teachers/Authors/Photographers)	6	1.5
Clerical & related workers (Stenographers/Typists etc)	30	7.7
Sales workers	9	2.3
Agricultural, Animal Husbandry, Fisherman, & related Forestry workers	73	18.7
Production process workers, Craftsman& related workers transport equipment operators & laborers	23	5.9
Armed Services, Police, Security Personnel	5	1.3
Students	61	15.6
Unemployed persons	183	46.8
Workers not classified by occupation	1	0.3
<b>Total</b>	<b>391</b>	<b>100.0</b>



#### 4.1.3.4 Family income levels

From the family income data obtained, the highest frequencies of suicide can be seen among families with average incomes between 5,001 to 10,000 Rupees and between 10,001 to 15,000 Rupees with a frequencies 175 (44.8%) and 121 (30.9%) respectively. However, families with lower incomes and higher incomes showed lower occurrences of suicide attempts.

The table 13 below indicates the family income levels of the study sample

Family Income	Frequency	Percentage
Less than 5,000 Rupees	32	8.2
Between 5,001 to 10,000 Rupees	172	44.0
Between 10,001 to 15,000 Rupees	125	32.0
Between 15,001 to 20,000 Rupees	52	13.3
More than 20,001 Rupees	10	2.6
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.4 Data relating to Physical & mental factors

##### 4.1.4.1 History of Chronic diseases

Suicide attempts related to the history of chronic diseases were low with a frequency of 88(22.5%), when compared to that of patients with no history of chronic diseases with a frequency of 303 (77.5%).

The table 14 below indicates the prevalence of chronic diseases of the study sample

Chronic Diseases	Frequency	Percentage
YES	88	22.5
NO	303	77.5
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.4.1.1 Type of chronic disease

Fragmenting the 88 who were suffering from chronic diseases at the time of attempting suicide, several diseases were identified in this research which were Malignancy, Neurological disorders, Respiratory diseases, Diabetes, Cardiac problems and a few others. Out of 88 a total of 30 were suffering from respiratory diseases assembling 34.1 %. The second highest were identified with cardiac problems with an outcome of 28.4%.

The table 15 below indicates the prevalence of chronic disease type

Type of Chronic Disease	Frequency	Percentage
Malignancy	7	8.0
Neurological disorders	12	13.6
Respiratory diseases	30	34.1
Diabetes	3	3.4
Cardiac problem	25	28.4
Others	11	12.5
<b>Total</b>	<b>88</b>	<b>100.0</b>

#### 4.1.4.2 Psychiatric diseases

It was also apparent that the patients with no history of psychiatric diseases had the highest attempts of suicide with a frequency of 297 (76.0%) as opposed to patients with a history of psychiatric diseases.

The table 16 below indicates the prevalence of psychiatric diseases

Psychiatric Disorders	Frequency	Percentage
YES	94	24.0
NO	297	76.0
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.4.2.1 Type of psychiatric disorders

Out of the 94 people who reported a past history of psychiatric disorders, 75 were suffering from depression making it the commonest psychiatric disorder. The second highest psychiatric disorder was psychosis with a frequency of 14.9%.

The table 17 below indicates the prevalence of type psychiatric diseases.

Type of psychiatric disorders	Frequency	Percentage
Psychosis	14	14.9
Depression	75	79.8
Bipolar disease	4	4.3
Others	1	1.1
<b>Total</b>	<b>941</b>	<b>1. 100.01</b>

#### 4.1.4.3 Family history of psychiatric problems

Patients with no family history of psychiatric problems revealed the highest attempts of suicide with a frequency of 253 (64.7%) when compared to that of patients with a family history of psychiatric problems.

The table 18 below indicates the prevalence of family history of psychiatric problems

Family History of Psychiatric Problems	Frequency	Percentage
YES	138	35.3
NO	253	64.7
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.1.4.3 Family history of suicide attempts

60.9% of patients attempted suicide did not have a similar family history.

The table 19 below indicates prevalence of Family history of suicide attempts

Family history of Suicide attempts	Frequency	Percentage
YES	153	39.1
NO	238	60.9
<b>Total</b>	<b>391</b>	<b>100.0</b>

#### 4.2 History of Prior Suicide Attempts

Patients with no history of suicide attempts showed the highest frequency of 301 (77%) when compared to patients with a past history of suicide attempts with a frequency of 90 (23%).

The table 20 below indicates the prevalence of past suicidal acts.

History of suicide attempts	Frequency	Percentage
YES	90	23.0
NO	301	77.0
<b>Total</b>	<b>391</b>	<b>100.0</b>

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### 4.3 Types of suicidal attempts made

It was identified that 94.4% attempts were by poisoning which can further be segmented into sub-types such as types of poisoning, types of drugs and types of pesticides which will be further discussed in this report. Out of the sample size of 391 patients, 369 patients who performed suicide attempts were by poisoning which identifies that this could be due to easy accessibility of types of poisoning.

The table 21 below shows the types of suicidal attempts made

Method used in the Suicidal Attempt	Frequency	Percentage
Poisoning	369	94.4
Setting fire to Oneself	2	.5
Hanging	15	3.8
Drowning	5	1.3
<b>Total</b>	<b>391</b>	<b>100.0</b>

### 4.5 Type of Poisoning

Drilling down to the types of poisoning the table 22 shows the details of how the intake of poison has been made. It is clearly shown that the use of pesticides and drugs have reached its maximum at 168 (45.5 %) for pesticides and 177 (48.5%) for drugs by making the other aspects barely noticeable.

The table 22 below shows the type of poisoning used in the suicidal attempt

Type of Poisoning	Frequency	Percentage
Pesticide	168	45.5
Drugs	177	48.0
Eating natural poison	7	1.9
Others	17	4.6
<b>Total</b>	<b>369</b>	<b>100.0</b>

#### 4.6 Type of Pesticide

Data shown above outlines the types of pesticides used in suicidal attempts. Out of the identified number of 168 from the above outcome it was clarified that 126 attempts were done by the usage of Organophosphate which is 75% of the total. This may be due to easy access to pesticides at retail outlets which are mostly used by the farmers in the area.

The table 23 below shows the type of pesticide used in suicidal attempt

Type of Pesticide	Frequency	Percentage
Organophosphate	126	75.0
Carbanate	20	11.9
Paraquat	9	5.4
Others	13	7.7
<b>Total</b>	<b>168</b>	<b>100.0</b>

#### 4.7 Type of drug used in suicidal attempt

When the types of drugs were analyzed, a variation of drugs such as Paracetamol, Chlorpheniramine, Salbutamol, Diazepam and a certain other variations were used in suicide attempts. Out of 177 sample size, Paracetamol has been identified as the most commonly used drug with a percentage of 47.5 %.

The table 24 below shows the type of drug used in suicidal attempt

Type of drug used	Frequency	Percentage
Paracetamol	84	47.5
Chlorpheniramine	12	6.8
Salbutamol	16	9.0
Diazepam	19	10.7
Others	46	26.0
<b>Total</b>	<b>177</b>	<b>100.0</b>

$$\chi^2 = 0.031 \quad df=1 \quad P=0.860$$

#### 4.8 Associations between selected Demographic Factors, Behavioral factors, Socio-economic factors and Physical & mental factors.

##### 4.8.1 Type of attempted suicide by gender

When the method of attempt suicide was considered, more males attempted suicide by poisoning. When males and females were compared, 57.2% males took poisoning compared to 42.8% females. The association between being gender and type of attempt was statistically not significant ( $P=0.860$ ).

Table 25 indicates the distribution of type of attempt suicide by gender.

		TYPE OF ATTEMPT SUICIDE		Total
		poisoning	Others	
GENDER	MALE	211 57.2%	13 59.1%	224 57.3%
	FEMALE	158 42.8%	9 40.9%	167 42.7%
<b>Total</b>		<b>369</b> <b>100.0%</b>	<b>22</b> <b>100.0%</b>	<b>391</b> <b>100.0%</b>

#### 4.8.2 Method of suicidal attempt and employment status.

Poisoning was higher among unemployed persons (61.2; 226/369) than employed persons. The association between being employment status and type of attempt were statistically not significant ( $P=0.069$ ).

Table 26 indicates the distribution of type of attempt suicide by employment status

		TYPE OF ATTEMPT SUICIDE		Total
		poisoning	others	
Employment	YES	143	4	147
		38.8%	18.2%	37.6%
	NO	226	18	244
		61.2%	81.8%	62.4%
<b>Total</b>		<b>369</b>	<b>22</b>	<b>391</b>
		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

$$\chi^2 = 3.745 \quad df=1 \quad P=0.069$$

#### 4.8.3 Type of attempt suicide by age

A larger percentage of people above 30 years of age (90%), used methods other than poisoning (example- Fire, hanging). The association between age (over 30) and type of attempt (Methods other than poisoning) was statistically significant ( $P=0.017$ ).

Table 27 indicates the distribution of type of attempt suicide by age

		TYPE OF ATTEMPTED SUICIDE		Total
		Poisoning	others	
age with 2 categories	<30 yrs	126	2	128
		34.1%	9.1%	32.7%
	30 yrs and above	243	20	263
		65.9%	90.9%	67.3%
<b>Total</b>		<b>369</b>	<b>22</b>	<b>391</b>
		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

$$\chi^2 = 5.919 \quad df=1 \quad P=0.017$$



#### 4.8.4 Type of attempt suicide by marital status.

A greater proportion of those who were single (55.6%; 205/369) tried poisoning. However, the association between marital status and type of attempt was not statistically not significant (P=0.355).

Table 28 indicates the distribution of type of attempt suicide by marital status

		TYPE OF ATTEMPT SUICIDE		Total
		poisoning	Others	
MARITAL STATUS	Single	205	10	215
		55.6%	45.5%	55.0%
	others	164	12	176
		44.4%	54.5%	45.0%
<b>Total</b>		<b>369</b>	<b>22</b>	<b>391</b>
		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

$$\chi^2 = 0.856 \quad df=1 \quad P=0.355$$

#### 4.8.5 Past suicidal attempts by age.

Those above 30 years had more past suicidal attempts compared with those below 30 years. This association between age and history of past suicidal attempts was statistically significant (P=0.001).

Table 29 indicates the presence of past suicidal attempts by age.

		HISTORY OF PRIOR SUICIDE ATTEMPTS		Total
		YES	NO	
age with2 categories	<30 yrs	17	111	128
		18.9%	36.9%	32.7%
	30 yrs and above	73	190	263
		81.1%	63.1%	67.3%
<b>Total</b>		<b>90</b>	<b>301</b>	<b>391</b>
		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

$$\chi^2 = 10.181 \quad df=1 \quad P=0.001$$

#### 4.8.6 Past suicidal attempts by marital status

Those who not single had more past suicidal attempts when compared with those who were single. This association between marital status and history of past suicidal attempts was statistically significant ( $p=0.000$ ).

Table 30 indicates the presence of past suicidal attempts by marital status.

		HISTORY OF PRIOR SUICIDE ATTEMPTS		Total
		YES	NO	
MARITAL STATUS	Single	33 36.7%	182 60.5%	215 55.0%
	others	57 63.3%	119 39.5%	176 45.0%
<b>Total</b>		<b>90</b> <b>100.0%</b>	<b>301</b> <b>100.0%</b>	<b>391</b> <b>100.0%</b>

$$\chi^2 = 15.854 \quad df=1 \quad P=0.000$$

#### 4.8.7 Past suicide attempts by gender

Males had a more prevalence of past suicidal attempts. The association between gender and past suicidal attempts was not statistically significant ( $P=0.892$ ).

Table 31 indicates the presence of past suicidal attempts by gender.

		HISTORY OF PRIOR SUICIDE ATTEMPTS		Total
		YES	NO	
GENDER	MALE	51 56.7%	173 57.5%	224 57.3%
	FEMALE	39 43.3%	128 42.5%	167 42.7%
<b>Total</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

$$\chi^2 = 0.019 \quad df=1 \quad P=0.892$$

#### 4.8.8 Psychiatric diseases by age

Those above 30 years had more history of psychiatric diseases when compared with those below 30 years. This association between age and history of psychiatric diseases was statistically significant (P=0.001).

Table 32 indicates the prevalence of psychiatric diseases by age.

		HISTORY OF PSYCHIATRIC DISEASES		Total
		YES	NO	
age with 2 categories	<30 yrs	17 18.1%	111 37.4%	128 32.7%
	30 yrs and above	77 81.9%	186 62.6%	263 67.3%
<b>Total</b>		<b>94</b> <b>100.0%</b>	<b>297</b> <b>100.0%</b>	<b>391</b> <b>100.0%</b>

$$\chi^2 = 12.064 \quad df=1 \quad P=0.001$$

#### 4.8.9 Psychiatric diseases by marital status.

Those who were not single had more psychiatric diseases when compared with those who were single. This association between marital status and psychiatric diseases was statistically significant (p=0.039).

Table 33 indicates the prevalence of psychiatric diseases by marital status.

		HISTORY OF PSYCHIATRIC DISEASES		Total
		YES	NO	
MARITAL STATUS	Single	43 45.7%	172 57.9%	215 55.0%
	others	51 54.3%	125 42.1%	176 45.0%
<b>Total</b>		<b>94</b> <b>100.0%</b>	<b>297</b> <b>100.0%</b>	<b>391</b> <b>100.0%</b>

$$\chi^2 = 4.271 \quad df=1 \quad P=0.039$$

#### 4.8.10 History of psychiatric disorders by gender

Males had a more prevalence of psychiatric diseases. The association between gender and psychiatric diseases was not statistically significant ( $P=0.321$ ).

Table 34 indicates the prevalence of psychiatric diseases by gender.

		HISTORY OF PSYCHIATRIC DISEASES		Total
		YES	NO	
GENDER	MALE	58 61.7%	166 55.9%	224 57.3%
	FEMALE	36 38.3%	131 44.1%	167 42.7%
<b>Total</b>		<b>94</b> <b>100.0%</b>	<b>297</b> <b>100.0%</b>	<b>391</b> <b>100.0%</b>

$$\chi^2 = 0.985 \quad df=1 \quad P=0.321$$

#### 4.9 The incidence of suicidal attempts in Badulla General Hospital, Sri Lanka.

$$\text{Cumulative incidence} = \frac{\text{Number of new cases of suicide during a period}}{\text{Population exposed during this period}}$$

Number of new cases of suicidal attempts from 01st January 2008 to 31st December 2008 to the General hospital Badulla = 391

Number of total admissions to the General hospital Badulla from 2008.01.01 to 2008.12.31 = 88349

$$\begin{aligned} \text{Cumulative incidence} &= 391 / 88349 \\ &= 4.4 / 1000 \text{ per year} \end{aligned}$$

In this study the study population was based on the hospital admissions due to suicidal attempts to the General hospital Badulla in 2008. Therefore we can't apply this cumulative suicidal incidence rate for the whole population of the Badulla district because there were many other hospitals which treated to the admitted patients due to the suicidal attempts. General hospital Badulla was the main curative care institution of the district with the availability of consultant psychiatrist facilities and the highest number of patients treated in Badulla district.

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## **CHAPTER V**

### **DISCUSSION, SUMMARY AND CONCLUSIONS**

#### **Discussion**

The first demographic data collected in this study was age. Studies done in Sri Lanka have shown that risk of deliberate-self-harm was greatest in the younger age group. Samarasinhe (1991) in a study done in the Colombo south hospital reported that the majority (81%) were below 30 years of age, the findings of which are very similar to this study. Fernando (1990) reported that 75% of patients presenting with suicidal attempts to the National hospital in Colombo were between the age of 10 and 20. Eddleston (1998) in a study done at general hospital Anuradhapura reported that two third of those who were admitted following act of deliberate self harm were under the age of 30 years. In the study done by Talagala in 2000, those below 19 years were the most at risk group. According to a retrospective hospital based study done at Teaching Hospital, Peradeniya, about 60% of admissions for suicide and parasuicide were in the 16 to 25 years age group (de Silva H. J., 2000). Of these, 39.9% were in the age group 16 to 20 years.

Preponderance of younger age group among suicide attempters has been shown in studies from other countries too (Kar, 2010; Ronald, 1999). This study replicated those finding by showing that about two third of suicidal attempters were between the age of 10 to 29. However only a small percentage of suicide attempters (1.8%) were over the age of 60. Previous studies have shown elderly are another high risk groups (Gelder et al., 2006) Reasons for low incidence of suicidal attempts in over 60 age group in this study could be related to social and cultural factors as identified by Beautris (2000). Religious and cultural influences may have a role in reducing suicidal risk in this age group. (Beautrais, 2000; Swahn and Bossarte, 2007) However this is an area which needs to be further explored. In this study population every participant reported to have a religion. However that does not necessarily mean that each participant practices their religion. Hence it is difficult to make inferences on effects of religion on suicidal attempts. Even though the numbers of suicidal

attempts were low in elderly population in this study, it needs to be interpreted with caution as that age group is at a higher risk of completed suicide.

In the present study more males attempted suicide compared to females (Male:Female (1.34:1). Other studies from Sri Lanka have shown either male or female preponderance among suicidal attempters. Samarasinhe (1991) reported a male to female ratio of 1.1:1..However, Kathriarachchi (1996) and DeSilva (2002) found a female preponderance.A recent study from India shows a Male:female ratio of 1:1.1 (Kar, 2010). According to Gelder et al., 2006, the difference in rates of deliberate self-harm between males and females in the West is becoming less.

Majority of people who attempted suicide was Sinhalese. 26% of suicidal attempters were Tamils. However Tamil only contributed to 11% of the population in Badulla district. This highlights the higher incidences of suicidal attempts by Tamils mainly among Indian Tamils as two thirds of those Tamils who attempted suicide were Indian Tamils. The reason behind increase incidence among Indian Tamil population needs to be explored further.

More than half of the suicide attempters were single. Incidence of suicide attempts among widowed, separated and divorced was low which is different to previous findings..Even though been single, widowed and divorced are considered to be high risk factors, high incidence of married people attempting suicide suggests the possibility of other factors which increase the risk of suicide. Studies have shown those unmarrieds are at a greater risk of suicide attempts (Talagala 2000, Samarasinghe 1991, Kathriarachchi 1996). In the West, single people and the divorced have high rates of deliberate self-harm (Gelder et al., 2006).

About 60% of participants did not have children. This could be due the fact that similar percentage was single. Significance of number of children is difficult to ascertain in the present study.

History of harmful use of alcohol is a risk factor for mental illnesses. It is also a maladaptive coping strategy people use when they are under stress and struggle to cope. Hence use of alcohol can have a direct link to suicidal behavior through its link to mental illnesses or indirectly through poor coping with life stressors which leads to

both heavy use of alcohol and suicidal attempt. Interestingly in this study only 28% stated that they use alcohol regularly. Similar percentage of people seemed to have under the influence of alcohol too. Low incidence of reported use of alcohol may be due to religious and cultural factors. As discussed above, large percentage of the study population was Buddhists. Buddhism and Hinduism together contribute to 85% of religion of study participants. Both these religions are critical about drinking alcohol. This could be a reason for low number of alcohol use among participants or due to religious beliefs, people may not report even if they consume alcohol.

Level of education was another area assessed in this study. The study showed that 25% of participants did not have school education. However there are no data on educational level of the population in badulla district. Therefore it is difficult to make conclusions on relationship between educational level and suicidal attempts as this distribution of educational level may also be found in normal population of this area. However the large number of patients with minimal or no education raises the possibility if suicidal attempt is an maladaptive measure of coping with difficulties. It can also be that people with no or low education come poor financial backgrounds, hence there are more life difficulties compared to people from higher financial and economic backgrounds.

Nearly 50% of study participants were unemployed in the present study. Unemployment has been recognised as a high risk factor for suicide (Morrell et al. 1998). The other two large groups identified by this study were students and agricultural/ animal and related forestry workers. Availability of suicidal methods such as chemicals used in agriculture may explain high incidence of suicide among agricultural workers with suicidal attempts. Similar percentage of students has also attended with suicidal attempts. The reason behind this is open for speculation. Stressors associated with studying and financial difficulties of engaging in education without any financial support may be some of the reasons.

24% of participants reported to have a past history of psychiatric disorders. Out of those psychiatric disorders, history depression was present in nearly 80% of patients. Presence of a depressive disorder leads to thoughts of worthlessness. Increasing severity of depressive symptoms lead to self harming behaviors and



suicidal ideas. Therefore the high incidence of past history of depression among suicidal attempters needs to be taken seriously. Recognition and treatment of depression can lead to reduction of suicide attempts. In this study, history of psychiatric illness was looked at. Therefore it is difficult ascertain whether these patients were suffering from a mental disorder at the time of suicidal attempt.

Family history of psychiatric problems and family history of suicide attempts seem to be present in about one third of participants. The associations between family history of suicide and suicidal attempts have been shown in studies. (Beautrais, 2003)

A majority (94%) attempted suicide by poisoning. Only a small percentage tried other methods such as setting fire, hanging or jumping. Out of those who attempted to poisoning, equal number of people used either pesticides or drugs. Use of pesticides has been recognised as a common method of suicide in Sri Lanka leading to high mortality and highest bed occupancy in medical wards (Eddleston 1998). This study has shown that pesticide poisoning still remains a common method. Out of the pesticides, paraquat and organophosphate were commonly used chemicals. Mortality associated with the use of Organophosphate and Paraquat is high as 60% (Eddleston 1998). As Badulla is an agricultural area, there is easy access to these pesticides. When planning suicide prevention methods these findings need to be considered carefully. The other common method is use of drugs. Out of the drugs, Paracetamol accounted for nearly half of the suicidal attempts. Paracetamol overdose is a common method of attempted suicide in western world. Measures taken such as reducing the number of tablets sold to one person at a time have led to decrease in suicidal rate in UK (Hawton et al., 2004). Considering these measures to reduce the accessibility for drugs and poisons need to be further assessed.

Family history of suicide attempts or knowing a person with a history of suicide is considered to be a risk factor. Eddleston (1998) studied all patients admitted with deliberate self harm to Anuradapura hospital. This showed that 2559 patients were admitted with deliberate self harm. This is about six times higher than admissions to Badulla hospital. This showed that more than 90% of people with suicide attempts attending Anuradapura Hospital (Agricultural town) knew someone who had killed themselves. However figures from the present study are much lower

than that; only 40% of people had a family history of suicide attempts. This shows that people who attempt suicide are different from one area to another. This should be kept in mind when planning interventions for suicide prevention.

Majority of men (57%) used poisoning as the suicidal method. However further analysis showed that there is no statistically significant relationship between gender and method of suicidal attempt ( $P=0.86$ ). However there was a statistically significant relationship for people older than 30 years using methods other than poisoning.

A larger percentage of people over the age of 30 had a past history of suicide attempts. This association was statistically significant. If people attempt suicide repeatedly, then people who are older more likely to have a history of attempts compared to younger. This could be the reason for this significant association. Reasons for significant association between past psychiatric history and increasing age could also be described as above.

### **Strengths**

- a. This study has a bigger sample size. It included all patients who attended Badulla district hospital in one year period. Therefore the results of this study give a clearer understanding of people with suicide attempts.

### **Weaknesses**

- a. This study looks at all admissions with suicide attempts to a hospital in Baduall district. Since Badulla district is covered by few other hospitals, data on patients attending this hospital does not give an overall picture of suicide attempts in the Badulla district.
- b. Findings of this study are derived from Badualla district. Population of Badulla district has a different socio economic background to the rest of the country. Therefore these findings cannot be generalized to rest of the country.

- c. Data was collected retrospectively using patients' medical records. The data recorded on these patients were not done with the aim of research. Therefore some of the information collected in this study was not found in detail in patient's medical records. This limited the ability to do further analysis of the data. Example- Medical records stated whether the patient has a history of alcohol use. But it did not comment on use of alcohol at the time of suicide attempt which would have provided with more insight into the problem.



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## SUMMARY

The majorities (69%) of the patients were below 30 years of age and 36.6% were in the 20-29 age group. The 10-19 years age group formed the second highest group in attempting suicide. The median age in attempting suicide was 23 years. The study showed that the act of deliberate self-harm were very common among the young adults therefore, placing the adolescents as a risk group.

The study also showed that 57% of the sample was males. A female to male's ratio was 1:1.3.

Buddhism and Hinduism showed the highest rates in religion related suicide attempts with frequencies 230 (58.8%) and 99 (25.3%) respectively in comparison with Christianity and Islamism.

Single and married groups showed comparatively high frequencies, 215 (55.0%) and 143 (36.6%) respectively, as opposed to divorced, separated or widowed groups.

Among ethnic related suicide attempts, Sinhalese showed the highest frequency of 245 (62.7%). When family related suicide attempts were studied, families without children had the highest suicide frequency of 242 (61.9%) when compared to families with 1, 2, 3, 4, 5 and 6 children.

Patients who didn't use alcohol showed the highest frequency of 278 (71.1%) in suicide attempts when compared with patients who consumed alcohol 113 (28.9%). Similar results were also seen among patients who were not influenced by alcohol showing a high frequency of 280 (71.67%) as opposed to patients under the influence of alcohol.

Among patients who used drugs, 55 (14.3%) of patients abused other drugs such as cannabis, heroin and other types.

Patients who had an average education level up to Ordinary Levels showed the highest frequency of 148 (37.9%). The second highest attempts of suicide were seen among patients with no education with a frequency of 101(25.8%).

Overall, employment data concluded that suicide attempts were more common among the unemployed persons with a frequency of 244 (62.4%). In occupation related suicides, the highest attempts were seen among unemployed persons with a frequency of 179 (45.8%). Persons involved in agriculture showed the next highest frequency of 73 (18.7%). The data also showed low suicide frequencies among patients with high status occupations.

From the family income data obtained, the highest frequencies of suicide were seen among families with an average income between 5,001 to 10,000 Rupees with a frequency of 175 (44.8%).

The history of chronic diseases was low with a frequency of 88 (22.5%) when compared to that of patients with no history of chronic diseases with a frequency of 303 (77.5%).

The patients with a history of psychiatric diseases had a frequency of 94 (24%). In the 94 sample lot, 75 (79.8%) were suffering from depression while 14.9% were suffering from Psychosis. Among the sample size 23% reportedly committed previous acts of deliberate self- harm.

Out of the sample size of 391 patients, a considerable amount of 369 patients committed suicide by using poison, which identifies that this could be due to easy accessibility to different types of poisoning. From the types of poisoning used, pesticides and drugs showed the highest frequencies with 168 (45.5 %) for pesticides and 177 (48.5%) for drugs therefore, making the other aspects barely noticeable

Analysis of the types of pesticides used revealed that out of the identified number of 168 patients, 126 patients committed suicide by using organophosphate making it 75% of the total. We can conclude that this pesticide is possibly used in rural areas more frequently and is very much accessible at retail outlets to farmers in the area.

Ingestion of drug over dose is the most common method of suicide, with a percentage of 48%. Paracetamol was the most widely used drug (47%), due to its wide availability and easy accessibility.

Association factors

The association between age and type of attempt were statistically significant. The association between age and marital status with history of past suicidal attempts was statistically significant. The association between age and marital status with history of psychiatric diseases was statistically significant.

Cumulative incidences of suicidal attempts in badulla general hospital were 4.4 / 1000 per year (2008).



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## RECOMMENDATIONS

### 1) Interventions aimed at high risk groups

1.1 In this study depression was found to be the most prevalent mental illness among those who were admitted with acts of deliberate self-harm. Therefore, the detection and treatment of depression is of primary importance by all medical officers with appropriate referral when necessary. The community, especially those who are depressed and persons around them need to be aware of symptoms and signs of depression and that effective treatment is available.

1.2 Although only 30% patients in this study had alcohol misuse and dependence, detecting and treating alcohol related problems is of importance because alcohol use is a known risk factor for suicide and deliberate self-harm. Therefore, educating primary care physician about detection and treatment of alcohol misuse, and implementation of national policies is vital.

1.3 Intervention for those who present with acts of deliberate self-harm. According to this study nearly 23% patients had attempted suicide in the past. Follow-up systems can be carried out by maintaining a register for patients who are at high risk and also by training social workers or family health workers to identify people and keep a watch on them with the consent of the patients and their families.

1.4 Mental illnesses were shown to be associated with suicidal attempts in this study. Regular training programs for primary healthcare staff can be offered in order to detect psychiatric disorders such as depression. This can in turn help the early identification of these disorders therefore allowing treatment for those with mental illnesses. By strengthening undergraduates can also benefit resulting in carrying out risk assessments for those who come with act of deliberate self-harm. Also, offering training in risk assessment for medical officers in all hospitals and especially in hospitals where there are no psychiatrists can also benefit in greater levels.

Expansion of mental health services by appointing medical officers of mental health and developing a referral system for people with mental illness is also a significant step which must be taken.

## **2) Population strategies related to prevention of suicidal attempts.**

2.1 Restricting the availability of pesticides and restriction of access has been found to be one of the most effective methods of bringing down suicidal rates due to pesticides. The majority of patients in this study used therapeutic substances. Therefore, restrictions based on preventing over the counter purchase of medicinal substances without prescriptions would also be of benefit.

2.2 The most affected group was youth and adolescents. Poor coping skills are a significant etiological factor. Life skill training for vulnerable groups such as adolescents and youth is essential. This component is already incorporated into the school curriculum and needs to be strengthened. Community level support systems to address the problems of youth and enhance coping skills have to be strengthened. And to people should be encouraged to seek help for mental health problems.

2.3 Those who suffer from mental illnesses are much more likely to commit suicide if they are not being treated or are not receiving adequate Treatment. Reducing stigma about both mental illness and suicide can help people to seek available treatment for mental and behavioral problems.

A change in the way of perceiving suicidal attempts as a method of problem-solving at community level is needed. Self-harm should not be portrayed as a natural response to any form of distress. The media have a big role to play regarding this issue. The community can have programs to sensitize the local media on sensitive reporting of suicide to prevent possible harmful outcomes.

2.4 Setting up of community support centers and wide availability and accessibility of counseling services may also be beneficial in providing services to encourage people to seek help.



### 3) Further research

Further research needed to further explore reasons behind high suicide attempt rate among people from certain ethnic minorities such as Indian Tamils. A clear understanding about the reasons behind their suicidal acts will shed light on to preventive strategies and help people who have attempted suicide.



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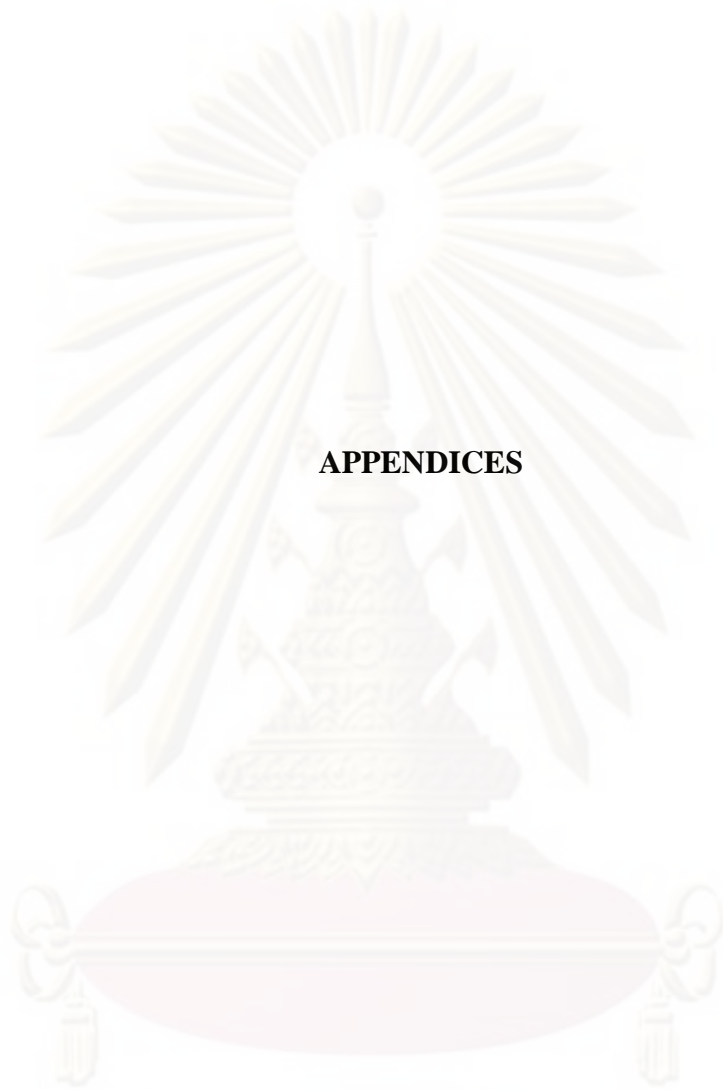
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**APPENDICES**

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

## APPENDIX A

## Patient Data and Information Sheet

BHT NO

Date of admission

Date of discharge

Diagnosis on discharge 1. \_\_\_\_\_  
2. \_\_\_\_\_

Ward \_\_\_\_\_

Age

Address  badulla district  other district  not recorded

Gender  male  female

Race  Sinhala  Lanka Tamil  Lanka Muslim  Indian Tamil  
 Indian Muslims  Burger or Mala  others  not recorded

Religion  Buddhism  Christianity  Hinduism  Islam  others  
 not recorded

Marital status    single    Married    Divorced    separated  
 widow    not recorded

No. of children's \_\_\_\_\_

Educational level    No school education  
 School education (till grade 5)  
 School education (above grade 5 to Ordinary Levels)  
 School education (above Ordinary Levels – Advanced Levels)  
 Bachelors Degree & higher  
 Not recorded

Employed    YES    NO

Occupation \_\_\_\_\_  
 Not recorded

Family income RS \_\_\_\_\_

- Type 1 less than 5,000 Rupees  
 Type2 between 5,001 to 10,000 Rupees  
 Type 3 between 10,001 to 15,000 Rupees

- Type 4 between above 15,001 to 20,000 Rupees
- Type 5 more than 20,001 Rupees
- Not recorded

History Of Chronic Disease  yes  no  not recorded

- Malignancy  neurological disorders  respiratory diseases
- diabetic  Cardiac problem
- Others \_\_\_\_\_

History of Past Psychological/psychiatric Disease  yes  no  not recorded

- If “yes” what 1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Type of suicide attempt  poisoning →  pesticide  drugs

eating natural poison  others

If “pesticide” type of pesticide

\_\_\_\_\_

If “drug” generic name of drug

\_\_\_\_\_

- Setting fire to oneself
- Hanging
- Jumping
- Using firearms
- Others \_\_\_\_\_

History of prior suicide attempts  yes  no  not recorded

If “yes” how many times \_\_\_\_\_

Alcohol use  yes  no  not recorded

Type of alcohol  spirits  beer  others

How many days per week \_\_\_\_\_

How much drinks a day \_\_\_\_\_

Were you under the influence of alcohol at the time of suicidal attempt?  Yes  no

Illicit drug use  yes  no  not recorded

Type of drugs \_\_\_\_\_

How many days per week -----

Family history of psychiatric problems  yes  no  not recorded

Family history of suicide attempts  yes  no  not recorded

ศูนย์วิทยุทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



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