

LIFE CHANGE EVENTS AND CEREBROVASCULAR
ACCIDENT

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DEDICATION

This thesis is dedicated in loving memory to my grandmother, Stella Gavronski, whose untimely death demonstrated to me the tragedy of cerebrovascular accident.

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CHAPTER 1

INTRODUCTION

Cerebrovascular accident (CVA) or stroke has become a major health problem in most parts of the world. Risk factors have been identified as contributory to the development of stroke, and so the collation of information concerning the natural history, incidence, and factors enhancing risk seems imperative. Arterial hypertension, diabetes mellitus, hyperlipidemia, obesity, oral contraceptives, heart diseases, personality patterns, and life stress have been implicated as etiologically related to the subsequent development of cerebrovascular disease. However, much controversy remains (Lavy, 1979).

Hinkle (1973) has noted the resemblance between ordinary life activities and laboratory studies of stress:

The ordinary activities of daily life--the ingestion of food, or the failure to ingest food; muscular activity, or the absence of muscular activity; breathing, or not breathing; sleeping, or not sleeping, all affect the dynamic steady state. Their effects are not qualitatively different from those "stressors" that are used in the laboratory. To be alive is to be under stress. (p. 43)

The role of stress related to life events has been a focus of research in recent years. The present study examined the effects of stress related to life changes for the 1-year period preceding a CVA. If life change events can be identified as a predisposing risk factor to the development of cerebrovascular disease, health care professionals will be able to use this information to identify people in life-change crises and teach people about life change and its effects on health.

Problem of Study

The problem of this study was to compare the life change unit mean score of persons who have a diagnosis of cerebrovascular accident (CVA) and the life change unit standard score of 300, which is indicative of a major life crisis, as described by Holmes and Rahe (1967).

Justification of Problem

Health care workers are in a unique position to identify persons who may suffer an illness following significant life changes. To reach people before illness strikes should be the focus in health education and in the prevention of illness and accidents in the community. Knowledge of the effect of life changes on

illness and accidents should serve as an impetus to the planning of programs aimed at preventing life-change crises (McNeil & Pesznecker, 1977).

The life-change approach implies that the significance of stress events is that they demand adaptation, which in itself is costly to the organism as demands increase. This notion is related to Selye's (1976) concept of stress as a nonspecific bodily response that is wearing on the biological system. The life-change approach to stress is less consistent than various cognitive theories of stress that give emphasis to perceptions of threat, loss, and challenges to self-esteem. Whereas the life-change conception of stress does not appear to require consideration of psychological intervening variables, the cognitive perspective of stress depends on them (Mechanic, 1974). Alternative interpretations of the impact of life changes include the following: there exists some direct biological response to continuing demands to maintain adaptive balance in the face of changing circumstances and demands reactivity which in itself increases vulnerability to illness. Still another view is that the types of life event usually included in such stress scales involve new demands,

changes in life routines, and breaks in established patterns. Or the activity itself may take time and attention away from protective and anticipatory coping and result in increased risks of illness and accidents (Mechanic, 1974).

A clustering of life-change events has been implicated as a precipitant of major health changes resulting in various diseases and conditions such as skin conditions, respiratory problems, inguinal hernias, and pregnancy (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964). There is a lack of information on the examination of life-change events prior to the occurrence of a CVA.

Cerebrovascular accident is the third leading cause of death in the United States, accounting for over 10% of all mortality. Even more alarming is the fact that CVA so often disables, leaving the patient with tremendous medical expenses, loss of function, and years of physical and emotional distress. Every year approximately 600,000 people in the United States become CVA victims. Almost 40% die within the first month and at least two-thirds of those who survive have some degree of permanent disability. At the present time the population of this country includes 2.5 million

disabled survivors of CVA (United States Department of Health, Education, and Welfare, 1979).

The personal, societal, and financial losses which are incurred due to CVA are enormous. The economic toll of this disease, considering both the cost of care and the loss of earnings is estimated to be about \$9.5 million annually. The demands for medical and nursing care are tremendously expensive. For instance, nursing home care for the completely dependent CVA patient is estimated to cost more than \$12,000 annually. For patients who have some ability to care for themselves, the costs are still \$3,500 a year. The increased demands on the family and emotional suffering are incalculable (United States Department of Health, Education, and Welfare, 1979).

Nursing is in the unique position of being able to assess the health status of individuals and groups in the community and in health care settings, and therefore, can identify persons at high risk for health problems from the stress of rapid change. Therefore, the importance of investigating the role of life change events prior to the occurrence of CVA has been identified as having potential value to nursing practice.

This knowledge may contribute greatly to the prevention, treatment, and rehabilitation of patients with cerebrovascular conditions.

Theoretical Framework

The theoretical framework for this study was based on Selye's (1976) theory of stress and adaptation. The concept of life changes developed by Holmes and Rahe (1967) also served as a basis for this study.

Selye (1976) defined stress as "the state manifested by a specific syndrome which consists of all the nonspecifically-induced changes within a biological system" (p. 64). The state of stress was first recognized by evidence of adrenal stimulation, shrinkage of the lymphatic organs, gastrointestinal ulcers, and loss of body weight with characteristic alterations in the chemical composition of the body. The stress state was later found to comprise many other changes as well that formed a syndrome, a set of manifestations which appeared together. This was called the general adaptation syndrome (GAS) (Selye, 1976).

Chemical alarm signals are sent out by the directly stressed tissues to the centers of coordination in the nervous system and then to the endocrine glands,

especially the pituitary and the adrenals. These glands produce adaptive hormones; i.e., cortisols, to combat wear and tear in the body. The effects of these hormones can be modified, or conditioned, by other hormones (adrenalines or thyroid hormones), nervous reactions, diet, heredity, and tissue memories or previous exposure to stress. Malfunction of the GAS produces diseases of adaptation, that is, stress diseases. Selye (1976) further defined the stress response as a

tripartite mechanism, consisting of: (1) the direct effect of the stressor upon the body; (2) internal responses which stimulate tissue defense or help to destroy damaging substances; and (3) internal responses which cause tissue surrender by inhibiting unnecessary or excessive defense. (p. 56)

An ever increasing proportion of the human population dies from the so-called wear-and-tear diseases, diseases of civilization, or degenerative diseases, which are primarily due to stress. Examples of these diseases of adaptation are high blood pressure, heart attack, peptic ulcer, migraine headache, neck pain, and others. These and many other diseases are not the direct result of any pathogen, but of defective bodily or mental reactions to the stressors encountered in daily life (Selye, 1976).

In 1943, through an experimentation on rats, Selye (1976) demonstrated that mineralocorticoids (which are released as part of the stress-response) produce a kidney disease of the kind which also occurs spontaneously in man and is called nephrosclerosis. Selye (1976) found that no matter whether this disease is produced in animals by overdosage of corticoids, or whether it develops spontaneously in man, nephrosclerosis is accompanied by a marked rise in blood pressure. At the same time, hardening, rigidity, and inflammatory changes develop in the walls of the arteries throughout the body. Selye grouped the changes of arteriosclerosis as belonging to a class of diseases commonly seen in the aged and stated that these diseases are presumably ones that are the result of lifelong stress. Selye concluded that life is a series of adaptations to one's surroundings (Selye, 1976).

In 1957, Holmes and his associates (cited in Holmes & Rahe, 1967) began a systematic study of the quality and quantity of life-changing events that appeared to cluster around the onset of illness. To assess the impact of these events, Holmes and Rahe (1967) devised the Social Readjustment Rating Scale. The Scale included

many events typically stressful in nature, such as divorce, death of a spouse, or loss of a job. The Scale also included desirable events such as retirement or a vacation. A theme identified as common to all life events was that the occurrence of each event usually evoked or was associated with some adaptive or coping behavior on the part of the involved individual. The emphasis of the event was on the change that was made from the existing steady state and not on the psychological meaning, emotional, or social desirability (Holmes & Rahe, 1967). The major premise in the research efforts of Holmes and his associates (cited in Masuda & Holmes, 1967) was that the adjustment which a person makes to the ongoing changes in his life tend to be associated with the onset of an illness.

Rahe et al. (1964) systematically studied the relationship of environmental variables to the time of illness onset. Seven sample groups (\bar{n} = 20 to 40) and two control groups were given a standardized questionnaire which yielded information about quantity and timing of social stresses experienced over a 10-year period. The disease group (tuberculosis) demonstrated

a clustering of social stresses in the final 2 years of the 10 premorbid years. The difference between the tuberculosis group and their control group with regard to the clustering of social stresses was significant at the .02 level of significance. Similar findings of clusters of social stresses were demonstrated in groups of patients with newly diagnosed skin conditions, subjects with inguinal hernias, and married and unmarried females who experienced pregnancy. The mounting frequency of changes in social status found in the 2-year period preceding disease onset was termed the psychosocial life crisis, and postulated that "the life crisis represented a necessary but not sufficient precipitant of major health changes" (Rahe et al., 1964, pp. 42-43). More recent studies conducted by Holmes and Masuda (1973) have demonstrated that the greatest clustering of life events occurs within the 1-year period preceding a major health change.

Despite a popular view that cerebrovascular accidents are precipitated by intense emotions, and that tense, high-pressured individuals subjected to stress are more prone to develop stroke, there has been little effort to examine the validity of this impression

(Adler, MacRitchie, & Engel, 1971). Therefore, drawing on Selye's (1976) theory of stress and the vascular changes that are associated with the stress state, this study explored the amount of life-stress related to change that existed in persons prior to the occurrence of a CVA. The conceptual framework of Holmes and Rahe (1967) which emphasized that life changes tend to cluster around health changes served as the basis for this investigation.

Assumptions

For this study the following assumptions were made:

1. Change is an inherent part of life.
2. Change is stressful.
3. Stress has been implicated as a potential risk factor in cerebrovascular disease.

Hypothesis

For the purpose of this study, the following hypothesis was tested:

There is no significant difference between the mean life change unit score of recently diagnosed CVA patients for the 1-year period preceding CVA, as measured by the Schedule of Recent Experience Questionnaire,

and the life change unit standard score of 300 which is indicative of a major life crisis, as described by Holmes and Rahe.

Definition of Terms

The following terms were defined for use in this study:

1. Cerebrovascular accident (CVA) or stroke--an interruption in the normal circulation of blood to the brain from intracranial hemorrhage, thrombosis, or embolism (Taber's cyclopedic medical dictionary, 1970), and diagnosed by a physician as CVA or stroke.
2. Life change events--the kind of life changes that are part of normal existence that are identified by Holmes and Rahe (1967) as requiring adaptive behavior.
3. Life change units (LCUs)--quantitative values reflecting the average degree or intensity of life change required by an event as measured by the Schedule of Recent Experience Questionnaire; the instrument developed by Holmes and Rahe.
4. Major life crisis--LCU sum of 300 or more for the 1-year period preceding a major change in health status.

Limitations

The following were limitations of the study:

1. The study was conducted in one geographic area.
2. The study lacked randomization in subject selection.
3. The ability to recall past events may vary with individuals.
4. Coping abilities vary among individuals; what would be a crisis situation for one individual may not be for another.

Summary

This study compared the life change unit mean score of persons who have a diagnosis of CVA and the standard score of 300 which is indicative of major life crisis. The theoretical framework for the study was based on Selye's (1976) theory of stress and adaptation and the conceptual framework of life change developed by Holmes and Rahe (1967).

The goal of this study was to contribute to the knowledge of what influence change has on a person's health. This knowledge could assist nurses in finding

methods to help people assess their stress levels and to cope with change before illness results.

CHAPTER 2

REVIEW OF LITERATURE

Research has shown evidence that life events, by evoking psychophysiological reactions, play an important role in the development of many diseases (Petrich & Holmes, 1977). This study examined the life change events of recently diagnosed stroke patients for the 1-year period preceding stroke to determine if a major life crisis existed.

This chapter includes a review of pertinent literature related to stress and life change events as they relate to health changes. Topics to be discussed include cerebrovascular disease, the concept of stress, life change, coping with stress, and nursing implications in regard to life change events.

Cerebrovascular Disease

According to Adams and Victor (1977), cerebrovascular diseases rank first in frequency and urgency among all neurologic disorders. At least 50% of the neurologic problems in a general hospital are of this type. The term cerebrovascular disease designates any

abnormality of the brain resulting from a pathologic process implicating the blood vessels.

So distinctive are the clinical features of cerebrovascular diseases that the diagnosis is seldom in doubt. The common mode of expression is the stroke, defined as a sudden, nonconvulsive, focal neurologic deficit. In its more severe form the patient becomes hemiplegic and even comatose, an event so dramatic that it has been given its own designation, namely apoplexy, stroke, shock, or cerebrovascular accident (CVA). In its mildest form, stroke may consist of only a trivial neurologic disorder, insufficient to arouse concern. Gradations of severity between these two extremes exist. In all forms of stroke, the denominative feature is the temporal profile of neurologic events. The abruptness with which the neurologic deficit develops--literally a matter of seconds, minutes, hours, or at most a few days--stamps the disorder as vascular (Adams & Victor, 1977).

Embolic strokes characteristically begin suddenly with the deficit reaching its peak almost at once. Thrombotic strokes may have the same abrupt onset, but many are comparatively slower and evolve over a period

of several minutes, hours, or days, usually in a saltatory fashion, rather than smoothly. In cerebral hemorrhage related to hypertension, the deficit is from its moment of onset steadily progressive over a period of minutes or hours (Adams & Victor, 1977).

The other important aspect of the temporal profile is the arrest and then regression of the neurologic deficit in all except the fatal strokes. Not infrequently an extensive deficit from embolism reverses itself dramatically within a few hours or a day or two. More often, improvement takes place gradually over weeks and months, and the residual disability is considerable (Adams & Victor, 1977). The large number of survivors of stroke represents a formidable challenge to the health care team in the area of rehabilitation.

Risk Factors and Cerebrovascular Disease

There is a great deal of evidence to support the thesis that stroke is not an inescapable accident, but rather the end result of a chain of circumstances and conditions. These conditions and circumstances can be recognized and, in many instances, prevented. Although the subject of risk factors in stroke is still controversial, the Stroke Council of the American Heart

Association (cited in Kannel, Wolf, Verter, & McNamara, 1970) has drawn up a stroke-prone profile.

While it is difficult to offer conclusive proof of the actual prognostic value of each item in the stroke-prone profile, there is no doubt that certain phenomena are more commonly followed by stroke than others. The following items have been designated as the stroke-prone profile.

1. Transient ischemic attacks--statistically transient ischemic attacks (TIAs) are the most important item on the stroke-prone profile. At least two-thirds of those persons experiencing temporary, reversible neurologic deficits of less than 24 hours duration can be expected to have a lethal or incapacitating stroke within 5 years (Kannel et al., 1970).

2. Hypertension--whatever the precise relationship between hypertension and stroke, there is no question that it is a highly important risk factor. Hypertension is more ominous and more frequently seen than any of the other risk factors.

3. Cardiac abnormalities--this risk factor includes clinical evidence of left ventricular hypertrophy, myocardial infarction, cardiac dysrhythmias,

cardiomegaly, and congestive heart failure. The Framingham Study has pointed out that prior electrocardiographic evidence of heart abnormalities is more strikingly related to stroke risk factors than the risk of heart attacks (Kennel et al., 1970).

4. Atherosclerosis--this may be clinically manifested as angina pectoris or myocardial infarction, intermittent claudication, and arterial bruits.

5. Diabetes--impaired glucose tolerance has been observed in disproportionate numbers of ischemic stroke patients as well as those considered potential candidates for cerebral infarction. While statistical support for this observation is not readily available, in some hospitals approximately 30% of those patients admitted with the diagnosis of cerebral infarction have diabetes (McHenry, 1978).

6. Elevated blood lipids--the relationship between blood lipids (cholesterol and triglycerides) and risk of cerebral infarction is not very clear. There is strong evidence, however, that high levels of these lipids in patients below 50 years of age are strongly associated with increased risk of stroke (McHenry, 1978).

The risk of cerebral infarction increases as the number of stroke precursors increases. Other less

well documented potential risk factors in thrombotic stroke include smoking, polycythemia, gout, increased platelet aggregation, and the use of oral contraceptives. The risk factors for stroke are not as well defined as those for coronary heart disease. There is no doubt, however, that the profile can be used effectively to identify susceptible persons, and that treating one or more of the noted risk factors may help prevent a catastrophic stroke, or significantly modify its course (McHenry, 1978).

The Framingham Study (cited in Kannel et al., 1970) investigated the physiological risk factors associated with stroke. Adler et al. (1971) investigated the psychological processes present prior to ischemic stroke. Adler et al. (1971) pointed out that despite a widely held popular notion that cerebrovascular accidents are predicted by intense emotions, particularly rage, and that tense, high-pressured individuals are more prone to develop stroke, there has been remarkably little effort to examine the validity of this impression.

The older literature described apoplexy as occurring under such conditions, but cardiac and cerebrovascular origins rarely were distinguished. In 1658, Wepfer was the first person to demonstrate cerebral

as a cause of apoplexy (Wepfer, 1658/1945). Wepfer's patient, a 45-year-old man described as "little inclined to anger, yet not loving brawls, nor making quarrels from disputes," (p. 474) suffered a subarachnoid hemorrhage.

Ecker (1954) was the first to report psychologic data on a series of stroke victims ($n = 20$). Thirteen of the stroke victims were described as having long-standing personality difficulties and great difficulty in dealing with aggressive and hostile feelings preceding the stroke. In addition, 15 victims had a special emotional stress immediately before the stroke. Seven of the stroke patients had ischemic disease due to thrombosis or vasospasm while 13 had intracerebral or subarachnoid hemorrhage (Ecker, 1954).

Storey (1969) conducted a study of 291 patients 6 months to 6 years after subarachnoid hemorrhage. Though no specific inquiry was made of the patient's life circumstances and mental state at the time of the stroke, 7 patients spontaneously reported dramatic episodes immediately preceding the hemorrhage, and 39 had a history of some "affective disturbance" before the stroke. Storey concluded that emotional turmoil may occasionally lead directly to subarachnoid hemorrhage.

Similarly, Ullman (1962) studying behavioral changes after stroke in 300 patients, presented 6 case vignettes all involving patients with ischemic disease, in which a striking temporal correlation with an unusual and deeply disturbing life event was noted. Aside from these reports, an exploration of the literature turns up but 10 scattered case reports describing the psychologic setting of stroke (Binger, Ackerman, & Cohn, 1945; Engel, Hamburger, & Reiser, 1953; Fisher, 1961; Hambling, 1951; Kaplan & Curtis, 1961; Weiss, 1940). Of these, 8 cases were secondary to hemorrhage, subarachnoid or intracerebral, while 2 were ascribed to vasospasm. The literature provides but fragmentary information on 40 patients, yielding the general impression that psychologic influences may occasionally be contributory to the development of stroke. Only Ecker (1954) suggested that relationship may be a common one.

Adler et al. (1971) conducted a retrospective study of 32 men experiencing a total of 35 ischemic strokes. Utilizing a standard open-ended interview approach, data were organized around the history of the illness, life setting, and any personal data the patients were willing and able to provide. The

interview approach was nondirective, in the sense of avoiding questions which could have been answered with a simple "yes" or "no." The queries sought to examine the major areas of life experience and behavioral style of each patient. In an independent analysis of the tape recorded interviews, two investigators noted three common categories of personality features.

A behavioral pattern designated "pressured" was identified based on the individual's need to assure satisfaction of self-set goals. This pattern was marked by a need to be active and to keep busy, a self-image as a hard worker, high standards, and a sense of responsibility. In addition, a feeling of urgency and time pressure with a need to meet deadlines and fulfill goals, determination, and strong will were characteristics of the pressured behavioral pattern (Adler et al., 1971).

The second behavioral pattern noted by the investigators consisted of individuals who had chronic problems with control of anger, especially in relationship to objects upon whom the patient felt dependent. Finally, the third behavioral pattern identified consisted of an object-relating style of behavior which was characterized by the patient assuming responsibility for the

gratification of his dependency needs. Gratification of needs was accomplished by a self-sufficient, independent attitude in which objects were pleased or placated (Adler et al., 1971).

The findings of Adler et al.'s (1971) study were summarized as follows. The stroke typically occurred during a period of sustained or intermittent and often severe emotional disturbance. Sometimes the emotional disturbance had become intensified over minutes to a month before the stroke actually occurred. The three personality features previously described were commonly represented in Adler et al.'s population. The period of emotional disturbance culminating in stroke occurred at times when the patient felt he no longer was performing up to his own standards, no longer was in control of his objectives or of the environment, or no longer was meeting the needs of others. Under such conditions, he was particularly prone to feel anger, hopelessness, and shame in the course of which stroke symptoms developed (Adler et al., 1971).

The Concept of Stress

While the concept of stress is not new, it has gained considerable attention since the early 1900s.

Cannon (1932) was a pioneer in the field of stress who studied the interrelatedness of emotions and physical well-being. Cannon suggested the concept of a critical stress level, defined as that which is capable of inducing a breaking strain in an individual's homeostatic mechanism.

Stress has been viewed as the stimulus or as a high degree of emotional tension that interferes with a person's response patterns (Janis, 1958). Monat and Lazarus' (1977) view of stress encompasses the psychological and mediating factors of the individual's perception of the stressful situation in addition to the stimulus and response components of the concept. Attempts are being made by investigators in the stress field to develop a unified definition of the concept of stress (Selye, 1976).

Many authors have suggested that the work of Selye has contributed greatly to the field of stress. Selye's (1976) theory of stress is unique in that it offers a basis for both the physiological and the psychological effects of stress on the living organism. The following section will describe the foundation of Selye's theory and present a review of pertinent studies related

to physiological changes observed in stressful situations.

Inherent in Selye's theory of stress is the concept that stress is the nonspecific response of the body to any demand made upon it. The same biological stress response results even though the stress-producing factors or stressors are different. In addition to the nonspecific response produced by stressors, another commonality shared by stressors is that they demand readjustment or coping by the body (Selye, 1976). Selye has pointed out that it is the intensity of the demand for readjustment that determines the result of exposure to a stressor, since the same nonspecific response to stressors is produced by pleasant and unpleasant stressors alike (Selye, 1976).

The nonspecific response to stressors produces a stereotypical syndrome characterized by adrenal cortical hypertrophy, atrophy or lymphatic tissue, and gastrointestinal ulceration. The foundation for the concept of stress was laid by these three objective indexes of stress (Selye, 1956).

Selye (1956) viewed the stress response as occurring in three stages: (a) the alarm reaction, characterized by signs of stimulation of the sympathetic nervous

system; (b) the stage of resistance, where some adjustment to a stressor occurs; and (c) exhaustion, when the body's defenses against a stressor fail and the individual cannot adapt. The alarm reaction is based on Cannon's (1932) description of the "fight-or-flight" reaction to a threatening situation. During the alarm reaction the nervous and endocrine systems release hormones which mobilize the body for defense against the stressor. The sympathetic nervous system response which is characterized by an increased heart rate, increased blood pressure, increased blood glucose, and other changes which prepare the organism for defense is mediated by the secretion of epinephrine from the adrenal medulla. Toffler (1970) stated that it is not only an acute crisis that stimulates this sympathetic response, but that this neural mechanism occurs many times every day to assist individuals in coping with a changing environment.

The alarm stage of the stress response is also characterized by hypothalamic stimulation which leads to the production and release of adrenocorticotrophic hormone (ACTH) from the anterior pituitary gland. Adrenocorticotrophic hormone stimulates the release of corticoids from the adrenal cortex. Cortisone, the

corticoid of primary importance, causes atrophy of the thymus and other lymphatic tissue, inhibition of the inflammatory response, and an elevation in the serum glucose level. In addition to the tissue changes described, ulceration of the gastrointestinal mucosa results in response to increased cortisone levels (Selye, 1976).

After the initial alarm reaction to the stressor, the body begins to adapt and resist the stressor. Determinants of the length of the resistance stage are the body's past experiences with coping or modifying the external as well as the internal environment. During the stage of resistance the corticoid activity declines to a serum level only slightly above normal. There is a decline in the signs of stimulation of the sympathetic nervous system (Selye, 1976).

The third stage of the stress response results from repeated and extended exposure to stressors with a resultant re-activation of the pituitary gland and the adrenal cortex. The same signs of activation of the sympathetic nervous system again appear, only at this stage the alarm reaction persists and eventually adaptation energy is exhausted. Without new stores of adaptive energy, death will follow. Reversal of the stress

response can occur in this stage, but often an external resource is needed to provide for an additional adaptive capacity (Selye, 1976).

Central to Selye's theory of stress is the idea that stress is not something that can or should be avoided. Individuals are constantly faced with a demand to provide the energy necessary to perform the tasks required to maintain life and to resist and adapt to the changing environment (Selye, 1976). Stress cannot be avoided except in death. Stress can, however, be met and coped with efficiently and even enjoyed because of the adjustments an individual makes in his/her life (Selye, 1976).

Coping with Stress

Dubos (1965) has described stress as placing an adjustive demand upon the individual. Individuals vary in their ability to cope with stress as a result of the external resources available to them and the severity of the stressful situation confronting them. An individual's perception of the event, the duration of the stress response, and the number of stressors present are additional determinants of the individual's ability to cope. Selye (1976) has addressed the importance of

the individual's perception of the stressful event "what matters is not so much what happens to us, but the way we take it" (pp. 177-178).

Individuals are faced not only with personal stressors, but with societal stressors as well that demand adaptation. Mechanic (1976) described the importance of viewing adaptation as a transactive process between individuals and their environment. The individual's coping mechanisms and the types of challenges present are key determinants to the outcome of the adaptation process. Toffler (1970) was warned that there are limits on adaptability and further stated that each adaptive reaction leads to a wearing down of the body's machinery.

Physiological Changes in Stressful Situations

Numerous studies have been conducted to determine the physiological changes which occur in individuals exposed to stressful situations. Kaplan (1978) reported that psychogenic stress presumably raises blood pressure by activation of the sympathetic nervous system by one or more neurogenic pathways. Evidence for such increased activity is particularly prominent in individuals with borderline hypertension who have high

cardiac output, heart rate and stroke volume, and enhanced pressorresponsibleness (Julius & Esler, 1975).

Another study conducted by Cobb and Rose (1973) demonstrated the influence of repeated psychogenic stresses and hypertension. Air traffic controllers, who work under tremendous psychologic stress, were found to develop hypertension at an annual rate 5.6 times greater than did nonprofessional pilots who were comparable in physical characteristics. In addition, Jonnson and Hansson (1977) reported significantly higher blood pressures and more hypertension in men repeatedly stressed by high levels of noise.

In a similar study, Levi (1964) examined 12 young healthy invoicing clerks during 4 consecutive days while they were performing their usual work in their usual environment. The primary objective of this study was to map out the change, if any, in productiveness, subjective feelings, and urinary catecholamine excretion, when the usual mode of remuneration of the subjects was changed from salary to piece-wages. The results of this study demonstrated an increase in output of piecework by 114%. However, this very high output of work was accomplished at the expense of considerable feelings of mental and physical discomfort.

The mean adrenaline and noradrenaline excretion levels rose by 40% and 27%, respectively, the changes being highly significant (Levi, 1964).

Based on the hypothesis that a connection exists between stress and hyperlipoproteinemia, Carlson, Levi, and Oro (1968) investigated the influence of mental stressors on the release of adrenal hormones in 33 male subjects. Subjects in the control group were allowed to sit calmly and read while subjects in the experimental group were exposed to periods of a simulated industrial situation involving distracting noises and light. In addition, one-half of the experimental group received 3 grams of nicotinic acid in divided doses. Results of this study showed no change in catecholamine levels in the control group and increased catecholamine levels in both stressor exposed groups. With respect to the free fatty acids, the arterial plasma level remained unchanged in the control group throughout the experiment. In the two groups exposed to stressors, the level of free fatty acids rose significantly during the stress period. However, this rise was significantly less pronounced in the group that received the nicotinic acid due to the pharmacological action of the drug (Carlson et al., 1968).

In a study conducted to determine changes in serum uric acid, cholesterol, and cortisol fluctuations, Rahe, Rubin, and Arthur (1974) recorded serum levels twice a week over a 3 or 6 month period on three medical researchers exposed to the stresses of everyday living. Findings in this study displayed an elevation in uric acid levels in two of the three subjects prior to a physical change being experienced. Marked elevation of cholesterol was observed in one of the individuals during the change of residence which was subjectively reported as unpleasant. An increase in serum cortisol was observed in one subject during reported periods of anger related to changes in the work setting (Rahe, Rubin, & Arthur, 1974).

These studies have demonstrated that both stressful situations and life changes, as measured by laboratory findings bear some relationship to the occurrence of physiological reactions within the body. An exploration of the relationship of life change to stress will be considered in the following section.

The Concept of Life Change in Relation to Selye's Theory of Stress

An extensive body of clinical and epidemiologic research suggests that stressful life events are

correlated with a variety of undesirable effects on functioning and health (Dohrenwend & Dohrenwend, 1974; Gunderson & Rahe, 1974; Wolff, Wolf, & Hare, 1950). The effects described range from lowering the grade-point average of college freshmen (Harris, 1972) to sudden death (Engel, 1971). Questions remain unanswered about the process whereby these effects are produced.

Mason (1975) pointed out that even though Selye's stress concepts were derived primarily from physiological research, there has been a widespread assumption that psychological stress merely represents one component of a larger category of biological stress phenomena. Selye proposed emotional stimuli as stressors and the nonspecificity of the general adaptation syndrome as a result of both physiological and psychological stressors. Mason (1975) concluded that many researchers recognized a relationship between the area of psychological stress and Selye's research.

The conceptual framework of life change events as developed by Holmes and Rahe (1967) appears to have evolved from Selye's (1956) theory of stress and adaptation. The major premise of life events research is that stress is evoked by the amount of change or readjustment required by the individual; regardless of the

desirability or undesirability of the event (Dohrenwend, 1968). The proposition that change is stressful is congruent with Selye's (1967) theory which states that even though the individual may perceive an event as desirable or positive, the same nonspecific response to any environmental change will require adaptation.

Rahe (1974) has described the connection between life change events and changes in health. When individuals are exposed to changes in their lives, their past experience, or lack of experience with similar events, will influence the ease with which adaptation to the life change occurs. Psychological defense mechanisms may assist the individual in successfully dealing with life changes. Rahe (1974) also stated that physiological reactions to life changes will occur only when those events cannot be dealt with effectively by the psychological defenses. This generalization lends support to Selye's explanation that individuals can cope successfully with stress.

Based on the concept that life events evoke change, which in itself is stressful, Holmes and Rahe (1967) developed the Schedule of Recent Experience Questionnaire (SREQ) and the Social Readjustment Rating Scale (SRRS) to provide a means by which one could measure the number

and magnitude of stressful life events an individual had experienced at any given time.

Numerous studies have been conducted utilizing the life change approach developed by Holmes and Rahe (1967). While a lack of information on studies related to cerebrovascular accident and life change exists, many studies which have examined life change and risk factors related to cerebrovascular accident have been conducted. The following section will describe selected studies that have explored life change events and hypertension and cardiovascular disease, the two primary risk factors associated with CVA.

Life change and illness researchers studying diseases of adult life have found a significant life change buildup in the lives of men and women 6 months prior to their development of severe cardiovascular disease and even death. Rahe and Paasikivi (1971) have demonstrated a life change buildup 6 months prior to myocardial infarction which reached a level almost 100% higher than patients' baseline levels. In addition, recent life change levels were seen to build to between 200% and 300% above baseline levels during the final 6 months of life for patients who experienced

sudden death from their cardiac disease (Rahe & Lind, 1971; Theorell & Rahe, 1971).

In similar studies of identical twins discordant for death due to coronary heart disease, De Faire (1975) found significantly higher recent life change levels reported for the twin who had died. In another study conducted by Rahe, Romo, Bennett, and Siltanen (1974), information was collected from 279 survivors of myocardial infarction and from 226 cases of sudden death to determine the magnitude of life change events that had occurred. The findings of this study were congruent with the previously cited studies in that a significant increase in the occurrence of life change events levels for the 6-month period preceding infarction or death was observed. Rahe, Romo, Bennett, and Siltanen (1974) suggested that recent life changes may be considered to be a nonspecific stressor that may increase the risks of myocardial infarction in individuals already prone to the development of cardiovascular disease.

Hypertension has been identified as the single most important factor associated with the development of cerebrovascular accident. Benson (1975) discussed the way in which high blood pressure is related to stress

through the inappropriate elicitation of the fight-or-flight response. The repeated use of the fight-or-flight response may ultimately lead to stroke. The following studies describe the influence of the stress of life changes on blood pressure.

Life-threatening events are the most obvious environmental circumstances requiring behavioral adjustment. In 1947, following an explosion of a ship, local physicians reported a marked increase in the blood pressure of their patients within the community for days after the explosion (Ruskin, Beard, & Schaffer, 1948). During World War II, physicians observed elevated blood pressures among the besieged Russian population of Leningrad as well as among soldiers going into battle (Graham, 1945).

Less dramatic but more immediately relevant to the life change approach is what happens to people who have to adjust to city living. Several studies have examined how individuals are affected when social roles break down and they are forced to establish new ones (Benson, 1975).

Several studies have demonstrated a high degree of correlation between high blood pressure and the adjustment to city life. For example, one study examined the

blood pressures of citizens living in Puerto Rican rural areas and found practically no hypertension; while in contrast, 18% of their counterparts living within a Puerto Rican metropolitan area had blood pressures in the hypertensive range (Benson, Costa, Garcia-Palmieri, Feliberti, Aixala, Blanton, & Colon, 1966).

Two similar studies described how higher blood pressure paralleled the degree of Westernization of Fiji Islanders and was also noted in members of an African Zulu tribe after migration from rural to urban areas (Gampel, Slome, Scotch, & Abramson, 1962; Madocks, 1961). Stress associated with the adjustment of becoming a city dweller is felt to be an important contributory factor in hypertension (Benson, 1975). A high rate of job mobility exists in the United States which leads to families frequently being uprooted. The average American family may move from 1 to 10 times during a lifetime. Behavioral adjustment is demanded frequently in an open society (Benson, 1975).

Moving up the so-called occupational ladder may involve more than geographical change and social readjustment. Reaching a long-sought-after, desirable position for which one does not feel adequately prepared

can raise blood pressure. Hinkle and Wolff (1961) measured the blood pressure of college and high school graduates who moved into white-collar jobs and found the less educated workers had higher blood pressures. The investigators concluded that the white-collar job required greater behavioral adjustment for those with less education than for the college graduates (Hinkle & Wolff, 1961).

Disagreement on the relationship of life events and subsequent illness can be found in some studies. An investigation of the influence of discord and life change on blood pressure, serum lipids, serum transaminase, and illness patterns of construction workers showed that life change without discord was not related to illness onset. The combination of life change and discord, however, showed an increased rate of hypertension, neurosis, and other illnesses (Theorell, 1976).

Still other researchers have emphasized that an accumulation of life events is correlated with health changes only when the events are perceived as undesirable. Byrne and Whyte (1980) collected life events data from 120 recently diagnosed myocardial infarction patients and used a visual analogue scale to assess the individually interpreted impact of the event. These

researchers contrasted the same data collected from 40 patients admitted to coronary care but rapidly discharged without a diagnosis of myocardial infarction or other serious illness. Differences between the two groups were not evident for life event frequency, magnitude estimation scales of life change and distress, or individual impact scales of life change. Individual impact scales of emotional distress did, however, distinguish between the two groups at a statistically significant level, suggesting that patients with myocardial infarction have interpreted their life event exposure in the year prior to illness onset as being particularly emotionally distressing (Byrne & White, 1980).

Many of the studies reported on life change events and illness onset report a certain percentage of subjects with high life event scores who remain healthy. The question arises as to why some people are adversely affected by a life change buildup while others are not. Rahe and Arthur (1978) suggested that it is not only the individual's perception of the desirability or undesirability of the life event that influences the outcome, but also the person's current social supports and past experience with related life change events.

Nursing Implications in Regard
to Life Change Events

A common theme identified in both the review of studies related to life change events and Selye's (1976) theory of stress and adaptation is the role of coping with change. Benson (1975) reiterated that a crucial factor in the development of many health problems is the necessity to cope with an environment requiring continuous behavioral adjustment. Nurses are in the position to assist individuals and groups in developing an increased awareness of situations that require behavioral adjustment and in turn place a person at risk for health changes. Since the complexities of life are usually not amenable to change, nurses can explore with clients new ways of coping with life change to promote successful adaptation.

The Neuman Health Care Systems Model (Neuman, 1980) is a wholistic approach to health care partly derived from Selye's theory of stress and adaptation. The theoretical approach proposed by Neuman directs that one must view the total person framework as an open system model of two components--stress and reaction to stress. Stressors, or tension-producing stimuli, have the potential for causing disequilibrium within

the system. Stressors as well as reaction and reconstitution factors can be viewed as intrapersonal, interpersonal, or extrapersonal in nature. McNeil and Pesznecker (1977) suggested using the life change events scale as a tool to identify areas of stress in a person's life.

Several studies support the proposed significance of the assessment of life change events to nursing practice. Rahe, Tuffle, and Suchor (1973) reported that cardiac patients who examined their life changes in group therapy programs returned to work at a significantly earlier date than the control group. Rahe et al. (1975) studied the influence of planning for anticipated life changes and its influence on future health changes in myocardial infarction patients. The myocardial infarction patients who examined their life change event scores and discussed ways of dealing with the stress of change demonstrated significantly lower reinfarction rates than the control group. Thus, the concept of life changes might have potential utility as both an assessment and treatment modality in the delivery of health care to individuals and groups of people. Nurses have not only the opportunity to utilize

this information, but also the professional responsibility to accept the challenge.

Summary

Cerebrovascular diseases rank first in frequency and urgency among all neurologic disorders and account for nearly 50% of all neurologic problems seen in a general hospital (Adams & Victor, 1977). Due to the high incidence of CVA in the United States, numerous studies have been conducted to elicit risk factors involved in the development of cerebrovascular disease.

This chapter provided background material for this study, which was to determine if recently diagnosed CVA patients experienced a major life crisis for the 1-year period prior to CVA. Pertinent studies discussing the relationship between psychosocial factors and vascular and heart disease were reviewed. Selye's theory of stress and adaptation and Holmes and Rahe's conceptual framework of life change in relation to stress were discussed with selected studies related to life change.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The study undertaken was classified as a descriptive study utilizing the survey approach. Descriptive studies are done primarily to obtain accurate and meaningful description of phenomena (Abdellah & Levine, 1979). Descriptive research is nonexperimental research in which data are collected, recorded, and analyzed to answer a question or problem (Treece & Treece, 1977).

An ex post facto design was employed in this study since the variables were examined retrospectively. Kerlinger (1973) identified limitations of the ex post facto design as: (a) the inability to manipulate independent variables, (b) the lack of randomization, and (c) the risk of inaccurate interpretation. Polit and Hungler (1978) identified the value of an ex post facto design as allowing for the convenient and efficient collection of a large amount of data. Furthermore, the use of an ex post facto design is indicated in instances where variables do not lend themselves to manipulation, such as medical diagnosis (Polit & Hungler, 1978).

In this study, the 1-year score as measured by the Schedule of Recent Experience Questionnaire was collected and recorded from recently diagnosed CVA patients. The data were analyzed to determine if a major life crisis existed prior to the occurrence of CVA.

This chapter includes a description of the setting in which the study was conducted and a description of the sample. The instruments utilized in the study are also described. Finally, the method of data collection and treatment is presented.

Setting

The setting for this study consisted of the inpatient and outpatient departments of the neurology service of a 1,200-bed county hospital. The inpatient department consisted of two 40-bed patient care units for adults with neurological problems. The outpatient department consisted of a stroke clinic which met on a bi-monthly basis. The institution is located in a Southern metropolitan area of a major city in the United States.

Population and Sample

The target population of this study was comprised of all patients of the selected hospital and its clinics,

and with the medical diagnosis of CVA or stroke. A convenience sample of 30 subjects was acquired as potential subjects were admitted to the hospital or came into the clinic. Polit and Hungler (1978) stated that the convenience sampling method is the obtainment of subjects who are available at hand. Kerlinger (1973) identified the shortcomings of this nonprobability sampling approach as its weakness due to lack of randomization but declared that careful selection of subjects can mitigate this weakness.

Subjects for this study met the following delimitations:

1. Alert and oriented to person, place, and time.
2. English speaking, literate.
3. Documented medical diagnosis of CVA or stroke within but no longer than 2 months ago.
4. No previous history of a CVA.
5. Eighteen years of age or older.

Protection of Human Subjects

The proposed study was submitted and approved by the Human Subjects Review Committee of Texas Woman's University (Appendix A) and the graduate school (Appendix B). Permission was also obtained from the agency

used in the study (Appendix C). Data were collected after permission had been obtained.

The prospective subjects were read a written presentation of the purpose of the study (Appendix D) and the nature of expected participation in the study. Individuals were told that their decision to participate (or not) in the study was voluntary and would not alter their care. Since the Human Subjects Review Committee of Texas Woman's University has decided to eliminate the requirement for signed informed consent for questionnaires, the following statement appeared within the body of the verbal explanation to subjects and on the tops of both the demographic information sheet and the Schedule of Recent Experience Questionnaire. "THE COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS INFORMED CONSENT TO PARTICIPATE IN THIS STUDY." Individuals were informed that they could withdraw from the study at any time without penalty. Anonymity and confidentiality were assured by use of a coding system where no names were written on the questionnaires. Individuals were told to place their questionnaires into an envelope so that no one could identify responses with specific individuals. Neither the name of the

individual nor the institution was mentioned in the report of the findings as only group data were reported.

Instruments

Two instruments were used for data collection. The first was the Demographic Information Sheet (Appendix E) which was developed for this study. This instrument was used to gather information regarding age, sex, ethnic background, and marital status. These data were used to describe the sample.

The second instrument used in this study was the Schedule of Recent Experience Questionnaire (SREQ) (Appendix F). Permission was obtained to use the latest revision of the SREQ as developed by Holmes and Rahe (Appendix G). The scale contains 42 items, each of which has an assigned numerical value derived from a constant referent technique (for example, marriage is assigned 50 points and other items representative of life change are above or below the value of 50). The scale is designed to reflect the magnitude of the change required in a person's life adjustment as he or she experiences each of the listed events. The values and scores are referred to as life change units (LCUs) (Holmes & Masuda, 1970).

Based on empirical results, Holmes and Rahe (1967) identified a mild life crisis as 150-199 LCUs, a moderate one as 200-299 LCUs, and a major life crisis as 300 LCUs and over. The major premise in the research efforts of Holmes and associates (cited in Holmes & Masuda, 1970) was that any change in one's life pattern requires a change in ongoing life adjustment and tends to be associated with the onset of illness. The greater the magnitude of the LCU, the greater the probability that there would be a change in health status. This hypothesis has been supported in a number of retrospective and prospective studies over the past several years, which have found a high degree of association between life change crisis and health changes (Holmes & Masuda, 1970; Rahe & Arthur, 1968).

Validity

The Schedule of Recent Experience Questionnaire (Holmes & Rahe, 1967) was tested for validity. Utilizing a standardized paper-and-pencil test, information regarding the time and frequency of occurrence of life change events was gathered from several populations. The magnitude of life change was observed to be significantly related to the time of disease onset. The greater

the magnitude of life change (or life crisis), the greater the probability that the life change would be associated with disease onset, and the greater the probability that the population at risk would experience disease. The major health changes observed covered a wide range of psychiatric, medical, and surgical diseases (Holmes & Masuda, 1973).

Reliability

The Schedule of Recent Experience Questionnaire was tested for reliability:

The degree of similarity between populations within the sample is impressive. A high degree of consensus suggests a universal agreement between groups and among individuals about the significance of life events under study that transcends differences in age, sex, marital status, education, social class, generation American, religion, and race. (Holmes & Rahe, 1967, p. 217)

The consensus is high concerning the relative order of magnitude of the means of items as demonstrated by the high coefficients of correlation (Pearson's r) between the discrete groups contained in the sample. All the coefficients of correlation are above .90 with the exception of that between white and Negro which was .82. Kendall's coefficient of concordance (W) for the 394 individuals was .477, significant at $p = .0005$. (Holmes & Rahe, 1967, p. 215)

In 1968, Komaroff, Masuda, and Holmes demonstrated correlation coefficients (Spearman's ρ) of .80 ($p = .001$) in a comparative study of the rank ordering and

means of the Social Readjustment Rating Scale items. This study exemplified reliability of the instrument across Mexican American, Negro, and White American middle income groups (Komaroff et al., 1968).

Data Collection

Patient records were reviewed in the inpatient and outpatient neurology units of the institution once permission had been obtained from Texas Woman's University and the participating agency. Individuals who met the selection criteria of the study were informed by a verbal presentation from a written form of the nature and purpose of the study. Individuals who agreed to participate in the study and met the criteria became the subjects of the study.

Subjects were asked to complete the demographic information sheet first and not to include their names on either form. The Schedule of Recent Experience Questionnaire was then shown to the subject and he/she was instructed to place a check mark next to all items that had occurred in his/her life for the 1-year period of time immediately preceding his/her stroke or CVA. If the life event occurred within the preceding year, individuals were asked to indicate how many times the

event had happened. If the event had not happened, individuals were instructed to place a check mark in the column labeled "did not happen." The investigator left an envelope with the subject for the purpose of maintaining anonymity and confidentiality of responses. The investigator returned to the patient's room at an appointed time to pick up the questionnaire. In the outpatient clinic, the subject was instructed to leave the questionnaire with the charge nurse in that clinic.

Treatment of Data

The demographic data were analyzed by use of descriptive statistics and frequency counts. The Schedule of Recent Experience Questionnaire was scored in the following manner. For items 1 through 12, the mean value of the life event was tabulated if the event occurred, regardless of the number of times that the event occurred. The values of items 13 through 42 were calculated by multiplying the number of times that each event occurred with the mean value for that event. Responses which occurred more than 4 times were scored as 4 (Holmes, 1979).

The hypothesis for this study which stated there is no significant difference between the mean life change unit score of recently diagnosed CVA patients for the 1-year period preceding CVA, as measured by the Schedule of Recent Experience Questionnaire, and the life change unit standard score of 300 which is indicative of a major life crisis, as described by Holmes and Rahe, was analyzed with a two-tailed, one-sample t -test. The student's t -test is a parametric statistical test based on the student's t distribution (Elzey, 1974). This test was used to test the significance of the difference in the values of the mean LCUs of the sample and the standard LCU score of 300 which is indicative of a major life crisis.

The level of significance utilized for this investigation was $p < .05$. In social science research where there is a minimal risk of harm to the subject, the precise value of alpha is customarily taken to be .05 (McCall, 1975). This implies that 5 times out of 100 the observed difference is due to chance.

CHAPTER 4

ANALYSIS OF DATA

This study was conducted for the purpose of investigating life change unit sum of CVA patients for the 1-year period preceding CVA. Using a sample of 30 recently diagnosed CVA patients, the mean life change unit score of the sample was compared with the standard life change unit score of 300 which is indicative of a major life crisis. This chapter describes the sample and presents an analysis of the data as well as a summary of the results of the analysis.

Description of Sample

Demographic data including age, sex, ethnic background, and marital status were collected from the 30 subjects and recorded on the Demographic Information Sheet. All subjects in the study resided in the same geographic area served by the institution utilized for data collection.

Descriptive statistics for the demographic data obtained from the sample revealed the following data. An even distribution of subjects was noted among the

age ranges with the exception of the age range of 71 years and older. These data are summarized in Table 1.

Table 1
Distribution of Age Range

Age Range (years)	Frequency	Percentage
18-29	5	17
30-40	5	17
41-50	5	17
51-60	7	23
61-70	6	20
71 and older	<u>2</u>	<u>6</u>
Total	30	100

Within the sample of 30 subjects, 18 (60%) were females and 12 (40%) were males. The majority (70%) of the subjects were black. The remaining 30% of the subjects were white. An analysis of the marital status of the subjects revealed that 13 subjects (43%) were divorced and 8 subjects (27%) were married. Six subjects (20%) were single and 3 (10%) were widowed. Table 2 presents a summary of the demographic variable of marital status.

Table 2
Marital Status of Sample

Marital Status	Frequency	Percentage
Single	6	20
Married	8	27
Divorced	13	43
Widowed	<u>3</u>	<u>10</u>
Total	30	100

Findings

The hypothesis stated that there would be no significant difference between the life change unit mean score of recently diagnosed CVA patients for the 1-year period preceding CVA, as measured by the Schedule of Recent Experience Questionnaire, and the life change unit standard score of 300 which is indicative of a major life crisis, as described by Holmes and Rahe.

The 1-year life change unit scores of the subjects ranged from 63 LCUs to 732 LCUs. Table 3 presents a summary of the distribution of life change event scores for the sample.

The mean LCU score of the sample was 332.8 while the median LCU score was 309. The standard deviation

Table 3
Distribution of Life Change
Event Scores of
Sample

Life Change Unit Sum	Frequency	Cumulative Percentage
49-100	5	16.7
101-150	2	23.4
151-200	1	26.7
201-250	1	30.0
251-300	5	46.7
301-350	2	53.4
351-400	3	63.4
401-450	1	66.7
451-500	5	83.4
501-550	3	93.4
551-600	1	96.7
601-650	0	-0-
651-over	1	3.3

$\underline{n} = 30.$

of the mean was 180.97. The one-sample, two-tailed t-test was used to compare the mean LCU score of the sample with the standard LCU score of 300. The

hypothesis was accepted with ($t = 1.0$, $p = .34$) at the .05 level of significance. Support of the hypothesis inferred that there was no significant difference between the sample mean LCU score and the standard LCU score of 300, indicating that the sample did experience a major life crisis.

Additional Findings

Utilizing a t -test with the level of significance set at $p = .05$, the mean LCU score of male subjects was compared to the standard LCU score of 300. No significant difference was found. Similarly, when the t -test was repeated using the mean LCU score of female subjects, no significant difference was found. In addition, when t -tests were run on the mean LCU scores of subjects based on difference in marital status, age range, and ethnic background, no significant differences were found.

Examination of the raw data revealed that certain life events frequently occurred within the sample (Appendix H). The two life events most frequently identified within the sample were death of a close family member (other than spouse) ($f = 30$) and death of a close friend ($f = 32$).

Summary of Findings

The following are the summary statements of findings for this study:

1. A comparison of the mean LCU score of 30 recently diagnosed CVA patients for the 1-year period preceding CVA and the LCU standard score of 300 which is indicative of a major life crisis did not reveal a significant difference.

2. The mean LCU scores of subjects based on differences in age range, sex, ethnic background, and marital status revealed no significant differences when compared to the LCU standard score of 300.

3. The two life events most frequently reported by the sample were death of a close family member and death of a close friend.

CHAPTER 5

SUMMARY OF THE STUDY

In this chapter, a summary of the study is presented, followed by a discussion of the findings and the implications of the study for nursing practice, education, and research. Recommendations for further study are also presented.

Summary

The problem of this study was to compare the LCU mean score of persons who have a diagnosis of cerebrovascular accident and the LCU standard score of 300, which is indicative of a major life crisis, as described by Holmes and Rahe (1967). Selye's (1976) theory of stress and adaptation and the conceptual framework of stress and life change events as developed by Holmes and Rahe were utilized in this study.

The major premise of Selye's (1976) theory is that the individual who is constantly exposed to multiple stressors may become depleted of the energy needed to adapt. Selye (1976) proposed that diseases of adaptation may result as adaptation energy is exhausted. The

conceptual framework of life change events proposed by Holmes and Rahe (1967) is based on the idea that change is inherently stressful and that too much change in too short a period of time can place an individual at risk for changes in his/her health status.

Thirty recently diagnosed CVA patients were selected to comprise a convenience sample from the target population of adults who had experienced a CVA. The setting of the study consisted of the inpatient and outpatient neurology services of a large publicly-funded hospital in a major Southwestern city.

Each subject was individually asked to complete a demographic information sheet which sought information regarding age, sex, marital status, and ethnic background of the sample. In addition, each subject was asked to complete the Schedule of Recent Experience Questionnaire for the 1-year period preceding their CVA.

Each completed questionnaire was then tabulated to determine the life change unit score. Next, the life change unit mean score of the sample was computed. The sample mean along with the life change unit standard score of 300 was subjected to a one-sample,

independent t -test to determine if a significant difference existed.

The hypothesis stated that there would be no significant difference between the life change unit mean score of the recently diagnosed CVA patients for the 1-year period preceding CVA, as measured by the Schedule of Recent Experience Questionnaire, and the life change unit standard score of 300 which is indicative of a major life crisis, as described by Holmes and Rahe. The results of the t -test yielded ($t = 1.0$, $p = .34$) resulting in acceptance of the hypothesis. A comparison of the mean LCU score of subjects based on differences in age range, sex, ethnic background, and marital status revealed no significant difference when compared to the LCU standard score of 300.

Discussion of Findings

A comparison of the mean life change unit score of 30 recently diagnosed CVA patients for the 1-year period preceding CVA and the life change unit standard score of 300 which is indicative of a major life crisis did not reveal a significant difference. The findings of this study suggested that the sample did experience a major life crisis. An analysis of the individual LCU

scores of the subjects revealed that 16 subjects (53%) experienced a major life crisis.

The wide range of values obtained caused large 95% confidence intervals as evidenced by the range of 265 to 400. While the upper limit of the confidence interval is of no significance to this study since any score of 300 or more represents a major life crisis, the lower limit probably represents artifact.

In attempting to analyze these findings, it is necessary to review the limitations of the study to provide some insight into possible intervening variables. The small size of the sample cannot be overlooked as a possible threat to internal validity. Previous research using the SREQ has been conducted on larger samples, allowing for greater differences with groups to emerge. Because the study was conducted in one geographical location with all subjects collected from one institution, the degree to which the sample is representative of the larger population of persons with CVA is questionable.

Past research utilizing the same instrument (SREQ) has included patient samples with myocardial infarction, respiratory conditions, inguinal hernia, psychiatric

conditions, and other diagnoses. These studies have repeatedly supported the proposal offered by Holmes and Rahe (1967) that a mounting frequency of life change events often precedes changes in a person's health status (Holmes & Masuda, 1970).

The findings of this study are in general agreement with the past research on life change events. The subjects of this study experienced a mounting frequency of life change events for the 1-year period preceding CVA.

Conclusions and Implications

Although guarded conclusions can be made from this study, the following projections can be made. While no significant difference was found between the mean LCU score of recently diagnosed CVA patients for the 1-year period preceding CVA and the LCU standard score of 300 which is indicative of a major life crisis, the findings indicated that 53% of the subjects did experience a major life crisis.

The implication for nursing practice is that nurses may be able to identify individuals who are at risk for CVA and who are experiencing an increased level of life stress related to change. Such individuals

could be identified in hypertension screening clinics by community health nurses or by nurses in hospital settings who are in contact with individuals who are at risk for CVA. Once these individuals have been identified, nurses may offer assistance in stress management and anticipatory planning to decrease the stress associated with life changes.

Recommendations for Further Study

Based on the conclusions of this study, the following recommendations are made:

1. A similar study be done using a large sample and conducted in another geographical area.
2. A similar study be conducted investigating more personal traits such as coping styles, in addition to life change events.
3. A similar study be conducted investigating any patterns of life change events frequently seen.

APPENDIX A

TEXAS WOMAN'S UNIVERSITY
Box 23717, TWU Station
Denton, Texas 76204

1810 Inwood Road
Dallas Inwood Campus

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Kathryn T. Ulmen Center: Dallas
Address: 1810 Inwood Road #502 Date: 4/13/81
Dallas, Texas 75235

Dear Ms. Ulmen:

Your study entitled Life Change Events and Cerebrovascular

Accident

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

____ Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

____ Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

____ The filing of signatures of subjects with the Human Subjects
Review Committee is not required.

____ Other:

 X No special provisions apply.

Sincerely,

Estelle D. Kurtz
Chairman, Human Subjects
Review Committee

at Dallas

PK/smu/3/7/80

APPENDIX B

TEXAS WOMAN'S UNIVERSITY

DENTON, TEXAS 76204

THE GRADUATE SCHOOL


June 10, 1981

Ms. Kathryn T. Ulmen
1810 Inwood Rd., #502
Dallas, Texas 75235

Dear Ms. Ulmen:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,


Robert S. Pawlowski
Provost

RP:dl

cc Ms. Susan Goad
Dr. Anne Gudmundsen
Graduate Office

APPENDIX C

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE Parkland Memorial Hospital

GRANTS TO Kathryn T. Ulmen, R.N., B.S.N.
a student enrolled in a program of nursing leading to a
Master's Degree at Texas Woman's University, the privilege
of its facilities in order to study the following problem.

Life Change Events and Cerebrovascular Accident

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may not~~) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other Will appreciate a copy of the findings

Date: 5-8-81

[Signature]
Signature of Agency Personnel

Kathryn T. Ulmen, R.N., B.S.N.
Signature of Student

[Signature] R.N. Ed.D.
Signature of Faculty Advisor

*Fill out & sign three copies to be distributed as follows:
Original - Student; First copy - Agency; Second copy - TWU
College of Nursing.

APPENDIX D

Verbal Explanation to Subjects

Hello,

My name is Kathryn Ulmen. I am a registered nurse attending the graduate school at Texas Woman's University in Dallas. I am conducting a study to determine the influence that changes in a person's life have on the occurrences of illness. I have permission from your hospital to carry out this study and would like very much to have you serve as a participant in this study.

The enclosed questionnaire asks you to fill in your age, sex, marital status, and ethnic background. The Schedule of Recent Experience Questionnaire asks you to put a check mark by all events which happened to you for the 1 year before your stroke.

Your participation in this study is voluntary, and your choice to participate (or not) will not affect your medical care. Your privacy will not be violated in any way. If you choose not to complete the questionnaires, please place them in this envelope. Do not include your name on the envelope or on either of the questionnaires.

The potential benefits of your participation in this study will be to help health care workers gain a better understanding of the influence that changes in

a person's life have on the occurrence of illness or disease.

You may stop and rest if you become tired and finish the questionnaire at a later time if you so desire. You may withdraw from the study at any time by not completing the questionnaires. It may be uncomfortable for you to recall certain events that occurred in your life. If you feel anxious because of the information the questionnaire asks you to recall, I will be glad to talk to you and answer any questions that I can.

Let me remind you that completion of these questionnaires will be construed as informed consent to participate in this study.

I will leave you now. I will return later to pick up the envelope with the questionnaires in it. Do you have any questions?

Thank you very much for your time and attention.

APPENDIX E

Demographic Information

COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS
INFORMED CONSENT TO PARTICIPATE IN THIS STUDY.

Please use an "X" to indicate the appropriate information related to you and your situation. Write out any information that you feel is indicated.

1. Age at last birthday:

<input type="checkbox"/> 18-29 years	<input type="checkbox"/> 51-60 years
<input type="checkbox"/> 30-40 years	<input type="checkbox"/> 61-70 years
<input type="checkbox"/> 41-50 years	<input type="checkbox"/> 71 years or older

2. Sex:

<input type="checkbox"/> Male	<input type="checkbox"/> Female
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3. Marital Status:

<input type="checkbox"/> Single	<input type="checkbox"/> Divorced
<input type="checkbox"/> Married	<input type="checkbox"/> Widowed

4. Ethnic Background:

<input type="checkbox"/> White	<input type="checkbox"/> Oriental
<input type="checkbox"/> Black	<input type="checkbox"/> Other, may specify
<input type="checkbox"/> Hispanic	_____

APPENDIX F

Schedule of Recent Experience Questionnaire

COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS
INFORMED CONSENT TO PARTICIPATE IN THIS STUDY.

Instructions: For each life event item listed below,
 please do the following:

Think back on the event and decide if it happened during
 the past 12 months. If the event did happen, indicate
 the number of times it happened by placing a number in
 the column labeled 0 to 12 months ago.

If the event did not happen during the last 12 months,
 check under "Does not apply."

	<u>0-12 months ago</u>	<u>Does not Apply</u>
1. A lot more or a lot less trouble with the boss.	_____	_____
2. A major change in sleeping habits (sleeping a lot more or a lot less, or change in part of day when asleep).	_____	_____
3. A major change in eating habits (a lot more or a lot less food intake, or very different meal hours or surroundings).	_____	_____
4. A revision of personal habits (dress, manners, associations, etc.).	_____	_____
5. A major change in your usual type and/or amount of recreation.	_____	_____
6. A major change in your social activities (e.g., clubs, dancing, movies, visitng, etc.).	_____	_____
7. A major change in church activi- ties (e.g., a lot more or a lot less than usual).	_____	_____

COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS
INFORMED CONSENT TO PARTICIPATE IN THIS STUDY.

	<u>0-12 months ago</u>	<u>Does not Apply</u>
8. A major change in number of family-get-togethers (e.g., a lot more or a lot less than usual).	_____	_____
9. A major change in financial state (e.g., a lot worse off or a lot better off than usual).	_____	_____
10. In-law troubles.	_____	_____
11. A major change in the number of arguments with spouse (e.g., either a lot more or a lot less than usual regarding child-rearing, personal habits, etc.).	_____	_____
12. Sexual difficulties	_____	_____
13. Major personal injury or illness.	_____	_____
14. Death of a close family member (other than spouse).	_____	_____
15. Death of spouse.	_____	_____
16. Death of a close friend.	_____	_____
17. Gaining a new family member (e.g., through birth, adoption, oldster moving in, etc.).	_____	_____
18. Major change in the health or behavior of a family member.	_____	_____
19. Change in residence.	_____	_____
20. Detention in jail or other institution.	_____	_____

COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS
INFORMED CONSENT TO PARTICIPATE IN THIS STUDY.

	<u>0-12 months ago</u>	<u>Does not Apply</u>
21. Minor violations of the law (e.g., traffic tickets, jaywalking, disturbing the peace, etc.).	_____	_____
22. Major business readjustment (e.g., merger, reorganization, bankruptcy, etc.).	_____	_____
23. Marriage	_____	_____
24. Divorce.	_____	_____
25. Marital separation from spouse.	_____	_____
26. Outstanding personal achievement.	_____	_____
27. Son or daughter leaving home (e.g., marriage, attending college, etc.).	_____	_____
28. Retirement from work.	_____	_____
29. Major change in working hours or conditions.	_____	_____
30. Major change in responsibilities at work (e.g., promotion, demotion, lateral transfer).	_____	_____
31. Being fired from work.	_____	_____
32. Major change in living conditions (e.g., building a new home, remodeling, deterioration of home or neighborhood).	_____	_____
33. Wife beginning or ceasing work outside the home.	_____	_____

COMPLETION OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS
INFORMED CONSENT TO PARTICIPATE IN THIS STUDY.

	<u>0-12 months ago</u>	<u>Does not Apply</u>
34. Taking on a mortgage greater than \$10,000 (e.g., purchasing a home, business, etc.).	_____	_____
35. Taking on a mortgage or loan less than \$10,000 (e.g., purchasing a car, TV, freezer, etc.).	_____	_____
36. Foreclosure on a mortgage or loan.	_____	_____
37. Vacation.	_____	_____
38. Changing to a new school.	_____	_____
39. Changing to a different line of work.	_____	_____
40. Beginning or ceasing formal schooling.	_____	_____
41. Marital reconciliation with mate.	_____	_____
42. Pregnancy.	_____	_____

APPENDIX G



DEPARTMENT OF THE NAVY
NAVAL REGIONAL MEDICAL CENTER
LONG BEACH, CALIFORNIA 90822

IN REPLY REFER TO:

Code 1021:bab
6000

27 FEB 1981

Ms. Kathryn T. Ulmen, R.N., BSN
Texas Woman's University
1810 Inwood Road
Dallas, Texas 75235

Dear Ms. Ulmen:

In response to your request concerning information about my Recent Life Change Questionnaire (RLCQ), I am enclosing a packet of information which describes the deviation of this instrument from its parent questionnaire - the Schedule of Recent Experience. This packet also provides suggestions for scoring the RLCQ. The topic of scoring recent life events was the also addressed by me in an editorial in "Psychosomatic Medicine".

I believe this information should answer your questions in this area. Best of luck in your research efforts.

Sincerely,

A handwritten signature in cursive script, appearing to read "R. H. RAHE", is written over a horizontal line.

R. H. RAHE
Captain, Medical Corps
United States Navy
Director of Clinical Services

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

School of Medicine
Department of Psychiatry and Behavioral Sciences

RP-10

February 23, 1981

Kathryn T. Ulmen, R.N., B.S.N.
1810 Inwood Road
Dallas, Texas 95235

Dear Ms. Ulmen:

Thank you for your interest in our research. I am pleased to give you permission to use the Schedule of Recent Experience (SRE) in your proposed research. I am enclosing three versions of the SRE for your consideration. You may purchase the Opscan version from us; or you have my permission to duplicate either of the typed versions. I am enclosing other reprints which I hope will be of assistance to you.

I am sorry but I do not find it possible to grant a blanket permission to the University to use the questionnaire. I prefer to have an opportunity to grant permission on an individual basis and thus have some idea of how it is being used. I am sure you can appreciate my thoughts in this matter.

If we can be of further help please let us know.

Sincerely yours,

Thomas H. Holmes, M.D.
Professor of Psychiatry and
Behavioral Sciences

THH:ma
Encl.

APPENDIX H

Schedule of Recent Experience Raw Scores

No.	SRE Question	Reported Frequency
1.	Trouble with boss	2
2.	Change in sleeping habits	5
3.	Change in eating habits	3
4.	Revision of personal habits	4
5.	Change in Recreation	11
6.	Change in social activities	4
7.	Change in church activities	6
8.	Change in number of family get-togethers	9
9.	Change in financial state	14
10.	Trouble with in-laws	5
11.	Change in number of arguments with spouse	8
12.	Sex difficulties	6
13.	Personal injury or illness	20
14.	Death of close family member	30
15.	Death of spouse	2
16.	Death of close friend	32
17.	Gain of new family member	13
18.	Change in health of family member	18
19.	Change in residence	9
20.	Jail term	2

No.	SRE Question	Reported Frequency
21.	Minor violations of the law	4
22.	Business readjustment	2
23.	Marriage	1
24.	Divorce	6
25.	Marital separation	1
26.	Outstanding personal achievement	4
27.	Son or daughter leaving home	6
28.	Retirement	5
29.	Change in work hours or conditions	7
30.	Change in responsibilities at work	3
31.	Fired at work	2
32.	Change in living conditions	1
33.	Wife begin or stop work	1
34.	Mortgage over \$10,000	0
35.	Mortgage or loan less than \$10,000	1
36.	Foreclosure of mortgage or loan	0
37.	Vacation	11
38.	Change in schools	0
39.	Change to different line of work	3
40.	Begin or end school	3
41.	Marital reconciliation	0
42.	Pregnancy	1

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