

Stress Management Technique, And Cardiac Activity Among Female Nurses

B. Prasila Leelavathy Pappathy

Pursuing Final year Master Degree of Business Administration in Hospital Management from – DDE - Annamalai University, Tamilnadu, India

Dr. Ramachandran Narayanan

Assistant Professor, Business Management Wing, Directorate of Distance Education, Annamalai University, Tamilnadu, India

Abstract: Over the past two decades there has been an increasing belief that the experience of stress has undesirable consequences for health. The international labour Organisation (ILO) has reported that the executive stress is one of the most serious occupational hazards of the 21st century. The engineering approaches have treated stress as stimulus characteristics of the adolescent's environment. International theories of stress focus on the structural characteristics of an adolescent's interaction with their environment.

The most transactional theories of stress focus on the cognitive processes underpinning the adolescents' interaction with their environment. The psychological and physiological changes which are associated with the recognition of such a stress state, and which include coping, represent the third stage of the model.

Stress is caused by various factors - not all of which are work-related of course, (which incidentally doesn't reduce the employer's obligation to protect against the causes of stress at work). Stress is proven beyond doubt to make people ill, and evidence is increasing as to number of ailments and diseases caused by stress. A person's susceptibility to stress can be affected by any or all of these factors, which means that everyone has a different tolerance to stressors, like childhood, Personality, genetics, Immunity abnormalities, life style, and duration of stressors.

Keyword: stress, Adolescent, Exhaustion, health and performance, Distress

I. INTRODUCTION

Over the past two decades there has been an increasing belief that the experience of stress has undesirable consequences for health. It has become a common assumption, if not a 'cultural truism' (Leventhal and Tomarken, 1987), that it is associated with the impairment of health. Despite, this, the evidence is otherwise: the experience of stress per se does not necessarily have pathological sequel.

STRESS

Previously stress was used to known as "nerves". Later it was referred to as anxiety. These days everyone calls it "stress". The international labour Organisation (ILO) has reported that the executive stress is one of the most serious occupational hazards of the 21st century. Hansselye first

introduced the concept of stress in the life sciences in 1936. Stress can be viewed as a stimulus to growth and achievement to new balance. Selye (1956) define stress by two approaches:

STIMULUS –ORIENTED: This perceives stress as threatening and any external event or internal drive, which threatens to upset, organism equilibrium is "stress".

RESPONSE – ORIENTED: As a response, it has been defined as a nonspecific response to a situation which demands that the individual adapt to the change physically or psychologically. It has been concluded in several reviews of the literature that there are essentially three definition, but overlapping, approaches to the on and study of stress (Lazarus, 1966; Appley and Trumbull, 1967; Cox 1978, 1990; Cox and Mackay, 1981; Fletcher, 1988). The first approach conceptualizes stress as an aversive or noxious characteristic of the environment and, in related studies, treats as an

independent variable-the environmental cause of ill health. This approach has been termed the 'engineering model'.

The second approach, on the other hand, defines in terms of the common physiological of a wide range of aversive or noxious stimuli. It treats stress as a dependent variable, particular physiological response to a threatening or damaging environment. This approach has been termed the 'medico-physiological model'.

The *engineering approaches* has treated stress as a stimulus characteristics of the adolescent's environment, usually conceived in terms of the load or level of demand placed on the individual, or as some aversive or noxious element of that environment (Cox and Mackay, 1981; Fletcher, 1988).

The *medico-physiological* approach to the definition and study of stress received its initial impetus from the work of Selye (1950, 1956). He defined stress as 'a state manifested by a specific syndrome which consist of all the nonspecific changes within the biologic system' that occur when challenged by aversive or noxious stimuli. Stress is treated as a generalized and non-specific physiological response syndrome.

The third approach to the definition and study of stress generally conceptualizes it in terms of the dynamic interaction between the adolescent's and their environment.

INTERNATIONAL THEORIES OF STRESS: International theories of stress focus on the structural characteristics of an adolescent's interaction with their environment. Two particular international theories stand out among the various that have been offered: those of French, Caplan and Van Harrison (1982) and Karasek (1979).

ADOLESCENT - ENVIRONMENT FIT: Several researchers have shown that the goodness of fit between the adolescent and their environment frequently offers a better explanation of behavior than individual or situational differences (Bowers, 1973; Ekehammer, 1974).

JOB DEMANDS/DECISION LATITUDE: Karasek (1979) defined 'decision latitude' as the working individual's potential control over his tasks and his conduct during the working day and defined 'job demands' as the psychological stressors involved in accomplishing the workload.

TRANSACTIONAL THEORIES OF STRESS: Most transactional theories of stress focus on the cognitive processes underpinning the adolescents interaction with their environment, and now here is this more obvious than in relation to theories of appraisal and coping, such as those of Lazarus and Folkman in the USA (e.g. Lazarus and Folkman, 1984) and of Cox and Mackay in the UK (e.g. Cox, 1978; Cox and Mackay, 1981; Cox, 1990). The adolescent does (a) realize that they are failing to cope with the demands of a task, and (b) experiences concern about that failure, then this is a stress scenario. Cox (1978) described the stress process in terms of a five stage model. The first stage, it is argued, represents the sources of demand iced by the adolescents and is part of their environment.

The psychological and physiological changes which are associated with the recognition of such a stress state, and which include coping, represent the third stage of the model. Emotional changes are an important part of the psychological response to stress. These tend to be negative in nature and

often define the experiences of stress for the adolescent. The fourth stage is concerned with the consequences with the consequences of coping. The fifth stage is the general feedback which occurs in relation to all other stages of the model. Stress is an internal state of an individual to respond over environmental, physical, mental and social stressors. It changes the psyche of an individual. After trapping in the stress, person loses his/her capabilities for performing even normal tasks. The feeling of disappointment is generated and which in turn in depression.

GENERAL ADOPTION SYNDROME (GAS): Selye (1936) coined the term "stress syndrome" and showed that it is fundamental to virtually all higher animals.

ALARM REACTION: It is a shock phase during which the defense mechanism of an individual becomes active. This stage is characterized by autonomous excitability; adrenaline discharge; increased heart rate, muscle tone, blood content and gastro-intestinal ulceration.

STAGE OF RESISTANCE: Maximum adoption occurs during this stage. When the bodily reactions experienced during the alarm stage disappear. But if the stressor persists, then the individual moves to the next stage.

STAGE OF EXHAUSTION: After the reactions of the alarm stage disappear and the adaptation energy gets exhausted, the organism collapses.

STRESS: BIOLOGY AND MEDICINE PERSPECTIVE: Stress is a force which deforms bodies. In biology and medicine, the term has acquired another sense. (Levi, 1971). It refers to a process in the body, to the body's general plan for adapting to all the influences, changes, demands and strains to which it might be exposed. This plan swings into action, for e.g. when a person is attacked in the street, but also when someone is exposed to radioactivity or to extreme heat or cold. But it is not just physical strains which activate this plan, mental and social ones do so as well. For instance, when we are reminded of an unpleasant experience or are expected to achieve something of which we do not believe we are capable, or when, with or without cause, we worry about our job or family life.

CAUSES OF STRESS: Stress is caused by various factors - not all of which are work-related of course, (which incidentally doesn't reduce the employer's obligation to protect against the causes of stress at work). Causes of stress - known as stressors - are in two categories: external stressors and internal stressors.

EXTERNAL STRESSORS - physical conditions such as heat or cold, stressful psychological environments such as working conditions and abusive relationships, e.g., are bullying.

INTERNAL STRESSORS - physical ailments such as infection or inflammation, or psychological problems such as worrying about something. Internal factors have more of a moderating influence or effect on stress. These factors are:

PERSONALITY: personality traits such as authoritarianism, rigidity, masculinity, Felinity, extroversion, supportiveness, spontaneity, emotionality, tolerance of ambiguity, anxiety and need for achievement have been uncovered by research as being particularly relevant to the individual stress(brief, 1981).

ANXIETY STATE AND ANXIETY TRAIT: Sushiate (1986) found a significant correlation between stress and anxiety state and anxiety trait.

NEED FOR ACHIEVEMENT: Srivastava and Sehgal (1984), Mohan Chauhan (1999), Hauhan and Chauhan (2001), all studied effect of employees and achievement on their perception of occupational stress and inferred that high need for achievement acts as a resource in influencing the cognitive appraisal of stress, thus moderating their effectiveness.

EGO STRENGTH AND JOB INVOLVEMENT: Srivastava and Sinha (1983) concluded that perceived role stress is a function of ego strength and job involvement. The ego strength enables one to cope effectively with excessive demands and conflicting expectations.

VALUES, GOALS AND PRIORITIES: Autunovsky (1974) has identified commitment to self i.e. an ability to recognize one's distinctive values, goals and priorities and an appreciation of one's own capacity to have purpose and to make decisions as a generalised resistance resource against the impact of stress.

Stressors are also described as either short-term (acute) or long-term (chronic): *Short-term* 'acute' stress is the reaction to immediate threat, also known as the fight or flight response. *Long-term* 'chronic' stressors are those pressures which are ongoing and continuous, when the urge to fight or flight has been suppressed.

STRESS EFFECTS ON HEALTH AND PERFORMANCE: Stress is proven beyond doubt to make people ill, and evidence is increasing as to number of ailments and diseases caused by stress. Stress is now known to contribute to heart disease; it causes hypertension and high blood pressure, and impairs the immune system. Stress is also linked to strokes, IBS (irritable bowel syndrome), ulcers, diabetes, muscle and joint pain, miscarriage during pregnancy, allergies, alopecia and even premature tooth loss. Various US studies have demonstrated that removing stress improves specific aspects of health: stress management was shown to be capable of reducing the risk of heart attack by up to 75% in people with heart disease; stress management techniques, along with methods for coping with anger, contributed to a reduction of high blood pressure, and; for chronic tension headache sufferers it was found that stress management techniques increased the effectiveness of prescribed drugs, and after six months actually equaled the effectiveness of anti-depressants. The clear implication for these ailments is that stress makes them worse.

Stress significantly reduces brain functions such as memory, concentration, and learning, all of which are central to effective performance at work. Certain tests have shown up to 50% loss of performance in cognitive tests performed by stress sufferers.

FACTORS INFLUENCING THE EFFECTS OF STRESS AND STRESS SUSCEPTIBILITY: A person's susceptibility to stress can be affected by any or all of these factors, which means that everyone has a different tolerance to stressors.

- ✓ Childhood experience (abuse can increase stress susceptibility)
- ✓ Personality (certain personalities are more stress-prone than others)

- ✓ Genetics (particularly inherited 'relaxation response', connected with serotonin levels, the Brain's 'well-being chemical')
- ✓ Immunity abnormality (as might cause certain diseases such as arthritis and eczema, which weaken stress resilience)
- ✓ Lifestyle (principally poor diet and lack of exercise)
- ✓ Duration and intensity of stressors.

TYPES OF STRESS: Every one of us would probably experience different types of stress at one time or another. It could be, emotional stress caused by financial problems, post traumatic disorders after an unhappy event some personal stress arising in the work place, strained family relationships with teenage children like an accident or even feeling stress when you are on holiday! All these various types of stress and many more can however be group into four main types of stress.

EUSTRESS: These feelings sure make us feel good and they are the so-called "good stress" or "positive stress". They are able to exert a healthy effect on you. It gives one a feeling of fulfillment or contentment and also makes one excited about life. Unfortunately, it is a type of stress that only occurs for a short period of time. Eustress is also often called the curative stress because it gives a person the ability to generate the best performance or maximum output. In this stress person felt;

- ✓ The thrill and excited feeling while watching a horror movie
- ✓ The feeling of excitement when you won a game or race
- ✓ The excitement when you bought your first car
- ✓ The accomplishment of a challenge
- ✓ The proud feeling of being a first time parent
- ✓ The happy feeling of being loved
- ✓ The excitement of going for a holiday

DISTRESS: Just like everything in life, when there is good or positive stress, there is also "bad" or "negative stress". These types of stress are the opposite of Eustress and its called Distress is a "negative stress". It is a stress disorder that is caused by adverse events and it often influences a person's ability to cope. Some events leading to distress are:

- ✓ Death of a loved one
- ✓ Financial problems
- ✓ Heavy work responsibility and workload
- ✓ Strained relationship
- ✓ Chronic illnesses

Distress can be classified further as acute stress or chronic stress. Acute stress is short-lived while chronic stress is usually prolonged in nature. The remaining two types of stress are:

HYPER STRESS: When a person is pushed beyond what he or she can handle, they will experience what we called hyper stress. Hyper stress results from being overloaded or overworked. It's like being stressed out.

HYPO STRESS: The extreme opposite of hyper stress is Hypo stress of hypo stress Hypo stress stands in direct opposite to hyper stress. That is because hypo stress is one of those types of stress experienced by a person who is constantly bored.

RESPONSE TOWARD STRESS: Our response to stress depends on two main aspects of an individual: personality type.

- ✓ Control and influence
- ✓ There are two categories of people “A” and “B”. Type “A” person is one who is competitive, hard driving, tense, aggressive, preoccupied with deadliness; work oriented and have a high need to control his environment (Friedman and Rosenman, 1974). Type “B” Who doesn’t suffer from impatience and time urgency, has no need to impress others with his achievement, is able to work without agitation and relax without guilt. Type “A” people are likely to experience more stress.

II. REVIEW OF LITERATURE

Review of Literature provides comparative data useful for the interpretation of results and contributes to the general scholarship of the investigator. The importance of the review of the related literature is expressed in the words by Billy Turney and George Robb as follows “Identification of a problem, development of a research design and the determination of the size and scope of the problems all depend to a great extent on the case and intensity with which a researcher has examined the literature related to the intended research” The present review of literature will consider the conceptual phenomena as well as the variables under study to assess empirical clarifications. Any research needs support, verification and clarification by having thorough critical evaluation of the literature available to the researcher, as much as possible within the literature available to the research investigation.

A longitudinal perspective in 14 hospitals, examined sources of occupational stress, coping strategies, and job satisfaction. A sample of 200 nurses was compared to 147 nurses sampled from the same hospital wards after 5 years and revealed a significant increase in nurses’ workload, involvement with life and death situations, and pressure from being required to perform tasks outside of their competence. Although nurses working in public hospitals generally reported more stress than private hospitals, surprisingly nurses’ satisfaction with their job increased particularly in public hospitals, which may be attributable to age, improvements in monetary compensation, and organizational support. (Elsevier B.V Elsevier B.V. Elsevier B.V; 2009) Joel E. Dimsdale, San Diego and La Jolla, (2008) reviewed the conceptual issues in defining stress and then explored the ramification of stress in terms of the effects of acute versus long-term stressors on cardiac functioning. Examples of acute stressor studies are discussed in terms of disasters (earthquakes) and in the context of experimental stress physiology studies, which offer a more detailed perspective on underlying physiology. Studies of chronic stressors are discussed in terms of job stress, marital unhappiness, and burden of care giving.

NIMHS (2007) investigated numerous emotional and physical disorders that have been linked to stress including depression, anxiety, heart attacks, stroke, hypertension, immune system disturbances that increase susceptibility to

infections, a host of viral linked disorders. When people react to stressors, a wide variety of cognitive and emotional responses can occur.

Two general personality traits, positive affectivity (also called extroversion) and negative affectivity (also called neuroticism) are particularly relevant to stress. People who are high in positive affectivity tend to have positive feelings like enthusiasm and energy (Waston and Pellegen, 2005), feelings that characterize eustress. People who are high in negative affectivity tend to have negative feelings like anxiety and depression (Clark2004), feelings that characterize distress. In particular negative affectivity is associated with the ineffective use of coping strategies (Bogler, 2000 and McCrae, 2006) and susceptibility to daily stressors. Even when taking into account other personality traits like negative affectivity, perceived control, and self-esteem, optimism is still associated with a lack of stress responses like depression (Bridges, 2004). Self-esteem is one factor that can influence the relation between daily hassles and emotional responses to stressors.

Low Self-esteem also has an important role in depression (Beck, 1967 & Folkman et.al., 1988). People are particularly resistant to stress if they lead a healthy lifestyle, which includes a healthy diet, physical fitness and enough rest and relaxation. In particular, people who lead a healthy lifestyle have the energy they need to cope with stressors (Lazarus and Folkman; 1984).

Stressors tend to prompt weaker psychological responses, such as lower level of anxiety, emotionality and depression in people who are physically fit than they do in people who are not physically fit (Doan et. al., 2006). Observational studies by James A. Blumenthal, Andrew Sherwood, Michael A. Babyak, Lana L. Watkins, Robert Waugh, Anastasia Georgiades, Simon L. Bacon, Junichiro Hayano, R. Edward Coleman and Alan Hinderliter (2005) have shown that psychosocial factors are associated with increased risk for cardiovascular morbidity and mortality.

Their Objective was to determine the effect of 2 behavioral programs, aerobic exercise training and stress management training, with routine medical care on psychosocial functioning and markers of cardiovascular risk. Randomized controlled design was employed and 134 patients (92 male and 42 female; aged 40-84 years) with stable ischemic heart disease (IHD) were taken as a sample. Routine medical care (usual care); usual care plus supervised aerobic exercise training for 35 minutes 3 times per week for 16 weeks; usual care plus weekly 1.5-hour stress management training for 16 weeks. They concluded that patients with stable IHD, exercise and stress management training reduced emotional distress and improved markers of cardiovascular risk more than usual medical care alone.

Anne Mandy and Paul Tinley (2004) have made study on inexperienced practitioners. This study was undertaken to compare the levels of burnout in newly qualified practitioners in Australia and the United Kingdom.

Gold, Dave and Alistair (2003) studied the value of meditation in business workingwomen. Meditation techniques are applied to the small business enterprises. Concerning the view of their involvement in the meditation programme, the results reveals that meditation is of real importance is

monitoring the stress and it reduces the stress level also and helps the workingwomen to work efficiently is their business.

Howard (1980) studied the effect of meditation on the integration of self system and hypothesised that individuals engage in meditation experience reconcile confliction self systems that arise in disparate social situations. The subject underwent four month period intensive meditation exercises (who had conflating self system).

Levine Stephen (1987) in his paper on healing into life death concluded that through opening the heart and meditation technique, People gets relief from pain and grief and develops a technique as a means of healing their body as well as mind. Delone and Susan (1987) concluded by their study that meditation has a psychological effect on the stress management. It is the self control strategy for stress management.

Roy – Dilip (2000) discusses physical and mental sources to stress in the work environment and proposes yoga & meditation as an approach to stress management for business working women. Meditation helps in cleaning the minds of accumulated worries. It helps in mind management and restoration of nervous balance. They concluded that meditation exercises plays a great role is the management of stress.

Neault & Roberata (2000) in their study on career management emphasised the role of counseling in building up strategic partnerships between individuals and their employers. This study concludes that counselors can provide solutions urgently sought by human resources, practitioners and managers in the corporate world.

III. METHODOLOGY – INTRODUCTION

Stress is a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize.

- ✓ **ACTION-ORIENTED:** In which we seek to confront the problem causing the stress, changing the environment or the situation;
- ✓ **EMOTIONALLY-ORIENTED:** In which we do not have the power to change the situation, but we can manage stress by changing our interpretation of the situation and the way we feel about it; and
- ✓ **ACCEPTANCE-ORIENTED:** Where something has happened over which we have no power and no emotional control, and where our focus is on surviving the stress.
- ✓ **PROBLEM:** “Stress management technique and cardiac activity among female nurses”

OBJECTIVE

- ✓ To study and compare the cardiac movement of private and public sector nurses with higher stress.
- ✓ To study and compare the cardiac movement of experienced and fresher nurses with higher stress.
- ✓ To study and compare the cardiac movement of matron, staff nurse and ANM level female nurses with higher stress.

HYPOTHESIS

- ✓ There is no significant difference in level of stress of private and public sector female nurses with higher stress.
- ✓ There is no significant difference in level of stress of experienced and fresher nurses with higher stress.
- ✓ There is no significant difference in level of stress of matron, staff nurse, and ANM level of female nurses with higher stress.

	A1 Private Sector		A2 Public Sector	
	B1 Experienced	B2 Fresher	B1 Experienced	B Fresher
	C1 Matron	30	30	30
C2 Staff Nurse	30	30	30	30
C3 ANM	30	30	30	30

Table 3.1

PHASE I

In the present investigation incidental cum purposive sampling technique was used. Whole sample was comprised of 360 employees from various hospitals in Chennai District. On the basis of stress questioner only those sample was taken whose stress level was found higher. 180 samples were taken from private sector (A1) and rest 180 was taken from public sector (A2). Both subgroups were subdivided with equal number of experienced (B1) and fresher (B2) type of employees. All four subcategory were made of equal number of Manager C1 Executive C2 Worker C3 type of employee. In this research only those samples were taken, whose stress level found high or above average.

PHASE II

In this phase the sample constituted of total 60 employees from the sample of first phase. It was taken into consideration that five numbers of employees were randomly selected from each sub-group of first phase.

Variables:-

To considered the objective of the present investigation whole study was done under two phases-

PHASE I

Independent Variables:

- ✓ Type of sector- Private A1 Public A2
- ✓ Level of experience 105 Experience B1, Fresher B2.
- ✓ Type of Employees- Manager C1 Executive C2 Worker C3

Dependent Variables:

- ✓ Stress
- ✓ Autonomic Response i.e. Heart Rate (E.C.G.)

PHASE II

Independent Variables:

- ✓ Effect of stress management techniques

Dependent Variables:

- ✓ Stress
- ✓ Autonomic Response i.e. Heart Rate (E.C.G.)

Test and Tools:

- ✓ Occupational stress (Scale) test by A K Srivastava
- ✓ Cardiac machine for measurement of cardio logical test.

OCCUPATIONAL STRESS SCALE

In this research to measure stress the Occupational Stress Scale, prepared by Srivastava and Singh (1981) was used. This scale the stress measure for particular person in his organising .it is contained by 46 details in which 28 details i.e.1, 2, 3, 4, 5, 9, 11, 12, 13, 16, 17, 23, 24, 25, 26, 27, 28, 29, 34, 35, 36, 37, 38, 39, 42, 44, 45 and 46 are of positive nature five options are given to answer each detail e.g. firmly agreed, agree, undecided, disagree, and firmly disagree. 5, 4,3,2,1 points given accordingly, While 16 details are negative type. The no are 6, 7, 8, 10, 14, 15, 18, 19, 20 ,21, 22, 30, 31, 32, 33, 40, 41 and 43 same five options are given to answer the question 1, 2, 3, 4, 5, points are assigned accordingly. In this measurement minimum marks would be 46 and maximum 230. According to the marks obtained by the person it can be concluded that higher marks higher stress and lower marks lover the stress. Method and apparatus for performing minimally invasive cardiac procedures:-

Electro-Cardio-Gram (E.C.G.) is used to measure the heart rate from muscle strips and from electrodes placed directly on the surface of the heart. In normal condition, the heart rate in adults is found to be 72 per minute, the range being 70-80, though the heart rate is depend on gender, age, metabolic rate, respiration etc.

Procedure: - A system for performing minimally invasive cardiac procedures. The system includes a pair of surgical instruments that are coupled to a pair of robotic arms. The instruments have end effectors that can be manipulated to hold and suture tissue. The robotic arms are coupled to a pair of master handles by a controller. The handles can be moved by the surgeon to produce a corresponding movement of the end effectors. The movement of the handles is scaled so that the end effectors have a corresponding movement that is different, typically smaller, than the movement performed by the hands of the surgeon. The scale factor is adjustable so that the surgeon can control the resolution of the end effectors movement. The movement of the end effector can be controlled by an input button, so that the end effector only moves when the button is depressed by the surgeon. The input button allows the surgeon to adjust the position of the handles without moving the end effector, so that the handles can be moved to a more comfortable position. The system may also have a robotically controlled endoscope which allows the surgeon to remotely view the surgical site. A cardiac procedure can be performed by making small incisions in the patient's skin and inserting the instruments and endoscope into the patient. The surgeon manipulates the handles and moves the end effectors to perform a cardiac procedure such as a coronary artery bypass graft. Data on Elector-Cardio-Graft (E.C.G.) were recorded as-

Average stress - 70 to 80 hearts' beats per minute

Higher stress- Above 80 hearts' beats per minute

Low stress - Below 70 hearts' beats per minute

Research Design:-

Phase I

As in the present investigation considered objective was to compare the groups to see the only main effect of independent variables (Each I.V. was treated separate) on stress and on E.C.G. Between group design was employed viz depicted as follow:

Private Sector	Public Sector
180	180

Table 3.2: Between Group Design to compare the type of Sector

Private Sector	Public Sector
180	180

Table 3.3: Between Group Design to compare the Level of Experience

Matron	Staff Nurse	ANM
120	120	120

Table 3.4: Between Group Design to compare the Type of Employee

Phase II To study the effectiveness of stress management technique Pre-Post Single group design was employed in this phase viz depicted as follow:

	Pre test Score	Intervention of stress management	Post test score	Reduced Stress Score
Stress mean score	---	---	---	---

Table 3.5: Pre-Post single group Design for Stress

	Pre test Record	Intervention of stress management	Post test Record	Reduced Frequency
Mean of Heart rate (E.C.G. Record data)	---	---	---	---

Table 3.6: Pre-Post single group Design for ECG

PROCEDURE: Pilot Study

The Pilot study was conducted in order to decide the appropriateness of tests used and sample in conducting the final study. The pilot study also gave direction about the coding method and the statistical procedures that could be used for final study. Main Study to select the sample various institute and companies were visited and then permission was sought out from their head or director after discussing the purpose of the present study.

PHASE I

The data was collected from the respondents on the stress and on E.C.G variable. Stress score was collected by using occupational stress questionnaire and for E.C.G. data minimally invasive cardiac procedure was used. Data was collected in best possible conditions, so that reliability of this study can be considered.

PHASE II

The phase II of the main study was meant to find out the effectiveness of stress management technique in order to reduce stress. For this purpose total 60 number of sample from the first phase was selected (5 subjects from each group). After selection of sample, stress management techniques given to this selected sample. The instructions of stress management by power point c.d. by Dr. N. Kannan (Physician) used by investigator. So the applications of the steps were effectively done. That treatment given three times, Pre and post single group design was used to observe the effects of stress management technique. Apart from the demonstration of this technique the subject asked to do the exercises at their regularly ones in a day for fifteen days to one month. Similarly cardiac care measured before and after demonstration of stress management technique.

STATISTICAL ANALYSIS

The data were analyzed as follows;

The mean (with graphical representation) for Level of sector (Private A1 Public A2), Level of experience (Experience B1, Fresher B2) and Types of Employees (Manager C1 Executive C2 Worker C3) on stress and on ECG was analyzed. Each Independent variable of the first phase was treated separately. To attempt the objective of the present investigation t test and one way ANOVA method of statistical analysis were used as per requirement.

IV. RESULTS AND DISCUSSION

To date, stress research has not investigated whether these high levels of self reported occupational stress are predictive of any adverse physiological parameters (such as blood pressure or heart rate). Evidence suggests that job stress may be an independent risk factor in an etiology of cardiovascular disease.

PHASE I

The modern world, which is said to be a world of achievement, is also a world of stress. Occupational stress is now a major concern and will very likely to be so in the future. Stress in the work environment and its effects are not restricted to just the employers but also include the organizations that hire them. Occupational stress initially arises from the constituent factors of job and its psychological environment, Selye (1956) who is the father of modern stress research defined it as the “nonspecific” response of the body to any specific condition which makes it up.

In this regard result of the present research has made their effort to compare various groups in relation to their stress and autonomic response i.e. heart rate (E.C.G.).

HYPOTHESIS 1

“There is no significant difference in level of stress of private and public sector employees with higher stress”.

Sub Sample	Mean score	T - Value	Level of Significance
Private	139.27	1.30	NS
Public	136.67		

Table 4.1: Comparison of Mean Stress Score of Private and Public Sector Female Nurses

From table 4.1 and respective above graph, it is seen that mean score on stress test for private employees 139.27, while for public employees it is 136.67. It implies that person who is working in private sector has more stress as compare to person who are working in public sector. This table also reveals that private and public employees are not significant on their level of stress (t=1.30). From this result it can be concluded that individual’s stress level does not effect from their sector in which they are working. This result also reveals that both sector whether private and public does not work as an independent factor for stress.

On the basis of present finding null hypothesis in this regard has been proven that there is no significant difference in level of stress of private and public sector employees.

HYPOTHESIS 2

“There is no significant difference in level of stress of experienced and fresher employees with higher stress”.

Sub Sample	Mean score	T - Value	Level of Significance
Experience	138.70	4.08	0.01
Fresher	132.25		

From table 4.2 it can be observed that fresher employees having more stress (138.70) than employees who are experienced (132.25). On the basis of calculated t-value i.e. 4.08 which was found significant at 0.01 level. It can be concluded that fresher and experienced employees are significantly differ on their level of stress. Result can be attributed on the fact that employees who are newly involved in the work have no idea about work and their strategy to do work and work-related problem and their solution. Their climate is also unfamiliar. Further this finding is line with the study of Mandy and Paul Tinley (2004) who has study on inexperienced and experienced practitioners. This study was undertaken to compare the levels of Stress in newly qualified practitioners in Australia and the United Kingdom. The results suggest that levels of stress are higher in inexperienced practitioners as compare to experience. They concluded that Occupational stress was associated with lack of professional status and with geographic and professional isolation. Within these two themes, there were clear differences between the two groups.

Null hypothesis regarding effect of experiences level on stress was thus rejected as results of the present research does not support this hypothesis.

HYPOTHESIS 3

“There is no significant difference in level of stress of managerial, executive, and worker level employees with higher stress”.

Sub Sample	Mean score	f - Value	Level of Significance
Matron	136.72	0.33	NS
Staff Nurse	138.60		
ANM	136.60		

Table 4.3: Comparison of Mean Stress Score among Matron, staff nurses and ANM

The above table 4.3 indicates the mean on stress which were found 136.72, 138.60 and 136.60 for manager, executive and for worker respectively. The 't' value 0.33 not proven statistically significant at any level of confidence. This mean value indicate that executive group of employees had higher stress as compare to managers and worker group of employees. This results are not in line with the view of Cooper and Marshall (1978) that managers from technical and scientific backgrounds, having "thing orientation" experience high stress. Though this cannot be generalize on everywhere but it revealed that executive group having more pressure of job on their role which resultant higher stress on them.

Thus the related null hypothesis that there is no significant difference in level of stress of managerial, executive, and worker level employees is accepted here on the basis of present finding.

The result of present finding gets indirect support from the following studies;

John Richard (1998) who studied the effect of meditation on psychological, physiological and organizational variables at the work site.

A hypothesis that the group that participated in the stress reduction programme will have better mental and physiological health was proved as compared to those who did not participated in the stress reduction programme.

Gold, Dave and Alistair (2003) studied the value of meditation in business workingwomen. Meditation techniques are applied to the small business enterprises.

Delone and Susan (1987) concluded by their study that meditation has a psychological effect on the stress management. It is the self control strategy for stress management.

Smith (1991) in his book "A guide to stress management" gave many methods to cope with stress. One of the methods described is the meditation exercises & relaxation technique. The result revealed that the stress management is nowadays must for each and every organization to provide their employees as People most at risk from stress. The nursing and teaching occupations are most affected by work related stress, with 2% of workers at any one time suffering from work related stress, depression and anxiety. (The figure for teachers rises to 4% when including physical conditions relating to stress.) Care workers, managers and professionals are the next highest affected occupations, with over 1% suffering from serious work-related stress at any one time.

Aforementioned study as well as this finding emphasize on stress management technique to use on person in order to reduce their stress. Further On the basis of this finding concern hypothesis that stress management technique will be the effective intervention to reduce stress is proven true. Autonomic Response and Stress management

HYPOTHESIS 8

"Stress management technique will be effective intervention to get normal autonomic response i.e. cardiac movement (Heart rate)".

Group	Pre – Test Mean Score	Post – Test Mean Score	Mean Difference
A1B1C1	136.46	128.50	7.96
A1B1C2	140.66	136.50	4.16
A1B1C3	137.06	130.33	6.73
A1B2C1	139.86	136.20	3.66
A1B2C2	142.96	138.20	4.76
A1B2C3	138.63	135.00	3.63
A2B1C1	137.90	132.36	5.54
A2B1C2	136.30	130.70	5.60
A2B1C3	135.13	127.76	7.37
A2B2C1	132.66	126.86	5.80
A2B2C2	142.50	132.50	10.00
A2B2C2	135.56	133.30	5.23

Table 4.4: Comparison of pre-test and post-test means score of each group on E.C.G

To study the difference of stress level between before and after intervention of stress management technique, it was hypothesized that there would be significant difference on their level of stress .Above table and graph indicate that all groups were noted with less level of stress after introduce the stress management technique as mean of stress score of each group were found to be less than before

The result of present finding gets indirect support from the following studies;

John Richard (1998) who studied the effect of meditation on psychological, physiological and organizational variables at the work site. This study evaluated the effectiveness of a stress reduction intervention offered to employees at one worksite where 80 were employed. Volunteers (aged 21-65) participated in meditation and rest did not attend any of the stress reduction programmes.

Gold, Dave and Alistair (2003) studied the value of meditation in business workingwomen. Meditation techniques are applied to the small business enterprises. Concerning the view of their involvement in the meditation programme, the results reveals that meditation is of real importance is monitoring the stress and it reduces the stress level also and helps the workingwomen to work efficiently is their business.

Delone and Susan (1987) concluded by their study that meditation has a psychological effect on the stress management. It is the self control strategy for stress management.

Smith (1991) in his book "A guide to stress management" gave many methods to cope with stress. One of the methods described is the meditation exercises & relaxation technique. Which gives the strategies for stress management coping and emphasizes upon the cognitive behavioral relaxation theory through concentrating on the behavior change to manage stress.

Cooper et al (1991) concluded by their study on the stress counseling in the post office that the impact of stress counseling on sickens, absence and psychosocial measures of job stress for 78 subjects indicated that counseled employees

showed significant improvement in anxiety, stress and depression.

A fore mentioned study as well as this finding emphasize on stress management technique to use on person in order to reduce their stress. Further On the basis of this finding concern hypothesis that stress management technique will be the effective intervention to reduce stress is proven true. Autonomic Response of Stress management.

V. SUMMARY AND CONCLUSIONS

The complexity of industrial, organizational and modernized life is a source of stress to all individual. The nature of the stress and the effect can be understood by advance our knowledge regarding factor lead to stress and how stress can be reduce. This stress may lead to strain or long term negative effects. In the present study, an attempt was made to see the effect of certain variable (Type of sector, Level of experience and Type of Employees on stress and autonomic response (heart rate or cardiac movement). Whole sample was comprised of 360 female Nurses from Chennai district, Tamilnadu, India. On the basis of stress questioner only those sample was taken whose stress level was found higher. 180 samples were taken from private sector (A1) and rest 180 was taken from public sector (A2). Both subgroups were subdivided with equal number of experienced (B1) and fresher (B2) type of Nurses. All four subcategory were made of equal number of Manager C1 Executive C2 Worker C3 type of employee. In this research only those samples were taken, whose stress level found high or above average. Occupational stress (Scale) test by A K Srivastava was used to measure stress level of employees and cardiac movement was measured by using E.C.G. record. Between group design and pre and post single group design was employed to reach out the objectives of this study. Obtained data was analyzed by employed t test and one way ANOVA as per requirements.

After analysis of the result, the following conclusions were drawn;

- ✓ Private and public sector nurses were not found significantly differ on their level of stress.
- ✓ Fresher and experienced nurses were found significantly differ on their level of stress. Fresher employees were having higher stress as compare to experienced employees.
- ✓ All three groups i.e. matron, staff nurses, and ANM were not found significantly differ on their level of stress.
- ✓ Mean difference of heart rate was not found significantly differ at any level of confidence which revealed that private and public nurses are not differ on their autonomic activities as heart rate is one of them.
- ✓ T-value for the mean difference of E.C.G. record (heart rate) of fresher and experienced employees was found to be significant at the .05 level of confidence. It indicates that nurses who is having more experience having low stress as they were found low heart rate which is indicator of stress, as compare to those employees who were newly involved in their job.

- ✓ Nurses whether they are working as Matron or Staff Nurse or as a ANM do not differ on their autonomic response that is heart rate in the present research.
- ✓ Stress management technique was found effective intervention to reduce stress of Nurses.
- ✓ Stress management technique was found effective intervention to get optimum autonomic response i.e. cardiac movement has been proven true.

VI. LIMITATIONS AND SUGGESTIONS

Following limitation and related suggestions of the present investigation are; in the present investigation, only employees of organizations were taken as a sample. Though there are a number of adolescents whether they are working or not that go through stress and who are also need of interventions in order to reduce their stress, thus their samples could also be included in further research so as to get a comprehensive view of the problem.

The present research considered only type of sector, employees and level of experience as independent variables though other than these variables also work as factors cause stress, and thus other variable can also be taken as an independent variable in further research. Here only stress management technique was taken as an intervention in order to reduce stress and associate autonomic response. In future research other technique like music therapy, psychic therapy etc could also consider in order reducing stress. In this investigation autonomic response includes only heart rate other associate autonomic response can also be considered in other research related to stress.

The stress management technique has a positive impact not only for the individual in the workplace but also for co-workers, customers and the organization as a whole so it has to be examining the further research. The common assumptions of a relationship between the experiences of stress accompanied with poor physical and mental health. However, any researches which advance our knowledge regarding stress have social importance or practical usefulness so it has to be examined in greater detail. Such an examination must address not only the fact of the relationship, but also the nature of the psycho-physiological mechanism that might underpin it.

REFERENCES

- [1] Andrea Sgoifo , Donatella Stilli , Sietse F. de Boer , Jaap M. Koolhaas2, Ezio Musso; 2009. Volume 24 Issue 4, Pages 287 – 296; Social Defeat and Subordination as Models of Social Stress. Wiley-Liss, Inc., A Wiley Company
- [2] Anne Mandy and Paul Tinley; 2004. Journal of the American Podiatric Medical Association Volume 94 Number 3 282-291 2004. American Podiatric Medical Association.
- [3] Aron, A.R., Robbins, T.W., Poldrack, R.A. (2004). Inhibition and the right inferior frontal cortex. Trends in Cognitive Sciences, 8 (4), 170-7.

- [4] B.D. Kirkcaldy, R.M. Trimpop, S. Williams; 2002. "Occupational stress and health outcome among British and German managers". *Journal of Managerial Psychology*; Volume: 17; Issue:6 ;Page: 491 – 505;ISSN: 0268-394; MCB UP Ltd
- [5] B.K. Houston, Cardiovascular and neuro endocrine activity, global Type A and components of Type A behaviour. In: B.K. Houston and C.R. Snyder, Editors, *Type A Behaviour Pattern*, Wiley, New York (1988), pp. 212–253.
- [6] Barrett, L.F., Robin, L., Pietromonaco, P.R., Eyssell, K.M. (1998). Arewomen the 'more emotional' sex? Evidence from emotional experiences in social context. *Cognition & Emotion*, 12 (4), 555-78.
- [7] Bartels, A., Zeki, S. (2000). The neural basis of romantic love. *Neuro report*, 11, 3829-34.
- [8] Bartels, A., Zeki, S. (2004). The neural correlates of maternal and romantic love. *Neuroimage*, 21, 1155-66.
- [9] Beauregard, M., Levesque, J., Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *Journal of Neuroscience*, 21, RC165.
- [10] Belkic KL, Landsbergis PA, Schnall PL, Baker D. Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health* (2004) 30:85–128.
- [11] Blalock, H. (1972). In *Social Statistics*. NY: McGraw-Hill, pp. 406-
- [12] Blumenthal J, Sherwood A, Babyak M, et al. Effects of exercise and stress management training on markers of cardiovascular risk in patients with ischemic heart disease: a randomized controlled trial *JAMA* 2005;293:1626-1634.
- [13] Blumenthal JA, Sherwood A, Babyak MA, Watkins LL, Waugh R, et al. Effects of exercise and stress management training on markers of cardiovascular risk in patients with ischemic heart disease: a randomized controlled trial. *JAMA* (2005) 293:1626–1634.
- [14] Bosma H, Peter R, Siegrist J, Marmot M. Two alternative job stress models and the risk of coronary artery disease *Am J Public Health* 1998; 88:68-74.
- [15] Carrasco, G.A., Van de Kar, L.D. (2003). Neuroendocrine pharmacology of stress. *European Journal of Pharmacology*, 463, 235-72.
- [16] Cebelin M, Hirsch C. Human stress cardiomyopathy. Myocardial lesions in victims of homicidal assaults without internal injuries. *Hum Pathol* 1980; 11:123-132.
- [17] Chandola T, Britton A, Brunner E, Hemingway H, Malik M, Kumari M, Badrick E, Kivimaki M, Marmot M. Work stress and coronary heart disease: what are the mechanisms? *Eur Heart J* (2008) 29:640– 648. First published on January 23, 2008. doi:10.1093/eurheartj/ehm584.
- [18] Charney, D.S. (2004). Psychobiological mechanisms of resilience and vulnerability: implication is for successful adaptation to extreme stress. *American Journal of Psychiatry*, 161, 195-216.
- [19] Christoff, K., Ream, J.M., Geddes, L.P., Gabrieli, J.D. (2003). Evaluating self-generated information: anterior prefrontal contributions to human cognition. *Behavioral Neuroscience*, 117, 1161-8.
- [20] Cyranowski, J.M., Frank, E., Young, E., Shear, M.K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: a theoretical model. *Archives of General Psychiatry*, 57 (1), 21-7
- [21] D.G. Byrne, Type A behaviour, anxiety and neuroticism: re conceptualizing the patho-physiological paths and boundaries of coronary-prone behaviour. *Stress Medicine* 12 (1996), pp. 227–238.
- [22] Dagher, A., Owen, A.M., Boecker, H., Brooks, D.J. (1999). Mapping the network for planning: a correlational PET activation study with the Tower of London task. *Brain*, 122 (Pt 10), 1973-87.
- [23] Davey Smith G, Ben-Shlomo Y, Beswick A, Yarnell J, Lightman S, Elwood P. Cortisol, testosterone, and coronary heart disease: prospective evidence from the Caerphilly Study. *Circulation* (2005) 112:332–340.
- [24] Davidson, R.J., Irwin, W. (1999). The functional neuro anatomy of emotion and affective style. *Trends in Cognitive Science*, 3, 11-21.
- [25] Davidson, R.J., Jackson, D.C., Kalin, N.H. (2000). Emotion, plasticity, context, and regulation: perspectives from affective neuroscience. *Psychological Bulletin*, 126, 890-909.238 SCAN (2007) J.Wang et al.
- [26] Davis, K.D., Taylor, S.J., Crawley, A.P., Wood, M.L., Mikulis, D.J. (1997). Functional MRI of pain- and attention-related activations in the human cingulate cortex. *Journal of Neurophysiology*, 77, 3370-80.
- [27] Deanfield J, Shea M, Kensett M, et al. Silent myocardial ischaemia due to mental stress *Lancet* 1984;2:1001-1005.
- [28] Dekker JM, Crow RS, Folsom AR, Hannan PJ, Liao D, Swenne CA, Schouten EG. Low heart rate variability in a 2-minute rhythm strip predicts risk of coronary heart disease and mortality from several causes: the ARIC study. *Circulation* (2000) 102:1239–1244.
- [29] Elsevier B.V; 2009. *International Journal of Nursing Studies*, Volume 41, Issue 3, Pages 247-254.2009.
- [30] *Family Practice* Vol. 18, No. 1, 92-94; © Oxford University Press 2001
- [31] Fischer, A.H. (1993). Sex differences in emotionality: fact or stereotype? *Feminism & Psychology*, 3 (3), 303-18.
- [32] Franklin, T.R., Wang, Z., Wang, J., Sciortino, N., Harper, D., Li, Y., Ehrman, R., Kampman, K., O'brien, CP, Detre, JA., Childress, AR.(2007). Limbic activation to cigarette smoking cues independent of nicotine withdrawal: A perfusion fMRI study. *Neuro psycho pharmacology* Mar 21; [Epub ahead of print].
- [33] Gobbini, M.I., Leibenluft, E., Santiago, N., Haxby, J.V. (2004). Social and emotional attachment in the neural representation of faces. *Neuroimage*, 22 (4), 1628-35.
- [34] Goldstein, J.M., Jerram, M., Poldrack, R., et al. (2005). Hormonal cycle modulates arousal circuitry in women using functional magnetic resonance imaging. *Journal of Neuroscience*, 25, 9309-16.
- [35] Guimont C, Brisson C, Dagenais GR, Milot A, Vézina M, Mâsse B, Moisan J, Laflamme N, Blanchette C. Effects of job strain on blood pressure: a prospective study of male and female white-collar workers. *Am J Public Health* (2006) 96:1436–1443.

- [36] Hamann, S., Canli, T. (2004). Individual differences in emotion processing. *Current Opinion in Neurobiology*, 14, 233-8.
- [37] Hampel, P., Petermann, F. (2006). Perceived stress, coping, and adjustment in adolescents. *Journal of Adolescent Health*, 38, 409-15.
- [38] Holden, C. (2005). Sex and the suffering brain. *Science*, 308, 1574.
- [39] Kudielka, B.M., Kirschbaum, C. (2005). Sex differences in HPA axis responses to stress: a review. *Biological Psychology*, 69 (1), 113-32.
- [40] Lampert R, Jain D, Burg M, Batsford W, McPherson C. Destabilizing effects of mental stress on ventricular arrhythmias in patients with implantable cardioverter-defibrillators *Circulation* 2000;101:158-164.
- [41] Lazarus, R.S., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.
- [42] Matsuo T, Suzuki S, Kodama K, Kario K. Hemostatic activation and cardiac events after the 1995 Hanshin-Awaji Earthquake *Int J Hematol* 1998;67:123-129.
- [43] Matthews K, Gump B. Chronic work stress and marital dissolution increase risk of post trial mortality in men from the Multiple Risk Factor Intervention trial *Arch Intern Med* 2002;162:309-315.
- [44] McClure, S.M., York, M.K., Montague, P.R. (2004). The neural substrates of reward processing in humans: the modern role of fMRI. *Neuroscientist*, 10, 260-8.
- [45] O'Brien E, Petrie J, Littler W, de Swiet M, Padfield PL, O'Malley K. The British Hypertension Society protocol for the evaluation of automated and semi-automated blood pressure measuring devices with special reference to ambulatory systems. *J Hypertension* 1990; 8: 607-619.
- [46] O'Connor DB, O'Connor RC, White BL, Bundred PE. The effect of job strain on British general practitioners' mental health. *J Mental Health* 2000; in press.
- [47] Orth-Gomer K, Wamala S, Horsten M, Schenck-Gustafsson K, Schneiderman N, Mittleman M. Marital stress worsens prognosis in women with coronary heart disease: the Stockholm female coronary risk study *JAMA* 2000;284:3008-3014.
- [48] Rees K, Bennett P, West R, Davey Smith G, Ebrahim S. Psychological interventions for coronary heart disease *Cochrane Database Syst Rev* 2004;2CD002902.
- [49] Rosengren A, Hawken S, Ounpuu S, et al. Association of psychosocial risk factors with risk of acute myocardial infarction in 11,119 cases and 13,646 controls from 52 countries (the INTERHEART study): case-control study *Lancet* 2004;364:953-962.
- [50] Schnall PL, Landsbergis PA, Baker D. Job strain and cardiovascular disease. *Annu Rev Public Health* 1994; 86: 324-331.
- [51] Schroeder EB, Liao D, Chambless LE, Prineas RJ, Evans GW, Heiss G. Hypertension, blood pressure, and heart rate variability. The Atherosclerosis Risk in Communities (ARIC) Study. *Hypertension* (2003) 42:1106-1111.
- [52] Sutherland VJ, Cooper CL. Identifying distress among general practitioners: predictors of psychological ill-health and job dissatisfaction. *Soc Sci Med* 1993; 37: 575-581.
- [53] Taylor, S.E., Klein, L.C., Lewis, B.P., Gruenewald, T.L., Gurung, R.A., Updegraff, J.A. (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-flight. *Psychological Review*, 107, 411-29.
- [54] Theorell T, Tsutsumi A, Hallquist J, et al. Decision latitude, job strain, and myocardial infarction: a study of working men in Stockholm *Am J Public Health* 1998; 88:382-388
- [55] Twisk J, Snel J, Kemper H, van Mechelen W. Changes in daily hassles and life events and the relationship with coronary heart disease risk factors: a 2-year longitudinal study in 27-29 year old males and females *J Psychosom Res* 1999;46:229-240.
- [56] Van Egeren LF. The relationship between job strain and blood pressure at work, at home, and during sleep. *Psychosoc Med* 1992; 54: 337-343.
- [57] Vapnik, V.N. (1999). *The nature of statistical learning theory*, 2nd edn, New York: Springer-Verlag.
- [58] Von Kanel R, Dimsdale J, Adler K, Patterson T, Mills P, Grant I. Exaggerated plasma fibrin formation (D-dimer) in elderly Alzheimer caregivers as compared to non-caregiving controls *Gerontology* 2005;51:7-13.
- [59] Von Kanel R, Dimsdale J, Ancoli-Israel S, et al. Poor sleep is associated with higher plasma proinflammatory cytokine interleukin-6 and procoagulant marker fibrin D-dimer in older Alzheimer caregivers *J Am Geriatrics Soc* 2006;54:431-437.