

**A STUDY ON STRESS AND PROFESSIONAL
EFFICIENCY OF THE HEADS OF PRIMARY
SCHOOLS IN KERALA**

ABDUL KADER PARAMBAT, M.A; M.Ed

*THESIS SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY IN EDUCATION*

**DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT
KERALA-673 635. INDIA**

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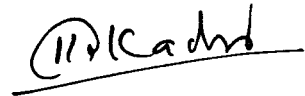
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DECLARATION

I, Abdul Kader Parambat, do hereby declare that this study “A STUDY ON STRESS AND PROFESSIONAL EFFICIENCY OF THE HEADS OF PRIMARY SCHOOLS IN KERALA” has not been previously formed the basis for the award of a Degree, Diploma or Recognition.



ABDUL KADER PARAMBAT

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CERTIFICATE

Certified that the thesis "A STUDY ON STRESS AND PROFESSIONAL EFFICIENCY OF THE HEADS OF PRIMARY SCHOOLS IN KERALA" is a record of bonafide study and research carried out by Mr. Abdul Kader Parambat, under my supervision and guidance and that it has not been previously formed the basis for the award of a Degree, Diploma or Recognition.



Dr. C. NASEEMA.

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CHAPTER I

INTRODUCTION

-
- NEED AND SIGNIFICANCE OF THE STUDY
 - STATEMENT OF THE PROBLEM
 - DEFINITION OF KEY TERMS
 - VARIABLES OF THE STUDY
 - OBJECTIVES OF THE STUDY
 - HYPOTHESES OF THE STUDY
 - PROCEDURE IN BRIEF
 - SCOPE AND LIMITATIONS OF THE STUDY
 - ORGANISATION OF THE REPORT
-

INTRODUCTION

Education has continued to evolve and extend its reach and coverage since the dawn of human history. It refines sensitivities and perceptions that contribute to develop a balanced personality, a sense of independence, and scientific temper in the individual. Every country develops its system of education to express and promote its unique socio-cultural identity and also to meet the challenges of times.

In post independence India, education aimed to promote national progress, a sense of common citizenship and culture, to strengthen national integration and to develop the ideas of socialism, secularism, democracy etc.

When we speak about education, primary education comes the first and the foremost. This is because the programmes and practices of primary schools contribute in one way or another to the development of an individual. The individual's future may depend heavily upon what he has gained from the primary school. An individual at his impressionable primary school ages acquire thought patterns and habits that will affect him throughout his life. Besides primary education is a pre-requisite for any further education.

Primary education is the largest single enterprise all over the world. So from the point of view of magnitude, from the

standpoint of psychological preparedness, from the sociological point of view, from economic necessities, from the philosophical background and in view of scientific enlightenment and humanism the role of primary education is extremely significant and crucial.

NEED AND SIGNIFICANCE OF THE STUDY

The success of any primary school system depends largely upon the teachers working in that school. Among the teachers the headmaster/headmistress occupy the pivotal role. The efficiency of the school largely depends upon the efficiency of the headmaster/headmistress. The professional efficiency of the heads of primary schools include his efficiency in planning, executing and evaluating the instructional programme, efficiency in rendering services to the staff and students, efficiency in the management of physical and financial resources etc.

But in Kerala the heads of primary schools have to perform different types of duties at a time which may affect their professional efficiency. They are supposed to do full time teaching work, plan and execute curricular and co-curricular activities, do routine class supervision and at the same time do all the clerical works. More over they have to keep in touch with parents, departmental officers and the public and are considered solely responsible for the success and failure of the institution.

This work overload may create stress in the heads of primary schools.

Stress has become a serious topic for discussion during the last two decades. High level of personal frustration and inadequate coping skills make the problem worse and have major personal and social costs.

Different scholars have different definitions for the concept of stress. According to Selye (1956) stress refers to a response of the organism to a noxious or threatening condition. According to Magnusson (1982) stress is an individual's psychic and somatic reactions to demands that approach or exceed the limits of his coping resources.

Despite the variability and diversity in the understanding and definition of stress researchers agree on the idea that stress is a subjective phenomenological experience of an individual. They have differentiated stress from stressor. Any change or stimulus that evoke stress is called a stressor. In other words if stress is the reaction of the organism to any force this force is the stressor which evokes a programmed reaction within oneself. So a particular stressor to an individual may not be a stressor to another individual.

When workers experience stress from occupational problems occupation itself become a stressor. Almost all jobs produce stress but some are more stressful than others.

Pines and Aronson (1988) observed that all work with people involves some degree of stress. Certain categories of human services such as medical, educational, social and psychological services share particular kinds of emotional stress.

According to Paine (1982) there are organisational features that lead to stress and burn out. He divides them to three categories namely: bureaucratic, administrative, and role in the organisation. The bureaucratic features include red tapism, paper work and communication problems. Administrative features include rules and regulations, policy influence and participation. Role in the organisation include role conflict, role ambiguity and status disorder.

Human relations between employee and employer cannot be harmonious unless the interpersonal relations between employees, supervisors and management are improved. Zachariah (1983) reports that workers are seriously concerned with the treatment they get from the supervisors.

Many of the factors mentioned above are present in the occupational ecology of the primary school headmasters / headmistresses. The work overload, greater responsibility for others, crowded workspace, less attractive salary and meagre promotion prospects act as stressors. The investigator being a primary school headmaster himself felt that the level of stress

may influence the professional efficiency of the heads of primary schools.

On reviewing studies on stress the investigator found that studies on primary school teachers are very less with the heads of primary schools of Kerala being practically untouched.

Hence the present study attempts to explore the influence of stress on the professional efficiency of the primary school headmasters in Kerala.

Possible outcomes

The findings of the study are expected to yield the following outcomes:

- i) They will help to find out the group differences in stress and professional efficiency of the heads of schools.
- ii) They will help to identify the levels of stress among the heads of primary schools.
- iii) The findings will help to find out the influence of sex, age, educational qualifications, teaching experience, marital status, locality of schools and management category of schools on stress and professional efficiency of the heads of schools.
- iv) They will help to find the relationship between stress and professional efficiency of the heads of primary schools in Kerala.

- v) The findings will be helpful to the policy makers and administrators in the field of education.
- vi) The findings of the study will be a background for further research.

STATEMENT OF THE PROBLEM

The study is entitled as "A STUDY ON STRESS AND PROFESSIONAL EFFICIENCY OF THE HEADS OF PRIMARY SCHOOLS IN KERALA"

DEFINITION OF KEY TERMS

Operational definition of the key terms are given below:

a) **Stress**

In the present study 'stress' refers to a state of anxiety, heightened emotionality, and frustration that can be diagnosed from manifestations/in physiological, psychological, occupational and socio-familial responses of an individual.

b) **Professional Efficiency**

The term 'professional efficiency' in the present study stands for the extent of accomplishment of the desired objectives of the different administrative as well as teaching activities to be performed by the heads of primary schools in Kerala.

c) **Heads of primary schools in Kerala**

In the present study the term 'heads' stands for the headmasters and headmistresses of primary schools.

The term 'primary schools in Kerala' denotes recognised primary schools in Kerala, offering classes from standard I to standard VII and functioning under Kerala Education Act and Rules.

VARIABLES OF THE STUDY

The present study is a survey of the extent of stress experienced by the heads of primary schools in Kerala and its influence on their professional efficiency. So Stress of the heads of primary schools is considered as the independent variable and their Professional Efficiency as the dependent variable for the study.

Basal variables

The basal variables selected for the study are sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools and the locality and management category of schools in which they are working.

OBJECTIVES OF THE STUDY

1. To compare the mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age, educational qualifications, teaching experience and marital

status of the heads of primary schools in Kerala and the locality and management category of their schools.

2. To study the levels of Stress experienced by the heads of primary schools in Kerala.
3. To compare the percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.
4. To compare the percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
5. To examine whether any association exists between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables and Professional Efficiency of the heads of primary schools in Kerala.
6. To find out the relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.
7. To compare the relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples.

8. To identify the most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala.
9. To find out whether the variance-co- variance structure of Stress and Professional Efficiency of heads primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency.
10. To find out whether significant association exists between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

HYPOTHESES OF THE STUDY

- 1) There will be significant difference in mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age educational qualifications, teaching experience and marital status of the heads of primary schools in Kerala and the locality and management category of their schools.
- 2) There will be different levels of Stress experienced by the heads of primary schools in Kerala.
- 3) There will be significant difference in percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.

- 4) There will be significant difference in percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
- 5) There will be significant association between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables and Professional Efficiency of the heads of primary schools in Kerala.
- 6) There will be significant relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.
- 7) There will be significant difference in relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples.
- 8) There will be a most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala.
- 9) The variance-co-variance structure of Stress and Professional Efficiency of the heads of primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency.

- 10) There will be significant association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

PROCEDURE IN BRIEF

a) **Sample**

The study was conducted on a sample of 275 heads of primary schools in Kerala. Stratified random sampling technique was employed for the selection of the sample.

The sample was classified according to sex, age, teaching experience, educational qualifications, and marital status of the heads of primary schools and locality and management category of schools.

b) **Tools used**

The tools used for the study are the following:

1. Stress Inventory for Headmasters (SIH)
2. Professional Efficiency Rating Scale for Headmasters (PERSH)

The tools were prepared and standardised by the investigator with the help of his supervising teacher.

c) **Statistical techniques used**

The following statistical techniques were used for the analysis of the data.

- (i) Test of significance for difference between means.
- (ii) Estimation of percentages for total stress and dimensions of stress.
- (iii) Test of significance for difference in percentages.
- (iv) Biserial coefficient of correlation (r_{bis}) to find the association between dichotomized variables (sex, marital status, locality, management category) and the variables of the study.
- (v) Chi-square test to find the association between educational qualifications and variables of the study.
- (vi) Correlation analysis using Pearsons Product moment method (r)
 - (a) to find the association between the basal variables (age, teaching experience) and variables of the study, and
 - (b) to find the relationship between the variables of the study.
- (vii) Test of significant for difference between r 's
- (viii) Multiple Linear Regression Analysis.

- (ix) Principal Component Analysis.
- (x) Canonical Correlation Analysis.

SCOPE AND LIMITATIONS OF THE STUDY

The variables of the study were selected on the consideration that there may be a relationship between them in the dependent-independent manner. Both of the tools to estimate the variables are prepared and standardised by the investigator with the help of his supervising teacher giving due consideration to the theoretical aspects of the variables and the actual situations prevailing in the ecology of the population of the study.

The investigator took care to collect the data from almost all districts of Kerala and to give representation to the sub-samples selected for the study so that the findings would be more valid and reliable.

In order to make the study more comprehensive and effective the investigator has used proper statistical techniques. Test of significance for difference between means, percentage analysis and analysis of association between the basal variables and variables of the study were conducted. Pearson's 'r' and Canonical Correlation Analysis were used to find the relationship between the variables of the study. Multiple Linear Regression Analysis was used to predict the dependent variable from the best sub-set of dimensions of the independent variable. Principal

Component Analysis was done for data reduction. The limitations envisaged for the present study are the following.

- (i) The study is limited to government and aided primary schools in Kerala. Unaided primary schools are not considered for the present study because the nature of work of the heads of such schools is different from the work of heads of government and aided schools.
- (ii) The present study was conducted in schools which are functioning under the 'Kerala Education Acts and Rules'. The schools affiliated to the agencies of the government of India do not come under the purview of the study.

Despite these limitations it is hoped that the study on Stress and Professional Efficiency of the heads of primary schools in Kerala will bring forth dependable findings useful for the primary education.

ORGANISATION OF THE REPORT

The report of the study is organised in five chapters. The first chapter presents the need and significance of the study, statement of the problem, statement of the objectives and hypotheses of the study. The procedure, scope, and limitations of the study are also briefly discussed.

The second chapter consists of two sections. The first section contains a theoretical overview of stress and profession of

heads of schools. The second section is a detailed review of studies related to teacher Stress and Professional Efficiency of heads of schools.

The third chapter presents the methodology used for the study i.e. variables, tools employed, sample used, data collection procedure, scoring and consolidation of data and the statistical techniques used.

The analysis of the data is presented in the fourth chapter under two sections. The first section includes the descriptive analysis, analysis of group differences, analysis of percentages and analysis of association. The second section contains correlation analysis, multiple linear regression analysis, principal component analysis and canonical correlation analysis.

The fifth and final chapter deals with the major findings and conclusions of the study, educational implications and suggestions for further research in the area.

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CHAPTER II

REVIEW OF RELATED LITERATURE

SECTION I

- STRESS: A THEORETICAL OVERVIEW
- PROFESSION OF HEADS OF SCHOOLS: A THEORETICAL OVERVIEW

SECTION II

- STUDIES RELATED TO TEACHER STRESS
 - STUDIES RELATED TO PROFESSIONAL EFFICIENCY OF HEADS OF SCHOOLS
 - CONCLUSION
-

REVIEW OF RELATED LITERATURE

A review of related literature is essential in order to avoid unnecessary replication of studies. It also helps to formulate correct hypotheses, to adopt appropriate tools and to collect relevant data.

As Fox (1969) pointed out, it becomes part of the accumulated knowledge in the field and so contributes to thinking and research that follow. Through a process of integration and past research and thinking with current research, we move knowledge forward. When new research is not based on a thorough review of the literature, it becomes an isolated entity bearing at best accidental relevance to what has gone before.

The present study is an investigation of Stress experienced by the heads of primary schools in Kerala and its influence on their Professional Efficiency.

This chapter has two major sections as listed below.

Section One

1. Stress: A theoretical overview.
2. Profession of the Heads of Schools: A theoretical overview.

Section Two

1. Studies related to teacher stress
2. Studies related to Professional Efficiency of the Heads of schools.

Discussion & conclusion.

SECTION ONE

1. **Stress: A theoretical overview**
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SECTION ONE

This section gives a description of the theoretical overview of stress and the profession of heads of primary schools along with a substantiation of certain theories for the present study.

STRESS: A THEORETICAL OVERVIEW

Stress is a word of Latin derivation which was used popularly in the seventeenth century to mean hardship, straits, adversity, or affliction. During the eighteenth and nineteenth centuries it used to denote force, pressure, strain and strong effort with reference to object / person. It was this connotation of an external pressure being resisted by the person / object that it gained currency in engineering and physics. In physics stress refers to the 'internal force generated with in a solid body by the action of any external force which tends to distort the body'. Subsequently the term has been passed to life science and social sciences.

Mc Grath (1970 a) has defined stress as a perceived substantial imbalance between demand and response capability, under conditions where failure to meet demand has important perceived consequences. According to Lazarus (1971) stress refers to a very broad class of problems differentiated from other problem areas because it deals with any demands which tax the

system, whatever it is, a physiological system, a social system, or a psychological system and the response of that system.

Modern View has broken from the early pre-occupation with the external force and acknowledge that stress is essentially individually defined and must be understood with reference to characteristics of both the focal individual and his environment as it is the outcome of a partial combination of the two.

Manifestations of stress may be psychological, physical and/or behavioural. Anxiety is one of the first and most important signs that an individual feels unable to cope. Even if he/she tries to hide this symptom he/she will probably find concentrating and thinking clearly difficult and will tend to focus on short rather than long-term outcomes. Being preoccupied with problems he may become irritable and find that he is unable to relax.

Minor physical ailments such as a headache, having an upset stomach or sleeping problems are among the early signs of trouble. If external pressure is persistent, the individual may develop more severe symptoms such as an ulcer, high blood pressure, shingles etc.

Behavioural manifestations maybe withdrawal from those relationships which are proving difficult. Excessive smoking and drinking, use of tranquillisers etc. may be an attempt to relieve of tension.

Symptoms at each of these three levels can feed back to become causes of stress in their turn. Worries about inability to concentrate on deteriorations in health will be an added burden to the already stressed man. Trying to solve problems in one life area such as work may cause further trouble by neglecting the demands of another life area such as the socio-familial life of the individual.

There are mainly three types of theories of stress. The first one is the stimulus oriented which view stress as a potential residing with in the stimulus properties of the organism's environment. The second is the response oriented theories which define stress as the response of the individual to the events of the environment. The third group of theories is the interactional one which emphasize the characteristics of the environment and the responses they evoke.

The following models of stress are discussed in this section.

1. General adaptation syndrome (GAS)
2. Model of conservation of resources
3. Type A behaviour and stress
4. Person-environment-fit model.
5. Stress: Arousal and task performance
6. Occupational stress

1 General adaptation syndrome

Selyé's (1956) general adaptation syndrome (GAS) has been widely held as a comprehensive model to explain stress phenomenon. This three stage model states that when an organism is confronted with a threat, the general psychological response occurs in three stages.

i Alarm reaction

Alarm reaction is the first stage which in divides an initial 'shock phase' in which the resistance is lowered and a countershock phase in which defensive mechanism become active. Alarm reaction is characterised by autonomous excitability, adrenalin discharge, increased heart rate, muscle tone, and blood content and gastro-intestinal ulceration. Depending on the nature and intensity of the threat and the condition of the organism, the periods of resistance vary and severity of symptoms may differ from mild invigoration to disease of adaptation.

ii Stage of resistance

Maximum adaptation occur during this stage. The use of self defence mechanisms may also be intensified during this period. During the stage of resistance the individual tends to become rigid and cling to previously developed defences. If the stressor persists, or the defensive reaction proves ineffective the organism deteriorates and moves to the next stage.

iii Stage of exhaustion:

In this stage the adaptive energy is exhausted. Signs of alarm reaction disappear and the resistance level begins to decline irreversibly and the organism collapses.

The major shortcoming of this theory is that it is based on laboratory setting on infra-human subjects where stressors are physical or environmental only. In human beings intrapsychic or social factors emerge as major stressors and human responses are always mediated through several layers of cultural and social filters.

2. Model of conservation of resources

Hobfoll (1989) has proposed this model. Stress is defined as a reaction to the environment in which there is a threat of a net loss of resources, or a lack of resource gain following the investment of resources. Resources may be those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as means for attainment of these objects, personal characteristics, conditions or energies. Environmental circumstances may threaten people's status, position, economic stability, loved ones, basic beliefs of self esteem etc.

When confronted with stressors individuals are predicted by the model to strive to minimise the loss of resources. When not confronted with stressors they strive to develop resource

surpluses in order to offset the possibility of future loss which leads to positive well-being or eustress.

According to this model there are four resources, whose loss and gain result in stress or eustress respectively. They are as follows

i. Object resources

Object resources are valued because of some aspect of their physical nature or because of their acquiring secondary status value based on their rarity and expense.

ii. Conditions

Conditions are resources to the extent that they are valued and sought after. Marriage, tenure, seniority etc. are examples of this.

iii. Personal Characteristics.

Personal characteristics are resources to the extent that they generally aid stress resistance. One's personal orientation toward the world, which means seeing events as predictable and generally occurring in one's best interests is very important.

iv. Energies

Energies include time, money, and knowledge which are valuable in aiding acquisition of other kinds of resources.

The model also suggests that although loss of resources is stressful, individuals may employ other resources to offset the net loss by replacement or at least symbolic replacement through indirect means. The theory asserts that individuals are motivated to gain resources so that they invest resources in order to enrich their resource pool.

In short this resource oriented model is based on the supposition that people strive to retain, protect and build resources and what is threatening to them is the potential or actual loss of these valued resources

3. Type A behaviour and Stress

Friedman and Rosenman (1974) were two cardiologists who put forward the theory that personality factors can exacerbate stressful reactions. They classified people into type A and type B personalities.

Four main characteristics are considered important in type A personalities - (1) Multiple behaviour patterns, i.e. a tendency to undertake two or more tasks consequently which may lead to a failure to complete the tasks satisfactorily. (2) Time urgency, i.e. the tendency to habitually programme too much work in to a limited period of time - (3) Inappropriate aggression, hostility and competitiveness, and (4) Poorly defined goals, i.e., the tendency to rush into work without defining objectives and the means by which those will be attained.

Type A patterns involve many factors such as an eagerness to compete, a desire for recognition, quickness of physical and mental functioning a fierce drive towards poorly defined objectives, self imposed deadlines, multiple thinking and acting, impatience at the rate of progress of events, a sense of unease and guilt at relaxing, and rapid overt behaviours.

Type B patterns involve passivity or not being overly ambitious, restraint, and not being prone to develop stress related disorders.

Friedman and Rosenman (1974) believe that individuals with type A personalities are predisposed to develop premature coronary heart disease (CHD). Their research on men in the age group of 39-49, 85% of those who developed CHD were originally diagnosed as having type A personalities. Type A individuals in response to social stressors have significantly higher systolic blood pressure, heart rate and heart variability when compared to non type As.

4. Person - environment fit model

Person-environment fit model is based on the theory that human behaviour can not be understood in terms of either the environment or the person alone. The theory looks at the fact that both job satisfaction and occupational stress are the result of the interaction between the person holding a particular job and the environment in which he or she is employed (Vachon, 1987).

There are two kinds of fit between the individual and the environment. One kind of fit is the extent to which the person's skill and abilities match the demands and requirements of the job. The other kind of fit is the extent to which the job environment provides supplies to meet the individual's needs. When misfit of either kind occurs, it threatens the individual's well being.

The environment is classified into objective and subjective in this model. The objective environment refers to the environment as it exists independently of the person's perception of it. The objective environment includes the physical environment. The family environment, and other aspects of the physical and social worlds which exist independently of the person's perception of them. The objective environment is causally related to the person's subjective environment. The subjective environment represents the person's perception of his objective environment, that is the person's psychological construction of the world in which he lives.

The objective person refers to the person as he really is. This includes his needs, values, abilities and other attributes which are more or less enduring. The subjective person represents the individual's perception of objective self that is the self concept or the self identity of the person. Thus the subjective person includes the individual's perception of his needs, values, abilities and other attributes.

The individual's contact with reality is defined as the discrepancy between the objective environment and the individual's perception of it. The individual's accuracy of self assessment is defined as the discrepancy between the subjective person and the individual's perception of his self.

A good fit occurs when the job environment can provide the supplies wanted by the person while the person can provide the abilities required by the job environment. The degree of P-E fit can be determined objectively or subjectively. The objective P-E fit refers to the fit between the objective person and the objective environment i.e. fit independent of the individual's perception of it. Subjective fit refers to the fit between the subjective person and the subjective environment. P-E fit represents the interaction of the person and the environment.

P-E fit can be used to define job stress. A job is stressful to the extent that it does not provide supplies to meet the individual's motives and the extent that the abilities of the individual fall below demands of the job which are prerequisite to receiving supplies. In both cases the individual's needs and values will not be met by supplies in the job environment.

Job stress i.e., poor P-E fit can lead to several types of strain or deviation from normal responses in the person. Psychological strain include job dissatisfaction, anxiety, or complaints of insomnia and restlessness. Physiological strain include high

blood pressure or elevated serum cholesterol. Behavioural symptoms of strain include excessive smoking, over-eating, frequent trips to medical help etc. Any such strain can occur singly or in combinations of other strains as the level of job stress increases.

5. Stress: Arousal and task performance

This model was proposed by McGrath (1976). It postulates that variation in performance demands of an objective situation have three effects. 1). An increase in consequences, 2). An increase in perceived task difficulty, and an increase in actual task difficulty. The effectiveness of the task performance is the function of three factors. (I) the difficulty of the task, (ii) ability of the person and (3). Arousal. Ability depends on experience and talent. Arousal depends on perceived consequences and uncertainty. Uncertainty will be at its maximum when perceived difficulty is equal to perceived ability.

Task difficulty and performance are negatively correlated where as ability and performance are positively correlated. Similarly arousal and task performance are positively correlated.

According to this model we can improve performance by making the task actually easier, increasing the individual's actual ability and increasing the individual's arousal.

6. Occupational Stress

When the sources of stress are related to the occupation itself it is termed as occupational stress. The sources of the occupational stress can broadly be classified in to (a) blue collar stressors and (b) white collar or managerial Stressors.

a) **Blue collar Stressors**

Poultron (1978) identified some of the blue collar stressors as: (1) poor visibility, (2) noise, (3) vibration and motion (4) heat, cold and wind, (5) atmospheric pollution, (6) changes in atmospheric pressure (7) perceived danger (8) work overload/underload, and (9) shift work and loss of sleep.

i. **Poor visibility**

Variation in visibility due to too little light, glare, flickers etc. are the potential stressors under this category. Hopkins and Collins (1970) identified the minimum amount of light which is required for different occupational tasks as ranging from 30 to 1000 candela per square metre (cd/m^2). According to Poultron (1978) one person in every 5000 to 10,000 people can have an epileptic attack when exposed to flickering light at frequencies between 3 and 100 Hz.

ii. **Noise**

Noise is another stressor under this category. Continuous noise isolates a person from his normal auditory environment.

Noise also masks the inner speech a person uses in thinking and in keeping track of what he is doing. Noise also masks the auditory feedback cues coming from the equipment which a person is using. It distracts him from what he is doing and may tend to produce spoilt work and accidents.

iii. **Vibration and motion**

Another blue collar stressor is vibration and motion. The amplitude of vibration of the human body depends partly upon the amplitude of vibration to which it is exposed. The human body has its own natural frequencies of vibration, which depends up on its mass and its structure. The responses to vibration and motion include blurred vision, shaky hands and feet, muscle tension and alertness, motion sickness etc.

iv. **Heat, cold and wind**

Heat, cold and wind are another group of blue collar stressors. Human body is like a machine, which produce heat. Heavy work and exercise increase the amount of heat produced by it. According to Poultron (1978) the upper limit of comfortable temperature for heavy work is 15°C, and the maximum comfortable temperature for sedendery work ranges from 20°C to 25°C. In cold conditions precise movements take longer to make and are made less accurately. Similarly skilled activities and accurate aiming movements are difficult in wind.

v. Atmospheric pollution

Stressors in this category include a wide ranging dusts and fumes, ionizing radiation, electromagnetic radiation etc. that are produced in the work environment.

vi. Increased or reduced pressure

The increased or reduced atmospheric pressure is one of the source of stress. People working in high altitude mountains and deep in water may experience stress from this kind of stressors.

vii. Perceived danger

Certain jobs have perceived danger in the work environment itself like rescue operations, fire fighting, mining underground, warfare, construction work in skyscrapers etc.

viii. Work overload/ under-load

Work overload and under-load result from the irregular flow of work. Work under-load occurs in the same jobs as work overload during the periods when there is little or nothing to do.

ix. Shift work and loss of sleep

Night shifts and rotating shifts and subsequent loss of sleep are potential stressors related to blue collar work.

A person may be exposed to a number of stressors at the same time. People working in certain occupations are exposed simultaneously to noise, vibration, heat, shift work etc. and may

experience severe stress which will be detrimental to their health and well being.

b) White collar or managerial Stressors

According to Cooper and Marshall (1978) the sources of occupational Stress (managerial or white collar Stress) are the following.

- (i) Factors intrinsic to the job
- (ii) Role in the organisation
- (iii) Relationships at work
- (iv) Career development
- (v) Organisational structure and climate.
- (vi) Home-work interface.

A basic model of occupational stress is shown in figure 1.

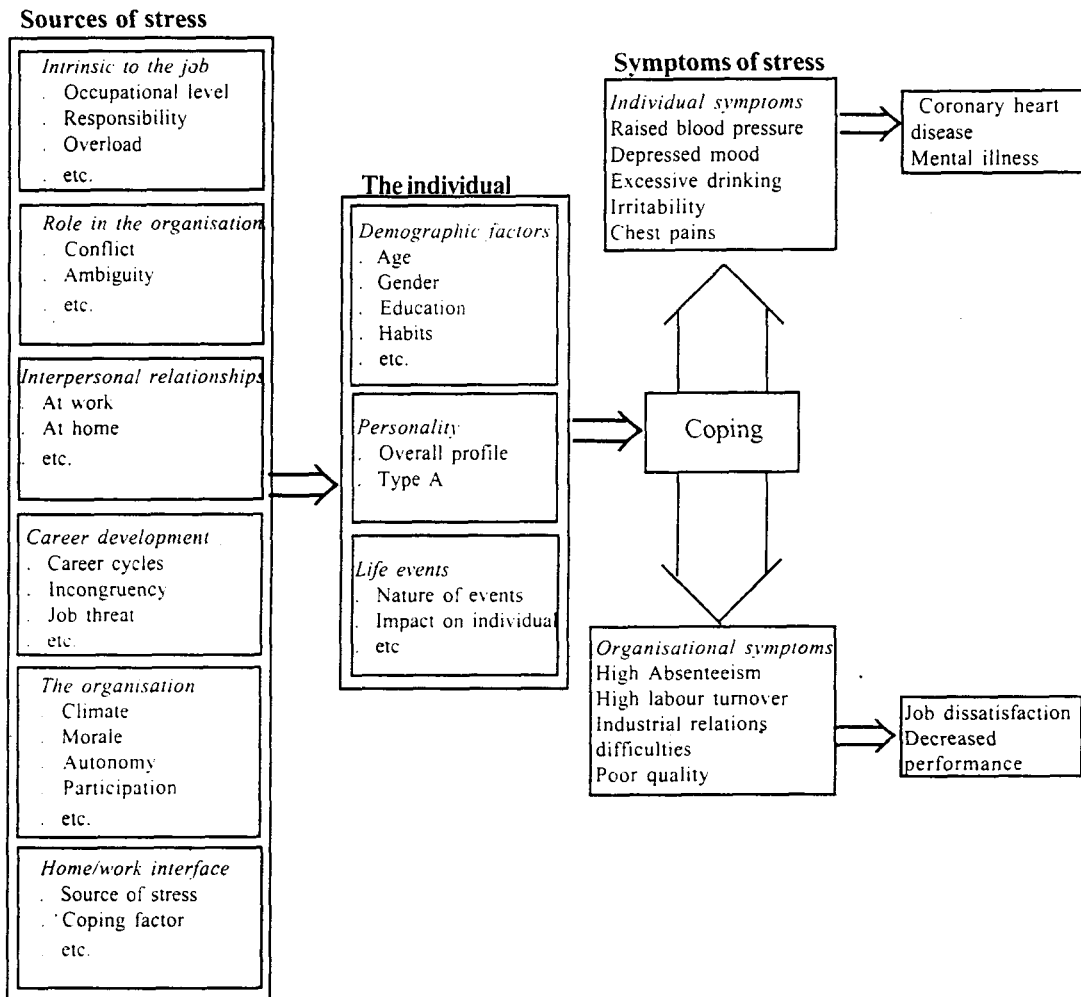


Fig. 1: A basic model of occupational stress

i. Factors intrinsic to the job

The intrinsic factors refer to those aspects which are integral parts of the job i.e. characteristics of the job that affect other aspects of the job and the individual's working life. This will include physical working conditions, shift work, work overload/under-load, physical danger, person-environment fit and job satisfaction.

Konhouser (1965) found that mental health was directly related to unpleasant work conditions, necessity to work fast and to expend a lot of physiological effort and excessive and inconvenient work hours. A more important job related stressor is work over-load which can be classified into quantitative and qualitative. Quantitative refers to having too much to do whereas qualitative refers to the difficulty of the job. French and Caplan (1973) suggested that both quantitative and qualitative overload produce at least nine different symptoms of psychological strain.

ii. Role in the organisation

Another major source of white-collar work stress is associated with a person's role at work. The major stressors in this category are role ambiguity and role conflict. Role ambiguity exists when an individual has inadequate information about his work role, that is where there is lack of clarity about work objectives associated with the role, about work colleagues' expectation of this work role and about the scope and

responsibilities of the job. Kahn *et al* (1964) found that men who suffered from role ambiguity experienced lower job satisfaction, high job related tension, greater futility and lower self-confidence.

Role conflict exists when an individual in a particular work role is torn by conflicting role demands or doing things he/she really doesn't want to do or does not think are part of job specification. Another important potential stressor associated with one's organizational role is responsibility for others, too little responsibility, lack of participation in decision making, lack of managerial support, having to keep up with increasing standards of performance and coping with rapid technological change.

iii. Relationships at work

The third major source of stress at work has to do with the nature of relationship with one's boss, subordinates, and colleagues. French and Caplan (1973) concluded that mistrust of persons one worked with was positively related to high role ambiguity which led to inadequate communication between people and to psychological strain in the form of low job satisfaction and to feeling of job related threats to one's well being.

iv. Career development

The potential stressors in this category include lack of job security fear of redundancy and early retirement. Sometimes old knowledge and methods becoming obsolete act as stressors to middle aged, as they have to face fresh and young recruits in competition. Similarly under-promotion and career ceiling and over-promotion which leads to a feeling of inconfidence are potential stressors.

Another important stressor in this category is status incongruity that is the incongruity between an individuals social status and that of his parents. Shekelle *et al* (1969) discovered that men were at a significantly higher risk of coronary heart disease (CHD) when their social class in childhood or the wife's social class in her childhood were higher or lower than their class level that they presently shared.

v. Organisational structure and climate

A fifth potential source of white collar work stress is simply being in the organisation, and the threat to an individuals freedom, autonomy and identity. This poses problem areas such as little or no participation in decision making process, no sense of belongingness, lack of effective consultation, poor communication, restrictions on behaviours are some of the more impactful ones here. Greater participation in decision making leads to lower staff turnover, higher productivity. When

participation is absent, lower job satisfaction and higher levels of physical and mental health risks may result.

vi. Home work interface

The sixth source of stress is all those interfaces between life outside the organisation that might put pressure on the individual. Family problems, life crises, financial difficulties, conflict of personal beliefs with those of the organisation and the conflict of organization with family demands.

Mobility and constant moving can have profound effects on the life style of the people concerned—particularly on their relationship with others. Staying only two years or so in one place, mobile families do not have time to develop close ties with the local community. Researchers agree that whether she is willing or not, the wife bears the brunt of relocations and conclude that most husbands do not appreciate what this involves. Immundo (1974) hypothesises that increasing divorce rates are seen as the upwardly aspiring employee races ahead of his socially unskilled stay-at-home wife.

The management of Stress

Understanding the sources of meaningful stress is only the first step in stress reduction. Changes must be introduced in the organisational life to begin to manage the stress at work. The responsibility for maintaining better physical and mental health should be a reflection of the basic relationship between the

individual and the organisation for which he works. It is in the best interests of both parties that reasonable steps are taken to live and work sensibly and not too demandingly.

Theoretical dimensions of Stress considered for the study

The investigator examined the above theoretical models of stress. He decided to select the occupational stress model presented by Cooper and Marshall (1978) as a basis for conducting the study.

THE PROFESSION OF HEADS OF SCHOOLS: A THEORETICAL OVERVIEW

The profession of the head of any educational institution is based on the educational administration with its two distinct and yet interrelated dimensions. The first is the foundation of the school administration which draws on theories, constructs and models from basic and applied social, behavioural and administrative sciences. The second is the function of the administrator, i.e. the headmaster or principal. It focus on tasks, jobs and activities that occupy the bulk of the headmaster's time and the major competencies that must be demonstrated by an effective school headmaster.

Figure 2 represents the theoretical dimensions of profession of school headmasters. The theoretical dimensions shown in the figure are described below.

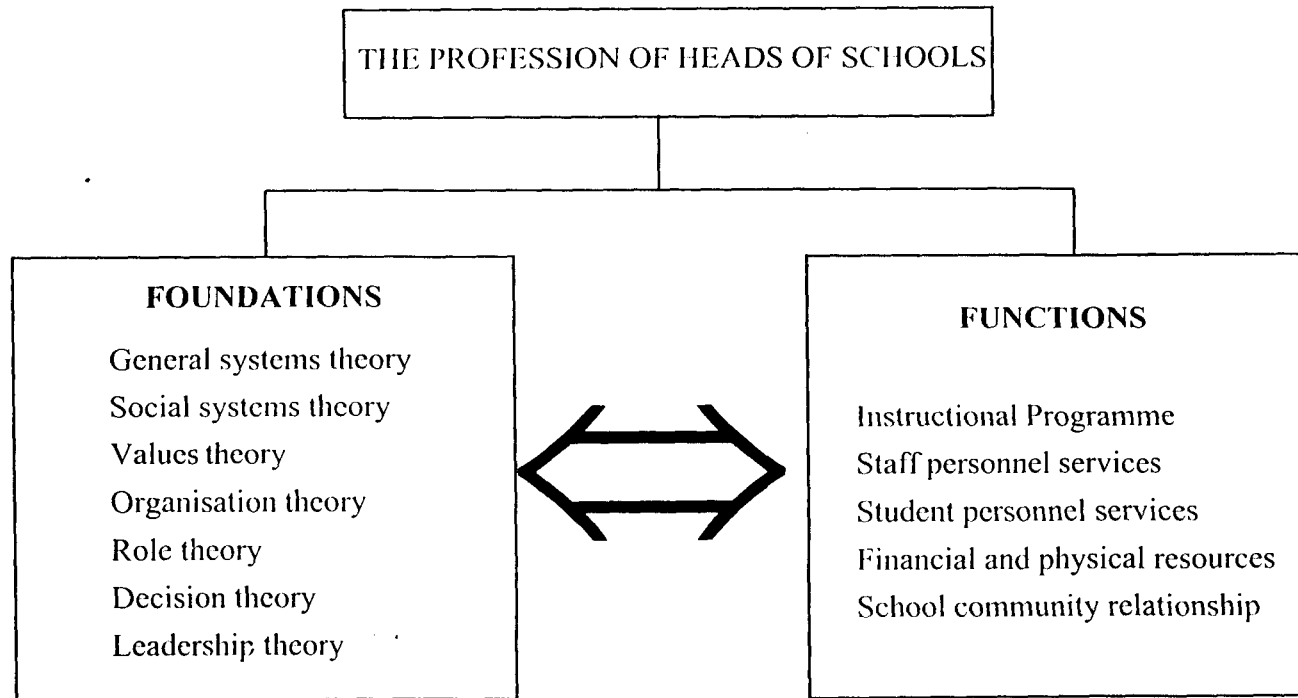


Fig. 2: Theoretical dimensions of profession of heads of schools

The foundations

The theories, constructs, models and research findings of behavioural and administrative sources are very useful in that they provide the principal with certain concepts. They provide with alternative ways of viewing, understanding, and ordering the multitude of variables and with predicting and influencing the outcomes of issues with which he usually must deal. In a sense, each theoretical or foundational view serves the Principal as a pair of spectacles, bring in to focus a few selected aspects of the world around him.

The following behavioural and administrative science theories are briefly described here.

1. General systems theory
2. Social systems theory
3. Values theory
4. Organisation theory
5. Decision theory
6. Leadership theory.

1. **General systems theory**

Grinker (1956) has defined a system as 'some whole form in structure or operation, concepts or function, composed of united and integrated parts'. The systems approach to education is interdisciplinary and provides a means for viewing the school in terms of their general properties and its specific dynamics. It

focuses on the interrelationships and linkages between and among the sub units of school as well as the relationship of the school to its larger environment.

It has been observed that all systems exhibit the following (1) All systems exist in time and space (2) All systems tend toward a state of randomness and disorder, the ultimate of which is entropy or inertia. (3) All systems have boundaries (4) All systems have environment (5) All systems have factors that affect the structure and function of the system. (6) All but the largest systems have supra systems; (7) All but the smallest systems have subsystems.

Kaufman (1970) has divided the systems approach to the school administration of a school in to two categories - systems analysis and system synthesis together making a total of five major stages. System analysis includes two stages: (1) identifying the problem by assessing the needs and emerging opportunities and (2) determining the objectives and solution requirements and alternatives. The system synthesis on the other hand involves three remaining stages: (3) choosing a solution strategy from alternatives (4) Implementing the solution strategy, and (5) Determining performance effectiveness.

Figure 3 is a flow diagram of the systems approach.

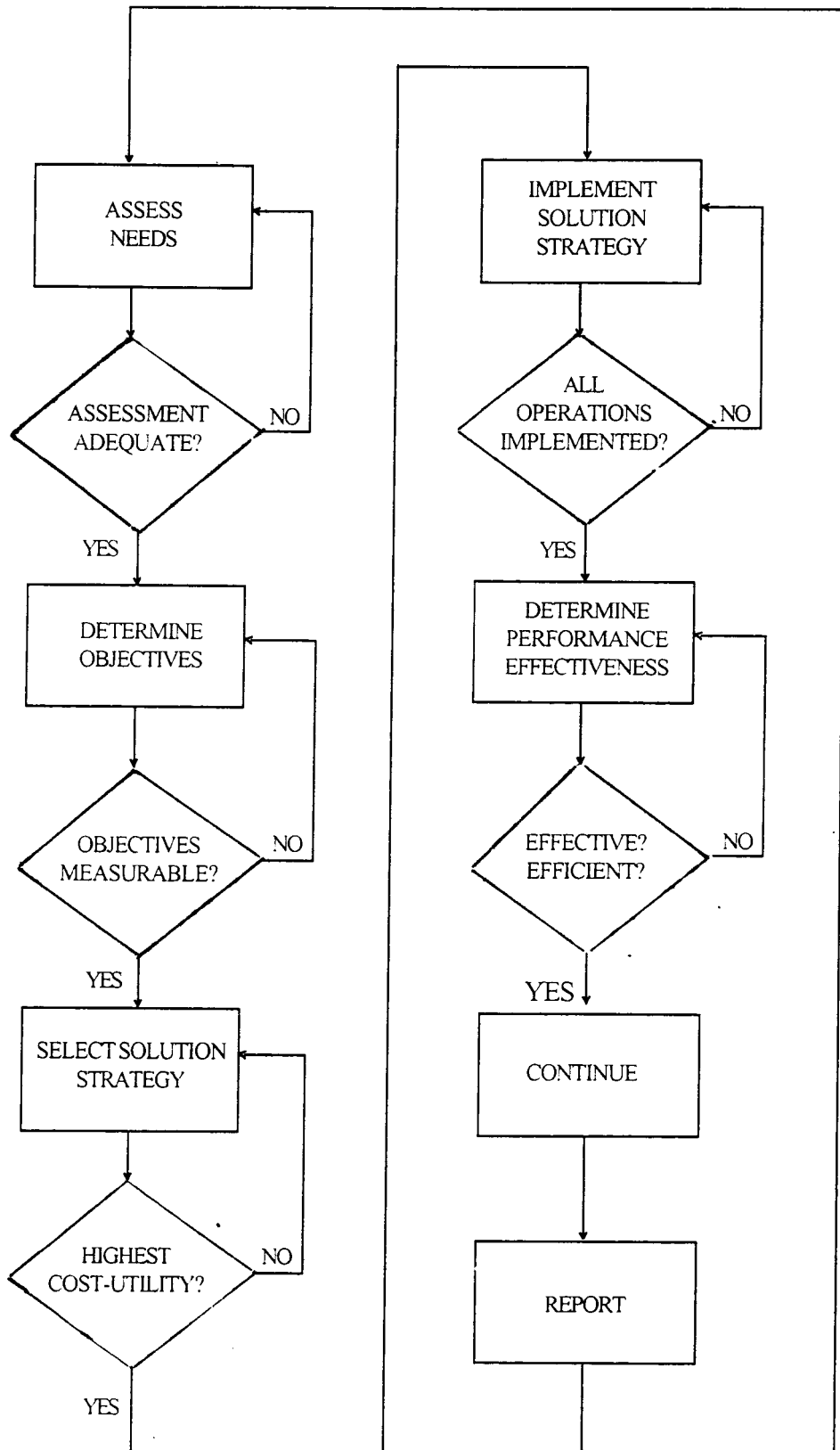


Fig. 3: Flow diagram of the systems approach to administration

Systems approach has produced several logical and quantifiable tools to assist the headmaster in assessing the educational needs, analysing the school programmes, making and monitoring educational projects and evaluating educational outcomes.

2. Social systems theory

Social systems theory represents a focus on social aspects of general systems. The school is viewed as a complex and interactive and dynamic system that is examined both structurally and operationally. Structurally the school is a unique social system with in the hierarchy of super ordinate, parallel and subordinate relationships in the larger social system. Operationally the administration of the school always function within a network of person to person interaction.

Carr (1955) has defined a social system as an aggregation of individuals and institutional organisations located in an identifiable geographical locality and functioning in various degrees of interdependence as a permanent organised unit of the social order.

There are two classes of phenomena that are independent and at the same time integrative in a social system. They are first the institution having certain roles and expectation that will fulfil the goals of the system. The second is the individuals, having certain personalities and need disposition who inhabit the

system. The former constitutes the normative dimension and the latter the personal dimension. The school has become such an institution, which is devoted to educating and is purposive, peopled and normatively structured. There are such established roles as headmaster, teachers, and students in the school. Roles are defined in terms of role expectations which are normative rights and duties of a role incumbent. But roles are filled by individuals and no two are exactly alike. Each individual stamps the roles he occupies with the unique style of his own pattern of behaviour. Therefore to understand, predict, or control behaviour in a specific social system it is also necessary to know what kind of individuals inhabit the roles and their modes of perceiving and reacting to the expectations.

Behaviour in a social system derives from many considerations other than normative and personal dimensions. Other dimension is particularly relevant. The institutional behaviour may be understood as a function not only of institution with its structural roles and expectations but also of the cultural ethos with its predominant values.

It is a unique function of the headmaster to integrate the expectations of the organisation and the dispositions of the individual in a way that is simultaneously fruitful for the organisation and satisfying for the individual.

3. Values theory

Splintler (1955) defined values as 'objects of possession, conditions of existence, personality or categorical features, and states of mind that are conceived as desirable and act as motivating determinants of behaviour' .

We can state that theories of values deal simultaneously with the general values held by a society and with specific values held by an individual. There are several common recurring themes in the school society relationship that condition the expectations held for the school as an institution. This include the following: (1) The school belongs to the people, (2) education is the function of the state, (3) education is of national interest, (4) education is in terms of ones abilities and interests, and (5) education is equally available to all. Differences in educational expectations seems to be related to such sub public differences as social class, occupation, education, religion, political party identification, and other variables.

The value orientations held by individuals -principals, teachers, students and parents are powerful determinants of behaviour.

4. Organisation theory

Since the school is a complex organisation, the analytic characteristic that distinguish it as such possess great utility for examining its structural and organisational dynamics. The formal

structure of the organisation in terms of its complexity, centralisation, formalisation and stratification has been shown to be related to such outcomes of the organisation as adaptiveness, production, efficiency and job satisfaction (Hage, 1965). Moreover theories of organisation make it possible to analyse the extent to which the school is a mechanistic or bureaucratic organisation, as contrasted with an organic or professional organisation. Knowledge of the organisational parameters and their interrelationships should enable the principal to lead the school in the direction of a professional organisation.

Just as the school may be analysed as a formal organisation, it is possible to analyse it as an informal organisation – in terms of its organisational climate. Organisational climate is concerned with the organisational ‘personality’ of the school i.e., whether the working environment is open, autonomous, controlled, familiar, paternal, or closed. ‘Openness’ in the behaviour of the headmaster and teachers as well is essential if leadership is to be initiated in the school and if conjoint satisfaction is to be realised concerning the accomplishment of both organisational and individual goals.

Having developed an understanding of both the formal and the informal relationships in the school, the headmaster is in a better position to initiate organisational change. Organisational change may be analysed according to descriptors: (1) types of

change, (2) process of change (3) agents of change, and (4) variables that affect change. The role of the headmaster as a change agent is crucial, since few changes of any importance can occur in a school without his active support.

5. Role theory

Derived from social systems theory, role theory permits assessment of the role expectations held by the headmaster himself and his significant reference groups—office personnel, other headmasters, teachers, parents, citizens and students. It also permits assessment of the extent to which one is able to perceive accurately the role expectations held by others.

The critical task areas of the headmaster are the following:

(1) Introduction and curriculum development (2) pupil personnel services, (3) staff personnel services, (4) community school relationship (5) school plant maintenance, (6) organisation and structure, (7) school finance and business management, (8) evaluation responsibilities, and (9) professional improvement.

Some of the major types of role conflict that are endemic to the headmastership include: conflicts in expectations for the many roles the headmaster fulfils, conflicts in role expectations for the headmastership held between and among different reference groups, conflicts in role expectations for the headmastership within a reference group, and conflicts between the headmaster's role and his need as a person. More over

significant differences often exist between actual role behaviour and idealised role behaviour of the headmaster.

6. Decision theory

Decision making is a central responsibility of the headmaster. Knowledge of decision theory should enable the principal to sharpen and improve his decision making skills.

According to Lipham and Hoeh (1974) decision making may be defined as a process where in an awareness of a problematic state of a system, influenced by information and values, is reduced to competing alternatives among which a choice is made based on perceived outcome states of the system.

When we consider decision making as a process it imply a particular set of continuing activities, steps, stages and operations. Process is usually sequential such that one step serves logically as the basis for the next step. Some times the process may be cyclical that the interactive steps are recycled in a continuos test of system states and attainment at any point in the process. In decision making incremental judgements are made concerning whether to continue, terminate or change the major or minor decisions made.

The decision making can be classified in to process stages of planning, organising, stimulating and evaluating. Throughout a typical school year the headmaster finds need to spend considerable time in making planning type decisions such as

determining the goals, specifying objectives, developing strategies and making long range decisions. The organising stage includes decision concerning selection of specific rational processes to implement a plan, assigning primary role responsibilities, assessing the time frame for each responsibility and providing necessary personnel, facilities, or equipment to accomplish each responsibility. The process of stimulating involves the decisions that are directed toward increasing the identification of individuals with the objectives and activities of a plan increasing the rationality of a plan, enhancing on the job satisfaction of individuals, communicating plans, problems, and progress, providing supportive relationships and influencing individuals to change. Decision relating to evaluation include the following: (1) reviewing plans and objectives (2) obtaining data regarding inputs, processes, and outputs, (3) interpreting the data obtained (4) drawing implications for future planning and (5) reporting results.

In another dimension the decision making may be categorised in to three (1) routine decision making, (2) creative decision making, and (3) compromise decision making.

The decision making competencies of the headmaster are (1) skill in differentiating among types of decisions, (2) skill in determining the amount and type of information needed to reach a decision (3) skill in determining the appropriate involvement of

other people in reaching decisions, (4) skill in establishing priorities for action, and (5) skill in anticipating both intended consequence of decisions.

7. Leadership theory

The leadership of the headmaster in a critical factor is the success of any programme in the school. Knowledge about leadership, therefore is a prime prerequisite if an individual is to fulfil effectively the headmastership role.

Leadership may be defined as 'that behaviour which initiates a new structure in interaction within a social system; it initiates change in the goals, objectives, configurations, procedure, inputs, processes and ultimately the outputs of the social system' (Lippman and Hoeh, 1974).

The concept of leadership has been a perennial topic of investigation and concern in many fields. The study of leadership may be grouped according to psychological, sociological and behavioural approaches. The psychological approach to the study of leadership is based largely on the common recognition that an individual's behaviour is determined by his unique personality structure. At the same time the sociological approach maintains that leadership is determined less by the characteristics of individuals than by the requirements of social systems. The behavioural approach to the study of leadership recognises that

both psychological and sociological factors, i.e., both individual and situational variables are powerful determinants of behaviour.

There are three leadership styles i.e. ideograph, nomothetic and transactional. Idiographic or personal refers to the psychological or personalistic axis of behaviour. Nomothetic or normative refers to emphasis on the sociological and institutional axis of behaviour in a social system. Transactional refers to alternate emphasis on each.

In this conception, the three styles of leadership are the three modes of achieving the same goal. The variation in styles may be observed with respect to five major relational elements: (1) the proportion of role and personality factors in the behaviour, (2) differences with respect to authority, scope, affectivity and sanction dimensions, (3) the relative weight given to effectiveness, efficiency, and satisfaction, (4) the predominant conflicts dealt with, and (5) the major mechanisms of institutional-individual integration.

B. The Functions

The functional view focuses on the tasks and activities in which one must be competent if he is to be an effective headmaster. Lipham and Hoeh (1974) divide the functions in to the following dimensions.

- i. Instructional programme.
- ii. Staff personnel services.

- iii. Student personnel services
- iv. Management of financial and physical resources
- v. School community relationships
- i. **Instructional programme**

The most important functional task of the school headmaster is that relating to work with the instructional programme. The phases of instructional improvement are assessing programme relevance, planning programme improvements, implementing the programme change, and evaluating programme change.

Figure 4 shows the system model of the instructional leadership process.

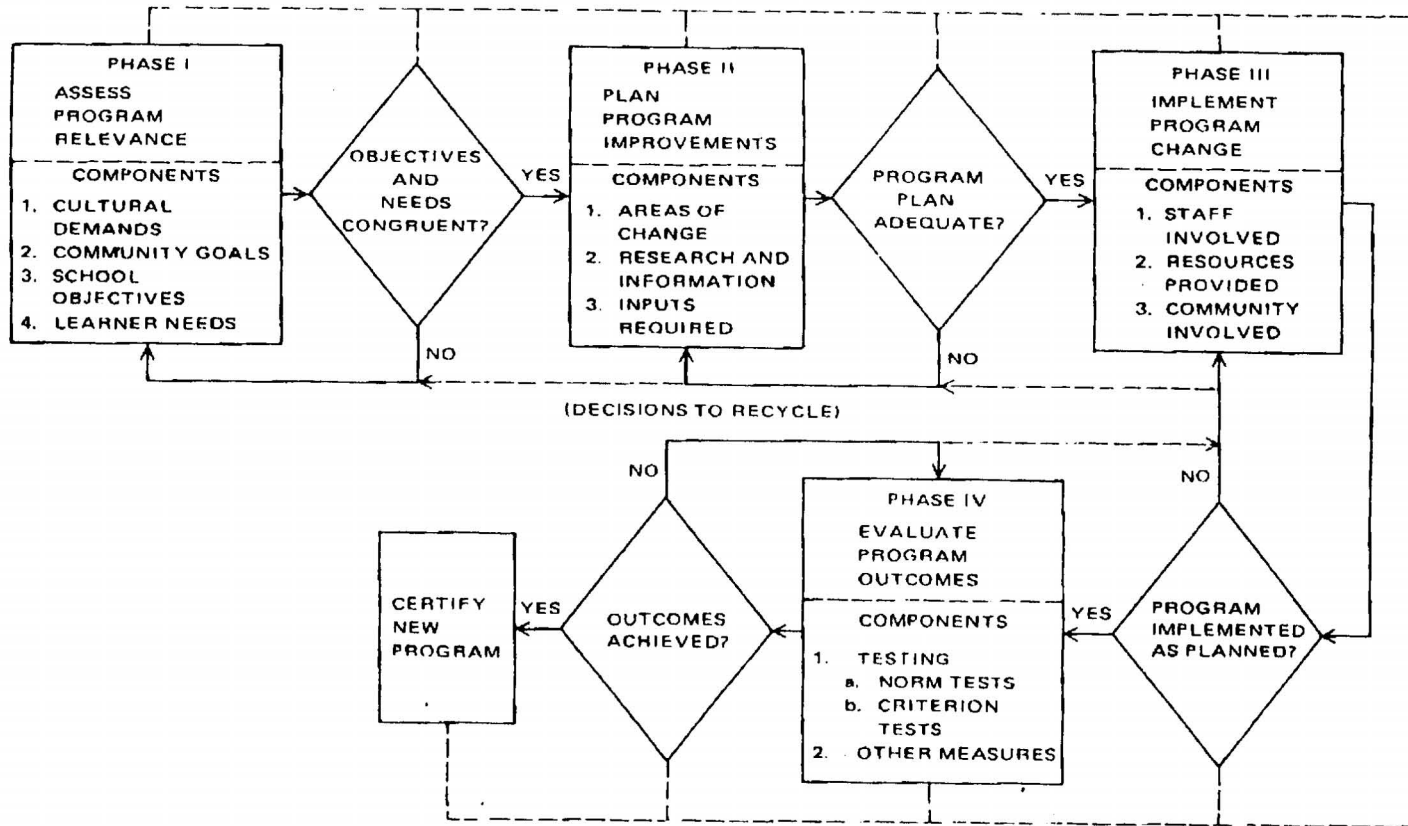


Fig. 4: Systems model of the instructional leadership process

In assessing the context for educational programme the headmaster of the school is supposed to give attention to both social change and community demands as they impinge on the programme of school. In determining the educational needs, attention is given to learners in general, as well as learners in a particular community. Activities in stating educational objectives are directed towards the reduction of broad goals and purposes in to measurable behavioural outcomes.

The planning of programme improvements involves the specific delineation of areas needed change, the use of information and research for the development of alternatives, and the analysis of the inputs required for each alternative. Success of implementation phase of the curriculum improvement process depends largely on the headmaster's ability to motivate others - particularly the teachers- to accept, internalize and behave in accordance with the programme plan. Throughout the implementation effort, attention must be given to such maintenance function as the selection of new equipment and supplies necessary to accommodate the intended change. Finally the headmaster must provide leadership in orienting the community to the programme change.

Having involved the staff and the community in implementing an instructional change, the headmaster must evaluate the curricular changes that have been implemented.

Although the evaluation process is time consuming endeavor, thoroughness and accuracy are necessary if intelligent decision regarding recycling, termination, or expansion of a programme are to be made. The headmaster's role is to ensure that evaluative techniques are appropriately chosen and conscientiously administered.

ii. **Staff personnel services**

The functional category of staff personnel service include the responsibilities of the headmaster in orienting, assigning, improving and evaluating staff members of the school.

Orientation of new staff members has as its major purpose the transmission and understanding of the major demands of the role as viewed by the headmaster, other teachers, students and the community. A new teacher should be given opportunities to become acquainted with members of the faculty with whom he will be working. Also a teacher is to be encouraged to reside within a near by area so that an increased association with residents and an incremental insight in to the community value orientation and parental expectation of the school can be developed. Similarly, opportunities must be given to interact with students so as to have an understanding of goals, need dispositions, strength and weaknesses of the entire student body.

The major purpose of assignment process is to ensure a maximum degree of congruence between the expectations for the

position vacancy and the personal characteristics of the teacher. It is essential that both the major expectation for the instructional role and the personal needs, dispositions, and abilities of the teacher be fully explored and mutually understood.

Improvement of the teaching staff comprises leadership techniques and procedure designed to change the teachers role performance. Classroom visits, observations, and conferences constitute the core of the staff improvement programme. Other components include school visits, professional association, professional library, student teaching supervision, and in-service educational programmes.

The evaluation of teaching personnel involves judging the extent to which the procedures and processes utilized are accomplishing the specified outcomes. Therefore both staff evaluation and instructional evaluation are aspects of the total evaluative process. The process of evaluation includes attention to the timing of evaluation, the purpose of evaluation, the information to be collected, and the instruments to be utilized.

iii. Student personnel services

Students no longer are passive recipients of educational programmes, instead they are active partners in initiation. So the headmaster must develop a greater understanding of today's students. To develop such an understanding it is necessary that the interactive distance between the staff and students be

decreased. Students desire a headmaster who is visible for consultations, interpretations, and explanations of school policy, as well as giving friendly advice.

It is also emphasised that as a leader the headmaster must either change existing structure or develop new mechanisms that will allow students to increase their involvement in making educational decisions. The co-curricular programmes and the student governments may be utilized to increase student interest and involvement.

The guidance programme is central to the effectiveness of the school as a social system and to the efficiency of the student as an individual. There are five guidance functions viewed as converging on the student—the individual inventory, information, counselling, placement, and research functions.

The inventory service includes activities connected with the obtaining and collecting of all relevant data about the individual student - his needs, values, abilities, interests, achievements and goals. The information service which includes personal, social, career, and academic information is effected through individual and group contacts and by making available in the guidance offices, library, and mass media. The counselling interview is the heart of the guidance programme, for in this setting the relevant data about the individual student and the relevant information bearing on the student's concerns are synthesised and merged in

a process of self understanding, growth, and development. At the elementary and middle school levels, the placement service is primarily concerned with in-school placement and student scheduling. At the senior high school level, the placement service entails in-school scheduling as well as part-time, work-study, and post-high school placement.

It is the function of the headmaster to integrate the ideas of student discipline, freedom of expression, and student liberty.

iv. Financial and physical resources

One of the dynamic dimensions of the school headmastership is the management of financial and physical resources. Management function of the headmaster include planning, programming, budgeting, and evaluating financial and physical resources.

Figure 5 shows a system approach to the planning, programming, budgeting and evaluating cycle.

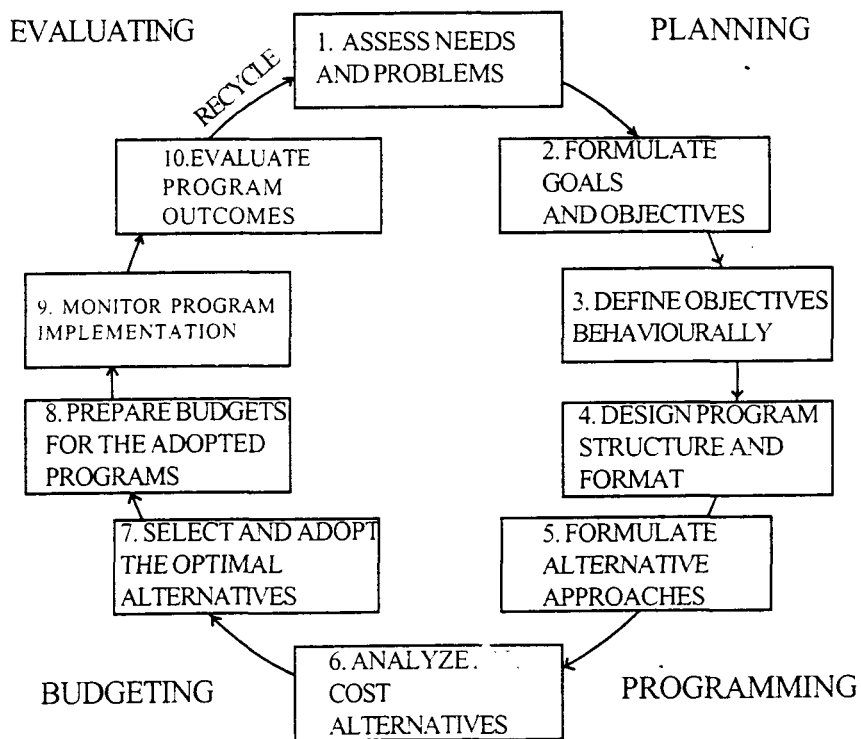


Fig. 5: System approach to the planning, programming, budgeting, and evaluating cycle

The major concerns of the budgeting process are the reconciliation of programme requirements with the available resources; the development, updating, and maintaining of budget documents; and monitoring, accounting, and progress reporting on the use of resources.

The supervision of activity of this functional category include the purchase and requisition of supplies, monetary accounting, maintaining an inventory of school property, supervising plant construction, and supervision of school lunch and other auxiliary services. It is the responsibility of the headmaster that he maintain the school building and grounds so as to promote a physical environment conducive of enhancing the teaching learning process and protect the financial investment of the community.

v. School community relationship

In fostering a sound programme of school community relations the principal must become intimately acquainted with the values, expectations, needs and aspirations of the local community. General system theory and social system theory provides the basis for developing such understanding. The principal also must become skilled in communicating and interacting with diverse reference groups and in shaping their understanding of school purposes, programmes operations, costs

and outcomes. Leadership and decision theory are the basis for developing and exercising these skills.

Eventhough education is a state function, the current structure of school operations grants considerable discretionary power to local communities. It is necessary, therefore, that all the intra-organisational reference groups, intimately concerned with the success of the school, know and fulfil their rôles in extra-organisational relationships. It is the responsibility of the headmaster that he must do arrangements for planning, co-ordinating, and implementing the public relations programme with the community.

Parents form the most concerned and interested reference group and schools must communicate then more detailed information about the progress, programmes, processes and products of the school. The hindrances for effective parent teacher grouping are :

- (1) negative attitudes
- (2) lack of objectives
- (3) poor leadership
- (4) unbalanced programmes, and
- (5) conflict situations

Headmasters and teachers are not always eager to participate in formal association with parents and the feeling may be mutual. Many parent teacher groups have difficulty in

identification of local needs. Some groups falter for lack of leadership even for well intentioned parents which leads to domination of teachers in PTA activities. Poor quality and unbalanced programmes and ideological, procedural or interpersonal conflicts between members or groups are hindrances for effective parent teacher grouping.

Within each community there exists a wide variety of human and physical resources that should be tapped for the enrichment of the instructional programme. People with specific competencies may be asked to interact with student groups and school sponsored field trips with the active support of the community can be held to provide reality centered learning experiences.

Apart from the five dimensions of the functional aspects of the headmastership described above, it is to be mentioned that the headmasters/headmistresses are basically teachers and their personal dispositions, temperament and job involvement influence their functions as administrators and as teachers. So the teacher competencies and certain personal qualities are mentioned briefly.

Borich and Feuton (1977) has classified the teacher competencies as follows (1) knowledge competencies (2) performance competencies and (3) consequence competencies.

Knowledge competencies have two dimensions - knowledge of the subject matter and the methodology of teaching the subject. performance competencies refer to the ongoing teaching behaviours as they are performed in the classroom. Consequence competencies refer to pupil outcomes produced by the teachers' proper use of knowledge and performance competencies.

The values, interests, needs, and dispositions, of the headmaster/headmistress as a person are determinants of his/her behaviour.

Li pham (1960) observed that the effective principal may be expected to exert himself energetically; to achieve and improve his performance; to strive for higher states in the profession and in society in general; to relate himself successfully to other people; to view the future with confidence, the present with understanding, the past with satisfaction; and to adjust well to frustrations, irritations, confusion and criticisms in pressure situations. Therefore an effective principal would rank higher in activity-drive, achievement drive, social ability, feeling of security, and emotional control.

Theoretical dimensions considered for the present study

On reviewing literature on theoretical foundations and functions of the profession of the heads of schools the investigator felt that though the foundational views are differing

in perspectives, the differences narrows down at the functional level. Since the investigator is concerned with the professional efficiency of the heads of primary schools, the functional aspect is considered for the study. The school principals' functional competencies presented by Lipham and Hoeh (1974) was chosen as a basis for the study.

The investigator has reviewed studies related to teachers Stress and the Professional Efficiency of the heads of schools and are presented briefly in section **Two**

SECTION TWO

1. Studies Related to Stress
2. Studies Related to the Professional Efficiency
of heads of schools

SECTION TWO

This section deals with the studies related to Stress and the Professional Efficiency of heads of schools and are presented as follows:

1. Studies related to teacher stress
2. Studies related to the professional efficiency of heads of schools.

Conclusion

1. STUDIES RELATED TO TEACHER STRESS

The investigator reviewed studies related to teachers stress and are arranged in chronological order as given below:

Hazelwood (1985) made a study on the factors inherent in the job of the teacher that makes stress an integral part of his profession. The variables included lack of resources, poor parental and political support and low student respect. In the final analysis it is the individual teacher who must accept responsibility for preventing and treating stress. Stress treatment involves three steps such as recognising the symptom without relying on negative reactions and realising self responsibility for individual responses to crisis. Coping programmes include creating a support system at school, changing grade levels and developing hobby. Suggestions of stress prevention include

changes in job and life style. It is concluded that teachers need to learn how to handle distress and prevent excess stress. Failing to meet this challenge may have detrimental effect on health and will reduce the effectiveness of the education they provide.

A study on occupational stress and its relationship to social supports and life turbulence of teachers in New South Wales was conducted by Laughlin in 1985. Nearly one third of the teachers reported their job to be extremely stressful. Self reported teacher stress was found to be negatively related to job satisfaction. Factors of stress identified were pupils recalcitrance, time and resource inadequacies, professional recognition needs, and curriculum demands. The generation and analysis of stress factor scores indicated that the biographical characteristics of teachers were significant stress factor predictors.

Mc Intyre (1985) made a study on the effect of class size on burnout by special education teachers. The result showed that no significant correlations exists between the amount of daily student load and any of the six aspects of burnout as measured by the M.B.I. He also conducted a study on the relationship between locus of control and teacher burnout. The result showed that Adult Nowickistrickland Internal/External Control Scale was significantly correlated with M.B.I.

Shea (1985) studied emotional exhaustion aspects of burnout and stressors in resource learning disability teachers. The

result indicated that teachers who reported feeling higher intensities of emotional exhaustion also reported higher stress associated with finding time to do assessment, to complete test write ups, to attend to the needs of severe and mild cases, balancing grouping with individualisation, securing parental and administrative support, finding a colleague with whom to discuss ideas and encouraging adaptation in regular classrooms.

An investigation on relaxation response as a stress coping strategy for student teachers was made by Steinmiller (1985). Results showed that there was no significant effect of the relaxation response in the stress of student teachers. There was a significant lowering of stress scores for all the subjects. There was a significant negative correlation between internal locus of control and high stress scores. But no difference was found between special education and non-special education majors.

Another investigation was made by Zastrow (1985) on the causes and prevention of burnout. He noticed that structural factors that contributes causes of high stress levels, also contribute factors in burn out. This factors include too much paper work, too much travel, isolation from peers, etc. People who enter helping professions with unrealistic expectations are particularly vulnerable to burnout. He found out that burnout is caused by distressing events and a certain kind of self defeating thought about distressing events. Prevention and treatment

include organisation of strategies to reduce these factors, individual strategies to change distressing events and individual strategies to alter negative, self defeating thoughts about distressing events.

Blaze (1986) made a qualitative analysis of sources of teacher stress. Linkages between teacher stress and teacher performance are firmly established. Organisational, student, administrative and teacher related factors were most frequently related to teacher stress and together constituted 83.1 percent of the responses. Job related factors were considered stressful because they were perceived as interfering primarily with time resources thereby overloading teachers in a quantitative sense. The findings also indicated that work stress was linked to strong negative feelings in teachers.

The study made by Bradfield and Fones (1986) was on the effects of perceived job related stress on special education teachers. The result indicated that high stress teachers showed an average of 5.2 physical stress symptoms and the low stresses teachers showed only an average of 2.9 symptoms. High stress teachers took more days than low stress teachers as sick leave. 42 percent of high stress teachers were planning to change careers where as it was only 8 percent for low stress teachers.

The dynamics, sources, and prevention of burnout among special education personnel were studied by Cherniss (1986). The

burn out responses develop when more direct and active problem solving efforts are perceived as useless. Factors in the work environment are found to be relatively more important than the characteristics of the individual. Lack of clarity, control, support and feed back, work overload are significant sources of burnout in special education. The burnout prevention strategies developed include individual strategies such as excessive, progressive relaxation, cognitive restructuring and social problem solving skills. Such group strategies as social support groups and resource exchange networks, participatory decision making etc. are options for avoiding burnout.

Holt (1986) examined the variation individual personality characteristics among female elementary teachers who had differing levels of burnout and high level of occupational stress. Hardiness, composed of degree of alienation and locus of control has been theorised as a mediator between high level of stress and negative consequences. It was found that a significant interaction of burnout and hardiness exists. Teachers with high levels of occupational stress and high levels of burn out felt more alienated and indicated more external locus of control. But teachers with high levels of occupational stress and low levels of burnout felt less alienated and had a more internal locus of control. Sixty six percent of special educators were in the high stress groups, Low burnout groups had significant frequencies of married teachers

with the most or least experience where as the high stress-high burnout group had more teachers with five to ten years experience. Physical illness was significantly correlated with levels of stress, emotional exhaustion and alienation. However no significant correlations were found between age marital status, education etc. Coping activities were passive to high burnout teachers and active for low burnout teachers.

In 1986 Pierson and Archambault conducted a study on the relationship between role stress and perceived intensity of burnout of public school reading specialists, classroom teachers, guidance counsellors, school psychologists and school social workers. Reading specialists reported the lowest comparable level of burnout for the emotional exhaustion sub-scale, a middle range level on the depersonalisation sub-scale and the highest level of burn out on personal accomplishment sub scale.

In another survey study conducted in 1986 by Raschke *et al.* It was found that the causes of teacher stress are the decline in public respect for teaching, decreasing or lack of enthusiasm among students, collective bargaining in teacher administrator relationships, lack of time, excessive paper work, lack of parental support, low pay and disruptive students. Suggestions for improvement include improving the climate of elementary schools including spacious classrooms, making availability of more supplies and equipment, reducing of paper work. Subjects

also suggested creating harmonious relations among all members of the school community with open communication, shared decision making collegial spirit of administrative practices.

Schlansker (1986) made survey on perceived teacher stress and burnout. Results indicated that teachers identified stressful events with high degree of correlation. Ten percent of the teachers were found to be experiencing stress leading to burnout. Teachers who were experiencing the least amount of burnout identified the principal as a significant source of support. Course work and inservice programmes were also found to be source of support. Teachers experiencing high degree of burnout reported utilising friends, sharing personal experiences etc as significant sources of support.

Thompson (1986) made a study to determine the problems of stress and burnout of principals of North Carolina school district. The result showed that the highest scores of stress concerned around task based roles associated with day-to-day functioning of the school. The occurrence of burnout among male principals, high school principals and principals of large schools was more than among female principals, middle and elementary school principals and principals in small schools respectively.

In 1987 Newburg investigated the relationships among job stress, job burnout and job satisfaction among schools teachers. The preponderance of the evidence implied that job burnout job

stress and job satisfaction are best considered as separate concepts. It was also found that poor correlation exists between a goal measure of stress and teaching events stress inventory.

The relationship of teacher burnout to individual and personality factors and perceived job stress was studied by Shapiro (1987). The result indicated that a significant positive relationship were found between burnout and the variables of perceived environmental stress and locus of control. A significant difference was obtained in the level of burnout experienced by male and female with females reporting significantly less frequent and less intense depersonalisation. A significant difference in the level of burnout was found among special educators with resource room teachers reporting less frequent depersonalisation.

Jones (1988) investigated the relationship of teachers' stress to institutional complexity and perception of working conditions. Results indicated that elementary teachers and junior high school teachers are significantly more emotionally exhausted than high school teachers. Whereas junior high school teachers are more depersonalised.

Rhoads (1988) conducted an investigation on the impact of teacher burnout upon the leadership behaviour within the classroom of colleges in the Colorado State system of community colleges. Results indicated that burnout did exist in various

demographic areas such as college size, geographic location, experience in teaching profession, experience in specific college, credit hours taught etc.

The relationship between teacher burnout and specific stressors was investigated by Dean in 1989. He found that a large number of stressors and stress themselves across the entire school environment were significantly related to burnout. Low burnout teachers reported that, direct contamination, social support, rationalisation, repression and intellectualisation as effective means of dealing with stress. It was recommended that stress reduction efforts should focus on diminishing the organisational sources of stress, the training of administrators and personal management skills of teacher trainees.

Lutton (1989) made a survey study on stress and burnout among elementary school principals. Results indicated that sixty percent of elementary school principals experience higher levels of burn out on one or more of the MBI sub scales. It was also indicated that significant difference existed in stressors and in coping strategies between those perceiving higher levels of burnout and those who did not. There was no significant difference with few expectations when the demographic variables were compared with the Administrative Stress Index and MBI. There were no significant difference when demographic variables were compared to the coping theme and the MBI.

Borg and Falzen (1990) made an investigation into stress and job satisfaction among primary school teachers in Malta. The result indicated the prevalence of stress and level of job satisfaction. Seventy five percent of subjects were satisfied with teaching, sex and age group taught were moderators of job satisfaction. Over 30 percent of respondents rated their job as stressful, and length of teaching experience and age group taught was moderates of teacher stress. Self reported teacher stress and job satisfaction were negatively correlated.

While investigating the relation between teacher stress and perceived coping effectiveness Long and Gessaroh (1990) found that males felt more stressed than females. Unmarried subject felt more role stress and life dissatisfaction compared with married subjects. There was difference in perception of coping techniques between males and females. Males felt that avoidance coping was more effective and females felt that problem solving was more effective. It was also observed that absenteeism was related to stress but not coping factors.

Borg and Riding(1991) examined teacher stress, job satisfaction, absenteeism, career intention, career commitment and self image among secondary school teachers in Malta. Teachers who reported greater stress were less satisfied with teaching, more frequently absent, more likely to leave teaching, and less likely to re-enter the field.

An investigation was carried out in 1991 by Blanchard about the factors associated with burnout in assistant principals in South Carolina. He also examined the relationships between reported levels of burnout and the variables of role conflict, role ambiguity, demographics and perceptions of school reform. Results indicated that the assistant principals did not report high levels of stress to MBI. Multiple and stepwise regression analysis indicated a relationship exist between the emotional exhaustion sub scale of the MBI and the variables of role conflict, role ambiguity and school reform. High levels of emotional exhaustion were associated with high levels of role conflict/role ambiguity and a negative perception of the impact of school reform.

In 1991 Chou conducted a study on the teacher burnout and its related variables among elementary teachers of mentally retarded students, gifted students and teachers in regular classrooms in Taiwan. Results indicated that both emotional exhaustion and depersonalisation sub scales indicted that there were no significant difference among these teachers. Teachers of mentally retarded students were inclined to feel a lesser sense of personal accomplishment than teachers of gifted students and teachers in regular classroom.

Mō (1991) studied burnout relationship to occupational stress, personality type and social support among secondary

school teachers. Results indicated that single and new teachers showed greater burnout. Similarly graduate teachers, those undergoing more stress and those lacking in social support showed greater burnout. Teachers with type A personalities suffered less from burnout and the harmful effects of stress.

The study conducted by Freidus (1992) revealed that although mature males who make midcareer changes into elementary school teaching share some experience with their female counterparts there appear to be variations in their experiences which are specific to males. Data from a cross case analysis that focuses on the career transition of ten second career men who became elementary school teachers indicates that both men and women experienced stress related to their financial needs, the social image that related to a career in teaching and their relationship to their co operating teachers.

In 1992 Okebukola and Jegeda made a survey of the factors that stress science teachers and an examination of coping strategies. The study identified five factors that inhibit science teaching effectiveness by bringing stress on science teachers; student characteristics, teacher characteristics, school environment, administrative procedures and conditions of service. Coping strategies to relieve stress are also provided.

A cross cultural study of coping with occupational stress among teachers was conducted by Gaziel (1993) in Jerusalem.

Among the 373 Arab and Jewish elementary teachers, Jewish teachers reported higher occupational stress overall and in relation to community and parental expectations, whereas Arab teachers were more stressed by working conditions and professional image. The two groups also differed in coping strategies for managing job stress.

Haridasan (1993) conducted a study on personality and adjustment as correlates of burnout among secondary school teachers of Kerala. A sample of 500 secondary school teachers of Kerala were selected. According to the findings of the study 92.6 per cent of the secondary school teachers reported experiencing average burnout. Younger and less experienced teachers are more burned out than older and more experienced teachers.

Francis (1995) conducted a practicum designed to increase the stress management skills of ten special educators working in a juvenile detention centre. Teachers at the juvenile detention centre were taking an inordinate amount of sick leave and engaging in behaviours that were counterproductive to their delivery of educational services to detained youth. Evidence of adequate stress management skills was gathered using surveys. The causes of stress included such factors as teacher's feelings of lack of accomplishment, effectiveness and closure. The stress management program was delivered in weekly 35 minute in service sessions over a 32 week period. Activities ranged from

instructions for simple releasing exercises, to brainstorming possible stress reducing changes in their environment, to presentations by a certified fitness instructor, a dietician, and massage therapists. The practicum resulted in the correctional educators learning to identify their levels of stress and use strategies to combat or manage stress.

Keiper and Busselle (1996) made a study on the rural teachers and stress in 120 rural teachers in Whatcom county, Washington. Result revealed that time management issues were listed most frequently as the highest stress factor followed by lack of administrative support, poor student motivation, and discipline. Salary levels and violence toward teachers were insignificant. The study includes teachers prediction of future stressors and methods of coping with stress.

A survey conducted in 1997 Abebe and Shanghnessy examined the stress factors and perceived remedies of 45 K-12 students teachers and 40 K-12 co-operating teachers. Stressful events they listed included material selection, unmotivated students, working with peers, supervisor's visits, discipline preparing for the unexpected, relationships with parents, co-operating teachers, lecture, inconsistent students behaviour, time management, power debates with students and relationships with students. Perceived solutions included expelling disruptive students, inservice workshops, parent involvement, increased

security, class size reduction, payment of student teaching, presence or absence of co-operating teacher from classroom, reduction of interruptions from pullout programmes, reduction or increase in visits by college supervisors etc.

Allison (1997) conducted a study on 643 public school principals in British Columbia on coping with administrative stress. Principals who set realistic goals, approach problems optimistically and objectively engaged in spiritual growth activities, take univacations are likely to be in better health and experience less stress.

Friedman (1997) conducted a study which hypothesised that environmental or role stressors could be classified as a task, organization and relation stressors each pertaining to a different domain of the professional's sense of self efficacy. The second hypothesis was that each of these role stressors accounted for a different proportion in the variation of the professional's perceived burnout. The study was conducted on a sample of 821 elementary and secondary school principals in Israel. Results indicated that the common environmental stressors could be categorized as organization stressors, task stressors, and relations stressors. The findings also indicated that organization stressors were the best predicting variables distinguishing between high- and low burn out principals. Human resource management best predicted high levels of depersonalisation and exhaustion where

as resource dependency predicted sense of accomplishment. Perceived threat against a principal's authority acts as a strain contributing to burnout.

An investigation was conducted by Richardson (1997) on stress of elementary school teachers in Caribbean. The goal of the study was to discover the sources of stress in elementary school teachers in Caribbean. The study sought the answers to three questions which focus on teachers perceptions of (i) the most stressful activity condition, (ii) difference in sources of stress between male and female teachers, and (iii) difference in sources of stress among teachers across eight Caribbean territories. The sample consisted of 645 elementary school teachers. Answers to the research questions were sought by means of the Teacher Stress Inventory which contains seven scales-role ambiguity, role stress, organisational management, job satisfaction, life satisfaction, task stress and supervisory support. Task stress emerged as the major source of stress for the teachers. Male teachers showed higher levels of stress, role stress and life satisfaction.

Terry (1997) found that excessive, prolonged stress can alter the body's normal physiologic functions. If adequate coping mechanisms are not instituted this extreme state can lead to burnout. Burnout can be experienced with physical, intellectual, social, psycho-emotional and spiritual adaptations. It has been

estimated that up to 40 percent of U.S teachers will not be teaching until retirement. If teachers are expected to continue teaching year after year with enthusiasm, then burnout prevention strategies must be implemented. Self assessment, stress reduction, proper diet, rest and exercise are essential. Principals can give positive feedback, maintain high standards, encouraged professional growth, promote support systems and utilise parent and community investment to assist in the prevention of teacher burnout.

Woverton *et al* (1997) identified and compared the environmental pressure and work related stresses that impart the chairs of academic departments at Universities in Australia and the United States. Chair stress was examined within each group and compared across the groups. Factor analysis identified five stress variables common to both groups. (i) administrative relationship stress, (ii) administrative tasks stress (iii) human relations stress, (iv) academic role stress, and (v) external time stress. Among findings were that the same underlying variables defined stress constructs in both countries, but the administrative relationship dimension was significantly more stressful for Australian chairs while Americans suffered greater pressure from administrative task stress.

Discussion

The studies reviewed in this chapter revealed that teachers are experiencing stress at varying degrees. In most of the studies some relationship was established between stress and other variables.

It can be observed that studies on stress of heads of schools are very less. Notable studies in this area are, the study by Thompson (1986) on stress and burnout among school principals, Allison (1997) on the coping strategies of the administrative stress of principals, and Friedman (1997) on burnout among principals.

The investigator also reviewed the studies related to Professional Efficiency of heads of schools and are presented below.

2. STUDIES RELATED TO PROFESSIONAL EFFICIENCY OF HEADS OF SCHOOLS

Moorhead and Nedinger (1989) conducted a study on behaviours of effective principals. The purpose of this qualitative and quantitative field study was to investigate the behaviours of effective secondary school principal in their respective school districts, to find commonalties in the behaviour of principals who were deemed by their peers to precide over effective schools, and to report the interim results. The findings were garnered from the ethnographic method of shadowing four secondary school principals with a reputation for excellence and collecting in

basket materials for visual analysis. In addition, questionnaires were administered to the principal, department heads, teachers and a sample group of students and parents to determine teacher and student attitudes and school climate. Personal interviews with a small representative sample of teachers and students were conducted. Although the four principals were considered to be effective by their peers, students, teachers and community members, there was no common pattern of behaviours, activities or leadership skills. It was found that the effective principal must have goals and values that fit the system and the community and meet the needs of staff and students.

An investigation was conducted by Seagren *et al* (1989) to provide a comparison of primary/elementary teachers perceptions in Australia and the United States of the skills, competencies and behavioural attributes that principals should possess to administer an effective school. Utilizing the Audit of Principal Effectiveness, 140 primary teachers in Australia and 347 elementary teachers in the United States rank ordered an 80 item validated questionnaire according to the degree of importance, each item had as it related to principal/administrator effectiveness. The items were grouped in to three domains and nine factors. Multivariate Analysis of Variance (MANOVA) was conducted to assess response differentiation. Significant differences were found for all nine factors with 14 items

contributing most to the difference observed. The differences are partially explained by variables in organisational structure. The Australian system of Primary education is characterised by central control at the state level. Control of the elementary education in the U.S is decentralised at the school and district level. Consequently the Australian principal has less autonomy because autonomy is shared to a greater extent with other professionals, especially at the system level. Because of the principal's place in the educational structure in Australia, greater attention is devoted to organisational procedure and teacher relations.

Six schools in an urban school system with varying socio-economic backgrounds were evaluated by Schmitt (1990) to determine what impact different instructional leadership styles have on student achievement. Since the principal is usually considered the instructional leader, the study focussed on the principal's leadership styles, with principals categorised in to three main types: responders, managers, and initiators. The school principals were asked questions pertaining to their effective school's programme and time management, then requested to fill out a questionnaire about working with teachers, expected student achievement, and achievement influencing factors. A teacher questionnaire was used to determine leadership style. School comprehensive Tests of Basic Skills

(CTBS) scores were used to find any differences in student achievement that resulted from leadership styles. Instructional leadership styles did effect student achievement, as did the school socio-economic status. However there was no relation between student achievement and the interaction of leadership style and socio-economic status. Six tables of result illustrate relationship between varying factors.

Scott, *et al.*, (1990) found that studies of principals leadership behaviour have been limited to purely descriptive content with no insight in to the meaning they ascribe to their actions. The inclusion of individual interpretation is crucial to understanding the link between action and their intended input on a situation. The methodology used in this study assesses principals own interpretation of their behaviour at the time of an action. An Instructional Leadership Inventory consisting of 48 items designed to measure the Five Dimensions of Instructional Leadership was given to each of the 81 principals representing schools from the Chicago metropolitan area studied along with a beeper. Five times each day during a regular work week, principals were signalled at random to fill out behavioural assessment form. Results of the survey relate the dimensions of instructional leadership to behavioural reports made by the principals. The most dramatic finding is the absence of consistent differences in the types of activities that effective versus less

effective principals engage in. Distinctions lie in specific meanings leaders ascribe to what they did.

The investigation conducted by Cummings *et al.*, (1992) revealed that the Indonesian school principal is a highly respected individual who serve as the critical link between the school and the community as well as local and national authorities. While most principals are well educated and capable, their positions are too limited. Most principals simply implement educational policy where as they could and should be creative leaders of educational instructions. Educational reform in Indonesia has led to improvements in education, but it has also shifted school level initiative and community involvement in education. A new balance must be struck that expands the responsibilities of the principal. This study examined variations in management practices and resources of the principals of six diverse elementary schools in the Sumatra Barat and West Java provinces. The schools were ranked on several issues. Independence from regulation, comprehensive management, entrepreneurship, proportion of resources financed from client revenues, average direct client costs, and efficiency. Several recommendations are made based on the study, including the need for clearer roles for educational players, decentralisation, increased governmental financial support, improved

intergovernmental communication, improved community involvement and awareness, and increased administrator training

Snyder and Ebmeier (1993) examined casual relationships among principal behaviour, school organisational process, and intermediate outcomes in the school context. Survey results of teachers, students and parents from 30 schools are discussed. They argued that principals can be evaluated directly in terms of their effects on teachers but only indirectly for their effects on students and parents.

Warner (1995) conducted a study on Navajo School Board Members perceptions of American Indian and non Indian administrators. The Navajo School board members felt that American Indian administrators exhibited better administrative skills and had a better sense of the cultural context of their roles than non Indian administrators. Perceptions of personal characteristics of the two groups, such as honesty, intelligence and self control did not differ. Non Indians hold 43 of 72 administrator positions in Navajo Schools.

Hausman and Goldring (1996) conducted a study that examined the differences in teachers ratings of effective principal leadership in magnet and non magnet schools in Cincinnati's (Ohio) systems of school choice. The study also examined the influence of school demographics, student achievement, teacher professionalism and work place conditions on teachers' ratings

effective principal leadership. The sample include 10 magnet schools and 10 non magnet school. A survey of all teachers in the sample schools (n = 628) elicited 417 returns, a 66 percent response rate. Non magnet principals were rated as more effective leaders by their teachers than were non magnet principals. There was a lack of correlation between teachers ratings of effective principal leadership and student out comes. Indicator's of teacher professionalism appeared to be the strongest predictors of effective principal leadership as rated by teachers, particularly teachers perceptions of their opportunity to learn. Goal congruence and resources were significant predictors in both school types, and may be even more critical factors in non magnet school. In magnet schools, greater school size was correlated with lower ratings of principal effectiveness.

The study conducted by Talbot and Crow (1996) examined the role conceptions of principals in the Centennial School Programmes (CSP) and those principals in non CSP schools. Communicator Style Measure (CSM) was sent to 136 Alabama members of the society for Human Resource Management. A total of 109 managers responded, an 80 percent rate of return. 72 percent of the respondents reported positive communicator image. However nearly 30 percent were uncertain or held a negative opinion about their personal communicator style. CSP principals reported practices emphasizing shared

decision making and partnerships, however there was little difference between CSP and non CSP principals, regarding some significant reform elements, eg. Involving parents in core technology activities. The findings have implications for all leaders, including principals who are the instructional supervisors and human resource managers for their school. A principals' communicator image may affect his or her ability to attract the best teachers for the school.

Coutts *et al* (1997) made a study that examined the degree of change in school climate in three schools with new principals. The Effective School Climate Inventory was administered to staff members in one elementary, one middle and one high school at the beginning of the school year and again in January. Results of the first ESCI were given to the principals at the beginning of the fall semester. Interviews were conducted with principals. Overall there was no statistically significant difference between the two survey results. In other words there was no clear indication that new principals had a positive impact on school climate. Despite a few exceptions principals' overall perceptions of their schools' climates were inconsistent with those reported by their school staff. The principals identified only 5 of the 17 school climate issues identified by staff as significant. The paper recommends that schools regularly conduct quantifiable measures of school

climate and arises the low level of parent involvement in three school.

Dussault and Thibodeau (1997) investigated the relationship between principals' professional isolation and their performance at work. Suburban Quebec principals were administered French versions of the UCLA Loneliness Scale and the Self Appraisal Instrument for Community College Administrators. Principals' professional isolation was negatively and significantly correlated with their performance at work. The study asserted that principals' work conditions must be changed.

A case study undertaken by Mc Gee (1997) has examined the role and responsibilities of two middle school principals one in Japan and one in United States. The study was based on theoretical framework that suggest a direct link between the principals instructional leadership and school effectiveness as measured by student achievement. The paper discusses the principals beliefs about the following five dimensions, (i) Communicating the mission of the school (ii) Monitoring the curriculum (iii) evaluating and supervising (iv) promoting a supportive school climate and (v) reviewing student progress. The two principals role and responsibilities revealed that their jobs were as different as fire and water. The American Principal spent long hours evaluating teachers, monitoring the curriculum, reviewing student progress and promoting a positive climate. He

has little time to articulate the mission statement of the school. In contrast the Japanese principal saw articulation of the school's mission as top priority. Evaluating and hiring teachers, monitoring the curriculum, and assessing student progress were not his responsibilities. Although the two principals shared common beliefs about effective leadership, they essentially operated with in two different job descriptions. The findings illustrate the importance of organisational structure and cultural expectations.

The study conducted by Peterson and Beekley (1997) has demonstrated that corporations succeed or fail on the basis of how well they are led. Although the importance of leadership in organisational decision making has been recognised and studied extensively, numerous studies have also demonstrated the central role that the principal plays in shaping the school factor in determining the success of the school district. Additionally, an essential component of effective leadership is the cultivation of followers. The data collected using Principal Sentiment Inventory (PSI) suggest that the secondary school principal of Ohio aware of and saw followership as essential to carrying out their role as middle managers. The principals exemplified three types of followership: exemplary, pragmatist, and conformist. Female high school principals reported a higher level of active engagement than male principals.

Portin (1997) has conducted a study that explored the changing role of school principals in Washington State. Data were collected during stage 1, through focus group interviews at an annual conference of a Washington State principals association. During Stage 2, a questionnaire was sent to all members. The data suggest that fundamental shifts have occurred in the role of the principal in Washington's Public schools. Principals face increasingly complex interactions and tasks while simultaneously encountering limitations to their capacity to lead their schools. The data show an increased complexity in the scope and elements of school change and school programmes. However the capacity of the principals to lead and develop shared leadership communities is constrained by the overwhelming nature of added responsibility, continuous innovation overload, an unclear empowerment for true direction setting, and threats to morale. The challenges described by the data reveal an imperative for shared and empowered leadership, in which the centre of power is passed around and on the move. Finally the data illustrate the need to build the leadership capacity of the schools.

Reed *et al.* (1997) have examined Ohio public and private school principals' self reported leadership orientations. A survey using the Principal Behaviour Inventory and interviews were conducted. Principals were classified into 'unfocussed and

'servant leadership orientations. Findings suggest that principals can be differentiated with respect to the emphasis they place on symbolic and technical aspects of their work. The unfocussed principals appeared to be more concerned with being accommodators, caretakers, collaborators, delegators, and facilitators. The majority of principals appeared to demonstrate a kind of 'servant leadership orientation, which emphasizes the professional relationships rather than symbolic or technical qualities of the principalship. Findings strongly support the use of survey instrument as a reliable and valid instrument for identifying the importance that principals attach to different aspects of their work. Almost one third of the survey sample indicated a bifocal leadership orientation and about one fourth reported an unfocussed orientation.

Daresh *et. Al.* (1998) made a study to explore way in which education programs can improve their screening of master's degree candidates. It examines information obtained from principals and assistant principals in El Paso, Texas for the purpose of understanding what effective campus administrators showed and be able to do. The Delphi process was used in this study to arrive at a group position regarding an issue and was also employed to create a 28 item survey instrument that identified the essential elements of an effective principal preparation programme. The resultant instrument, the Principal

Preparation Programme Survey was administered to 226 practicing principals/assistant principals in El Paso. Factor analysis produced six categories of skills for administrators (1) technical skills influenced by human relations, (2) technical skills influenced by legal mandates, (3) creating an inviting culture, (4) building community, (5) ethics in practice, and (6) understanding relationships. Together the technical-skill. Factors accounted for 38.2 percent of the total variance, incorporating 14 of the 28 items on the survey. The result suggest that the principalship is the art of leadership in an atmosphere of chaos and preparation programmes can teach technical skills but should also emphasize the intangible factors represented in categories 3 to 6.

The study conducted by Pashiardis (1998) was to identify characteristics and behaviours of effective elementary school principals in Cyprus. 49 principals judged as excellent by the Education Ministry were interviewed. Effective principals are ambitious, honest, and self-confident, deeply committed to their profession, proud of their country's heritage and traditions, deep thinkers and constant learners, willing to take risks and good time managers.

Pashiardis (1998) conducted another study to (1) explore the perceptions of teachers regarding their principals leadership styles, (2) to analyse the perceptions of principals themselves regarding their own leadership styles, and (3) to compare

teachers perceptions with those of the principals to discover discrepancies between the views of the two groups. To determine perceptions, a questionnaire was constructed and pilot tested in the secondary schools of Cyprus. The items in the questionnaire was grouped under 9 areas such as school climate, school leadership and management, administration and fiscal management, student management, professional development and inservice relations with parents and the community, problem solving and decision making, curriculum development, and personnel management. An ethnographic analysis was also used. Results grouped under the nine areas indicate some congruence and some disagreement between the teachers and the principal regarding a principal s self-perception and teachers' perceptions. In four out of the nine areas there is agreement of views from both sides.

A study made by Timperley (1998) sought to identify New Zealand secondary principals views concerning teachers evaluation system they had designed. Generally principals developed system meeting their own requirements. Some prioritised developmental purposes, others included accountability purposes. The two groups experienced different outcomes. In some cases, Staff opposition prevented principals from developing accountability systems.

Kreider and Lopez (1999) conducted an ethnographic study that interviewed 11 elementary principals provides examples of how principals with limited resources can build relationships with low income parents. The results indicated that the effective principals set goals, expand services to children and families, provide parenting education, negotiate and celebrate cultural differences, build strong relationships and support teachers.

Reavis *et al.* (1999) examines how a principal at a historically low performing high school brought about changes in the school culture and student achievement. The study describes how the principal emphasized achievement at the highest levels through heros and heroines, rites and rituals, stories, governance and leadership, symbols, enforcing expectations, and serving as the 'high priest' of the high achievement culture.

Discussion

On reviewing the studies related to the Professional Efficiency of the heads of schools the investigator found that studies on their efficiency and effectiveness are rare. Moorhead and Nedinger (1989) has studied the behaviours of effective principals. Dessault and Thibodeau (1997) studied the professional isolation and performance of school principals. Similarly Pashiardis (1998) has studied the characteristics of effective principals. The investigator found that studies

correlating professional efficiency of the heads of schools with other variables are very rare.

CONCLUSION

The investigator does not claim that the survey of studies attempted in this chapter is complete. It is hoped that the general trend shown by these studies can be considered as a conclusion with respect to the nature of the variables under this study. The conclusion drawn here is that the Stress of heads of schools varies according to their sex, age, educational qualifications and marital status. Similarly the Professional Efficiency of the heads of schools also varies according to their age, teaching experience, educational qualifications and locality and management category of the schools.

Considering the conditions existing in the Kerala state the investigator felt that the study on the influence of Stress on the Professional Efficiency of the heads of primary schools, taking into consideration the variables such as sex, age, educational qualifications, teaching experience and marital status of the subjects and locality and management category of their schools will be a relevant one.

**A STUDY ON STRESS AND PROFESSIONAL
EFFICIENCY OF THE HEADS OF PRIMARY
SCHOOLS IN KERALA**

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METHODOLOGY

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METHODOLOGY

The present study is an investigation of Stress experienced by the heads of primary schools in Kerala and its influence on their Professional Efficiency.

The methodology used for the study is described in this chapter under the following heads:

A. Variables of the study

B. Tools used for collecting data

1. Stress Inventory for the Headmasters (SIH)
2. Professional Efficiency Rating Scale for Headmasters (PERSH)

C. Sample used for the study

Factors considered for selecting the sample

Intended sample

D. Data collection procedure

Actual sample obtained

Sub samples

E. Scoring and consolidation of data

F. Statistical techniques used for the study

A. VARIABLES OF THE STUDY

The present study is a survey of the extent of Stress experienced by the heads of primary schools in Kerala and its influence on their Professional Efficiency. The details of the variables of the study are described below.

Dependent variable

The Professional Efficiency of the heads of primary schools in Kerala is treated as the dependent variable for the study.

Criteria for selecting the dependent variable

The investigator, being a headmaster in a primary school, is much interested in problems related to his profession. Since primary education is the stepping stone of the further stages of education the experiences one gets from this stage has a crucial role in deciding one's destiny. So the effectiveness of primary education is important to the well being of the individuals and hence the development of the nation. In a formal system of education the head of the institution plays a pivotal role. So the investigator decided to select the Professional Efficiency of the heads of primary schools as the dependant variable.

Independent Variable

Stress experienced by the heads of primary schools is treated as the independent variable for the present study.

Criteria for selecting the independent variable

The investigator has considered many variables, which may influence the dependent variable of the study, such as job satisfaction, stress, burnout, self-esteem etc. He felt that selecting so many independent variables may make the study haphazard. So he decided to limit the independent variables. As an experienced head of a primary school, the nature and magnitude of the job, having many potential stressors, influenced the investigator to select Stress as independent variable. Also in order to conduct an in-depth study, it was decided to concentrate the study on Stress of the heads of primary schools.

Basal variables

Following were the basal variables selected for the study:

- (i) Sex
- (ii) Age
- (iii) Educational Qualifications
- (iv) Teaching experience and
- (v) Marital status of the heads of schools
- (vi) Locality of the primary schools
- (vii) Management category of the primary schools

B. TOOLS USED FOR COLLECTING DATA

One of the difficulties faced by the investigator was lack of standardized tools for collecting data required for the study.

Though the investigator has come across certain tools regarding Stress, [Maslach, (1982), Cooper, (1988), Subrahmanyam and Ramadevi (1997)] those were not related to the occupational ecology of the heads of primary schools in Kerala. The conditions were the same in the case of Professional Efficiency.

So the following tools were prepared and standardized by the investigator with the help of his supervising teacher.

1. Stress Inventory for Headmasters (SIH)
2. Professional Efficiency Rating Scale for Headmasters (PERSH)

The description of the tools are presented below.

1. Stress Inventory for Headmasters (SIH)

Stress Inventory for Headmasters (SIH) was prepared to measure the extent of Stress experienced by primary school headmasters/ headmistresses in Kerala. The investigator made use of the suggestions given in some books [Selye (1956), Sloan and Cooper (1973), Paines and Aronson; (1988)] to develop the Stress Inventory. Besides he had useful discussions with experts in the field as well as his supervising teacher on several aspects of the variable.

On the basis of the existing theory and references made by the investigator, four dimensions of Stress were selected for preparing the inventory. The draft form of Stress Inventory for Headmasters consisted of 69 statements. The statements in the SIH are classified under the dimensions described below.

i. Physiological factors

It is a known fact that Stress will affect the physiological realm, and changes may occur due to Stress as increased blood pressure, increased heart beat, sweating, breathing difficulties, muscular tension, increased gastro intestinal problems, decrease in sexual instinct etc. These changes are indicators of the Stress and hence statements regarding them are included in the inventory under the dimension of Physiological factors .

13 statements with serial numbers 1, 5, 9, 13, 17,21, 25, 29, 33, 37, 41, 45 and 49 are included under this dimension. Examples of the statements under Physiological factors are given below:

Examples:

1. I feel decrease in appetite (No. 33)
2. I feel a tendency not to get up in the morning (No.45)

ii. Psychological factors

Stress experienced by an individual may manifest in ones psychological ecology. The individual s perception of the situations, his emotions and feelings, his reactions, etc. may be projecting his potential Stress. In order to estimate the Stress of primary school headmasters / headmistresses the investigator included 18 statements regarding the psychological dimension in the inventory.

Statements with serial numbers 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 53, 56, 59, 62 and 65 are measuring psychological dimension of Stress.

Examples:

1. I feel disappointment and worry without any reason
(No.26)
2. I feel regretful of some of my past decisions and actions
(No.42)

iii. Social and familial factors

There are 19 items included in this category. Stress will affect the familial and social relationships of an individual. The heads of primary schools are supposed to have wide ranging social relationships such as with students, teachers, parents, supervisors and the community where they work. So the investigator included statements about the social and familial relationships of the individual.

Statements with serial numbers 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 54, 57, 60, 63, 66 and 68 are related to social and familial dimension of Stress.

Examples:

1. I am satisfied in the inter-communication system in my school (No. 23).
2. My relationship with my colleagues are warm (No.27).

iv. Occupational factors

A key dimension of the Stress Inventory for Headmasters is the occupational factors. 19 statements about work overload, job satisfaction, job security, career development, role in the organisation, organisational climate etc. are included in this dimension.

Statements with serial numbers 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 55, 58, 61, 64, 67, and 69 are based on occupational dimension of Stress.

Examples:

1. I feel less confidence in my ability and skills associated with my job (No.58).
2. I feel disturbed during my work due to the heavy work load (No.64).

Distribution of statements under each dimension is presented in Table 1. The SIH (Draft) is presented as Appendix I.

TABLE 1
Distribution of Statements of
SIH (draft) under Different Dimensions

| Sl. No | Dimensions | Serial numbers of statements |
|--------|-----------------------------|---|
| 1 | Physiological factors | 1*, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49 |
| 2 | Psychological factors | 2*, 6*, 10, 14, 18, 22, 26, 30*, 34, 38, 42, 46, 50*, 53*, 56*, 59, 62*, 65* |
| 3 | Social and familial factors | 3*, 7*, 11*, 15, 19, 23*, 27*, 31*, 35*, 39*, 43, 47*, 51, 54, 57, 60, 63*, 66, 68 |
| 4 | Occupational factors | 4, 8*, 12*, 16*, 20*, 24*, 28*, 32*, 36*, 40*, 44*, 48*, 52*, 55, 58, 61, 64, 67, 69* |

Note: * Indicates negative statements

Mode of responding

Against each statement of the SIH choices are given such as 'Always', 'Sometimes' and 'Never' indicating the number of occurrence of the experience described in that statement. The respondent has to make a tick (✓) mark against the serial number of each statement under the space provided in the response sheet to show his or her response.

Scoring

Scoring of the responses made by the headmasters/headmistresses was done as indicated below.

| Statements | Scoring | | |
|---------------------|---------|-----------|-------|
| | Always | Sometimes | Never |
| Positive statements | 2 | 1 | 0 |
| Negative statements | 0 | 1 | 2 |

The scores on all the statements were added together and the sum of scores is taken as the measure of Stress experienced by a headmaster.

Item try-out

Stress Inventory for Headmasters was tried out on a sample of 90 headmasters of primary schools in Kerala. The headmasters were requested to respond to all of the statements.

Item analysis

Item analysis was conducted for finding out the suitability of each statement for inclusion in the final Inventory.

There are numerous statistical indices concerning the extent to which individual test items tend to measure the same thing a test as a whole. The most popular statistical index used with commercially distributed tests is the item- total correlation. Each individual has a score on each item and a score on the total as a whole. Correlation co-efficients can be computed in that circumstance. (Nunnally, 1972).

Details of item analysis of the SIH are given in Table 2.

TABLE 2
Details of Item Analysis of SIH

| Item No | Item-Total correlation (r) | Item No. in SIH (Final) | Item No | Item-Total correlation (r) | Item No. in SIH (Final) |
|---------|----------------------------|-------------------------|---------|----------------------------|-------------------------|
| 1 | 0.390 | 36 | 36 | 0.493 | 23 |
| 2 | 0.465 | 27 | 37 | 0.071 | - |
| 3 | 0.637 | 7 | 38 | 0.254 | 47 |
| 4 | 0.076 | - | 39 | 0.524 | 18 |
| 5 | 0.295 | 45 | 40 | 0.364 | 38 |
| 6 | 0.113 | - | 41 | 0.208 | - |
| 7 | 0.007 | - | 42 | 0.357 | 39 |
| 8 | 0.648 | 6 | 43 | 0.524 | 17 |
| 9 | 0.146 | - | 44 | 0.513 | 20 |
| 10 | 0.501 | 22 | 45 | 0.661 | 5 |
| 11 | 0.579 | 12 | 46 | 0.476 | 26 |
| 12 | 0.347 | 41 | 47 | 0.275 | 46 |
| 13 | 0.232 | 50 | 48 | 0.669 | 3 |
| 14 | 0.483 | 24 | 49 | 0.514 | 19 |
| 15 | -0.038 | - | 50 | 0.114 | - |
| 16 | 0.703 | 2 | 51 | 0.669 | 4 |
| 17 | 0.431 | 32 | 52 | 0.411 | 33 |
| 18 | 0.098 | - | 53 | 0.529 | 16 |
| 19 | 0.122 | - | 54 | 0 | - |
| 20 | 0.031 | - | 55 | 0.736 | 1 |
| 21 | 0.112 | - | 56 | 0.537 | 14 |
| 22 | 0.464 | 28 | 57 | 0.535 | 15 |
| 23 | 0.363 | 37 | 58 | 0.629 | 8 |
| 24 | 0.25 | 48 | 59 | 0.121 | - |
| 25 | 0.406 | 34 | 60 | -0.433 | - |
| 26 | 0.179 | - | 61 | 0.444 | 30 |
| 27 | 0.347 | 40 | 62 | 0.589 | 11 |
| 28 | 0.443 | 31 | 63 | 0.339 | 43 |
| 29 | 0.079 | - | 64 | 0.621 | 10 |
| 30 | 0.247 | 49 | 65 | 0.57 | 13 |
| 31 | 0.477 | 25 | 66 | 0.511 | 21 |
| 32 | 0.008 | - | 67 | 0.297 | 44 |
| 33 | 0.346 | 42 | 68 | -0.126 | - |
| 34 | 0.459 | 29 | 69 | 0.624 | 9 |
| 35 | 0.400 | 35 | | | |

The item-total correlation coefficients (r' s) were tested for significance. Items having an $r \geq 1.96 / \sqrt{N}$ i.e., $r \geq 0.207$ ($N=90$) were selected for the final Inventory. 51 items were found to have significant value of r . However item number 41 having of 0.208 was discarded to make the total number of items as even. Thus the final Stress Inventory for Headmasters consisted of 50 statements distributed under different dimensions.

The distribution of 50 statements under different dimensions of final SIH is presented in Table 3.

TABLE 3
Distribution Statements of
SIH (final) under Different Dimensions

| SL No. | Dimensions | Serial number of statements |
|--------|-----------------------------|---|
| 1 | Physiological factors | 5, 19, 22, 32, 34, 36*, 42, 45, 50 |
| 2 | Psychological factors | 11*, 13*, 14*, 16*, 24, 26, 27*, 28, 29, 39, 47, 49* |
| 3 | Social and familial factors | 4, 7*, 12*, 15, 17, 18*, 21, 25*, 35*, 37*, 40*, 43*, 46* |
| 4 | Occupational factors | 1, 2*, 3*, 6*, 8, 9*, 10, 20*, 23*, 30, 31*, 33*, 38*, 41*, 44, 48* |

Note: * indicates negative statements.

Table 3 indicates that the dimension of Physiological factors consists of 9 statements, psychological factors consists of 12 statements, social and familial factors consists of 13 statements and occupational factors consists of 16 statements.

Scoring of the final Inventory was done as indicated in the description of the SIH. The score for an individual may vary from 0 to 100.

Validity

The Stress Inventory for Headmasters (SIH) was prepared on the basis of valid theories on Stress suggested by Cooper (1978), Maslach (1982) and Paine (1982). So the investigator claims high content and construct validity for the inventory.

Reliability

The reliability of the SIH was established by the test-retest method. The retest was conducted six weeks after the first administration. The correlation co-efficient obtained from the scores of the test and re-test was found to be 0.674(N=30)

The final form of SIH and Response sheet are presented as Appendix II and III respectively.

2. Professional Efficiency Rating Scale for Headmasters (PERSH)

The Professional Efficiency of the heads of primary schools was measured by the Professional Efficiency Rating Scale for

Headmasters (PERSH) developed by the investigator with the help of his supervising teacher. The investigator had discussions with other experts in the field to develop the scale. Suggestions from several books such as Boles and Davenport (1975), Bhagya *et al.* (1990) and Bhatt and sharma (1992) etc. were used for selecting the dimensions of the Professional Efficiency. The school principal s functional competencies presented by Lipham and Hoeh (1974) was used as the basis for preparing the scale. Moreover, the investigator being a headmaster in a primary school, made use of discussions on the subject with his counterparts and the leaders of headmaster s associations.

The Professional Efficiency Rating Scale for Headmasters (Draft) which consisted of 80 positive statements was prepared based on the following seven dimensions of Professional Efficiency.

1. Management of physical and financial resources
2. Organisation of instructional programme
3. Staff personnel services
4. Student personnel services
5. School community relationship
6. Headmaster as a teacher
7. Personal disposition, temperament and job involvement.

The description of each dimension is presented below:

i. Management of physical and financial resources

Management of physical and financial resources is one of the dynamic dimensions of the scale. Some specific statements regarding competencies required to improve the headmaster's leadership in providing adequate financial and physical resources for the school are included in the scale. This will include purchase and requisitioning supplies and materials, accounting of school fund, maintaining inventory of school property, supervision, plant maintenance etc.

Nine items with serial numbers 1, 8, 15, 22, 29, 36, 43, 50, and 57 come under this dimension.

Examples:

1. I evaluate the functions and goals of the school (No.1)
2. I systematically arrange the tasks that are to be completed (No.50).

ii. Organisation of the instructional programme

Work with the instructional programme is the most important functional task of the school principal. Statements regarding the competencies in assessing programme relevance, planning programme improvements, implementing programme improvements and evaluating the programme are included in the scale.

This dimension consists of 13 statements with numbers 2, 9, 16, 23, 30, 37, 44, 51, 58, 63, 67, 71, and 74.

Examples:

1. I examine activities for improving curricular programmes (No. 30).
2. I allocate duties to my colleagues so as to attain instructional goals (No.44).

iii. Staff personnel services

Statements regarding the competencies required for the school headmasters include assigning, orienting , improving and evaluating staff members of the school.

Statements, 3, 10, 17, 24, 31, 38, 45, 52, 59, 64, 68, 72, 75, 76, 77, 78, 79 and 80 come under the dimension of staff personnel services. The dimension covers 18 statements in total.

Examples:

1. I improve the efficiency of the staff by class observations and discussion with them (No. 31)
2. I give guidance to each of the staff for improvement in particular areas of his interest (No. 38).

iv. Student personnel services:

Statements about competencies in fostering students values, student involvement such as student participatory decision making, school parliament etc. are included in this category. Statements about competencies in guidance, counselling, information giving etc. are also included in this section.

Nine statements with serial numbers 4, 11, 18, 25, 32, 39, 46, 53 and 60 are included under this dimension.

Examples:

1. I assess and analyse the value orientation of the students (No. 4)
2. I give support to the efficient functioning of the school parliament (No.32).

v. School community relationship

Statements about school community relationship include items for rating competencies in assessing the community needs and aspirations, analysing the composition, relationships and demands of school sub -publics, working with community leaders, organisations and agencies, working with parents and parent teacher associations, communicating with the community about the development of the school etc.

Statements 5, 12, 19, 26, 33, 40, 47 and 54 come under this section. Eight statements are included in this dimension.

Examples:

1. I emphasize to my students and teachers about their roles in the society (No.33).
2. I organise novel schemes and programmes for the utilisation of the community resources (No.47)

vi. Headmaster as a teacher

Even though the bulk of the headmaster's function centres round the administrative aspects, the teaching aspect cannot be ignored. So the investigator included some statements regarding the teaching aspect under a separate dimension. Items related to

classroom activities, lessons planning etc. are included in this section.

12 statements with serial numbers 6, 13, 20, 27, 34, 41, 48, 55, 61, 65, 69 and 73 are the items which come under this section.

Examples:

1. I always try to increase my knowledge (No. 13).
2. I select proper teaching methods for each class (No.41)

vii. Personal disposition, temperament and job involvement

Teachers as engineers of future generation should possess certain personal qualities other than their prescribed functions. Since the headmasters occupy the pivotal role in the school system, they are supposed to possess certain personal qualities. So the investigator included 11 statements about the personal disposition, temperament and job involvement of the headmasters.

Item 7, 14, 21, 28, 35, 42, 49, 56, 62, 66 and 70 are statements under this category.

Examples:

1. My higher authorities appreciate suggestions put forward by me (No. 21).
2. I overcome the challenges against my leadership (No.49).

The distribution of statements of Professional Efficiency Rating Scale for Headmasters under different dimensions are

given in Table 4. PERSH (draft) which consisted of 80 statements is presented as Appendix IV.

TABLE 4
Distribution of Statements of
PERSH (draft) under Different Dimensions

| SL No. | Dimensions | Serial number of statements |
|--------|--|---|
| 1 | Management of Physical and Financial Resources | 1, 8, 15, 22, 29, 36, 43, 50, 57 |
| 2 | Organisation of Instructional Programme | 2, 9, 16, 23, 30, 37, 44, 51, 58, 63, 67, 71, 74 |
| 3 | Staff Personnel Services | 3, 10, 17, 24, 31, 38, 45, 52, 59, 64, 68, 72, 75, 76, 77, 78, 79, 80 |
| 4 | Student Personnel Services | 4, 11, 18, 25, 32, 39, 46, 53, 60 |
| 5 | School Community Relationship | 5, 12, 19, 26, 33, 40, 47, 54 |
| 6 | Headmaster as a Teacher | 6, 13, 20, 27, 34, 41, 48, 55, 61, 65, 69, 73 |
| 7 | Personnel Disposition, Temperament and Job Involvement | 7, 14, 21, 28, 35, 42, 49, 56, 62, 66, 70 |

Mode of responding

Three categories of responses such as 'Always', 'Some times' and 'Never' are given against each statement. The headmaster/headmistress has to make a tick mark (✓) against

the serial number of each item under the space provided in the Response sheet to indicate his/her response.

Scoring

A score of 2, 1 and 0 was given for the responses of 'Always', 'Sometimes' and 'Never' respectively. The scores on all the statements were added together to get the total score of Professional Efficiency of a headmaster.

Item try-out

The PERSH was tried out on a sample of 90 heads of primary schools. The subjects were instructed to respond to all statements.

Item analysis was carried out by finding the item-total correlation coefficient as described in the case of SIH. The details of item analysis of PERSH are given in Table 5.

TABLE 5
Details of Item Analysis of PERSH

| Item No (draft) | Item total Correlation (r) | Item No. in the Final scale | Item No (draft) | Item total correlation (r) | Item No in the Final Scale |
|-----------------|----------------------------|-----------------------------|-----------------|----------------------------|----------------------------|
| 1 | 0.667 | 9 | 41 | 0.475 | 33 |
| 2 | 0.234 | 56 | 42 | 0.283 | 53 |
| 3 | 0.538 | 24 | 43 | 0.486 | 30 |
| 4 | 0.587 | 18 | 44 | 0.601 | 17 |
| 5 | 0.728 | 3 | 45 | 0.537 | 25 |
| 6 | 0 | - | 46 | 0.556 | 23 |
| 7 | 0.533 | 26 | 47 | 0.761 | 2 |
| 8 | 0.795 | 1 | 48 | 0.297 | 51 |
| 9 | 0.656 | 11 | 49 | 0.243 | 54 |
| 10 | 0.308 | 49 | 50 | 0.631 | 14 |
| 11 | 0.293 | 52 | 51 | 0.587 | 19 |
| 12 | 0.561 | 22 | 52 | 0.698 | 6 |
| 13 | 0.644 | 13 | 53 | 0.045 | - |
| 14 | 0.157 | - | 54 | 0.369 | 45 |
| 15 | 0.580 | 20 | 55 | 0.000 | - |
| 16 | 0.567 | 21 | 56 | 0.397 | 43 |
| 17 | 0.371 | 44 | 57 | 0.488 | 29 |
| 18 | 0.666 | 10 | 58 | 0.510 | 28 |
| 19 | 0.201 | - | 59 | 0.122 | - |
| 20 | 0.045 | - | 60 | 0.306 | 50 |
| 21 | 0.242 | 55 | 61 | 0.413 | 42 |
| 22 | 0.174 | - | 62 | 0.021 | - |
| 23 | 0.675 | 8 | 63 | 0.516 | 27 |
| 24 | 0.180 | - | 64 | 0.219 | 58 |
| 25 | 0.361 | 46 | 65 | 0.709 | 4 |
| 26 | 0.047 | - | 66 | 0.692 | 7 |
| 27 | 0.201 | - | 67 | 0.479 | 32 |
| 28 | 0.125 | - | 68 | 0.425 | 9 |
| 29 | 0.217 | 60 | 69 | -0.133 | - |
| 30 | 0.655 | 12 | 70 | 0.421 | 40 |
| 31 | 0.460 | 35 | 71 | 0.419 | 41 |
| 32 | 0.323 | 48 | 72 | -0.184 | - |
| 33 | 0.613 | 16 | 73 | -0.093 | - |
| 34 | 0.438 | 38 | 74 | 0.482 | 31 |
| 35 | 0.186 | - | 75 | 0.218 | 55 |
| 36 | 0.619 | 15 | 76 | 0.000 | - |
| 37 | 0.473 | 34 | 77 | 0.179 | - |
| 38 | 0.455 | 36 | 78 | 0.034 | - |
| 39 | 0.454 | 37 | 79 | 0.224 | 57 |
| 40 | 0.360 | 47 | 80 | 0.709 | 5 |

The item total correlation coefficients obtained were tested for significance at 0.05 level. Items having $r \geq 1.96\sqrt{N}$ i.e., $r \geq 0.207$ ($N = 90$) were included in the final Scale. 60 items were found to have significant positive relationship with the total.

The distribution of statements of PERSH (Final) under different dimensions is given in Table 6

TABLE 6
Distribution of Statements of
PERSH (final) Under Different Dimensions

| SL No | Dimensions | Serial number of statements |
|-------|---|---|
| 1 | Management of physical and financial resources | 1,9,14,15,20,29,30,60 |
| 2 | Organisation of instructional programme | 8, 11, 12, 17, 19, 21, 27, 28, 31, 32, 34, 41, 56 |
| 3 | Staff personnel services | 5, 6, 9, 24, 25, 35, 36, 44, 49, 55, 57, 58 |
| 4 | Student personnel services | 10, 18, 23, 37, 46, 48, 50, 52 |
| 5 | School community relationship | 2, 3, 16, 22, 45, 47 |
| 6 | Headmaster as a teacher | 4, 13, 33, 38, 42, 51 |
| 7 | Personal disposition, temperament & job involvement | 7, 26, 40, 43, 53, 54, 55 |

Scoring of the PERSH (Final) was done as indicated in the description of PERSH (draft). The score for an individual may vary from 0 to 120.

Validity

The PERSH was constructed on the basis of school principal s functional competencies presented by Lipham and Hoech (1974). So the investigator claims high content and construct validity for the tool.

In order to establish the criterion related validity of the scale, the investigator made use of scores obtained from the rating of a headmaster s Professional Efficiency by the individual teachers in his/her school. For this, 15 primary school heads were rated for their Professional Efficiency by 5 teachers each in the concerned schools.

For this purpose PERSH was converted so as to rate the headmaster by the teachers and the tool was named as Professional Efficiency Rating Scale of Heads of Schools by Teachers which is presented as Appendix VII.

The mean score of 5 teachers' rating on the Professional Efficiency of their headmaster was treated as the external criterion. The correlation between the mean value of teacher s rating and the score for each head by self rating was considered as the index of validity. The validity co-efficient obtained for PERSH was 0.682 (N=15).

Reliability

The reliability of PERSH was established by test-retest method. The PERSH (final) was re-administered to the heads of primary schools, six weeks after the first administration. The scores obtained for each headmaster in the first and second administration were correlated and found to be 0.646 (N=30). This indicates that the PERSH has high reliability.

C. SAMPLE USED FOR THE STUDY

Stratified random sampling technique was employed for the selection of the sample for the present study. The various steps involved in the selection of the sample are described below.

Factors considered for selecting the sample

The population of the present study is the heads of primary schools in Kerala. The following factors were considered while selecting the sample:

- (i) The sample should not be too small to get optimum information and it should not be too large so that it will be very difficult for a close study.
- (ii) Due representation should be given to different strata in the population such as sex of the heads of schools, locality and management category of the primary schools.
- (iii) There should be enough number of subjects in the subsamples based on the basal variables such as sex, age,

educational qualifications, teaching experience and marital status of the heads of the schools and locality and management category of the schools.

- (iv) The sample should be collected from almost all districts of Kerala.

Intended sample of the study

Considering the above factors the investigator took the following decisions about the sample:

- (i) The sample should be around 400 in size.
- (ii) The ratio of headmasters and Headmistresses should be 3:2.
- (iii) The ratio between rural and urban schools should be 4:1.
- (iv) The ratio between private and government schools should be 2:1.

The investigator has completed the standardisation of the tools and fixed the intended sample in the last week of March 1999 and made arrangements for printing the tools required for the collection of the data.

D. DATA COLLECTION PROCEDURE

The final form of the Stress Inventory for Headmasters (SIH) and the Professional Efficiency Rating Scale for Headmaster s (PERSH) along with the response sheets were printed and sorted out and got ready for distribution.

The intended sample of the study was 400 heads of primary schools in Kerala. The investigator visited many schools

for collecting the data. But in some cases, since each school has only one headmaster and the nature of his job does not ensure his availability in his school all the day, the investigator was compelled to visit some of the usual visiting places of the heads of primary schools. This includes offices of the educational officers, treasuries and Block Resource Centres. Official and unofficial gathering places such as venues of headmaster's conferences, association meetings etc. were visited by the investigator. The investigator requested the authorities concerned for granting permission to distribute the tools to which almost all extended their co-operation.

The investigator made ample briefings about making responses to the tools to the heads of primary schools. Since much attention and nearly an hour duration were needed to make responses to the SIH and the PERSH, it was impractical to administer the tools and receive the response sheets on the same day. So the investigator distributed self addressed envelopes to the respondents.

The tools were distributed to a total of 500 heads of primary schools. Data collection was started in the first week of May 1999 and completed in the second week of September, 1999.

Actual sample obtained

Though the administration of the tools was completed in the second week of September 1999 the investigator waited till 30th September 1999 for receiving the mailed response sheets. A

total of 305 response sets received till that date were scrutinized. Among these some were incomplete and were discarded. Hence the obtained sample for the study was 275 heads from the primary schools in Kerala.

The details of the actual sample obtained are presented in Table 7.

TABLE 7
Details of the Actual Sample Obtained

| SL No. | Name of School | Revenue District | Locale | Management Category | Sex | Marital Status |
|--------|--------------------------------|--------------------|--------|---------------------|-----|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | ALPS Urathur | Kannur | R | P | M | M |
| 2 | ALPS Tirur | Malappuram | U | P | F | M |
| 3 | PV ALPS Irikkur | Kannur | R | P | M | M |
| 4 | GLPS Peratta | Kannur | R | G | M | M |
| 5 | GBUPS Nedumangadu | Thiruvananthapuram | U | G | M | M |
| 6 | MMAUPS Alappuzha | Alappuzha | U | P | M | M |
| 7 | GLPS Malappuram | Malappuram | U | G | M | M |
| 8 | SA UPS Elavur | Malappuram | R | P | M | M |
| 9 | GPMUPS Bhoothamkari | Kannur | R | P | F | M |
| 10 | Kamala Nehru UPS | Kannur | R | P | F | M |
| 11 | Naravoor North LPS | Kannur | U | P | F | M |
| 12 | Olaikkara South LPS | Kannur | R | P | F | M |
| 13 | Chidambarandh UPS | Kannur | R | P | M | M |
| 14 | ALPS Kannukulangara | Thrissur | R | P | M | M |
| 15 | St Joesphs LPS Pavaratty | Thrissur | R | P | M | M |
| 16 | St. Antony's LPS Paranyrappily | Thrissur | R | P | M | M |
| 17 | KLS UPS Peruvanam | Thrissur | R | P | F | M |
| 18 | GLPS Mannampoyil | Kozhikode | R | G | M | M |
| 19 | GMPUS Raroth | Kozhikode | R | G | M | M |
| 20 | Nanminda ALPS | Kozhikode | R | P | F | M |

| | | | | | | |
|----|-------------------------------|----------------|---|---|---|---|
| 21 | Malaparamba AUPS | Kozhikode | U | P | M | M |
| 22 | Civil Station AUPS | Kozhikode | U | P | M | M |
| 23 | MMLPS Calicut -3 | Kozhikode | U | P | M | M |
| 24 | Sree Vidya mandiram LPS | Kozhikode | R | P | M | M |
| 25 | GLPS Beypore West | Kozhikode | R | G | M | M |
| 26 | AMLPS Kunnammal Malappuram | Malappuram | U | P | M | M |
| 27 | AMLPS Kumaramangalam | Malappuram | U | P | F | M |
| 28 | MSC LPS Velliyangadi | Pathanamthitta | U | P | F | M |
| 29 | GMUPS Tirur | Malappuram | U | G | M | M |
| 30 | GUPS Kottakkal | Malappuram | R | G | M | M |
| 31 | GMLPS Cherukunnu | Malappuram | R | G | M | M |
| 32 | NLPS Kolathur | Malappuram | R | P | F | M |
| 33 | AMLPS Pattarkadavu | Malappuram | U | P | M | M |
| 34 | AMUPS Ummathoor | Malappuram | R | P | M | M |
| 35 | AMLPS Mattathoor North | Malappuram | R | P | M | M |
| 36 | GLPS Arakkuparamba | Malappuram | R | G | M | M |
| 37 | Thavarool ALPS | Kannur | R | P | M | M |
| 38 | GLPS Chelannur | Kozhikode | R | G | M | M |
| 39 | GLPS Karapparamba | Kozhikode | U | G | M | M |
| 40 | AUPS Arakkuparamba | Malappuram | R | P | M | M |
| 41 | Keezhuthally East UPS | Kannur | R | P | F | S |
| 42 | Providence LPS Calicut | Kozhikode | U | P | F | S |
| 43 | AMUPS Vazhenkada North | Malappuram | R | P | F | M |
| 44 | SMUPS Perintalmanna | Malappuram | U | P | F | M |
| 45 | GLPS Kunnakkavu | Malappuram | R | G | F | M |
| 46 | ISM UPS Olakara | Malappuram | R | P | M | M |
| 47 | PTMUPS Mannarmala | Malappuram | R | P | F | M |
| 48 | Kizhinhaniyam ALPS | Kozhikode | R | P | M | M |
| 49 | PTAM UPS Chemmaniyode | Malappuram | R | P | M | M |
| 50 | GLPS Pallikkunnu | Malappuram | R | G | M | M |
| 51 | GLPS Cheripperamba | Malappuram | R | G | M | M |
| 52 | ALPS Puliyakkode | Malappuram | R | P | M | M |

| | | | | | | |
|----|----------------------------------|--------------------|---|---|---|---|
| 53 | AMLPS Chemmaniyode | Malappuram | R | P | M | M |
| 54 | ALPS Keezhattoor | Malappuram | R | P | M | M |
| 55 | ALPS Melattoor | Malappuram | R | P | M | M |
| 56 | AMLPS Kuruvambalam | Malappuram | R | P | M | M |
| 57 | GLPS Chamal | Kozhikode | R | G | M | M |
| 58 | AMLPS Vazhenkada South | Malappuram | R | P | M | M |
| 59 | HILPS Neer kunnam | Alappuzha | R | P | M | M |
| 60 | MSCCLPS Mannarkulanjy | Kottayam | R | P | F | M |
| 61 | MTLPS Kavungumprayar | Thrissur | R | P | F | M |
| 62 | MTLPS Perayam Mulavana | Kollam | R | P | M | M |
| 63 | Kovilloor LPS | Pathanamthitta | R | P | M | S |
| 64 | St George UPS Naranganam | Kottayam | R | P | M | M |
| 65 | MGUPS Prakkanam | Pathanamthitta | R | P | M | M |
| 66 | MTLPS Cherukol | Pathanamthitta | R | P | F | M |
| 67 | KPPM UPS Elamannoor | Pathanamthitta | R | P | F | M |
| 68 | CMS LPS Omallur | Pathanamthitta | R | P | F | M |
| 69 | LMS LPS Parasuvayahil | Thiruvananthapuram | R | P | M | M |
| 70 | MSL LPS Nannuvakkad | Pathanamthitta | U | P | F | M |
| 71 | SCSE ALPS Thiruvalla | Pathanamthitta | U | P | M | M |
| 72 | LPGS Velliyam | Kollam | R | P | M | M |
| 73 | MTLPS Keekozhoor East | Pathanamthitta | R | P | F | M |
| 74 | MTLPS Poovanmala | Pathanamthitta | R | P | F | M |
| 75 | MTLPS Uthimoodu | Pathanamthitta | R | P | F | M |
| 76 | MTLPS Ponkuthara | Pathanamthitta | R | P | F | M |
| 77 | MTLPS Kanjeettukara | Pathanamthitta | R | P | F | M |
| 78 | AMLPS Muthannoor | Malappuram | R | P | M | M |
| 79 | Little Flowr LPS Thazhivan Kunnu | Pathanamthitta | R | P | M | M |
| 80 | Central Naravoor LPS | Kannur | U | P | M | M |
| 81 | SMMALPS Pandikkadu | Malappuram | R | P | F | M |
| 82 | AMLPS Chemmankadavu | Malappuram | U | P | M | S |
| 83 | GLPS Valakkode | Kollam | U | G | F | M |

| | | | | | | |
|-----|--------------------------------------|--------------------|---|---|---|---|
| 84 | Kuzhikkal LPS | Kannur | U | P | F | S |
| 85 | St. Antony's AUPS Kozhikode | Kozhikode | U | P | F | S |
| 86 | OAUPS Poopalam | Malappuram | R | P | F | M |
| 87 | HFLPS Parur | Ernakulam | R | P | F | M |
| 88 | AMUPS Munduparamba | Kannur | U | P | M | M |
| 89 | Kappakkadav JLPS Azhikode | Pathanamthitta | R | P | M | M |
| 90 | Puthussery Sirian MDLPS Kallupara | Pathanamthitta | R | P | M | M |
| 91 | Kariyadu New Muslim LPS | Kannur | R | P | F | S |
| 92 | AMLPS Edayattoor | Malappuram | R | P | F | M |
| 93 | CUPS Chandanakkampara | Kannur | R | P | M | M |
| 94 | ALPS Valiyadu | Malappuram | R | P | M | M |
| 95 | Muzhapala LPS Anjarakandy | Kannur | R | P | M | M |
| 96 | GLPS Vizhinham | Thiruvananthapuram | R | G | F | S |
| 97 | GLPS Cherumukku | Malappuram | R | G | M | M |
| 98 | MMOALPS Nellikkunnu | Malappuram | R | P | F | M |
| 99 | Mudiyambath MLPS | Kannur | R | P | F | M |
| 100 | Ayithara LPS | Kannur | R | P | F | M |
| 101 | Thrikkanapuram LPS | Kannur | U | P | M | M |
| 102 | ALPS Karthala | Malappuram | R | P | M | M |
| 103 | Kara LPS | Malappuram | U | P | F | M |
| 104 | Kantirode LPS | Kannur | R | P | F | M |
| 105 | Narayamkulam AUPS | Kannur | R | P | M | M |
| 106 | AMUPS Kunnappally | Malappuram | U | P | M | M |
| 107 | Kanhileri UPS | Kannur | R | P | F | M |
| 108 | ALPS Thelekkadu | Malappuram | R | G | F | M |
| 109 | GUPS Anakkayam | Malappuram | R | G | M | M |
| 110 | AMLPS Kidangazhi | Malappuram | U | G | M | M |
| 111 | GMLPS. Odampatta | Malappuram | R | G | F | M |
| 112 | GLPS Karuvambram | Malappuram | R | G | F | M |
| 113 | GLPS Thottupoyil | Malappuram | U | G | M | M |
| 114 | AUPS Pattarkulam | Malappuram | U | P | M | M |

| | | | | | | |
|-----|---------------------------|------------|---|---|---|---|
| 115 | GLPS Theyyampadikuthu | Malappuram | R | G | M | M |
| 116 | GMLPS Pndikkad | Malappuram | R | G | F | M |
| 117 | GLPS Narukara | Malappuram | U | G | F | M |
| 118 | ALPS Mullampara | Malappuram | U | P | F | M |
| 119 | AMAUPS Kunduthode | Malappuram | R | P | M | M |
| 120 | ALPS Pazhedam | Malappuram | R | P | F | M |
| 121 | GMLPS Manjeri South | Malappuram | U | G | M | M |
| 122 | GLPS Manhappatta | Malappuram | R | G | M | M |
| 123 | GLPS Madathumpoyil | Kozhikode | R | G | M | M |
| 124 | Akkraramba AMLPS | Malappuram | R | P | M | M |
| 125 | AMLPS Kuttasseri kulamba | Malappuram | R | G | M | M |
| 126 | AMLPS Panikkar kandu | Malappuram | R | P | F | M |
| 127 | GLPS Melmuri south | Malappuram | U | G | F | M |
| 128 | GLPS Kodur | Malappuram | R | G | F | S |
| 129 | ALPS Muthvathuparamba | Malappuram | U | P | F | M |
| 130 | GLPS Peringottupulam | Malappuram | R | G | M | M |
| 131 | AMUPS Mangattupulam | Malappuram | R | P | F | M |
| 132 | Mooriyadu Mopla LPS | Kannur | U | P | F | M |
| 133 | GLPS Kunnikode | Kollam | R | G | M | M |
| 134 | AKTM LPS Manalvayal | Kozhikode | R | P | M | M |
| 135 | Kanthapuram East AMLPS | Kozhikode | R | P | M | M |
| 136 | GLPS Kinalur | Kozhikode | R | G | M | M |
| 137 | AUPS Mangad | Kozhikode | R | P | M | M |
| 138 | AUPS Poonoor | Kozhikode | R | G | M | M |
| 139 | ALPS Adivaram | Kozhikode | R | P | M | M |
| 140 | AMLPS Nooramthodu | Kozhikode | R | P | F | M |
| 141 | AMLPS Cheppur | Malappuram | R | P | M | M |
| 142 | GMLPS Kuthirachira | Kollam | U | G | F | M |
| 143 | AUPS Irumpuchola | Malappuram | R | P | M | M |
| 144 | MMLPS Muvattupuzha | Ernakulam | U | P | F | M |
| 145 | St. Thomas LPS Mudapanoor | Ernakulam | R | P | M | S |
| 146 | DBUPS Angadikkal North | Alappuzha | R | P | F | M |
| 147 | Kudavathoor LPS | Alappuzha | R | P | F | M |

| | | | | | | |
|-----|-----------------------------|------------------------|---|---|---|---|
| 148 | SKVUPS Mundappally | Kollam | R | P | F | M |
| 149 | PTM UPS Puthangadi | Malappuram | R | P | F | M |
| 150 | ALPS Chooliyad | Malappuram | R | P | F | M |
| 151 | GUPS Kundungal | Malappuram | U | G | M | M |
| 152 | NSUPS Parakkodu | Malappuram | U | P | F | M |
| 153 | GLPS Kadavandu | Palakkad | R | G | M | M |
| 154 | MCBM ALPS Ballakodapuram | Kasargod | U | P | M | M |
| 155 | TKTIM UPS Panniyodu | Thiruvanantha puram | R | P | M | M |
| 156 | PPTMLPS Pathody | Kollam | R | P | M | M |
| 157 | PSMUPS Charara | Kollam | R | P | F | M |
| 158 | St. George UPS Chenganur | Alappuzha | R | P | F | M |
| 159 | SG UPS Thottakkara | Palakkad | R | P | M | M |
| 160 | GLPS Cheengeri | Wynad | R | G | M | M |
| 161 | Asram LPS Perumbavoor | Ernakulam | U | P | M | M |
| 162 | MPLPS Chithragiri | Wynad | R | P | M | M |
| 163 | MTLPS Kumaramperur | Pathanamthitta | R | P | F | M |
| 164 | ALPS Palathu | Kozhikode | R | P | M | M |
| 165 | GLPS Ayarknnam | Alappuzha | R | G | M | M |
| 166 | St. Joseph's UPS Peringuzha | Ernakulam | U | P | M | M |
| 167 | LMS LPS Neyyattiinkara | Thiruvanantha puram | R | G | M | M |
| 168 | ALPS Ummanazhi | Palakkad | R | P | M | M |
| 169 | JBS Kadampazhippuram | Palakkad | R | P | F | M |
| 170 | AMUPS Atteeri | Malappuram | R | P | M | M |
| 171 | Thiruvode ALPS | Kozhikode | R | P | M | M |
| 172 | Paloli AMLPS | Malappuram | R | P | M | M |
| 173 | GUPS Elettil | Kozhikode | R | G | M | M |
| 174 | GLPS Puthanangadi | Malappuram | R | G | F | M |
| 175 | GLPS Madathinpoyil | Kozhikode | R | G | M | M |
| 176 | ALPS Kandalapatta | Malappuram | R | P | M | M |
| 177 | SVALPS Karikkadu | Malappuram | R | P | F | M |
| 178 | GUPS Kuruka | Malappuram | R | G | M | M |

| | | | | | | |
|-----|---------------------------------------|------------|---|---|---|---|
| 179 | GMUPS Melakkem | Malappuram | U | G | F | M |
| 180 | AMUPS Pulikkode South | Malappuram | R | P | F | M |
| 181 | GMUPS Kodinhi | Malappuram | R | G | M | M |
| 182 | AMLPS Kahiyattumukku | Malappuram | R | P | M | M |
| 183 | GMLPS Chappanangadi | Malappuram | R | G | M | M |
| 184 | CKMMALPS Panakkad | Malappuram | U | P | F | M |
| 185 | AMLPS West Muthiriparamba | Malappuram | R | P | M | M |
| 186 | Puthiyamaliyakkal AMLPS Malappuram | Malappuram | U | P | M | M |
| 187 | GZPS Olakara | Malappuram | R | G | M | M |
| 188 | AMLPS Poovat | Malappuram | R | P | M | M |
| 189 | AMLPS Cheruputhur | Malappuram | R | P | M | M |
| 190 | ALPS Chittathupara | Malappuram | R | P | F | M |
| 191 | GMLPS Pathapiriyam | Malappuram | R | G | M | M |
| 192 | GLPS Arukizhaya | Malappuram | U | G | M | M |
| 193 | GLPS Cherankuth | Malappuram | R | G | M | M |
| 194 | AMUPS Valluvambram | Malappuram | R | P | M | M |
| 195 | GLPS Cherukulam | Malappuram | R | G | M | M |
| 196 | GLPS Cheruvannoor | Malappuram | R | G | M | M |
| 197 | SULPS Kuttoor | Malappuram | R | P | M | M |
| 198 | GLPS Parambil Peedika | Malappuram | R | G | F | S |
| 199 | GMLPS Mundayangara | Malappuram | R | G | F | M |
| 200 | ALPS Vattaparamba | Malappuram | R | P | F | M |
| 201 | GMLPS Mangalassery | Malappuram | U | G | M | M |
| 202 | ALPS Karayil | Malappuram | R | P | F | S |
| 203 | Kundoor Naduveettil AMLPS | Malappuram | R | P | M | M |
| 204 | MUAUPS Panakkad | Malappuram | U | P | F | M |
| 205 | GMLPS Tirurangadi | Malappuram | R | G | M | M |
| 206 | GLPS Edakkparamba | Malappuram | R | G | M | M |
| 207 | AEMAUPS Moorkkanad | Malappuram | R | P | M | M |
| 208 | GLPS Vilakkuvettam | Kollam | U | G | F | M |
| 209 | AMUPS Koottil | Malappuram | R | P | F | M |
| 210 | MMALPS Vadakkangara | Malappuram | R | P | M | M |

| | | | | | | |
|-----|-----------------------------|--------------------|---|---|---|---|
| 211 | GLPS Pazhamalloor | Malappuram | R | G | M | M |
| 212 | AMLPS Pariyapuram | Malappuram | R | P | F | S |
| 213 | ALPS Valamboor West | Malappuram | R | P | F | S |
| 214 | AMLPS Valemboor | Malappuram | R | P | M | M |
| 215 | AMLPS Kachinikkad | Malappuram | R | P | M | M |
| 216 | GLPS Valikkapetta | Malappuram | R | G | M | M |
| 217 | MMSAUPS Kozhinhil | Malappuram | R | P | M | M |
| 218 | ALPS Pathiramanna | Malappuram | R | P | M | M |
| 219 | AMLPS Ramapuram | Malappuram | R | P | M | M |
| 220 | AMLPS Mannaramba | Malappuram | R | P | M | M |
| 221 | AMLPS Padinhattummuri East | Malappuram | R | P | M | M |
| 222 | AUPS Vazhikkadavu | Malappuram | R | P | M | M |
| 223 | AMLPS Pang South | Malappuram | R | P | M | M |
| 224 | AUPS Kuruva | Malappuram | R | P | F | M |
| 225 | Thiruthi AUPS, Velimukku | Malappuram | R | P | M | M |
| 226 | Ponnam South LP Kadirur | Kannur | R | P | F | M |
| 227 | Ganapath AUP Karimkallai | Kozhikode | R | P | M | M |
| 228 | Kolavallloor East LPS | Kannur | R | P | F | S |
| 229 | GUPS Nemom | Thiruvananthapuram | R | G | M | M |
| 230 | KALPS Panamanna | Palakkad | R | P | M | M |
| 231 | AVLPS Vadakkancheri | Palakkad | R | P | F | M |
| 232 | Manakkad GUPS | Thrissur | R | G | M | M |
| 233 | GLPS Vengod | Palakkad | R | G | M | M |
| 234 | AUPS Tenhipalam | Malappuram | R | P | F | M |
| 235 | GLPS Padinhattummuri | Malappuram | R | G | M | M |
| 236 | MISMUPS Tenhipalam | Malappuram | R | P | F | M |
| 237 | AMLPS Parappur, Iringalloor | Malappuram | R | P | M | M |
| 238 | KMLPS Kuttoor North | Malappuram | R | P | F | M |
| 239 | GMLPS Velimukku | Malappuram | R | G | M | M |
| 240 | ALPS Valakkulam | Malappuram | R | P | M | M |
| 241 | GLPS Calicut University | Malappuram | R | G | M | M |
| 242 | AMLPS Manathumangalam | Malappuram | U | P | M | M |

| | | | | | | |
|-----|------------------------------|------------|---|---|---|---|
| 243 | Ganapath Vilasam LPS, Kannur | Malappuram | U | P | F | S |
| 244 | MMALPS Mukkil Cheriyam | Malappuram | R | P | F | M |
| 245 | GLPS Pang | Malappuram | R | G | F | M |
| 246 | GLPS Pothukundu | Malappuram | R | G | M | M |
| 247 | PKHMALPS Padapparamba | Malappuram | R | P | M | M |
| 248 | MAMUPS Vellila | Malappuram | R | P | M | M |
| 249 | GLPS Pakkaparambil | Malappuram | R | G | M | M |
| 250 | GLPS Karkidakam | Malappuram | R | G | F | M |
| 251 | GLPS Poopalam | Malappuram | R | G | M | M |
| 252 | GLPS Thekketheri | Kollam | R | P | F | M |
| 253 | Narayana UPS Manappuram | Malappuram | R | P | F | M |
| 254 | ALPS Pariyapuram | Malappuram | R | P | M | M |
| 255 | AMLPS Pulikkalparamba | Malappuram | R | P | F | M |
| 256 | AMLPS Cherakkaparamba | Malappuram | R | P | F | M |
| 257 | GUPS Pang | Malappuram | R | G | M | M |
| 258 | AMLPS Vattaloor | Malappuram | R | P | F | M |
| 259 | AMLPS Thirurkkad | Malappuram | R | P | F | M |
| 260 | AMLPS Eranthode | Malappuram | R | P | F | M |
| 261 | ALPS Kolathur | Malappuram | R | P | F | M |
| 262 | AMUPS Cherakkaparamba | Malappuram | R | P | F | M |
| 263 | ALPS Pang West | Malappuram | R | P | M | M |
| 264 | AMLPS Aripa | Malappuram | R | P | M | M |
| 265 | AMLPS Aripa Melmuri | Malappuram | R | P | F | M |
| 266 | GUPS Kottilangadi | Malappuram | R | G | M | M |
| 267 | AMLPS Kadannamana North | Malappuram | R | P | M | M |
| 268 | ALPS Chovvana | Malappuram | R | G | M | M |
| 269 | AHLPS Ramapuram | Malappuram | R | P | M | M |
| 270 | MRLPS Cherukulamba | Malappuram | R | P | M | M |
| 271 | PMSALPS Kadannamutty Pang | Malappuram | R | P | M | M |
| 272 | PPTMALPS Punnakkad | Malappuram | R | P | M | S |
| 273 | AMUPS Vangad | Malappuram | R | P | F | M |
| 274 | AMLPS Parappur West | Malappuram | R | P | F | M |
| 275 | ALPS Kdannamanna South | Malappuram | R | P | M | M |

Sub samples

Sub samples of the study were selected on the basis of sex, age, educational qualifications, teaching experience and marital status of the heads of schools and locality and management category of their schools. Sub samples obtained for the study were the following.

i. Based on sex

Male (N= 169) and female (N=106) heads of schools were selected as sub samples based on sex.

ii. Based on age

Three sub samples were selected based on the age of the heads of schools. They are, heads of schools having age (a) up to 40 years (N= 36), (b) 41-50 years (N= 120) and (c) 51 and above years (N= 119)

iii. Based on educational qualifications

Three sub samples i.e. under graduates (N= 212), graduates (N= 49), and post graduates (N=14) were selected for the study based on the educational qualifications of heads of primary schools.

iv. Based on teaching experience

Three sub samples were selected based on the teaching experience of heads of schools. They are, heads of schools having experience (a) up to 20 years (N= 65), (b) 21-30 years (N= 156) and 31 and above years (N= 54).

v. **Based on marital status**

Married (N= 258) and single (N= 17) heads of schools were the two sub samples based on the marital status.

vi. **Based on locality**

Sub samples of the study based on the locality of the school were heads of schools working in rural(N=223) and urban (N=52) primary schools

vii. **Based on management category**

Heads of schools working in private (N= 197) and government (N= 78) primary schools were the sub samples of the study based on the management category.

E. SCORING AND CONSOLIDATION OF DATA

The 275 pairs of response sheets were serially numbered. The scores of Stress and Professional Efficiency of the heads of schools were tabulated along with other data such as sex, age, educational qualifications, teaching experience, marital status of the subjects and locality and management category of the respective schools. The dimension wise score of the variables were also found out. The data were entered in such a way that they could be used for computer data processing.

F. STATISTICAL TECHNIQUES USED

The objectives of the study and hypotheses to be tested dictated the following techniques for analysis:

1. For the preliminary analysis of the scores, statistical indices of mean, median, mode, standard deviation, skewness and kurtosis of the distribution of Stress and Professional Efficiency of the heads of primary schools were computed.
2. The levels of Stress of the heads of primary schools were estimated by finding out the percentages of heads of schools coming under, High, Moderate and Low levels of Stress. Percentages of heads of schools coming under different dimensions of Stress were also computed.

The comparison of percentages of heads of schools having different levels of Stress belonging to different sub samples were done using the formula,

$$CR = \frac{P_1 - P_2}{\sqrt{PQ \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Where,

$$P = \frac{P_1 N_1 + P_2 N_2}{N_1 + N_2} \text{ and } Q = 100 - P$$

P_1 & P_2 = Percentage of primary school heads having different levels of Stress in the first and second samples

N_1 & N_2 = Number of heads of schools in the first and second samples.

The critical ratios were interpreted using two tailed test of significance.

3. The test of significance for difference between means

The difference between means of Stress and Professional Efficiency of the heads of primary schools for the total sample and for the sub samples were found out by the formula,

$$CR = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Where,

M_1 & M_2 = Mean values for the first and second group

σ_1 & σ_2 = standard deviation of the first and second group

N_1 & N_2 = size of the sample of the first and second group.

Critical ratios were interpreted using two tailed test of significance.

4. Biserial Coefficient of Correlation

The association between the variables of the study and the dichotomous variables such as sex and marital status of the heads of primary schools and the locality and management category of the schools, was found out using biserial coefficient of correlation (Garrett, 1979).

$$r_{bis} = \frac{m_p - m_q}{\sigma} \times \frac{pq}{u}$$

Where,

m_p = Mean of the group in the first category.

m_q = Mean of the group in the second category

σ = Standard deviation of the entire group

p = Proportion of the entire group in the first category.

q = Proportion of the entire group in the second category

($q = 1-p$)

u = height of the normal curve ordinate dividing the two parts p & q .

Test of significance of r_{bis} :

If the obtained r_{bis} is greater than $1.96 \times Sr_{bis}$, r_{bis} will be significant at 0.05 level (Guilford, 1970).

$$Sr_{bis} = \frac{\sqrt{pq}}{u\sqrt{N}}$$

Where, N = total number of subjects, and other symbols are as explained above. The 0.95 confidence interval is ($r_{bis} \pm 1.96 Sr_{bis}$).

5. Chi-square Test

Association between educational qualifications of the heads of schools and the variables of the study was estimated by chi-square test (Garrett, 1979).

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

Where,

f_o = observed frequency of occurrence

f_e = expected frequency of occurrence.

Interpretation of the χ^2 values was done with the help of chi-square table for $df = (r-1)(c-1)$ where r and c are the number of rows and columns respectively, in the chi-square table.

6. Pearson's Product Moment Coefficient of Correlation

This was used (1) to find out the relationship between Stress and Professional Efficiency of the heads of schools for the total sample and for the sub-samples, and (2) to find out the association between the variables of the study, and age and teaching experience of the heads of schools.

The obtained 'r' has been interpreted using the following procedure:

- (a) Testing the significance of the obtained correlation coefficient against null hypothesis,

$$\text{i.e. } r \geq 1.96 / \sqrt{N} \text{ or } r \geq 2.58 / \sqrt{N} \quad (\text{Garrett, 1979})$$

- (b) Verbally interpreting the significant 'r' using the following classification (Garrett, 1979).

'r' from 0 to ± 0.20 denotes Negligible relationship.

'r' from ± 0.20 to ± 0.40 denotes Low correlation

'r' from ± 0.40 to ± 0.70 denotes Substantial relationship

'f' from ± 0.70 to ± 1.00 denotes High to Very High relationship.

- (c) Working out the 0.05 or 0.01 confidence interval for all r 's (depending up on the significance) as,

$$r \pm 1.96 \times \frac{(1-r^2)}{\sqrt{N}} \text{ or } r \pm 2.58 \frac{(1-r^2)}{\sqrt{N}} \quad (\text{Garrett, 1979})$$

- (d) Determining the percentage overlap (shared variance) and interpreting this as a measure of association. Shared variance is given by $r^2 \times 100$ (Fox, 1969).

7. Comparison of f 's

r 's obtained for the sub samples were compared using the formula presented by Garrett, (1979).

$$CR = \frac{\bar{z}_1 - \bar{z}_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}$$

Where,

z_1 = Fischer's z corresponding to r_1

z_2 = Fischer's z corresponding to r_2

N_1 = Size of the sample 1

N_2 = Size of the sample 2

Critical ratios were interpreted using the two tailed test of significance.

8. Multiple Linear Regression Analysis

Multiple Linear Regression Analysis uses to predict the value of one or more dependant variables from a collection of

independent variables. When there are two or more independent variables, a best sub set of independent variables which are highly contributing on dependent variables, is found out using forward stepwise method, In each step we take a sub set of independent variables and test its effectiveness on the dependent variables using F-test. A best sub set is the one having high F-value and maximum influence on the dependant variable and low residual value.

In the present study the four dimensions of Stress of heads of primary schools are treated as four independent variables and the seven dimensions of their Professional Efficiency as seven dependent variables.

For predicting the Professional Efficiency of the heads of schools from their Stress, the regression formula obtained from the analysis of the best subset in the forward stepwise regression method is used.

Multiplier Linear Regression Analysis was done with the help of computer using MINI-TAB software.

9. The Principal Component Analysis

A Principal Component Analysis is concerned with explaining the variance-co-variance structure through a few linear combinations of the original variables. Its general objectives are (1) data reduction and (2) interpretation.

In Principal Component Analysis, an attempt was first made to find a linear combination of the Stress variables x_1, x_2, x_3

and x_4 in such a way that a maximum of variance is extracted from these four variables.

Where

x_1 = Physiological factors

x_2 = Psychological factors

x_3 = Social and familial factors

x_4 = Occupational factors

such a linear combination is indicated as PC_1 (Principal Component 1). PC_1 can be explained as

$$PC_1 = a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4$$

In the exceptional situations in which PC_1 would extract 100% of variance of the four variables, the first component would be sufficient because, it would exhaustively represent all information of the data. This is of course seldom the case.

Suppose for example, the situation in which the first component shares only 60% of the variance with the four variables, we then look for a second component, perpendicular to the first, in such a way that next maximum variability is extracted from the remaining 40%. Next we look for a third component and then for a fourth component, if the situation demands so. The four components together extract 100% of the variance of the four variables.

Thus in Principal Component Analysis, we look for as many linear combinations as there are, under two restricting conditions;

1. The components have to be perpendicular.
2. The first component has to extract as much variance as possible from the original variables, the second component as much as possible from the remaining variance, etc. until all variance is used up.

In the full form the PCA model has as many components as variables. The diagram for a three variable model is presented in Figure 6.

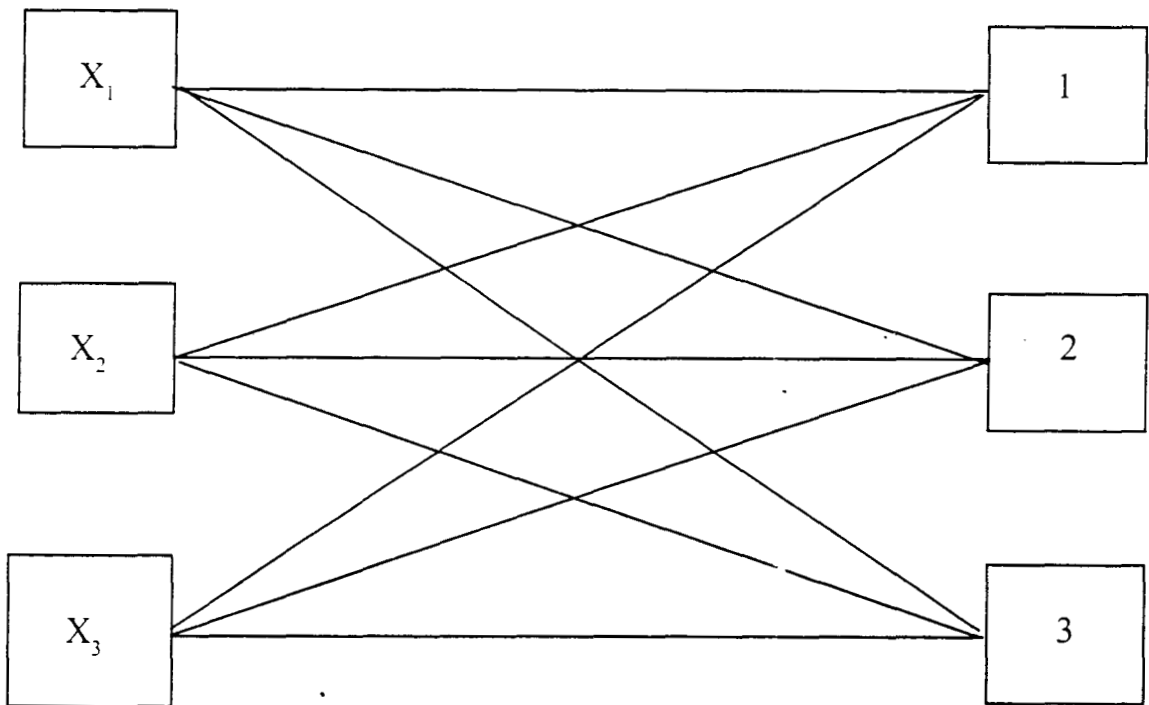


Fig. 6 A three variables model of PCA

In the present study PCA was done for both Stress and Professional Efficiency. PCA was carried out with the help of computer using MINI-TAB software.

10. Canonical Correlation Analysis

Canonical correlation is the correlation between two sets of variables. In the present study components (dimensions) of Stress are considered as one set and components (dimensions) of Professional Efficiency as the other set.

In the present study, Stress of heads of primary schools i.e. X^* and Professional Efficiency of heads of schools i.e. Y^* are called canonical variables. The correlation between the two is known as canonical correlation (P). The first canonical variable X^* is measured by $p = 4$ indicators i.e. (4 dimension of Stress) and we will consider X^* as a linear combination (a weighted sum) of the X variables. Similarly, Y^* the second canonical variable is a linear combination of $q = 7$ indicators i.e. Y_1 to Y_7 . Generally X set contain p variables and Y set contain q variables. The diagram for the canonical correlation can be represented as in Figure 7.

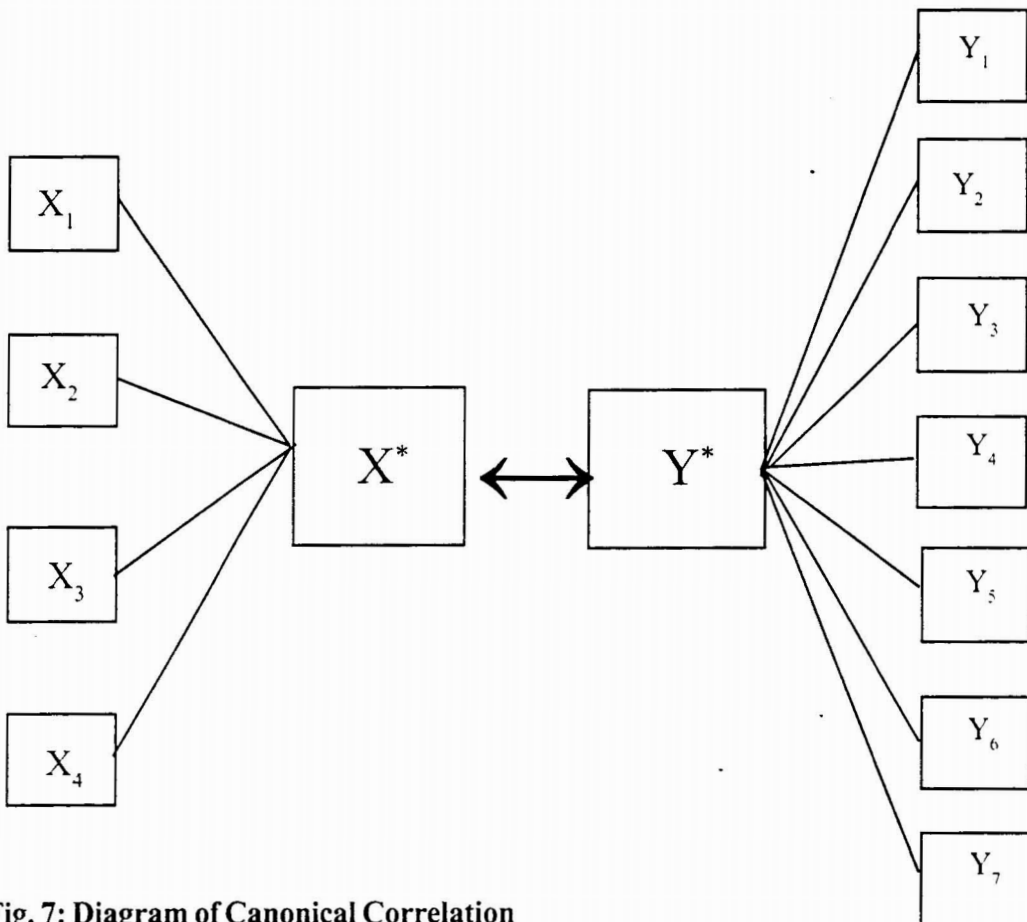


Fig. 7: Diagram of Canonical Correlation

In Canonical Correlation Analysis, we want to see if there is significant association between a set of X variables and a set of Y variables. For this reason we look for a linear combination X^* , of the X set, and a linear combination Y^* of the Y set in such a way that there is maximum correlation between X^* and Y^* . The correlation P between X^* and Y^* is called canonical correlation.

Canonical Correlation Analysis aims to examine the between correlation and not the within correlation. P measures to what degree the Stress and Professional Efficiency of heads of primary schools are correlated, controlling for (i.e. assuming the absence of) within-association, within the Stress components on the one hand and the Professional Efficiency components on the other.

Objective of the technique are the following:

- i. We look for a first pair of linear combinations, one from the set of Stress variables and one from the set of Professional Efficiency variables in such way that the correlation between both of the linear combinations is maximal. Next, we look for a second linear combination also maximally correlated and uncorrelated with the first pair. We do this as many times as there are variables in the smallest set. We call the linear combinations as canonical variables. The weights are known as canonical weights. The maximized correlations are called canonical correlations. On the basis

of the canonical weights, we attempt to interpret the association between the sets.

- ii. Making use of the canonical weights, the scores of the canonical variables are calculated.
- iii. We check to see whether the associations between the two sets can be generalized to the population. This is done by testing the canonical correlations for significance. since the first canonical correlation is the largest and the following correlations become smaller and smaller, it seems obvious to test these separately, and only to interpret the ones which give us the most significant result.

The Canonical Correlation Analysis in the present study was carried out with the help of computer using 'Statistica' software.

The data for the study has been analysed using the techniques mentioned above. Statistical processing for Multiple Linear Regression Analysis, Principal Component Analysis and Canonical Correlation Analysis were done by the computer.

**A STUDY ON STRESS AND PROFESSIONAL
EFFICIENCY OF THE HEADS OF PRIMARY
SCHOOLS IN KERALA**

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*THESIS SUBMITTED FOR THE DEGREE OF
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2000

ANALYSIS

SECTION ONE

- DESCRIPTIVE ANALYSIS
- STUDY OF GROUP DIFFERENCES
- ANALYSIS OF PERCENTAGES
- ANALYSIS OF ASSOCIATION

SECTION TWO

- CORRELATION ANALYSIS
 - MULTIPLE LINEAR REGRESSION ANALYSIS
 - PRINCIPAL COMPONENT ANALYSIS
 - CANONICAL CORRELATION ANALYSIS
-

ANALYSIS

The study intended to find out the extent of Stress experienced by the heads of primary schools in Kerala and its influence on their Professional Efficiency. The Stress was treated as the independent variable and the Professional Efficiency as the dependent variable. The analysis was done in accordance with the major objectives of the study as mentioned below.

1. To compare the mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools in Kerala and the locality and management category of their schools.
2. To study the levels of Stress experienced by the heads of primary schools in Kerala.
3. To compare the percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.
4. To compare the percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
5. To examine whether any association exists between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables

and Professional Efficiency of the heads of primary schools in Kerala.

6. To find out the relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.
7. To compare the relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples.
8. To identify the most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala.
9. To find out whether the variance -co-variance structure of Stress and Professional Efficiency of heads of primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency.
10. To find out whether significant association exists between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

Based on the objectives the hypotheses formulated for the study were as follows:

1. There will be significant difference in mean scores of Stress and Professional Efficiency for the selected sub-samples based

on sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools in Kerala and locality and management category of their schools.

2. There will be different levels of Stress experienced by the heads of primary schools in Kerala.
3. There will be significant difference in percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.
4. There will be significant difference in percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
5. There will be significant association between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables and Professional Efficiency of the heads of primary schools in Kerala.
6. There will be significant relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.
7. There will be significant difference in relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples.

8. There will be a most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala.
9. The variance-co-variance structure of Stress and Professional Efficiency of the heads of primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency.
10. There will be significant association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

The scores obtained on the variables were subjected to statistical treatment. The analysis of the data has been presented in two sections under the following heads:

Section **One**

- A. Descriptive Analysis
- B. Study of Group Differences
- C. Analysis of Percentages
- D. Analysis of Association

Section **Two**

- A. Correlation Analysis
- B. Multiple Linear Regression Analysis
- C. Principal Component Analysis
- D. Canonical Correlation Analysis

SECTION ONE

- A. Descriptive Analysis
- B. Study of Group Differences
- C. Analysis of Percentages
- D. Analysis of Association

SECTION ONE

A. DESCRIPTIVE ANALYSIS

The scores obtained for Stress and Professional Efficiency of the heads of schools were subjected to preliminary statistical analysis to decide the further statistical procedure to be done. The major statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the independent and dependent variables were calculated. The distribution were separately examined for normality.

The statistical constants of the Stress and Professional Efficiency for the total sample are presented in Table 8.

TABLE 8
Statistical Constants of Stress and
Professional Efficiency of the Heads of Primary Schools

| Sl. No | Variables | N | Mean | Median | Mode | Standard deviation | Skewness | Kurtosis |
|--------|-------------------------|-----|--------|--------|---------|--------------------|----------|----------|
| 1 | Stress | 275 | 26.580 | 25.873 | 24.459 | 11.499 | 0.184 | 0.288 |
| 2 | Professional Efficiency | 275 | 97.064 | 98.069 | 100.081 | 14.017 | -0.215 | 0.276 |

Table 8 reveals that both of the distributions are approximately normal since the three measures of central tendency are in close proximity and the indices of skewness and kurtosis are near to normal.

The statistical constants such as mean, median, mode and standard deviation were found out for the sub-samples based on the sex, age, educational qualifications, teaching experience and marital status of the heads of schools and the locality and management category of schools in which they are working. The statistical constants for Stress is presented in Table 9 and that for Professional Efficiency in Table 10.

TABLE 9
Statistical Constants of Stress of
Heads of Primary Schools for Different Sub-samples

| Sl No. | Sub-samples | N | Mean | Median | Mode | Standard deviation |
|--------|-------------------------------|-----|--------|--------|--------|--------------------|
| 1 | Males | 169 | 26.275 | 25.283 | 23.298 | 10.938 |
| 2 | Females | 106 | 27.066 | 27.167 | 27.368 | 12.325 |
| 3 | Age up to 40 years | 36 | 29.167 | 28.500 | 27.167 | 14.530 |
| 4 | Age 41-50 years | 120 | 28.433 | 26.100 | 21.433 | 10.905 |
| 5 | Age 51 and above | 119 | 25.475 | 25.278 | 24.884 | 10.423 |
| 6. | Under graduates | 212 | 26.236 | 26.184 | 26.081 | 10.469 |
| 7. | Graduates | 49 | 28.173 | 23.409 | 13.880 | 15.415 |
| 8. | Post graduates | 14 | 26.214 | 26.500 | 27.071 | 9.765 |
| 9. | Experience up to 20 years | 65 | 27.146 | 25.423 | 21.977 | 12.571 |
| 10. | Experience 21-30 years | 156 | 27.321 | 26.841 | 25.883 | 11.161 |
| 11. | Experience 31 and above years | 54 | 23.759 | 23.357 | 22.553 | 10.387 |
| 12. | Married | 258 | 26.484 | 25.875 | 24.656 | 11.342 |
| 13. | Single | 17 | 27.559 | 25.833 | 22.382 | 12.235 |
| 14. | Rural | 223 | 26.455 | 25.676 | 24.119 | 11.569 |
| 15. | Urban | 52 | 27.115 | 24.750 | 20.019 | 11.174 |
| 16. | Private | 197 | 27.038 | 26.453 | 25.284 | 11.756 |
| 17. | Government | 78 | 25.423 | 24.833 | 23,654 | 10.735 |

TABLE 10
Statistical Constants of Professional Efficiency
of the Heads of Primary Schools for Different Sub samples

| Sl No. | Sub-samples | N | Mean | Median | Mode | Standard deviation |
|--------|-------------------------------|-----|--------|---------|---------|--------------------|
| 1 | Males | 169 | 97.334 | 98.266 | 100.629 | 13.703 |
| 2 | Females | 106 | 96.632 | 97.700 | 99.836 | 14.493 |
| 3 | Age up to 40 years | 36 | 96.056 | 98.278 | 102.722 | 16.988 |
| 4 | Age 41-50 years | 120 | 96.500 | 97.274 | 98.823 | 13.687 |
| 5 | Age 51 and above | 119 | 97.931 | 98.781 | 100.470 | 13.282 |
| 6. | Under graduates | 212 | 96.538 | 97.591 | 99.697 | 13.697 |
| 7. | Graduates | 49 | 98.765 | 100.917 | 105.219 | 15.958 |
| 8. | Post graduates | 14 | 99.071 | 97.167 | 93.357 | 10.425 |
| 9. | Experience up to 20 years | 65 | 95.192 | 96.026 | 97.694 | 14.247 |
| 10. | Experience 21-30 years | 156 | 97.294 | 98.921 | 102.173 | 13.751 |
| 11. | Experience 31 and above years | 54 | 98.468 | 98.500 | 98.204 | 14.250 |
| 12. | Married | 258 | 97.244 | 98.147 | 99.953 | 14.549 |
| 13. | Single | 17 | 94.324 | 96.750 | 101.603 | 11.823 |
| 14. | Rural | 223 | 97.159 | 98.381 | 100.826 | 13.835 |
| 15. | Urban | 52 | 96.654 | 96.654 | 96.654 | 14.761 |
| 16. | Private | 197 | 96.312 | 97.136 | 98.785 | 14.368 |
| 17. | Government | 78 | 98.962 | 100.935 | 104.861 | 14.441 |

The descriptive analysis (Table 9 &10) revealed that the data obtained in the present study is suitable for further analysis as decided earlier. As a first step, the investigator studied the

group differences in mean values of Stress and Professional Efficiency as described below.

B. STUDY OF GROUP DIFFERENCES

The means of Stress and Professional Efficiency were compared for the different sub-samples based on the sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools and the locality and management category of schools in which they were working. The critical ratios obtained were interpreted using two tailed test of significance and are presented below.

i. Sex difference

The test of significance for difference between mean scores of the variables for male and female heads of schools are presented in table 11.

TABLE 11
Data and the Results of Test of
Significance for Difference between Means for Sex Groups

| Variables | Sex groups | | | | Critical ratios |
|-------------------------|---------------|--------|-----------------|--------|-----------------|
| | Males (N=169) | | Females (N=106) | | |
| | M | SD | M | SD | |
| Stress | 26.275 | 10.938 | 27.066 | 12.325 | -0.541 |
| Professional Efficiency | 97.334 | 13.703 | 96.632 | 14.493 | 0.399 |

Table 11 shows that the sex difference in mean values of Stress is not significant. Similarly the difference between means of Professional Efficiency for headmasters and headmistresses is not significant.

ii. Age group difference

The age group difference in means of variables under study were analysed. Heads of schools were divided into three age groups. The mean scores and the critical ratios of difference in means are given in Table 12.

TABLE 12
Data and the Results of the Test
of Significance for Difference between Means for Age Groups.

| Variables | Age groups (In years) | | | | | | Critical ratios | | |
|----------------------------|-----------------------|--------|---------------------|--------|-------------------------|--------|------------------------|------------------------|------------------------|
| | Group 1 | | Group 2 | | Group 3 | | Between Group 1 & 2 | Between Group 2 & 3 | Between Group 1 & 3 |
| | Upto 40 (N = 36) | | 41 -50 (N = 120) | | 51 & above (N = 119) | | | | |
| | M | SD | M | SD | M | SD | | | |
| Stress | 29.167 | 14.530 | 28.433 | 10.905 | 25.475 | 10.423 | 0.280 | 1.554 | -0.887 |
| Professional Efficiency | 96.056 | 16.988 | 96.500 | 13.687 | 97.931 | 13.282 | -0.144 | -0.824 | -0.578 |

Table 12 shows that in the case of mean Stress and mean Professional Efficiency there is no significant difference among the age groups. It indicates that the Stress and Professional

Efficiency of the heads of schools belonging to different age groups are almost alike.

iii. Difference based on educational qualifications

The heads of primary schools were classified into three groups based on their educational qualifications as under graduates, graduates and post-graduates. Critical ratios between means of the variables for these groups were calculated. Details of the data and the results of the test of significance for difference between means for groups based on educational qualifications are given in Table 13.

TABLE 13
Data and the Results of the
Test of Significance for Difference between
Means for Groups based on Educational Qualifications.

| Variables | Educational qualifications groups | | | | | | Critical ratios | | |
|----------------------------|-----------------------------------|--------|-----------------------|--------|---------------------------------|--------|------------------------|------------------------|------------------------|
| | Group 1 | | Group 2 | | Group 3 | | Between group 1 & 2 | Between group 2 & 3 | Between group 1 & 3 |
| | Under Graduates (N = 212) | | Graduates (N = 49) | | Post - Graduates (N = 14) | | | | |
| | M | SD | M | SD | M | SD | | | |
| Stress | 26.236 | 10.469 | 28.173 | 15.415 | 26.214 | 9.765 | -0.836 | 0.574 | 0.008 |
| Professional Efficiency | 96.538 | 13.697 | 98.765 | 15.958 | 99.071 | 10.425 | -0.903 | -0.085 | -0.862 |

Table 13 shows that there are no significant differences in means of Stress and Professional Efficiency among the different

groups based on the educational qualifications of the heads of schools. It means that heads of schools having different educational qualifications are similar in their Stress and Professional Efficiency.

iv. Difference based on teaching experience

Test of significance for difference in means of the select variables among groups based on teaching experience of the heads of schools were carried out. Details of the test of significance is given in Table 14.

TABLE 14
Data and the Results of the Test of Significance
for Difference between Means for Teaching Experience Groups.

| Variables | Teaching experience (In years) | | | | | | Critical ratios | | |
|----------------------------|--------------------------------|--------|---------------------|--------|------------------------|--------|------------------------|------------------------|------------------------|
| | Group 1 | | Group 2 | | Group 3 | | Between group 1 & 2 | between group 2 & 3 | Between group 1 & 3 |
| | Up to 20 (N = 65) | | 21 -30 (N = 156) | | 31 & above (N = 54) | | | | |
| | M | SD | M | SD | M | SD | | | |
| Stress | 27.146 | 12.751 | 27.321 | 11.161 | 23.759 | 10.387 | -0.096 | 2.130 * | 1.597 |
| Professional Efficiency | 95.192 | 14.247 | 97.294 | 13.751 | 98.648 | 14.250 | -1.010 | -0.607 | -1.317 |

(Note: * indicates significance at 0.05 level)

Table 14 reveals that significant difference (at 0.05 level) exists only between means Stress of heads of primary schools having teaching experience of 21-30 years and more than 30

years. The Stress of heads of schools having a teaching experience of 21-30 years is higher than those having experience more than 30 years. No significant difference in mean Stress was found to exist among other experience groups of the heads of schools. In the case of Professional Efficiency, no significant difference exists between means among groups based on teaching experience. This means that heads of schools belonging to different teaching experience groups are alike in their Professional Efficiency.

v. Difference based on marital status

Among the obtained sample of 275 heads of schools 258 (N=258) were married and 17 (N=17) were single. The mean scores of the two groups for the select variables were compared and the details are presented in Table 15.

TABLE 15
Data and the Results of the Test of Significance
for Difference between Means for Marital Status Groups.

| Sl. No | Variables | Marital Status | | | | Critical ratios |
|--------|-------------------------|-----------------|--------|---------------|--------|-----------------|
| | | Married (N=258) | | Single (N=17) | | |
| | | M | SD | M | SD | |
| 1 | Stress | 26.484 | 11.342 | 27.552 | 12.235 | -0.352 |
| 2 | Professional Efficiency | 97.244 | 14.549 | 94.324 | 11.823 | 0.971 |

It appears from Table 15 that there is no significant difference between means of the married and single heads of primary schools either in Stress or in Professional Efficiency.

vi. Difference based on locality of the school

The mean scores for Stress and Professional Efficiency for the heads of rural and urban primary schools were compared. The data and results of the test of significance for difference between means are presented in Table 16.

TABLE 16
Data and the Results of the Test of Significance
for Difference between Means for School Locality Groups

| Sl. No | Variables | Locality | | | | Critical Ratios |
|--------|-------------------------|---------------|--------|--------------|--------|-----------------|
| | | Rural (N=223) | | Urban (N=52) | | |
| | | M | SD | M | SD | |
| 1 | Stress | 26.455 | 11.569 | 27.115 | 11.174 | -0.381 |
| 2 | Professional Efficiency | 97.159 | 13.835 | 96.654 | 14.761 | 0.225 |

Table 16 indicates that no significant difference exists between mean values of Stress and Professional Efficiency of heads in rural and urban schools. This means that heads of rural and urban primary schools are almost equal in their mean Stress and Professional Efficiency.

vii. Difference based on management category of schools

The heads of private and government schools were compared for their mean Stress and Professional Efficiency. The data and the results of the test of significance for difference between means are given in Table 17

TABLE 17
Data and the Results
of the Test of Significance for Difference
between Means for School Management Groups

| Sl. No | Variables | Management categories | | | | Critical ratios |
|--------|-------------------------|-----------------------|--------|-------------------|--------|-----------------|
| | | Private (N=197) | | Government (N=78) | | |
| | | M | SD | M | SD | |
| 1 | Stress | 27.038 | 11.756 | 25.423 | 10.735 | 1.094 |
| 2 | Professional Efficiency | 96.312 | 14.368 | 98.962 | 14.441 | -1.373 |

Table 17 shows that there is no significant difference between mean Stress and Professional Efficiency of heads in private and government schools. This implies that heads of private and government primary schools are almost alike in their Stress and Professional Efficiency.

Discussion

The study of group differences proved that there is no significant difference in mean Stress of heads of schools among sub -samples based on their sex, age, educational qualifications

and marital status and locality and management category of their schools. But among groups based on teaching experience only the mean Stress of heads of schools having an experience of 21-30 years was found to be higher than those having teaching experience more than 30 years.

No significant differences were observed in the mean Professional Efficiency of different sub-samples of heads of primary schools based on the basal variables.

C. ANALYSIS OF PERCENTAGES

Analysis of percentages was carried out to understand the level of total Stress experienced by the heads of schools and to examine whether any significant difference exists among the sub-samples. The level of Stress was also examined for different dimensions of the Stress.

The analysis of percentages is described in the order mentioned below.

1. Level of total Stress experienced by the heads of schools
2. Comparison of the percentages of heads of schools experiencing different levels of Stress.
3. Percentage of heads of schools experiencing different dimensions of Stress.

4. Comparison of percentages of heads of schools experiencing Stress under different dimensions.

1. **Levels of total Stress experienced by the heads of schools**

The heads of primary schools were classified into three groups on the basis of their Stress scores. Heads of schools with Stress scores above the value $M+1$ S.D (i.e., score 38 and above) were considered as High Stress group and with Stress score below $M-1$ S.D (i.e. score 15 and below) were considered as Low Stress group. Heads of schools whose Stress scores are between $M+1$ S.D and $M-1$ S.D (i.e. between score 16 and 37) were considered as Moderate Stress group.

The details of percentages of heads of schools under different Stress groups are presented in Table 18.

TABLE 18
Details of Percentages of
Heads of Schools under Different Levels of Stress

| Sl. No | Sample | N | High Stress | | Moderate Stress | | Low Stress | |
|--------|------------------------------------|-----|-------------|--------|-----------------|--------|------------|--------|
| | | | N | % | n | % | n | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | Total sample | 275 | 50 | 18.182 | 181 | 65.818 | 44 | 16.000 |
| 2 | Males | 169 | 24 | 14.201 | 121 | 71.598 | 24 | 14.201 |
| 3 | Females | 106 | 26 | 24.528 | 60 | 56.604 | 20 | 18.868 |
| 4 | Age up to 40 years | 36 | 10 | 27.778 | 18 | 50.000 | 8 | 22.222 |
| 5 | Age 41-50 years | 120 | 22 | 18.333 | 81 | 67.500 | 17 | 14.167 |
| 6 | Age 51 & above years | 119 | 18 | 15.126 | 82 | 68.908 | 19 | 15.966 |
| 7. | Under graduates | 212 | 35 | 16.509 | 148 | 69.811 | 29 | 13.680 |
| 8. | Graduates | 49 | 14 | 28.571 | 22 | 44.898 | 13 | 26.531 |
| 9. | Post graduates | 14 | 1 | 7.143 | 11 | 78.571 | 2 | 14.286 |
| 10. | Teaching experience up to 20 years | 65 | 13 | 20.000 | 41 | 63.077 | 11 | 16.923 |
| 11. | Teaching experience 21-30 years | 156 | 29 | 18.590 | 107 | 68.590 | 20 | 12.820 |
| 12. | Teaching experience 31 and above | 54 | 8 | 14.815 | 33 | 61.111 | 13 | 24.074 |
| 13. | Married | 258 | 45 | 17.442 | 171 | 66.279 | 42 | 16.279 |
| 14. | Single | 17 | 5 | 29.412 | 10 | 58.824 | 2 | 11.765 |
| 15. | Rural | 223 | 40 | 17.937 | 147 | 65.919 | 36 | 16.144 |
| 16. | Urban | 52 | 10 | 19.230 | 34 | 65.385 | 8 | 15.385 |
| 17. | Private | 197 | 41 | 20.812 | 124 | 62.944 | 32 | 16.244 |
| 18. | Government | 78 | 9 | 11.538 | 57 | 73.077 | 12 | 15.385 |

Table 18 reveals that in the total sample, percentages of heads of schools experiencing Moderate Stress is 65.818 percent, High Stress is 18.182 percent and Low Stress is 16 percent. When examining the sub-samples, it seems that higher percentage of subjects experiencing High Stress are those belonging to heads of schools who are single. In the Moderate Stress group highest percentage was obtained for post graduates. In the Low Stress group percentage was highest for graduate heads of schools.

For making the picture more clear, the investigator decided to compare the percentages of heads of schools based on the basal variables of the study.

2. Comparison of percentages based on sub-samples

The percentages of heads of primary schools belonging to different Stress groups were compared based on the sub-samples of the study to find out the difference between percentages. The critical ratios obtained were interpreted using two-tailed test of significance and are presented below.

i. Sex difference

Percentages of headmasters and headmistresses having High, Moderate and Low Stress were compared. Details of the test of significance of percentages for the sex groups are given in Table 19.

TABLE 19
 Details of the Test of Significance
 for Difference between Percentages of Heads
 of Schools having Different Levels of Stress for Sex Groups

| Sl.No | Sex groups | High Stress | | Moderate Stress | | Low Stress | |
|-------|------------|------------------|--------|-------------------|-------|------------------|--------|
| | | % | CR | % | CR | % | CR |
| 1. | Males | 14.201 (N=24) | -0.920 | 71.598 (N=121) | 2.01* | 14.201 (N=24) | -0.417 |
| 2. | Females | 24.528 (N=26) | | 56.604 (N=60) | | 18.868 (N=20) | |

Note: * indicates significance at 0.05 level.

Table 19 indicates that there is significant difference between percentages of male and female heads of schools having Moderate Stress since the critical ratio, i.e., 2.01 exceeds the limit for 0.05 level of significance. This means that percentages of headmasters in the Moderate Stress group is higher than headmistresses. But no significant difference between percentages was observed for the sex groups having High and Low Stress.

ii. Difference based on age

Details of comparison of percentages of heads of schools in different age groups having different Levels of Stress are presented in Table 20.

TABLE 20

Details of the Test of Significance for Difference between Percentages of Heads of Schools having Different Levels of Stress for Age Groups

| Sl No | Age groups (in years) | High Stress | | | | Moderate Stress | | | | Low Stress | | | |
|-------|-----------------------|-------------------|--------------------|--------------------|--------------------|------------------|--------------------|--------------------|--------------------|------------------|--------------------|--------------------|--------------------|
| | | % | Critical Ratios | | | % | Critical Ratios | | | % | Critical Ratios | | |
| | | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 |
| 1 | Up to 40 | 27.778 (N=10) | 0.70 | 0.27 | 0.80 | 50.000 (N=18) | -1.40 | -0.19 | -1.53 | 22.222 (N=8) | 0.50 | -0.50 | 0.39 |
| 2 | 41-50 | 18.333 (N=22) | | | | 67.500 (N=81) | | | | 14.167 (N=17) | | | |
| 3 | 51 & above | 15.126 (N= 18) | | | | 68.908 (N=82) | | | | 15.966 (N=19) | | | |

Table 20 reveals that the difference between percentages of heads of schools having High, Moderate and Low Stress belonging to different age groups are not significant. This indicates that heads of schools belonging to different age groups are similar in their levels of Stress.

iii. Difference based on educational qualifications

The percentages of heads of schools experiencing High, Moderate and Low Stress were compared for the groups based on educational qualifications such as undergraduates, graduates and post-graduates and the details are given in Table 21.

TABLE 21

Details of the Test of Significance for Difference between Percentages of Heads of Schools having Different Levels of Stress for Educational Qualification Groups

| Sl No | Groups based on educational qualification | High Stress | | | Moderate Stress | | | Low Stress | | | | | |
|-------|---|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | % | Critical ratios | | | % | Critical ratios | | | % | Critical ratios | | |
| | | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 |
| 1 | Undergraduates | 16.509 (N = 35) | -0.95 | 0.47 | 0.25 | 69.811 (N=148) | 2.32* | -1.84 | -0.61 | 13.680 (N=29) | -1.00 | 0.37 | -0.02 |
| 2 | Graduates | 28.571 (N = 14) | | | | 44.898 (N= 22) | | | | 26.531 (N = 13) | | | |
| 3 | Post Graduates | 7.143 (N=1) | | | | 78.571 (N=11) | | | | 14.286 (N=2) | | | |

(Note: * indicates significance of 0.05 level)

It appears from Table 21 that among the heads of schools experiencing Moderate Stress the percentage of undergraduates is significantly (at 0.05 level) higher than that of graduates. But the critical ratios obtained for the comparison between percentages of other pairs of educational qualification groups are not significant.

iv. Difference based on teaching experience

The heads of schools were categorised into three groups based on their teaching experience are mentioned earlier. The percentages of heads of schools having High, Moderate and Low Stress for the groups based on teaching experience as compared. The percentages and the critical ratios obtained are presented in Table 22.

TABLE 22

Details of the Test of Significance for Difference between Percentages of Heads of Schools having Different Levels of Stress for Teaching Experience Groups

| SI No | Groups based on teaching experience (in years) | High Stress | | | | Moderate Stress | | | | Low Stress | | | |
|-------|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|
| | | % | Critical ratios | | | % | Critical ratios | | | % | Critical ratios | | |
| | | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 | | Between groups 1&2 | Between groups 2&3 | Between groups 1&3 |
| 1 | Up to 20 | 20.000 (N = 13) | 0.11 | 0.25 | 0.30 | 63.077 (N=41) | -0.66 | 0.80 | 0.17 | 16.923 (N=11) | 0.32 | -0.84 | -0.43 |
| 2 | 21 - 30 | 18.590 (N = 29) | | | | 68.590 (N= 107) | | | | 12.820 (N= 20) | | | |
| 3 | 31 and above | 14.815 (N=8) | | | | 61.111 (N=33) | | | | 24.074 (N=13) | | | |

The Table 22 shows that the difference in percentages of heads of schools having different levels of Stress between groups based on their teaching experience are not significant. Groups based on the teaching experience of heads of schools are almost alike in their levels of Stress.

v. Difference based on marital status

The married and single heads of schools having High, Moderate and Low Stress were compared. The details of these comparisons are given in Table 23.

TABLE 23
Details of the Test of Significance
for Difference between Percentages of Married
and Single Heads of Schools having Different Levels of Stress.

| Sl. No | Marital Status | High Stress | | Moderate Stress | | Low Stress | |
|--------|----------------|------------------|----------------|-------------------|----------------|------------------|----------------|
| | | % | Critical ratio | % | Critical ratio | % | Critical ratio |
| 1. | Married | 17.442 (N=45) | -0.65 | 66.279 (N=171) | 0.48 | 16.279 (N=42) | 0.17 |
| 2. | Single | 29.411 (N=5) | | 58.824 (N=10) | | 11.765 (N=2) | |

Table 23 indicates that no significant difference between percentages of married and single heads of schools having different levels of Stress was obtained.

vi. Difference based on the locality of the school

Data and the results of comparison between percentages of rural and urban heads of schools having High, Moderate and Low Stress are given in Table 24.

TABLE 24
Details of the Test of Significance
for Difference between Percentages of Heads of
Rural and Urban Schools having Different Levels of Stress.

| Sl. No | Locality of the School | High Stress | | Moderate Stress | | Low Stress | |
|--------|------------------------|------------------|----------------|-------------------|----------------|------------------|----------------|
| | | % | Critical ratio | % | Critical ratio | % | Critical ratio |
| 1. | Rural | 17.937 (N=40) | -0.09 | 65.919 (N=147) | 0.06 | 16.144 (N=36) | 0.05 |
| 2. | Urban | 19.230 (N=10) | | 65.385 (N=34) | | 15.385 (N=8) | |

Table 24 reveals that the difference between percentages of rural and urban heads of schools having High, Moderate and Low Stress are not significant. This means that rural and urban heads of schools are almost alike in their levels of Stress.

vii Difference based on management category of schools

The details of test of significance for difference between percentages of heads of private and government schools with different levels of Stress are given in Table 25.

TABLE 25
 Details of the Test of Significance for
 Difference between Percentages of Heads of Private
 and Government Schools having Different Levels of Stress

| Sl. No | Management Category | High Stress | | Moderate Stress | | Low Stress | |
|--------|---------------------|------------------|----------------|-------------------|----------------|------------------|----------------|
| | | % | Critical ratio | % | Critical ratio | % | Critical ratio |
| 1. | Private | 20.812 (N=41) | 0.64 | 62.944 (N=124) | -1.34 | 16.244 (N=32) | 0.07 |
| 2. | Government | 11.538 (N=9) | | 73.077 (N=57) | | 15.385 (N=12) | |

It appears from Table 24 that no significant differences exist between percentages of heads of private and government schools having different levels of Stress.

Discussion

The comparison of percentages of heads of primary schools experiencing the three levels of Stress, i.e., High, Moderate and Low Stress revealed the following:

Among the heads of primary schools having Moderate Stress, (i) the percentage of Males was significantly (at 0.05 level) higher than the percentages of females and (ii) the percentages of undergraduate heads of schools is significantly higher than the percentage of graduates (iii) Among the percentage of heads of schools having High and Low Stress, no significant difference was obtained between the comparable subsamples.

3. Percentage of heads of schools experiencing different dimensions of Stress

The investigator analysed the percentage of heads of schools who experience Stress under different dimensions. As mentioned in the methodology chapter of the present study the investigator considered four dimensions of Stress i.e., physiological, psychological, social and familial and occupational. Median value of each dimension of Stress was considered as the cut-off point for finding out the percentage of heads of schools who experience Stress in that particular dimension. The heads of schools who secured a score above the median value of a dimension of Stress was considered as experiencing that dimensions of Stress and those secured below median as not experiencing Stress in that dimension.

The heads of primary schools who experience each of the dimensions of Stress were enumerated and percentages found out. The details of percentages of the subjects experiencing Stress under different dimensions are given in Table 26.

TABLE 26
Percentages of Heads of Schools
Experiencing Stress under Different Dimensions

| Sl. No | Sub Samples | N | Physiological factors (Mdn=4) | | Psychological factors (Mdn=8) | | Social & familial factors (Mdn=6) | | Occupational factors (Mdn=8) | |
|--------|--------------------------------------|-----|-------------------------------|--------|-------------------------------|--------|-----------------------------------|--------|------------------------------|--------|
| | | | n | % | n | % | n | % | n | % |
| 1 | Total sample | 275 | 114 | 41.455 | 112 | 40.727 | 122 | 44.364 | 121 | 44.000 |
| 2 | Males | 169 | 59 | 34.911 | 66 | 41.509 | 74 | 43.787 | 72 | 42.604 |
| 3 | Females | 106 | 55 | 51.888 | 46 | 49.936 | 48 | 45.283 | 49 | 46.226 |
| 4 | Age upto 40 years | 36 | 13 | 36.111 | 15 | 41.667 | 17 | 47.222 | 18 | 50.000 |
| 5 | Age 41-50 years | 120 | 43 | 35.833 | 48 | 40.000 | 60 | 50.000 | 55 | 45.833 |
| 6 | Age 51 & above years | 119 | 58 | 48.739 | 49 | 41.176 | 45 | 37.815 | 48 | 40.336 |
| 7 | Under graduates | 212 | 94 | 44.340 | 93 | 43.868 | 97 | 45.755 | 92 | 43.396 |
| 8 | Graduates | 49 | 15 | 30.612 | 16 | 32.653 | 20 | 40.816 | 21 | 42.857 |
| 9 | Post Graduates | 14 | 5 | 35.714 | 3 | 21.429 | 5 | 35.714 | 8 | 57.143 |
| 10 | Teaching experience upto 20 years | 65 | 22 | 33.846 | 26 | 40.000 | 28 | 43.077 | 29 | 44.615 |
| 11 | Teaching experience 21-30 years | 156 | 63 | 40.385 | 70 | 44.872 | 75 | 48.077 | 74 | 47.436 |
| 12 | Teaching experience 31 & above years | 54 | 29 | 53.704 | 16 | 29.630 | 19 | 35.185 | 18 | 33.333 |
| 13 | Married | 258 | 107 | 41.473 | 104 | 40.310 | 114 | 44.186 | 115 | 44.574 |
| 14 | Single | 17 | 7 | 41.176 | 8 | 47.059 | 8 | 47.059 | 6 | 35.294 |
| 15 | Rural | 223 | 92 | 41.256 | 90 | 40.359 | 97 | 43.498 | 100 | 44.843 |
| 16 | Urban | 52 | 22 | 42.308 | 22 | 42.308 | 25 | 48.077 | 21 | 40.385 |
| 17 | Private | 197 | 78 | 39.594 | 81 | 41.117 | 95 | 48.223 | 86 | 43.655 |
| 18 | Government | 78 | 36 | 46.154 | 31 | 39.744 | 27 | 34.615 | 35 | 44.872 |

Table 26 reveals that in the total sample, 41.46 percent experiences Stress under the dimension of Physiological factors, 40.73 per cent experiences Stress under the dimension of psychological factors, 44.36 percent experiences Stress due to social and familial factors and 44 per cent, that due to occupational factors.

Among the sub-samples, it seems that the heads of schools having teaching experience more than 31 years are experiencing the highest percentage of Stress i.e., 53.70 per cent due to Physiological factors. The highest percentage of heads of schools i.e. 47.06, experiencing Stress due to psychological factors are those having no spouse. Heads of schools in the age group of 41-50 years are experiencing the highest percentage (i.e., 50%) of Stress under social and familial factors. Post graduate heads of schools are found to be experiencing the highest percentage (i.e., 57.14%) of Stress due to occupational factors.

To make the picture more clear the investigator decided to compare the percentages of heads of schools experiencing Stress under different dimensions among the sub-samples.

4. Comparison of percentages of heads of schools experiencing Stress under different dimensions

The percentages of heads of primary schools experiencing different dimensions of Stress belonging to different sub-samples based on the basal variables of the study were compared. The

critical ratios obtained were interpreted using two-tailed test of significance and are presented below.

i. Sex difference

The percentages of male and female heads of schools experiencing Stress under different dimensions were compared. The result is given in Table 27.

TABLE 27
Details of Comparison of
Percentages of Male and Female Heads of
Schools Experiencing Stress under Different Dimensions.

| Sl. No | Sub Samples | Physiological factors | | Psychological factors | | Social & Familial factors | | Occupational factors | |
|--------|-------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------------|--------|
| | | % | CR | % | CR | % | CR | % | CR |
| 1 | Males | 34.911 (N=59) | -1.694 | 41.509 (N=66) | -0.199 | 43.787 (N=74) | -0.161 | 42.604 (N=72) | -0.396 |
| 2 | Females | 51.88 (N=55) | | 43.396 (N=46) | | 45.283 (N=48) | | 46.226 (N=49) | |

Table 27 shows that the difference in percentages between male and female heads of schools experiencing Stress under different dimensions are not significant. This indicates that male and female heads of schools are experiencing almost equal levels of Stress in all its four dimensions.

ii. Difference based on age

The percentages of heads of schools belonging to different sub-samples based on age experiencing Stress under different dimensions were compared. The details of test of significance are presented in Table 28.

TABLE 28

Details of Comparison of Percentages of Heads of Schools Experiencing Stress under Different Dimensions among sub-samples based on Age

| Groups based on age (in years) | Physiological factors | | | Psychological factors | | | Social & familial factors | | | Occupational factors | | | | | | |
|-----------------------------------|-----------------------|---------------------|---------------------|-----------------------|------------------|--------------------|---------------------------|--------------------|------------------|----------------------|--------------------|--------------------|------------------|--------------------|---------------------|--------------------|
| | % | Critical ratios | | | % | Critical ratios | | | % | critical ratios | | | % | critical ratios | | |
| | | Between groups 1 &2 | Between groups 2& 3 | Between groups 1& 3 | | Between groups1 &2 | Between groups2& 3 | Between groups1& 3 | | Between groups1 &2 | Between groups2& 3 | Between groups1& 3 | | Between groups 1&2 | Between groups 2 &3 | Between groups 1&3 |
| upto 40 years | 36.111 (N=13) | 0.018 | -1.300 | -1.275 | 41.667 (N=15) | 0.115 | -0.118 | 0.039 | 47.222 (N=17) | -0.202 | 1.240 | 0.675 | 50.000 (N=18) | 0.306 | 0.560 | 0.711 |
| 41-50 years | 35.833 (N=43) | | | | 40.000 (N=48) | | | | 50.000 (N=60) | | | | 45.833 (N=55) | | | |
| 51 & above years | 48.739 (N=58) | | | | 41.176 (N=49) | | | | 37.815 (N=45) | | | | 40.336 (N=48) | | | |

Table 28 indicates that no significant difference exists among percentages of heads of schools under different sub samples based on age, who experience different dimensions of Stress.

iii. Difference based on educational qualifications

The details of the test of significance for difference in percentages of heads of schools experiencing Stress under different dimensions among the sub-samples based on the educational qualifications are given in Table 29.

TABLE 29

Details of Comparison of Percentages of Heads of schools

Experiencing Stress under Different Dimensions among Sub-samples based on Educational Qualifications

| Sub samples based on educational qualifications | Physiological factors | | | psychological factors | | | Social & familial factors | | | Occupational factors | | | | | | |
|---|-----------------------|--------------------------|--------------------------|-----------------------|---------------------------|--------------------------|---------------------------|--------------------------|--------------------------|----------------------|--------------------------|---------------------------|-------------------------|-------|--------|--------|
| | % | Critical ratios | | % | critical ratios | | % | critical ratios | | % | critical ratios | | | | | |
| | | Between sub samples 1 &2 | Between Sub samples 2& 3 | | Between sub samples 1 & 3 | Between sub samples 1 &2 | | Between sub samples 2& 3 | Between sub samples 1& 3 | | Between sub samples 1 &2 | Between sub samples 2 & 3 | Between sub samples 1&3 | | | |
| Under graduates | 44.340 (N=94) | 0.996 | -0.212 | 0.378 | 43.868 (N=93) | 0.835 | 0.386 | 0.773 | 45.755 (N=97) | 0.404 | 0.208 | 0.440 | 43.396 (N=92) | 0.045 | -0.688 | -0.746 |
| Graduates | 30.612 (N=15) | | | | 32.653 (N=16) | | | | 40.816 (N=20) | | | | 45.857 (N=21) | | | |
| Post graduates | 35.714 (N=5) | | | | 21.429 (N=3) | | | | 35.714 (N=5) | | | | 57.143 (N=8) | | | |

Table 29 shows that no significant difference exists among percentages of heads of schools belonging to different educational qualifications groups who experience Stress under different dimensions. This means that percentages of undergraduate, graduate and post graduate heads of schools are alike in experiencing Stress under different dimensions.

iv. Difference based on teaching experience

The heads of schools belonging to the three sub-samples based on their teaching experience were compared for their percentages of Stress under different dimensions and the result of the test of significance is presented in Table 30.

TABLE 30

Details of Comparison of Percentages of Heads of Schools
Experiencing Stress under Different Dimensions Among Teaching Experience Groups

| Sub samples based on teaching experience (In years) | Physiological factors | | | psychological factors | | | Social & familial factors | | | Occupational factors | | | | | | |
|---|-----------------------|---------------------------|---------------------------|---------------------------|---------------|---------------------------|---------------------------|---------------------------|---------------|---------------------------|---------------------------|---------------------------|---------------|--------|-------|-------|
| | % | Critical ratios | | | % | critical ratios | | | % | critical ratios | | | | | | |
| | | Between sub samples 1 & 2 | Between sub samples 2 & 3 | Between sub samples 1 & 3 | | Between sub samples 1 & 2 | Between sub samples 2 & 3 | Between sub samples 1 & 3 | | Between sub samples 1 & 2 | Between sub samples 2 & 3 | Between sub samples 1 & 3 | | | | |
| up to 20 (N=22) | 33.846 | 0.545 | -1.200 | -1.420 | 40.000 (N=26) | -0.430 | 1.113 | 0.680 | 43.077 (N=28) | 0.453 | 1.009 | 0.540 | 44.615 (N=29) | -0.258 | 1.074 | 0.768 |
| 21-30 (N=63) | 40.385 (N=63) | | | | 44.872 (N=70) | | | | 48.077 (N=75) | | | | 47.436 (N=74) | | | |
| 31 and above (N=29) | 53.704 (N=29) | | | | 29.630 (N=16) | | | | 35.185 (N=19) | | | | 33.333 (N=18) | | | |

Table 30 reveals that no significant difference exists among percentages of heads of schools experiencing different dimensions of Stress, belonging to teaching experience groups.

v. Difference based on marital status

The percentage of married and single heads of primary schools who experience Stress under different dimensions were compared and the result is given in Table 31.

TABLE 31
Details of Comparison of
Percentages of Married and Single Heads of
Schools Experiencing Stress under Different Dimensions.

| Sl.No | Sub Samples | Physiological factors | | Psychological factors | | Social & familial factors | | Occupational factors | |
|-------|-------------|-----------------------|-------|-----------------------|---------|---------------------------|--------|----------------------|-------|
| | | % | CR | % | CR | % | CR | % | CR |
| 1 | Married | 41.473 (N=107) | 0.015 | 40.310 (N=104) | -0.0373 | 44.186 (N=114) | -0.157 | 44.574 (N=115) | 0.445 |
| 2 | Single | 41.176 (N=7) | | 47.059 (N=8) | | 47.059 (N=8) | | 35.294 (N=6) | |

Table 31 shows that the difference in percentages of married and single heads of schools experiencing different dimensions of Stress is not significant.

vi. Differences based on the locality of the school

The result of the test of significance for difference in percentages of rural and urban heads of schools experiencing Stress under different dimensions is given in Table 32.

TABLE 32
Details of Comparison of Percentages
of Heads of Schools Experiencing Dimensions
of Stress among Sub samples Based on Locality of Schools

| Sl.No | Sub Samples | Physiological factors | | Psychological factors | | Social & familial factors | | Occupational factors | |
|-------|-------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------------|-------|
| | | % | CR | 3% | CR | % | CR | % | CR |
| 1 | Rural | 41.256 (N=92) | -0.090 | 40.359 (N=90) | -0.168 | 43.498 (N=97) | -0.413 | 44.843 (N=100) | 0.343 |
| 2 | Urban | 42.308 (N=22) | | 42.308 (N=22) | | 48.077 (N=25) | | 40.385 (N=21) | |

Table 32 shows that no significant difference exist between percentages of rural and urban heads of schools experiencing different dimensions of Stress.

vii. Difference based on the management category of schools

The test of significance for difference between the percentages of heads of private and government schools experiencing different dimensions of Stress was carried out and the result is shown in Table 33.

TABLE 33
Details of Comparison of
Percentages of Heads of Schools Experiencing Different
Dimensions of Stress between School Management Groups.

| S.No | Sub Samples | Physiological factors | | Psychological factors | | Social & familial factors | | Occupational factors | |
|------|-------------|-----------------------|--------|-----------------------|-------|---------------------------|-------|----------------------|--------|
| | | % | CR | % | CR | % | CR | % | CR |
| 1 | Private | 39.594 (N=78) | -0.656 | 41.117 (N=81) | 0.133 | 48.223 (N=95) | 1.248 | 43.655 (N=86) | -0.121 |
| 2 | Government | 46.154 (N=36) | | 39.744 (N=31) | | 34.615 (N=27) | | 44.872 (N=35) | |

Table 33 indicates that the difference in percentages of heads of private and government schools experiencing different dimensions of Stress is not significant. This means that heads of private and government schools are experiencing same levels of Stress under different dimensions.

Discussion

The investigator examined the differences in percentages of heads of primary schools experiencing stress under different dimensions among sub-samples based on the basal variables of the study. The analysis revealed the following:

- (i) No significant difference exists in percentages of heads of schools experiencing Stress due to Physiological factors among sub-samples based on the basal variables.

- (ii) In the case of percentages of heads of schools experiencing Stress due to psychological factors, no significant difference exists among the sub-samples based on the basal variables.
- (iii) There exist no significant difference in percentages of heads of schools experiencing Stress due to social and familial factors among sub-samples based on the basal variables.
- (iv) The difference in percentages of heads of schools who experience Stress due to occupational factors, among sub samples are not significant.

The above discussion indicates that the heads of schools belonging to different sub-samples based on the basal variables are experiencing almost the same levels of Stress under different dimensions.

Next, the investigator conducted the analysis of association between the basal variables and the variables of the study and the details are given below.

D. ANALYSIS OF ASSOCIATION

Analysis of association was carried out to examine whether any association exists between (a) each of the basal variables and Stress experienced by the heads of primary schools, and (b) each of the basal variables and the Professional Efficiency of the heads of primary schools.

Among the basal variables of the present study, sex and marital status of the heads of schools and locality and

management category of their schools are dichotomised variables. Biserial coefficient of correlation (Υ_{bis}) was employed to find the association between these basal variables and the variables of the study. Pearson's product moment co-efficient of correlation (r) was used to find out the association between age, teaching experience and the variables of the study. Chi-square test was used to find out the association between educational qualifications and the variables of the study.

Details of analysis of association are presented below.

1. Biserial co-efficient of correlation (Υ_{bis})

(a) Between sex and variables of the study:

Υ_{bis} between sex and Stress, and between sex and Professional Efficiency was estimated and are presented in Table 34.

TABLE 34
Details of Association
between Sex and Variables of the Study

| Sl. No | Variables | Proportions | | S.D | Υ_{bis} | 0.95 Confidence interval | | SE Υ_{bis} |
|--------|---------------------------------|--------------|----------------|--------|------------------|--------------------------|-------------|---------------------|
| | | Male (N=169) | Female (N=106) | | | Lower limit | Upper limit | |
| 1 | Sex and Stress | 0.61 | 0.39 | 11.499 | -0.043 | -0.913 | 0.999 | 9.56 |
| 2. | Sex and Professional Efficiency | 0.61 | 0.39 | 14.017 | 0.030 | -0.926 | 0.986 | 9.56 |

Table 34 indicates that no significant association exists between sex and Stress of heads of schools since the obtained Υ_{bis}

does not exceed $1.96 SE Y_{bis}$. Similarly there is no association between sex and Professional Efficiency of the heads of schools.

(b) Between marital status and the variables of the study

Details of estimation of biserial 'Y' between marital status and variables of the study are presented in Table 35.

TABLE 35
Details of Association
between Marital Status and Variables of the Study

| Sl. No | Variables | Proportions | | S.D | Y_{bis} | 0.96 Confidence interval | | SE Y_{bis} |
|--------|--|-----------------|---------------|--------|-----------|--------------------------|-------------|--------------|
| | | Married (N=258) | Single (N=17) | | | Lower limit | Upper limit | |
| 1 | Marital status and Stress | 0.94 | 0.06 | 11.499 | -0.044 | -0.422 | 0.510 | 0.466 |
| 2. | Marital status and Professional Efficiency | 0.94 | 0.06 | 14.017 | 0.099 | -0.367 | 0.565 | 0.466 |

From Table 35, it can be seen that there is no significant association between (1) Marital Status and Stress and between (2) Marital status and Professional Efficiency of the heads of primary schools.

(c) Between locality of the school and variables of the study:

In order to estimate the association between locality of the schools and the variables of the study Y_{bis} was calculated and the results are given in Table 36.

TABLE 36
Details of Association between
Locality of the School and Variables of the Study

| Sl. No | Variables | Proportions | | S.D | Y_{bis} | 0.97 Confidence Interval | | SE Y_{bis} |
|--------|------------------------------------|------------------|-----------------|--------|-----------|--------------------------|-------------|--------------|
| | | Rural (N=223) | Urban (N=52) | | | Lower Limit | Upper limit | |
| 1 | Locality and Stress | 0.81 | 0.19 | 11.499 | -0.033 | -0.735 | 0.801 | 0.768 |
| 2. | Locality & Professional Efficiency | 0.81 | 0.19 | 14.017 | 0.021 | -0.747 | 0.789 | 0.768 |

Table 36 shows that the obtained Y_{bis} between locality of the school and Stress and between locality of the school and Professional Efficiency does not exceed the 1.96 SE Y_{bis} . This indicates that no significant association exists between the locality of the school and Stress and between locality of the school and Professional Efficiency of the heads of primary schools.

(d) Between management category of the school and variables of the study

The details of association between management category of the school and the variables of the study are presented in Table 37.

TABLE 37
Details of Association between
Management Category of the School and Variables of the Study

| Sl. No | Variables | Proportions | | S.D | Y_{bis} | 0.95 Confidence interval | | SE Y_{bis} |
|--------|---|-----------------|-------------------|--------|-----------|--------------------------|-------------|--------------|
| | | Private (N=197) | Government (N=78) | | | Lower limit | Upper limit | |
| 1 | Management category & Stress | 0.72 | 0.28 | 11.499 | 0.084 | -0.796 | 0.964 | 0.88 |
| 2. | Management category & Professional Efficiency | 0.72 | 0.28 | 14.017 | -0.113 | -0.767 | 0.993 | 0.88 |

Table 37 shows that there is no significant association between Stress of the heads of schools and the management category of their schools. Similarly no significant association exists between the Professional Efficiency of the heads of schools and the management category of the schools.

2. Coefficients of Correlation (r)

(a) Between age and the variables of the study

In order to find the association between age and the variables of the study coefficients of correlation were estimated. Details of correlation between age and the variables of the study are shown in Table 38.

TABLE 38
Details of Association
between Age and Variables of the Study

| Sl. No | Variables | N | γ | Confidence interval | | Percentage overlap |
|--------|-------------------------------|-----|----------|---------------------|-------------|--------------------|
| | | | | Lower limit | Upper limit | |
| 1 | Age & Stress | 275 | -0.093 | -0.024 | 0.210 | 0.86 |
| 2. | Age & Professional Efficiency | 275 | 0.054 | -0.064 | 0.172 | 0.29 |

Table 38 shows that there is no significant relationship between (i) Stress experienced by the heads of Primary schools and their age, and between (ii) Professional Efficiency of heads of schools and their age.

(b) Between teaching experience and variables of the study

In order to check the relationship between Stress and teaching experience and between Professional Efficiency and teaching experience of the heads of schools, coefficients of correlations were found out. The details are given in Table 39.

TABLE 39
Details of Association between
Teaching Experience and Variables of the Study

| Sl. No | Variables | N | γ | Confidence interval | | Percentage overlap |
|--------|---|-----|----------|---------------------|-------------|--------------------|
| | | | | Lower limit | Upper limit | |
| 1 | Teaching experience & Stress | 275 | -0.070 | -0.048 | 0.188 | 0.49 |
| 2. | Teaching experience & Professional Efficiency | 275 | 0.072 | -0.046 | 0.190 | 0.52 |

Table 39 shows that there is no significant relationship between (i) Stress experienced by the heads of schools and their teaching experience, and between (ii) Professional Efficiency and teaching experience of the heads of primary schools in Kerala.

3. Chi-square test

In order to examine the association between educational qualifications and variables of the study Chi-square test was used and the details are given below:

(a) Educational qualifications and Stress

Heads of schools were classified into High, Moderate and Low based on their Stress. The subjects who secured a score above $M + 1$ S.D (i.e. score 38 and above) were treated as having High Stress. The subjects who secured a score of $M-1$ S.D (i.e. score 15 and below) were treated as Low Stress group. The remaining subjects (i.e., who scored 16 to 37) were treated as Moderate Stress group.

Since the data on Stress of heads of schools is almost normally distributed, the proportion of the normal distribution was considered in estimating expected frequency of each group for calculation of the χ^2 value.

The result of the χ^2 test between Stress of heads of primary schools and their educational qualifications are given in Table 40.

TABLE 40
Chi-square Values Obtained for Educational
Qualifications and Stress of Heads of Primary Schools

| Under graduates | Graduates | Post graduates |
|-----------------|-----------|----------------|
| 0.348 | 4.586 | 2.728 |

Table 40 shows that there exists no significant association between Stress of heads of primary schools and their educational qualifications since the obtained χ^2 values did not exceed the χ^2 value at 0.05 level (i.e., 5.991) set for 2 degrees of freedom.

(b) Educational qualifications and Professional Efficiency

The heads of schools were classified into three groups as High, Average and Low based on their Professional Efficiency. The subjects who secured a score of $M + 1$ S.D for their Professional Efficiency i. e., score 111 and above were included in the High group whereas subjects with score $M-1$ S.D. i. e., score 83 and below were included in the Low group. The remaining subjects (score between 111 and 84) were included in the Average group.

Since the obtained data of Professional Efficiency also is normally distributed the proportion of normal distribution was considered in estimating expected frequency of each group for calculating the χ^2 value.

The result of χ^2 test between Professional Efficiency of the heads of primary schools and their educational qualifications are given in Table 41.

TABLE 41
Chi-square Values
Obtained for Educational Qualifications
and Professional Efficiency of Heads of Primary Schools.

| Under graduates | Graduates | Post graduates |
|-----------------|-----------|----------------|
| 0.846 | 8.366 * | 0.942 |

(Note : * indicates significance at 0.05 level)

Table 41 shows that there is significant association (at 0.05 level) between educational qualifications and Professional Efficiency in the case of heads of primary schools who are graduates. No other χ^2 values were significant.

Discussion

The analysis of association between the variables of the study and the basal variables such as sex, age, educational qualifications, teaching experience and marital status of the heads of schools and the locality and management category of the schools revealed the following:

- a) No significant association exists between sex and Stress, and sex and Professional Efficiency of the heads of primary schools.

- b) No significant association exists between marital status and Stress, and marital status and Professional Efficiency of the heads of primary schools.
- c) The association between locality of the school and Stress, locality of the school and Professional Efficiency of the heads of schools is not significant.
- d) The association between variables of the study and the management category of the schools is not significant.
- e) No significant association exists between age and Stress and age and Professional Efficiency of the heads of primary schools.
- f) The association between teaching experience of the heads of primary schools and the variables of the study is not significant.
- g) No significant association exists between educational qualifications and Stress of the heads of primary schools.
- h) Significant association between educational qualifications and Professional Efficiency was observed in the case of graduates. The association between educational qualifications and Professional Efficiency was not significant for under graduates and post-graduates.

SECTION TWO

- A. Correlation Analysis
- B. Multiple Linear Regression Analysis
- C. Principal Component Analysis
- D. Canonical Correlation Analysis

SECTION TWO

A. CORRELATION ANALYSIS

The sixth objective of the study was to find the relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the whole sample and for the relevant sub samples.

Pearson's Product Moment Coefficient of Correlation between Stress and Professional Efficiency of heads of schools were found out for the whole sample and for the sub-samples based on sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools and the locality and management category of their schools. The obtained r 's were interpreted using the procedure as described in the Methodology section (chapter III).

The details of correlation coefficients obtained for Stress and Professional Efficiency of the heads of primary schools for the total sample and for the sub-samples are presented in Table 42.

TABLE 42
 Details of the Relationship between Stress and
 Professional Efficiency of the Heads of Primary Schools

| SL No. | Sample | N | R | Confidence interval | | Percentage overlap |
|--------|--------------------------------------|-----|----------|---------------------|-------------|--------------------|
| | | | | Lower limit | Upper limit | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Whole sample | 275 | -0.409** | -0.279 | -0.539 | 16.73 |
| 2 | Males | 169 | -0.323** | -0.145 | -0.501 | 10.43 |
| 3 | Females | 106 | -0.523** | -0.341 | -0.705 | 27.35 |
| 4 | Age below 41 years | 36 | -0.683** | -0.454 | -0.912 | 46.65 |
| 5 | Age 41-50 years | 120 | -0.349** | -0.142 | -0.556 | 12.18 |
| 6 | Age above 50 years | 119 | -0.398** | -0.199 | -0.597 | 15.84 |
| 7 | Undergraduates | 212 | -0.339 | -0.182 | -0.496 | 11.49 |
| 8 | Graduates | 49 | -0.606** | -0.373 | -0.839 | 36.72 |
| 9 | Post graduates | 14 | -0.495 | -0.100 | -0.890 | 24.50 |
| 10 | Teaching experience up to 20 years | 65 | -0.511** | -0.275 | -0.747 | 26.11 |
| 11 | Teaching experience 21-30 years | 156 | -0.348** | -0.167 | -0.530 | 12.11 |
| 12 | Teaching experience 31 & above years | 54 | -0.430** | -0.144 | -0.716 | 18.49 |
| 13 | Married | 258 | -0.408** | -0.274 | -0.542 | 16.65 |
| 14 | Single | 17 | -0.431 | -0.044 | -0.818 | 18.58 |
| 15 | Rural | 223 | -0.418 | -0.275 | -0.561 | 17.47 |
| 16 | Urban | 52 | -0.390 | -0.087 | -0.693 | 15.21 |
| 17 | Private | 197 | -0.435 | -0.286 | -0.584 | 18.92 |
| 18 | Government | 78 | -0.316 | -0.053 | -0.579 | 9.99 |

(Note: ** Indicates significant relationship at 0.01 level)

Table 42 reveals the following:

- a)
 - (i) There exists significant (at 0.01 level) negative relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the whole sample.
 - (ii) Significant negative relationship (at 0.01 level) exists between Stress and Professional Efficiency for all sub-samples based on sex, age and teaching experience of the subjects and the locality and management category of the schools.
 - (iii) Among the sub-samples based on marital status and educational qualifications, significant (at 0.01 level) negative correlation was obtained for the married, undergraduate and graduate heads of schools only.
 - (iv) There is no significant relationship between the variables for sub-samples of postgraduates and of heads of schools having no spouse.
- b)
 - (i) Among the obtained significant correlations, substantial negative relationship was observed for the whole sample and for the sub-samples of females, heads having age less than 41 years, graduates, heads having teaching experience less than 21 years, and more than 30 years, married head of schools and for those belonging to rural and private schools.

- (ii) Among the obtained significant coefficients of correlation between Stress and Professional Efficiency of the heads of primary schools, low negative relationships were observed in the case of sub-samples of males, age groups of 41-50 years, and above 50 years, undergraduates, and heads of schools having teaching experience of 21 - 30 years. Also among heads of urban schools and government schools the obtained correlation were low and negative.
- c) The population value of coefficients of correlation falls between -0.279 and -0.539 for the whole sample and between -0.053 and -0.912 for sub-samples.
- d) The percentage overlap between variables was found to be ranging from 9.99 to 46.65.

Comparison of r 's

The comparison of the obtained ' r 's between Stress and Professional Efficiency of the heads of schools was the seventh objective of the study. The obtained ' r 's were converted in to Fischer's z scores and were compared using the procedure mentioned in chapter III of the present study. The critical ratios obtained were interpreted using two-tailed test of significance. The comparison of ' r 's are described below.

i. Sex difference

The correlation coefficients obtained for male and female heads of schools were compared and the details are given in Table 43.

TABLE 43
Details of the Test of
Significance for Difference between r ' s for Sex Groups

| Variables correlated | Males (N= 169) r_1 | Females (N= 106) r_2 | CR |
|------------------------------------|-------------------------|----------------------------|--------|
| Stress and Professional Efficiency | -0.323 | -0.523 | 1.99** |

*(Note: * indicates significance at 0.05 level)*

Table 43 indicates that the difference between correlation co-efficients obtained for male and female heads of schools is significant at 0.05 level. This shows that for the sex groups the negative relationship between Stress and Professional Efficiency is higher for females than males.

ii. Age difference

The t s between Stress and Professional Efficiency of different age groups were compared. The obtained critical ratios are given in Table 44.

TABLE 44
Details of the Test of Significance
for Difference between r' s for Age Groups

| SL No | Age group categories | r | Between Groups 1&2 | Between Groups 2&3 | Between Groups 1&3 |
|-------|-----------------------------|--------|--------------------|--------------------|--------------------|
| 1 | Up to 40 years (N = 36) | -0.683 | -2.333* | 0.382 | -2.078* |
| 2 | 41 -50 years (N = 120) | -0.349 | | | |
| 3 | Above 50 years (N = 119) | -0.398 | | | |

(Note: * indicates significance at 0.05 level.)

It appears from Table 44 that the difference between r' s of the variables for the heads of schools having age less than 41 years and from 41 to 50 years is significant at 0.05 level. This implies that the relationship between Stress and Professional Efficiency of heads of schools in the age group below 41 years is greater than the ' r ' of the age group 41-50 years. The difference between r' s of the subjects in the age group below 41 years and above 50 years is significant at 0.05 level. Here the relationship between the variables of heads of schools in the age group below 41 years is greater than the ' r ' of heads of schools in the age group of above 50 years. Table 44 also reveals that there is no significant difference between the ' r ' s of heads of schools in the age group of 41-50 years and above 50 years.

iii. Difference based on educational qualifications

The correlation coefficient between the Stress and Professional Efficiency for groups based on educational

qualifications were compared. The details of comparison of the r 's are given in Table 45.

TABLE 45
Details of the Test of Significance
for Difference between r 's for Educational Qualifications Groups

| SL No | Categories based on educational qualifications | r | Critical ratios | | |
|-------|--|---------------------|--------------------|--------------------|--------------------|
| | | | Between Groups 1&2 | Between Groups 2&3 | Between Groups 1&3 |
| 1 | Undergraduates | -0.339 (N = 212) | 2.210* | 0.477 | 0.647 |
| 2 | Graduates | -0.606 (N = 49) | | | |
| 3 | Postgraduates | -0.495 (N = 14) | | | |

(Note: * Indicates significance at 0.05 level)

Table 44 indicates that the difference in coefficients of correlation of Stress and Professional Efficiency between undergraduates and graduates is significant at 0.05 level. The ' r ' of graduate heads of schools is greater than the ' r ' of undergraduates. It also indicates that the differences between r 's of the graduates and postgraduates and between undergraduates and postgraduates are not significant.

iv. Difference based on teaching experience

Table 46 presents the details of comparison of r 's between Stress and Professional Efficiency of heads of schools among different groups based on their teaching experience.

TABLE 46
 Details of the Test of Significance
 for difference between r' sfor Teaching Experience Groups

| SL No | Categories based on teaching experience | r | Critical ratios | | |
|-------|---|---------------------|--------------------|--------------------|--------------------|
| | | | Between Groups 1&2 | Between Groups 2&3 | Between Groups 1&3 |
| 1 | Up to 20 years | -0.511 (N = 65) | -1.262 | 0.557 | -0.529 |
| 2 | 21 -30 years | -0.348 (N = 156) | | | |
| 3 | 31 and above years | -0.430 (N = 54) | | | |

Table 46 reveals that the difference between correlation coefficients of the variables among different groups based on teaching experience of the heads of schools are not significant. This shows that the relationship between Stress and Professional Efficiency is alike among the different groups of heads of schools based on their teaching experience

v. Difference based on marital status

The correlation coefficients of married and single heads of schools were compared and the details are given in Table 47

TABLE 47
 Details of the Test of Significance for
 Difference between r' sfor Marital Status Groups

| Variables | Married r_1 (N = 258) | Single r_2 (N = 17) | CR |
|------------------------------------|-------------------------------|-----------------------------|-------|
| Stress and Professional Efficiency | -0.408 | -0.431 | 0.073 |

Table 47 shows that the difference between correlation coefficients obtained for married and single heads of schools is not significant. This means that married and single heads of schools are alike in the relationship of their Stress and Professional Efficiency.

vi. Difference based on the locality of the school

Table 48 gives details of comparison of r' s between the variables for rural and urban school headmasters/headmistresses.

TABLE 48
Details of the Test of Significance
for Difference between r' s for School Locality Groups

| Variables | Rural r_1 (N = 223) | Urban r_2 (N = 52) | CR |
|------------------------------------|-----------------------------|----------------------------|--------|
| Stress and Professional Efficiency | -0.418 | -0.390 | -0.240 |

It appears from Table 47 that no significant difference exists between correlation coefficients of Stress and Professional Efficiency of the heads of rural and urban schools.

vii. Difference based on the management category of schools

Table 49 gives the details of comparison r' s of Stress and Professional Efficiency between heads of private and government schools.

Table 49
 Details of the Test of Significance
 for Difference between r' s for School Management Groups

| Variables | Private r_1 (N=197) | Government r_2 (N=78) | CR |
|------------------------------------|-----------------------------|-------------------------------|--------|
| Stress and Professional Efficiency | -0.435 | -0.316 | -0.240 |

Table 49 reveals that no significant difference exists between private and government school headmasters/headmistresses for the correlation coefficients obtained for the variables of the study. This indicates that the relationships between Stress and Professional Efficiency of the heads of private and government schools are alike.

Discussion

The comparison of the relationships between Stress and Professional efficiency of the heads of schools among different sub-samples revealed the following:

- (i) Between the sub-samples based on sex the relationship between Stress and Professional Efficiency of headmistresses is greater than that of headmasters.
- (ii) Among the sub-samples based on age the relationship between Stress and Professional Efficiency of heads of schools having age 41-50 years and more than 50 years are

smaller than 'f' of heads of school having age less than 40 years. But no significant difference in relationship exists between the age groups of 41-50 years and above 50 years.

- (iii) Among sub-samples based on educational qualifications of the subjects the relationship between Stress and Professional Efficiency of graduates is greater than that of under graduates. But no significant difference in relationships exists between graduates and postgraduates and between undergraduates and postgraduates.
- (iv) No significant difference exists in relationship between Stress and Professional Efficiency of the heads of schools for the sub-samples based on teaching experience and marital status of the subjects and locality and management category of the schools.

The correlation analysis revealed that significant negative relationships exist between Stress and Professional Efficiency of the heads of schools, and in certain cases, there exists differences in relationships also. So the investigator decided to study the influence of dimensions of the independent variable on the dependent variable and study the efficiency of dimensions of the independent variable to predict the dependent variable. For this, Multiple Linear Regression Analysis was carried out and the details are presented below.

B. MULTIPLE LINEAR REGRESSION ANALYSIS

Multiple Linear Regression Analysis was done to predict the Professional Efficiency of the heads of primary schools from the best sub-set of the dimensions of their Stress. The computation was done with the help of computer using the MINI-TAB software as mentioned in the Methodology chapter of the present study.

The four dimensions of Stress, i.e. Physiological factors, Psychological factors Social and familial factors and Occupational factors were considered as the independent variables. The seven dimensions of Profession Efficiency were considered as the dependent variables.

The results of Multiple Linear Regression Analysis are given in Table 50.

TABLE 50
Results of Multiple Linear Regression Analysis

| SL No | Sub-set of Stress Dimension | Multiple R | Residual value | F value | P value |
|-------|-----------------------------|------------|----------------|---------|---------|
| 1 | 1, 2, 3, 4 | 0.4417 | 22.0666 | 16.3607 | 0.000 |
| 2 | 1, 2, 3 | 0.4256 | 22.3660 | 19.9841 | 0.000 |
| 3 | 2, 3, 4 | 0.4394 | 22.0411 | 21.6105 | 0.000 |
| 4 | 1, 2 | 0.3465 | 23.9454 | 18.5076 | 0.000 |
| 5 | 2, 3 | 0.4222 | 22.3617 | 29.5076 | 0.000 |
| 6 | 1 | 0.2119 | 25.8961 | 12.8379 | 0.000 |
| 7 | 2 | 0.3394 | 23.9904 | 35.5432 | 0.000 |
| 8 | 4 | 0.3854 | 23.0865 | 47.6242 | 0.000 |
| 9 | 3 | 0.4001 | 22.7730 | 52.0380 | 0.000 |
| 10 | 3, 4 | 0.4291 | 22.2610 | 30.5800 | 0.000 |

Note: Stress 1 indicates Stress due to Physiological factors
 Stress 2 indicates Stress due to Psychological factors
 Stress 3 indicates Stress due to Social and familial factors
 Stress 4 indicates Stress due to Occupational factors.

Table 57 reveals that the sub-set containing Stress 3 and 4 has high F value, low residual value and a correlation (multiple R) of 0.4291 with the dependent variables. So the sub-set containing stress 3 and 4 (Social and familial factors and Occupational factors) is the best sub-set for predicting one's Professional Efficiency. The best prediction formula is

$$PE = -0.3843 S_3 - 0.2376 S_4 + 41.6947$$

It means that the Professional Efficiency of a headmaster/ headmistress is equal to $(-0.3843 \times \text{Stress due to Social and familial factors}) - (0.2376 \times \text{Stress due to occupational factors}) + 41.6947$, a constant.

In order to reduce the different dimensions of Stress and Professional Efficiency of the heads of schools into a single variable each, which may help further interpretation of the data the Principal Component Analysis was carried out and the details are given below.

C. PRINCIPAL COMPONENT ANALYSIS (PCA)

Principal component analysis was done to study the variance-co-variance structure of Stress and Professional Efficiency of heads of primary schools through linear combinations of the components of the Stress and Professional Efficiency respectively.

PCA was carried out using the procedure described in the Methodology section (chapter III) of the present study, with the help of computer using MINI-TAB software.

In the case of Stress, there are four components such as (i) Physiological factors, (ii) Psychological factors, (iii) Social and familial factors, and (iv) Occupational factors. The seven components of Professional Efficiency are: (i) Managements of physical and financial resources, (ii) Organisation of the

instructional programme, (iii) Staff personnel services, (iv) Student personnel services, (v) School community relationship (vi) Headmaster as a teacher, and (vii) Personal disposition, temperament and job involvement. Components of Stress and Professional Efficiency were considered for analysing the latent structure.

Details of the Principal Component Analysis are described below.

(a) Principal Component Analysis for Stress

Results of the Principal Component Analysis for Stress are presented in Table 51, 52 and 53.

TABLE 51
Dispersion Matrix of Stress Variables

| Sl. No. | Stress variables | 1 Physio- logical factors | 2 Psycho- logical factors | 3 Social & familial factors | 4. Occupational factors |
|---------|-----------------------------|------------------------------------|------------------------------------|--------------------------------------|-------------------------------|
| 1 | Physiological factors | 5.110824 | 3.562565 | 2.354221 | 3.369944 |
| 2 | Psychological factors | 3.562565 | 12.82917 | 7.134705 | 9.565592 |
| 3 | Social and familial factors | 2.354221 | 7.134705 | 12.07304 | 10.82573 |
| 4 | Occupational factors | 3.36944 | 9.565592 | 10.82873 | 21.57798 |

TABLE 52
Correlation Matrix of Stress Variables

| Sl. No. | Stress variables | 1 Physiological factors | 2 Psychological factors | 3 Social & familial factors | 4. Occupational factors |
|---------|-----------------------------|----------------------------|----------------------------|-----------------------------|----------------------------|
| 1 | Physiological factors | 1 | 0.439965 | 0.299705 | 0.320902 |
| 2 | Psychological factors | 0.439965 | 1 | 0.573282 | 0.57492 |
| 3 | Social and familial factors | 0.299705 | 0.573282 | 1 | 0.670724 |
| 4 | Occupational factors | 0.320902 | 0.57492 | 0.670724 | 1 |

TABLE 53
Details of Eigen Values of Stress

| | | | | |
|--------------|-------|-------|-------|-------|
| Eigen values | 36.02 | 7.103 | 4.852 | 3.667 |
| Proportion | 0.698 | 0.138 | 0.094 | 0.071 |

From Table 51, 52 and 53 it is clear that the first principal component (PC_1) has got 69.8 percent of total information contained in the four dimensions of Stress. PC_1 and PC_2 together has got 83.6 percent of information. The total information is found to be only 93 percent when PC_3 is added to it. Hence the first Principal Component is found to be the representative of all the four dimensions of Stress. The representative value of Stress of each of the subjects can be estimated from the linear combinations of the Principal Components.

The obtained linear combinations of PC_1 and PC_2 are given in Table 54.

TABLE 54
Linear Combinations of PC_1 and
 PC_2 of Stress Variables of Heads of Primary Schools

$$PC_1 = 0.171 X_1 + 0.469 X_2 + 0.484 X_3 + 0.719 X_4$$

$$PC_2 = -0.363X_1 - 0.748X_2 + 0.03X_3 + 0.555 X_4$$

The first Principal component value for Stress of each of the subjects can be calculated using the information contained in Table 54 by supplying the X values. For example;

In the case of the first observation of the data (Appendix VIII) :

$$PC_1 = 0.171 \times 9 + 0.469 \times 8 + 0.484 \times 9 + 0.719 \times 6 = \underline{13.961}$$

It means that the representative Stress value for this person is, 13.961.

(b) Principal Component Analysis for Professional Efficiency

Results of the Principal Component Analysis for Professional Efficiency of the heads of schools are given in Table 55, 56 and 57.

TABLE 55

Dispersion Matrix of Professional Efficiency Variables

| Sl. No. | Professional Efficiency variables | Management of physical & financial resources | Organisation of instructional programme | Staff personnel services | Student Personnel services | School community relationship | Headmaster as a teacher | Personnel disposition temperament and job involvement |
|---------|--|--|---|--------------------------|----------------------------|-------------------------------|-------------------------|---|
| 1 | Management of physical financial resources | 5.915367 | 6.244283 | 3.937833 | 3.356023 | 2.4109 | 2.504786 | 2.89785 |
| 2 | Organisation of instructional programme | 6.244283 | 12.71467 | 6.998998 | 5.3299 | 3.583253 | 4.560914 | 4.801895 |
| 3 | Staff personnel services | 3.937533 | 6.998998 | 7.147745 | 3.965951 | 2.494535 | 2.68098 | 3.104125 |
| 4 | Student personnel services | 3.356023 | 5.3299 | 3.965951 | 4.595026 | 2.119992 | 2.279765 | 2.129577 |
| 5 | School community relationship | 2.4109 | 3.583253 | 2.494536 | 2.119992 | 2.551849 | 1.548067 | 1.579339 |
| 6 | Headmaster as a teacher | 2.504786 | 4.560914 | 2.68098 | 2.219765 | 1.541849 | 3.557755 | 2.124766 |
| 7 | Personnel dispositions temperament and job involvement | 2.89785 | 4.801895 | 3.104125 | 2.129577 | 1.579339 | 2.124766 | 4.399543 |

TABLE 56
Correlation Matrix of Professional Efficiency Variables

| Sl. No. | Professional Efficiency variables | Management of physical & financial resources | Organisation of instructional programme | Staff personnel services | Student personnel services | School community relationship | Headmaster as a teacher | Personnel dispositions temperament and job involvement |
|---------|--|--|---|--------------------------|----------------------------|-------------------------------|-------------------------|--|
| 1 | Management of physical and financial resources | 1 | 0.72001 | 0.605595 | 0.64371 | 0.620527 | 0.54999 | 0.568043 |
| 2 | organisation of instructional programme | 0.720011 | 1 | 0.734174 | 0.697305 | 0.629068 | 0.678128 | 0.642032 |
| 3 | Staff personnel services | 0.605595 | 0.734174 | 1 | 0.69202 | 0.584087 | 0.531644 | 0.553543 |
| 4 | Student personnel services | 0.64371 | 0.697305 | 0.69202 | 1 | 0.619103 | 0.548855 | 0.473637 |
| 5 | School community relationship | 0.620527 | 0.629068 | 0.584087 | 0.619103 | 1 | 0.513776 | 0.471351 |
| 6 | Headmaster as a teacher | 0.54527 | 0.678128 | 0.531644 | 0.548855 | 0.513776 | 1 | 0.537056 |
| 7 | Personnel disposition temperament & job involvement. | 0.568043 | 0.642032 | 0.553543 | 0.473637 | 0.471351 | 0.537056 | 1 |

TABLE 57
Details of Eigen Values of Professional Efficiency

| | | | | | | | |
|--------------|--------|-------|--------|--------|--------|--------|--------|
| Eigen values | 4.6929 | 0.602 | 0.4704 | 0.4289 | 0.3419 | 0.2787 | 0.1852 |
| Proportions | 0.67 | 0.086 | 0.067 | 0.061 | 0.049 | 0.04 | 0.026 |

Table 55, 56 and 57 reveals that the first Principal Component of Professional Efficiency has got 67 percent of total information contained in the seven dimensions i.e. due to the first PC the information loss is 33 percent. By adding the second Principal Component, the information raises to 75.6 percent. The total information raises only to 82.3 percent and 88.4 percent by adding the third and fourth PCs respectively. So we can consider the first Principal Component as the representative of all the dimensions of the Professional Efficiency.

The obtained linear combinations of Principal Components are given in Table 58.

TABLE 58
Linear Combination of
Principal Components of Professional Efficiency

| |
|--|
| $PC_1 = 0.39 x_1 + 0.42 x_2 + 0.389 x_3 + 0.387 x_4 + 0.363 x_5 + 0.351 x_6 + 0.34 x_7$ |
| $PC_2 = 0.109x_1 - 0.043 x_2 + 0.219 x_3 + 0.388 x_4 + 0.351 x_5 - 0.434 x_6 - 0.69 x_7$ |
| $PC_3 = 0.183 x_1 + 0.012 x_2 + 0.251 x_3 + 0.047 x_4 + 0.14 x_5 + 0.79 x_6 + 0.507 x_7$ |
| $PC_4 = 0.178 x_1 - 0.193 x_2 - 0.464 x_3 - 0.289 x_4 + 0.766 x_5 - 0.107 x_6 + 0.187 x_7$ |
| $PC_5 = 0.826 x_1 + 0.101 x_2 - 0.361 x_3 - 0.065 x_4 - 0.356 x_5 + 0.008 x_6 - 0.213 x_7$ |

The first principal component values of Professional Efficiency of each of the subjects can be calculated using the information contained in Table 58 by supplying the X values. Thus for example we can estimate the Professional Efficiency value for the first observation (from Appendix VIII) as,

$$PC_1 = 0.39 \times 11 + 0.42 \times 15 + 0.389 \times 17 + 0.387 \times 10 + 0.363 \times 8 \\ + 0.351 \times 6 + 0.34 \times 10 = \underline{29.834}.$$

It means that the representative Professional Efficiency value for this person is 29.834.

The analysis also revealed that the correlation coefficient between the first principal component of Stress and first Principal Component of Professional Efficiency of all the subjects is -0.4356.

The results of PC_1 analysis of Stress and Professional Efficiency of all the subjects are presented in Appendix VIII.

After conducting the Principal Component Analysis the investigator decided to find out the association between the two sets of variables of the study. For this, the canonical correlation analysis was carried out and the details are presented below.

E. CANONICAL CORRELATION ANALYSIS

Canonical correlation analysis was done to throw light on the eighth objective of the study i.e. to find out the association between the set of the dimensions of Stress and the set of

dimensions of the Professional Efficiency of the heads of primary schools in Kerala.

Canonical correlation was computed with the help of computer using 'Statistica' software as mentioned in the Methodology section (Chapter III) of this report.

The dimensions of Stress and the dimensions of Professional Efficiency of the heads of schools were treated as two sets of variables for the analysis as given below.

(a) Stress

| <u>Dimensions</u> | <u>Variable No.</u> |
|-----------------------------|---------------------|
| Physiological factors | Variable 1 |
| Psychological factors | Variable 2 |
| Social and familial factors | Variable 3 |
| Occupational factors | Variable 4 |

(b) Professional Efficiency

| <u>Dimensions</u> | <u>Variable No.</u> |
|--|---------------------|
| Management of physical and financial resources | Variable 5 |
| Organisation of instructional programme | Variable 6 |
| Staff personnel services | Variable 7 |
| Student personnel services | Variable 8 |
| School community relationship | Variable 9 |
| Headmaster as a teacher | Variable 10 |
| Personal dispositions, temperament and job involvement | Variable 11 |

The variables of Stress (variable 1 to 4) were treated as the Left Set and the variables of Professional Efficiency (variable 5 to 11) as the Right Set.

The correlation among the variables in the Left Set (variable 1 to 4) are presented in Table 59.

TABLE 59
Coefficients of Correlation
among the Dimensions of Stress of Heads of Schools

| N = 275 | Correlations | | | |
|---------|--------------|----------|----------|----------|
| | VAR1 | VAR 2 | VAR 3 | VAR 4 |
| VAR 1 | 1.000000 | 0.433897 | 0.296138 | 0.318974 |
| VAR 2 | 0.433897 | 1.000000 | 0.573976 | 0.576808 |
| VAR 3 | 0.296138 | 0.573976 | 1.000000 | 0.669316 |
| VAR 4 | 0.31874 | 0.576808 | 0.669316 | 1.000000 |

Table 59 reveals that all the correlation coefficients among the variables in the left set i.e. among the dimensions of Stress of heads of primary schools are positive and significant at 0.01 level since the correlation coefficients are greater than $2.58/\sqrt{N}$.

The coefficients of correlation among the variables in the right set (Variable 5 to 11) are given in Table 60.

TABLE 60
Coefficients of Correlation among the
Dimensions of Professional Efficiency of Heads of Schools

| Correlation | | | | | | | |
|-------------|----------|----------|-----------|----------|----------|----------|----------|
| N=275 | VAR5 | VAR6 | VAR7 | VAR8 | VAR9 | VAR10 | VAR11 |
| VAR5 | 1.000000 | 0.727563 | 0.613847 | 0.643434 | 0.623157 | 0.546508 | 0.569970 |
| VAR6 | 0.727563 | 1.000000 | 0.7347728 | 0.706630 | 0.631827 | 0.681055 | 0.651357 |
| VAR7 | 0.613841 | 0.734728 | 1.000000 | 0.701393 | 0.584236 | 0.540898 | 0.562557 |
| VAR8 | 0.643434 | 0.706630 | 0.701393 | 1.000000 | 0.623214 | 0.553077 | 0.475274 |
| VAR9 | 0.623157 | 0.631827 | 0.584236 | 0.623214 | 1.000000 | 0.523685 | 0.478221 |
| VAR10 | 0.546503 | 0.681055 | 0.540898 | 0.553077 | 0.523685 | 1.000000 | 0.540718 |
| VAR11 | 0.569970 | 0.652557 | 0.562557 | 0.475274 | 0.478221 | 0.540718 | 1.000000 |

Table 60 shows that there exist significant (at 0.01 level) positive correlations among the variables in the right set i.e. among the dimensions of Professional Efficiency of the heads of primary schools. Since the obtained correlation co-efficients are greater than $2.58/\sqrt{N}$.

The correlation between each of the variables in the left set and each of the variables in the right set i.e. between the variables 1 to 4 and 5 to 11 are presented in Table 61.

TABLE 61
Coefficients of Correlation
among the Dimensions of Stress and the
Dimensions of Professional Efficiency of Heads of Schools

| Correlation coefficients | | | | | | | |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| N = 275 | VAR5 | VAR6 | VAR7 | VAR8 | VAR9 | VAR10 | VAR11 |
| VAR1 | -210585 | -0.178418 | -0.191381 | -0.147445 | -0.113886 | -0.139429 | -0.222543 |
| VAR2 | -0.300324 | -0.313017 | -0.264746 | -0.265080 | -0.229834 | -0.282642 | -0.287351 |
| VAR3 | -0.370421 | -0.333286 | -0.295700 | -0.347314 | -0.347293 | -0.352062 | -0.281620 |
| VAR4 | -0.346876 | -0.319140 | -0.284397 | -0.350090 | -0.325844 | -0.334191 | -0.300706 |

Table 61 reveals that the correlation co-efficients between each variable in the left set and each variable in the right set are negative and significant since the co-efficients are greater than $2.58/\sqrt{N}$. This indicates that each of the dimensions of Stress of heads of primary schools is negatively related to each of the dimensions of their Professional Efficiency.

The Eigen values and canonical weights obtained are given in table 62, 63, and 64.

TABLE 62
Eigen Values of Canonical Roots.

| Root | Root 1 | Root 2 | Root 3 | Root 4 |
|-------|----------|----------|----------|----------|
| Value | 0.219223 | 0.039138 | 0.009819 | 0.004832 |

TABLE 63
Canonical Weights
Obtained for Stress of Heads of Schools

| Root | Root 1 | Root 2 | Root 3 | Root 4 |
|-------|----------|-----------|-----------|----------|
| VAR 1 | 0.085720 | -0.734491 | -0.793204 | 0.25928 |
| VAR 2 | 0.121351 | -0.671445 | 1.152182 | -0.17994 |
| VAR 3 | 0.526728 | 0.552992 | -0.027030 | 1.19180 |
| VAR 4 | 0.441032 | 0.328563 | -0.509876 | -1.20877 |

TABLE 64
Canonical Weights Obtained for
Professional Efficiency of Heads of Schools

| Root | Root 1 | Root 2 | Root 3 | Root 4 |
|--------|-----------|-----------|----------|-----------|
| VAR 5 | -0.379950 | 0.242158 | 0.62141 | -0.950719 |
| VAR 6 | 0.177809 | 0.426440 | -1.69103 | 0.34858 |
| VAR 7 | 0.035759 | 0.546809 | 0.41420 | -0.671794 |
| VAR 8 | -0.301935 | -0.511614 | 0.32301 | 1.113875 |
| VAR 9 | -0.201455 | -0.823057 | 0.16496 | -0.183715 |
| VAR 10 | 0.362416 | 0.421553 | 0.30933 | 0.127453 |
| VAR 11 | -0.198851 | 0.656188 | 0.51347 | 0.838876 |

Since there are 4 variables in the smallest set, 4 Canonical Correlations are obtained. The obtained Canonical Correlations are presented in Table 65 and the summary of the Canonical Correlation Analysis is presented in Table 66.

TABLE 65
Chi-square Test with Successive Roots Removed

| Root Removed | Canonical R | Canonical R-sqr | Chi-sqr | df | p | Lambda Prime |
|--------------|-------------|-----------------|----------|----|----------|--------------|
| 1 | 0.468212 | 0.219223 | 79.45274 | 28 | 0.000001 | 0.739262 |
| 2 | 0.197834 | 0.039136 | 14.36932 | 18 | 0.704694 | 0.946830 |
| 3 | 0.099092 | 0.009819 | 3.86910 | 10 | 0.953048 | 0.985396 |
| 4 | 0.069513 | 0.004832 | 1.27391 | 4 | 0.865784 | 0.995168 |

TABLE 66
Summary of the Canonical Correlation Analysis

| Canonical R = 0.46821 | | | |
|--|---|----------|-----------|
| Chi ² (28) = 79.453, p = 0.0000 | | | |
| N = 275 | | Left Set | Right Set |
| No. of variables | | 4 | 7 |
| Variance extracted | | 100.008 | 79.36218 |
| Total redundancy | | 13.78238 | 13.85268 |
| Variables: | 1 | VAR 1 | VAR 5 |
| | 2 | VAR 2 | VAR 6 |
| | 3 | VAR 3 | VAR 7 |
| | 4 | VAR 4 | VAR 8 |
| | 5 | | VAR 9 |
| | 6 | | VAR 10 |
| | 7 | | VAR 11 |

From Tables 65 and 66, it can be seen that the first Canonical Correlation between two sets is 0.46821 and is significant at 0.01 level ($\chi^2 = 79.45274$). This indicates that there exists significant relationship between the two sets of Stress and Professional Efficiency variables of the heads of primary schools. The Tables also reveals that other Canonical Correlations are not significant.

Figure 8 presents the plot of the four Canonical Correlations. It shows that the first Canonical Correlation has high value and the value diminishes sharply in subsequent correlations. This indicates that the first canonical correlation is enough to interpret the data.

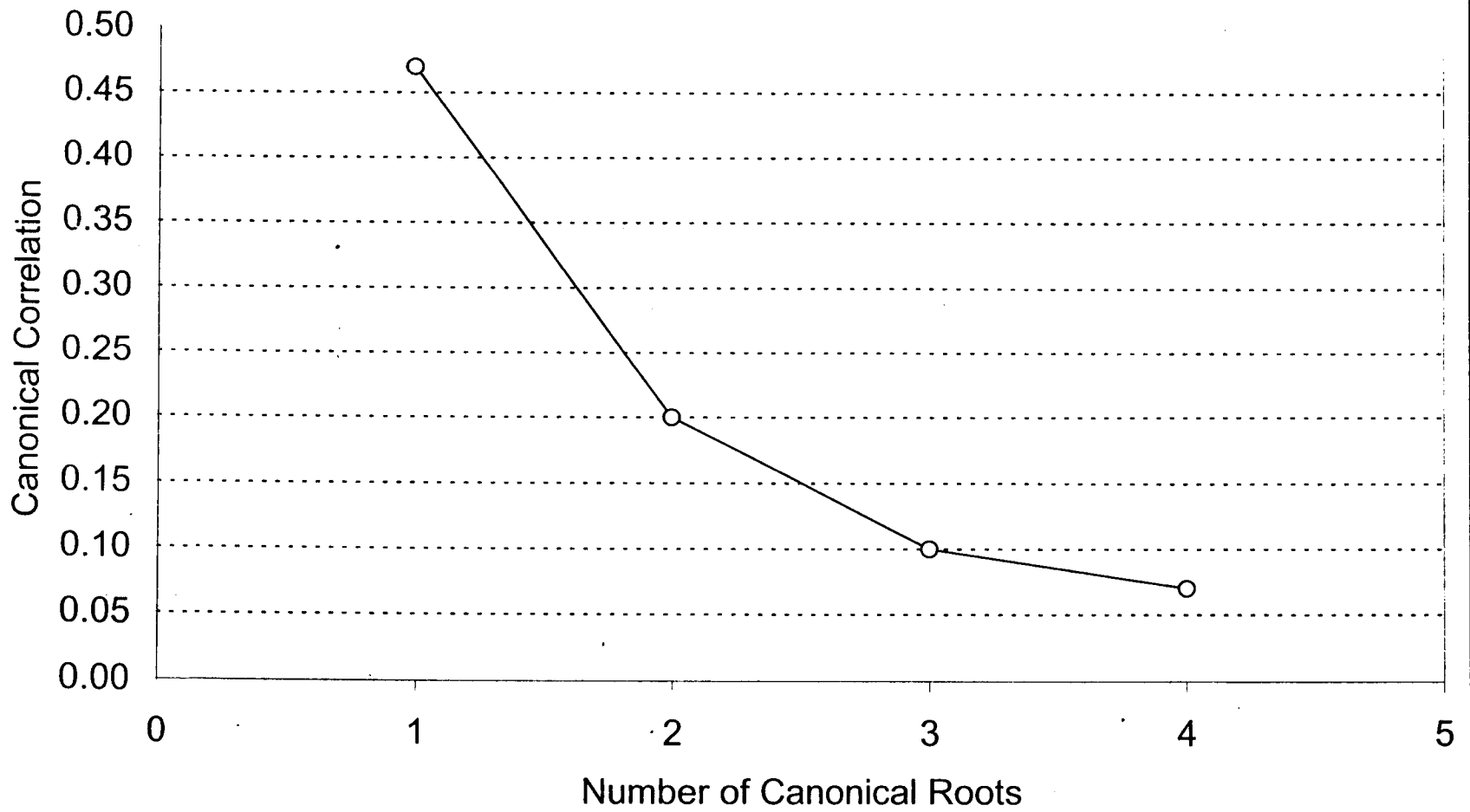


Fig. 8 - Plot of Canonical Correlations

Discussion

The Multiple Linear Regression Analysis proved that the subset of dimensions of Stress containing 'social and familial factors' and 'occupational factors' is the best sub set to predict the Professional Efficiency of the heads of primary schools in Kerala.

The Principal Component Analysis showed that the linear combination of first principal component has 69.8 percent of information contained in the four dimensions of Stress of heads of schools. Similarly the linear combinations of first principal component of Professional Efficiency of the heads of schools has 67 percent information contained in the seven dimensions. This indicates that the first principal components of both of the variables are sufficient to interpret the data.

The Canonical Correlation Analysis proved that the first canonical correlation between the two sets of variables is significant and it is sufficient to interpret the data.

**A STUDY ON STRESS AND PROFESSIONAL
EFFICIENCY OF THE HEADS OF PRIMARY
SCHOOLS IN KERALA**

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*THESIS SUBMITTED FOR THE DEGREE OF
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CONCLUSIONS AND SUGGESTIONS

-
- STUDY IN RETROSPECT
 - MAJOR FINDINGS
 - DISCUSSION OF RESULTS
 - CONCLUSION & INTERPRETATION
 - TENABILITY OF HYPOTHESES
 - EDUCATIONAL IMPLICATIONS
 - SUGGESTIONS FOR FURTHER RESEARCH
-

CONCLUSIONS AND SUGGESTIONS

THE STUDY IN RETROSPECT

Restatement of the problem

The study was an analysis of the extent of Stress experienced by the heads of primary schools in Kerala and its influence on their Professional Efficiency. The problem was stated as "A STUDY ON STRESS AND PROFESSIONAL EFFICIENCY OF THE HEADS OF PRIMARY SCHOOLS IN KERALA"

Variables

i. Dependent variable

The Professional Efficiency of the heads of primary schools was treated as the dependent variable of the study.

ii. Independent variable

Stress experienced by the heads of primary schools was treated as the independent variable of the study.

iii. Basal variables

The following variables were treated as the basal variables of the study based on which sub-samples were selected.

- (i) Sex
- (ii) Age
- (iii) Educational qualifications
- (iv) Teaching experience

- (v) Marital status
- (vi) Locality of the school
- (vii) Management category of the school.

Objectives of the study

The following were the objectives of the study:

1. To compare the mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools in Kerala and the locality and management category of their schools.
2. To study the levels of Stress experienced by the heads of primary schools in Kerala.
3. To compare the percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.
4. To compare the percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
5. To examine whether any association exists between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal

variables and Professional Efficiency of the heads of primary schools in Kerala.

6. To find out the relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.
7. To compare the relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples.
8. To identify the most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala.
9. To find out whether the variance co-variance structure of Stress and Professional Efficiency of heads of primary schools can be expressed through linear combinations of the dimensions Stress and Professional Efficiency.
10. To find out whether significant association exists between the set of dimensions of Stress and the set of dimension of Professional Efficiency of the heads of primary schools in Kerala.

Hypotheses of the study

1. There will be significant difference in mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age, educational qualifications, teaching

experience and marital status of the heads of primary schools in Kerala and the locality and management category of their schools.

2. There will be different levels of Stress experienced by the heads of primary schools in Kerala.
3. There will be significant difference in percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above.
4. There will be significant difference in percentages of heads primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study.
5. There will be significant association between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables and Professional Efficiency of the heads primary schools in Kerala.
6. There will be significant relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the total sample and for the relevant sub-samples.

7. There will be significant difference in relationships between Stress and Professional Efficiency of the heads primary schools in Kerala for the comparable sub-samples.
8. There will be a most effective subset of dimensions of Stress, which can predict the Professional Efficiency of the heads of primary schools in Kerala.
9. The variance co-variance structure of Stress and Professional Efficiency of the heads of primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency.
10. There will be significance association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

Procedure

Sample

The present study was conducted on a sample of 275 heads of primary schools in Kerala. Stratified random sampling technique was used for the selection of the sample. The sub-samples were selected on the basis of sex, age, educational qualifications, teaching experience and marital status of the heads of primary schools and the locality and management category of their schools.

Tools

The following tools were used for the collection of the data.

1. Stress Inventory for Headmasters (SIH)
2. Professional Efficiency Rating Scale for Headmasters (PERSH)

The above tools were prepared and standardised by the investigator with the help of his supervising teacher.

Statistical techniques used

Mean, median, mode, standard deviation, skewness and kurtosis of the distribution of the variables were determined. The mean score of both of the variables were compared for the comparable sub-samples.

Percentage analysis was carried out to determine the levels of Stress of heads of schools and to compare the levels of Stress among the sub-samples. The percentage of heads of schools experiencing different dimensions of Stress were computed and compared among comparable sub-samples.

Association between basal variables and the variables of the study was examined using Biserial coefficient of correlation, chi-square test and Pearson's product moment coefficient of correlation, depending on the nature of the basal variables.

The relationship between the variables of the study for the total sample and for the sub-samples were examined by

Pearson's r . The obtained r 's were compared for the comparable sub-samples.

Multiple Linear Regression Analysis was carried out to predict the dependant variable from the sub-set of one or more dimensions of the independent variable. Principal Component Analysis was carried out to study the variance co-variance structure of both of the variables of the study. Canonical Correlation was computed to find out the association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the subjects.

Multiple Linear Regression Analysis and the Principal Component Analysis were carried out with the help of computer using MINI-TAB software. Canonical Correlation was found out with the help of computer using 'Statistica' software. All other computations were done by hand.

MAJOR FINDINGS

1. a) The study of group differences of Stress of heads primary schools among sub-samples

When the differences in mean Stress of heads of schools were analysed the following results were obtained.

i. Sex difference

There exists no significant difference ($CR = -0.541$) between headmasters and headmistresses in their Stress.

ii. Age difference

No significant difference exists in mean Stress of the heads of primary schools belonging to the sub-samples of age below 41 years, 41-50 years and above 50 years.

iii. Difference based on educational qualifications

No significant difference exists in mean Stress of heads of schools belonging to sub-samples based on their educational qualifications such as undergraduates, graduates and post-graduates.

iv. Difference based on teaching experience

Comparison of mean Stress of heads of schools among sub-samples based on their teaching experience yielded the following results:

- a) The heads of schools belonging to the teaching experience group of 21-30 years were experiencing higher Stress (CR= 2.130) than those having teaching experience more than 30 years.
- b) No significant difference exists in mean Stress of heads of schools (1) having teaching experience below 21 years and between 21-30 years, and (2) having teaching experience below 21 years and more than 30 years.

v. **Difference based on marital status**

The comparison of mean Stress among married and single heads of schools revealed that their difference is not significant (CR=- 0.352).

vi. **Difference based on locality**

It was found that the mean Stress experienced by heads of rural and urban primary schools are almost alike (CR= -0.381).

vii. **Difference based on management category of the school**

It was found that the mean Stress experienced by heads of private and government schools were almost the same (CR= -1.094).

(b) **Study of group differences of Professional Efficiency of the heads of primary schools among sub-samples**

The study of group differences in mean scores of Professional Efficiency of the heads of primary schools among sub-samples based on the basal variables revealed the following:

i. **Sex difference**

There is no significant difference (CR= 0.399) between headmasters and headmistresses in the their mean scores of Professional Efficiency.

ii. Age difference

The difference in mean scores of Professional Efficiency of the heads of schools among age groups of below 41 years, 41-50 years and above 50 years are not significant.

iii. Difference based on educational qualifications

It was found that there exist no significant difference in mean scores of Professional Efficiency of the heads of schools among under graduates, graduates and postgraduates.

iv. Difference based on teaching experience

It was found that the difference in mean Professional Efficiency among heads of schools having teaching experience below 21 years, 21-30 years and above 30 years are not significant.

v. Difference based on marital status

The mean Professional Efficiency of married and single heads of primary schools is found to be almost similar (CR = 0.971).

vi. Difference based on the locality of the schools

The difference in mean scores of Professional Efficiency of heads in rural and urban primary schools is not significant (CR= 0.225).

vii. **Difference based on management category of the schools**

The analysis showed that there exist no significant difference in mean Professional Efficiency between heads of private and government primary schools.

2. **The study of levels of Stress experienced by the heads of schools**

The study of levels of total Stress experienced by the heads of schools revealed that the heads of primary schools are experiencing Stress in different levels. Out of the total sample 18.82 percent are experiencing High Stress, 65.818 percent are experiencing Moderate Stress and 16 percent are experiencing Low Stress.

It was found that among the sub-samples higher percentage of subjects experiencing High Stress, were those heads, who are single. In the Moderate Stress group highest percentage was obtained for postgraduates. In the Low Stress group the percentage was highest for graduate heads of schools.

3. **Comparison of percentages of heads schools experiencing different levels of total Stress among sub-samples**

The obtained results of comparison of percentages of heads of schools experiencing High, Moderate and Low Stress among sub-samples are presented below.

i. Sex difference

It was found that (a) the percentage of male heads of schools experiencing Moderate Stress is significantly higher (CR = 2.01) than that of females, and (b) the difference between percentage of male and female heads of schools experiencing High and Low Stress is not significant.

ii. Age difference

The study revealed that the difference in percentages of heads of schools experiencing High, Moderate and Low Stress belonging to different groups such as below 41 years, 41-50 years and above 50 years are not significant

iii. Difference based on the educational qualifications

The analysis revealed that (a) the percentage of undergraduate heads of schools experiencing Moderate Stress is significantly higher (CR= 2.32) than graduates, (b) the differences in percentages of heads of schools experiencing Moderate Stress between graduates and postgraduates and between undergraduates and postgraduates are not significant, and (c) there exists no significant difference in percentages of heads of schools experiencing High and Low Stress among undergraduates, graduates and post graduates.

iv. Difference based on teaching experience

It was found that there exist no significant difference in percentages of heads of schools experiencing High, Moderate and Low Stress among sub-samples based on teaching experiencing such as below 21 years, 21-30 years and above 30 years.

v. Difference based on the marital status

The difference in percentages of married and single heads of schools experiencing High, Moderate and Low Stress is not significant.

vi. Difference based on the locality of the school

The percentage analysis revealed that the heads of rural and urban primary schools are experiencing almost equal levels of Stress.

vii. Difference based on the management category of the school

The result of the comparison of percentages of heads of schools showed that heads of private and government schools are experiencing almost the same levels of Stress.

4. Comparison of heads of schools experiencing Stress under different dimensions

The comparison of heads of schools belonging to different sub-samples based on the basal variables, who experience Stress under different dimensions, such as physiological factors,

psychological factors, social and familial factors and occupations factors, revealed the following:

i. Sex difference

The study showed that the difference in percentages of headmasters and headmistresses experiencing Stress under different dimensions are not significant.

ii. Age difference

No significant difference exists in percentages of heads of schools who experience Stress under different dimensions and having age below 41 years, 41-50 years and above 50 years.

iii. Difference based on educational qualifications

No significant difference exists in percentages of heads of schools experiencing Stress under different dimensions among sub-samples of undergraduates, graduates and post graduates.

iv. Difference based on teaching experiences

The difference in percentages of heads of schools experiencing Stress under different dimensions is not significant among sub-samples based on teaching experience such as, below 21 years, 21-30 years and above 30 years.

v. Difference based on marital status

Married and single heads of schools experience almost same levels of Stress under different dimensions.

vi. Difference based on locality of the school

The heads of rural and urban schools are experiencing same levels of Stress under different dimensions.

vii. Difference based on management category of the school

No significant difference exists among percentages of heads of private and government schools experiencing different dimensions of Stress.

5. a) Association between Stress of heads of primary schools and the basal variables

The analysis of association between Stress of heads of schools and the basal variables such as sex, age, educational qualifications, teaching experience, marital status of the subjects and locality and management category of schools. revealed the following:

i. Sex and Stress

The obtained biserial co-efficient of correlation ($r_{bis} = -0.043$) showed that no significant association exists between sex and Stress of the heads of primary schools.

ii. Age and Stress

The Pearson's r obtained between age and Stress of heads of schools revealed that the association between age and Stress of heads of schools is not significant ($r = -0.093$).

iii. Educational qualifications and Stress

Chi-square test was employed to study the association between educational qualifications and Stress of heads of primary schools. The result showed that the association between educational qualification and Stress of heads of schools is not significant.

iv. Teaching experience and Stress

The value of Pearson's χ^2 between teaching experience and Stress of heads of schools showed that no significant association exists between teaching experience and Stress.

v. Marital status and Stress

The biserial co-efficient of correlation ($r_{bis} = 0.044$) revealed that there exists no significant association between marital status and Stress of the heads of schools.

vi. Locality and Stress

The analysis of association by biserial 'r' showed that there exist no significant association between locality of schools and Stress of heads of schools ($r_{bis} = -0.033$).

vii. Management category and Stress

The obtained biserial coefficient of correlation ($r_{bis} = 0.084$) revealed that no significant association exist between management category of schools and Stress of heads of schools.

b) **Association between Professional Efficiency of the heads of schools and the basal variables**

The following results were obtained when the analysis of association was carried out between Professional Efficiency of the heads of schools and the basal variables of the study.

i. **Sex and Professional Efficiency**

r_{bis} between sex and Professional Efficiency of the heads of schools showed that the association between the variables is not significant ($r_{bis} = 0.03$).

ii. **Age and Professional Efficiency**

The Pearson's r revealed that no significant association exists between age and Professional Efficiency of the heads of schools.

iii. **Educational qualifications and Professional Efficiency**

The result of chi-square test revealed that there is significant (at 0.05 level) association between educational qualifications and Professional Efficiency of the heads of schools in the case of graduates ($\chi^2 = 8.336$). No other χ^2 values were significant.

iv. **Teaching experience and Professional Efficiency**

The obtained coefficient of correlation between teaching experience and Professional Efficiency of the heads of schools

showed that there exist no significant association between them ($r = 0.072$).

v. Marital status and Professional Efficiency

The analysis of association using biserial 'r' showed that the association between marital status and Professional Efficiency of the heads of schools is not significant ($r_{bis} = 0.099$).

vi. Locality of the school and Professional Efficiency

No significant association exists between locality of the School and Professional Efficiency of the heads of schools ($r_{bis} = 0.021$).

vii. Management Category and Professional Efficiency

The obtained r_{bis} ($r_{bis} = -0.113$) revealed that there exists no significant association between management category of the schools and Professional Efficiency of the heads of schools.

6. Correlation between variables of the study

The obtained Pearson's product moment co-efficient of correlation between Stress and Professional Efficiency of the heads of Primary schools revealed the following.

(a) Significant negative correlation exists (at 0.01 level) between Stress and Professional Efficiency of heads of primary schools for the following samples:

| | |
|------------------------------------|--------------|
| Whole Sample | (r = -0.409) |
| Males | (r = -0.323) |
| Females | (r = -0.523) |
| Age below 41 years | (r = -0.683) |
| Age 41-50 years | (r = -0.349) |
| Age above 50 years | (r = -0.398) |
| Under graduates | (r = -0.339) |
| Graduates | (r = -0.606) |
| Teaching experience below 21 years | (r = -0.511) |
| Teaching experience 21-30 years | (r = -0.348) |
| Teaching experience above 30 years | (r = -0.430) |
| Married | (r = -0.408) |
| Rural | (r = -0.418) |
| Urban | (r = -0.390) |
| Private | (r = -0.435) |
| Government | (r = -0.316) |

(b) Correlation between the variables of the study were not significant for the following sub-samples.

| | |
|----------------|--------------|
| Post graduates | (r = -0.495) |
| Single | (r = -0.431) |

(c) Among the obtained significant correlations substantial negative relationships between the variables of the study were obtained for the following samples:

(i) whole sample (ii) females (iii) age below 41 years (iv) graduates (v) teaching experience below 21 years (vi) teaching

experience above 30 years (vii) married (viii) rural school, and (ix) private schools.

Low negative relationship between the variables of the study were obtained for the following samples: (i) males, (ii) age group of 41-50 years, (iii) age group above 50 years (iv) undergraduates (v) teaching experience group of 21-30 years, (vi) urban schools, and (vii) government schools.

(d) The population value of correlations falls between -0.279 and -0.539 for the whole sample and between -0.053 and -0.912 for sub-samples.

(e) The percentage overlap between variables was found to be ranging from 9.99 to 46.65.

The summary of the correlation analysis is presented in Table 67.

TABLE 67
Summary of Correlation Analysis

| SL No. | Sample | N | R | Confidence interval | | Percentage overlap |
|--------|--------------------------------------|-----|----------|---------------------|-------------|--------------------|
| | | | | Lower limit | Upper limit | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Whole sample | 275 | -0.409** | -0.279 | -0.539 | 16.73 |
| 2 | Males | 169 | -0.323** | -0.145 | -0.501 | 10.43 |
| 3 | Females | 106 | -0.523** | -0.341 | -0.705 | 27.35 |
| 4 | Age below 41 years | 36 | -0.683** | -0.454 | -0.912 | 46.65 |
| 5 | Age 41-50 years | 120 | -0.349** | -0.142 | -0.556 | 12.18 |
| 6 | Age above 50 years | 119 | -0.398** | -0.199 | -0.597 | 15.84 |
| 7 | Undergraduates | 212 | -0.339 | -0.182 | -0.496 | 11.49 |
| 8 | Graduates | 49 | -0.606** | -0.373 | -0.839 | 36.72 |
| 9 | Post graduates | 14 | -0.495 | -0.100 | -0.890 | 24.50 |
| 10 | Teaching experience up to 20 years | 65 | -0.511** | -0.275 | -0.747 | 26.11 |
| 11 | Teaching experience 21-30 years | 156 | -0.348** | -0.167 | -0.530 | 12.11 |
| 12 | Teaching experience 31 & above years | 54 | -0.430** | -0.144 | -0.716 | 18.49 |
| 13 | Married | 258 | -0.408** | -0.274 | -0.542 | 16.65 |
| 14 | Single | 17 | -0.431 | -0.044 | -0.818 | 18.58 |
| 15 | Rural | 223 | -0.418 | -0.275 | -0.561 | 17.47 |
| 16 | Urban | 52 | -0.390 | -0.087 | -0.693 | 15.21 |
| 17 | Private | 197 | -0.435 | -0.286 | -0.584 | 18.92 |
| 18 | Government | 78 | -0.316 | -0.053 | -0.579 | 9.99 |

(Note ** indicates significant relationships at 0.01 level)

7. Comparison of r s for comparable sub-sample

The comparison of correlation co-efficients between the variables of the study for the comparable sub-samples revealed the following:

i. **Sex difference**

The negative relationship between Stress and Professional Efficiency of heads of primary schools for females is significantly (at 0.051 level) higher than males.

ii. **Age difference**

a) The negative relationship between the variables of the study is significantly (at 0.05 level) higher for the heads of schools in the age group of below 41 years than those in the age group of 41-50 years.

b) The negative relationship between the variables of the study is significantly (at 0.051 level) higher for the heads of school in the age group of below 41 years than those in the age group of above 50 years.

c) There is no significant difference between the r ' s of heads of schools in the age group of 41-50 years and more than 50 years.

iii. **Difference based on the educational qualifications**

(a) Critical ratio obtained for difference in r ' s between undergraduates and graduate heads of schools is significant (at

0.05 level). Graduates are having higher negative relationship than undergraduates.

(b) The differences in r' s for the variables of the study between graduates and postgraduates, and between undergraduates and postgraduates are not significant.

iv. Difference based on teaching experience

No significant differences between r' s were obtained for sub-samples of heads of schools based on their teaching experience.

v. Difference based on marital status

There exists no significant difference ($CR = 0.073$) in correlation coefficients of Stress and Professional Efficiency between married and single heads of schools.

vi. Difference based on locality of the school

The obtained critical ratio for difference in r' s for the variables of the study between heads of rural and urban schools is not significant ($CR = -0.240$).

vii. Difference based on management category of schools

The difference in r' s for variables of the study between heads of private and government schools is not significant ($CR = 0.240$).

8. Multiple Linear Regression Analysis

The result of Multiple Linear Regression Analysis revealed that the sub-set containing dimensions of Stress such as social and familial factors and occupational factors is the best subset for predicting the Professional Efficiency of the heads of primary schools in Kerala. The best prediction formula obtained was

$$PE = -0.3843 S_3 - 0.2376 S_4 + 41.6947$$

Where, S_3 = Stress 3 i.e. Social and familial factors, and

S_4 = Stress 4, i.e. occupational factors.

The relationship obtained (R) between the sub set of the two dimensions and the Professional Efficiency of the heads of schools was 0.4291.

9. Principal Component Analysis

The result of the Principal Component Analysis showed that the first Principal Component for Stress of the heads of schools has 69.8 percent of total information contained in the four dimensions of Stress. The obtained linear combination of Principal Component of Stress was

$$PC_1 = 0.17 x_1 + 0.469 x_2 + 0.484 x_3 + 0.719 x_4$$

The first principal component (PC_1) of Professional Efficiency of the heads of schools has 67 percent information contained in all its dimensions. The obtained linear combination of the first principal component of Professional Efficiency was

$$PC_1 = 0.39 x_1 + 0.42 x_2 + 0.389 x_3 + 0.387 x_4 + 0.363 x_5 + 0.351 x_6 + 0.34 x_7$$

10. Canonical Correlation Analysis

The obtained Canonical correlation between the two sets of variables of Stress and Professional Efficiency of the heads of primary school was 0.46821 and is significant of 0.01 level.

DISCUSSION OF RESULTS

The present study revealed the following:

(i) The mean Stress is almost alike among sub-samples based on sex, age, educational qualification and marital status of the heads of primary schools and locality and management category of their schools. But among sub-samples based on the teaching experience the mean Stress of the heads of schools having teaching experience of 21-30 years was higher than those having teaching experience more than 30 years.

The heads of primary schools were having almost the same mean scores for their Professional Efficiency among sub-samples based on sex, age, educational qualifications, teaching experience and marital status of the heads of schools and the locality and the management category of their schools.

(ii) The heads of primary schools in Kerala are experiencing different levels of Stress such as High, Moderate, and Low. 18.182 percent of the subjects was experiencing High Stress, 65.818 percent of the subjects was experiencing Moderate Stress and 16 percent was experiencing Low Stress.

(iii) The percentages of heads of schools experiencing High, Moderate and Low Stress were almost equal among sub-samples based on age, teaching experience, marital status of the subjects and the locality and management category of their schools. Similarly the percentages of heads of schools experiencing High and Low Stress were almost alike among sub-samples based on their sex and educational qualifications. The percentage of male and undergraduate heads of schools experiencing Moderate Stress were higher than females and graduates respectively. But no significant difference existed in percentages of undergraduate and postgraduate heads of schools experiencing Moderate Stress when compared to graduates and post graduates respectively.

(iv) It was observed that no significant difference existed in percentages of heads of primary schools experiencing different dimensions of Stress among sub-samples based on the basal variables of the study.

(v) No association existed between the variables of the study and the basal variables except in the case of educational and Professional Efficiency. In the case of educational qualifications and Professional Efficiency of the subjects, χ^2 value was significant for graduates.

(vi) Stress and Professional Efficiency of the heads of primary schools are negatively correlated for the total sample and

for almost all of the sub-samples based on the basal variables. But the relationship between Stress and Professional Efficiency was not significant for heads of schools having no spouse and those having post-graduate qualifications.

(vii) Also, the negative relationship between the select variable was higher for headmistresses than headmasters. Similarly the negative relationship between Stress and Professional Efficiency of the heads of schools in the age group of 41-50 years and above 50 years were lower than those having age below 41 years. The negative relationship between the variables of the study was greater for graduates than for under-graduates. The relationship between the variables of the study was almost alike for sub-samples based on the teaching experience and marital status of the subjects and locality and management category of their schools. Similarly the relationship between the variables is almost the same for heads of schools having age 41-50 years and more than 50 years, between graduates and post graduates, and between undergraduates and post graduates.

(viii) It was also found that the dimensions of social and familial factors and occupational factors of the Stress variable are the best sub-set to predict the Professional Efficiency of the heads of primary schools.

(ix) The first principal component of Stress contained 69.8 percent of information in the original four dimensions of Stress.

Similarly the first Principal Component of Professional Efficiency of the heads of schools contained 67 percent of information in its seven variables.

(x) The first canonical correlation between the two sets of variables of Stress and Professional Efficiency of the heads of primary schools, i.e.0.46821 is significant at 0.01 level. This indicates that there exists significant association between the two sets of the variables of the study.

CONCLUSIONS AND INTERPRETATIONS

The following conclusions can be drawn from the discussion of the results.

The Stress experienced by the heads of schools having teaching experience 21-30 years is higher than the Stress experienced by those having teaching experience more than 30 years. This leads to the conclusion that heads of schools having teaching experience of 21-30 years may have less coping skills than those having experience more than 30 years. The increased experience in the field might have helped to develop suitable coping techniques for the latter group. There is no group differences in means Stress and mean Professional Efficiency for the sub-samples based on sex, age, educational qualifications, teaching experience and marital status of the heads of schools and the locality and management category of the schools.

It was found that the percentage of male heads of schools experiencing Moderate Stress is higher than the percentage of females experiencing Moderate Stress. This may be attributed to the inherent lower perseverance capacity of the males than females. It was also found that the percentage of undergraduates having Moderate Stress is higher than graduates. This may be due to the lower educational levels of the undergraduates and the subsequent incapability of the undergraduates to meet the demands of the job. The percentage of heads of schools experiencing High and Low Stress were almost alike among sub-samples based on their sex and educational qualifications.

But it was found that the percentage of heads of schools experiencing High, Moderate, and Low Stress are almost the same for sub-samples based on age, teaching experience and marital status of the subjects and the locality and management category of the schools.

The absence of difference in percentages of subjects experiencing different dimensions of Stress indicates that heads of schools belonging to different sub-samples based on the basal variables of the study are experiencing almost equal Stress under its different dimensions. The above result strengthens this conclusion that the level of Stress and Professional Efficiency are not changing with age, teaching experience, and marital status of the subjects and locality and management category of the schools.

Also, the absence of association between the variables of the study and the basal variables in almost all sub-samples indicates that the Stress and Professional Efficiency of the heads of schools are independent of sex, age, educational qualifications, teaching experiences and marital status of heads of schools and locality and management category of the schools. This result again strengthens the above mentioned results.

It was noticed that Stress and Professional Efficiency of heads of primary schools are negatively correlated for the total sample and most of the sub-samples. This proved that the Stress experienced by the heads of schools is negatively affecting their Professional Efficiency. But the absence of relationship between the variables of the study among post-graduates may be because, the postgraduates being more educated can exhibit better performance in spite of their Stress. Similarly, the Stress experienced by the heads of schools who are single was found to be not affecting their Professional Efficiency. This may be because of that they can spare more time for their work than their married counterparts and hence excel in their Profession.

It was found that the negative relationship between Stress and Professional Efficiency among headmistresses is higher than headmasters. This may be attributed to the fact that females are emotionally less stable than males and therefore the Stress is

likely to affect more on the Professional Efficiency of females than males.

Heads of schools having age below 41 years were observed to be having higher relationship between Stress and Professional Efficiency than those having age 41 - 50 years and more than 50 years. This suggests that the older heads of schools are more emotionally stable than youngsters and the younger heads of schools have less capacity to control the effect of Stress on their Professional Efficiency.

The relationship between Stress and Professional Efficiency is observed to be greater among graduates than undergraduates. This may be because of that the graduates are more ambitious due to their higher education than undergraduates. So their Stress will affect their Professional Efficiency more than the undergraduates.

The most effective sub-set of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools are the social and familial factors and occupational factors. The obtained Prediction formula is

$$\text{Professional Efficiency} = -0.3843 S_3 - 0.2376 S_4 + 41.6947$$

(Note: S_3 = score obtained for social and familial factors,
and

S_4 = score obtained for occupational factors)

Professional Efficiency is most affected by social and familial factors and occupational factors. This indicates that the sub-set containing social and familial factors and occupational factors influence the Professional Efficiency than all other possible sub-sets of dimensions of Stress. Job related Stress creating factors will, of course affect the familial and social life of the head of schools and hence as a whole his Professional Efficiency.

The obtained linear combination of the first Principal Component of Stress which contained 69.8 percent of the information is

$$PC_1 = -0.171 x_1 + 0.469 x_2 + 0.484 x_3 + 0.719 x_4$$

The linear combination support the early mentioned result that major contribution to Stress of heads of primary schools in from Stress 3 and 4 i.e. from social and familial factors and occupational factors.

The obtained linear combination for Professional Efficiency which contained 67 percent of the information is

$$PC_1 = -0.39 x_1 + 0.42 x_2 + 0.389 x_3 + 0.387 x_4 + 0.35 x_6 + 0.34 x_7$$

This component has 67 percent information contained in the seven dimensions of Professional Efficiency of the heads of primary schools. This proved that the PC_1 of Professional Efficiency is the single representative of all the seven variables of

Professional Efficiency of the heads of primary schools. The linear combination also showed that all of the seven dimensions of Professional Efficiency has almost equal levels of contribution to the total Professional Efficiency of heads of primary schools in Kerala. So in order to increase the total Professional Efficiency of the heads of primary schools, all dimensions - i.e., management of physical and financial resources, organisation of the instructional programme, staff personnel services, student personnel services, school community relationship, headmaster as a teacher, and personal disposition, temperament and job involvement - should be improved.

The first Canonical correlation between the two sets of variables of Stress and Professional Efficiency is significant at 0.01 level. This supports the conclusion obtained from correlation analysis that the Stress of the heads of primary schools is strongly affecting their Professional Efficiency.

TENABILITY OF HYPOTHESES

The tenability of the hypotheses set for the study was examined based on the findings of the study. It showed that most of the hypotheses of the study are substantiated.

1. The first hypothesis which states that 'there will be significant difference in mean scores of Stress and Professional Efficiency for the selected sub-samples based on sex, age, educational

qualifications, teaching experience and marital status of the heads of primary schools in Kerala and the locality and management category of their schools is partially substantiated.

Significant difference in Stress of heads of schools was observed in certain teaching experience groups only where as no significant difference was observed among the sub-samples in their Professional Efficiency.

2. The second hypotheses which states that 'there will be different levels of Stress experienced by the heads of primary schools in Kerala' is fully substantiated.

Heads of primary schools in Kerala experience different levels of Stress such as High, Moderate and Low Stress.

3. The third hypotheses states that 'there will be significant difference in percentages of heads of primary schools in Kerala experiencing different levels of Stress for selected sub-samples as mentioned above' . This hypothesis is partially substantiated.

There exists significant difference in percentages of heads of schools only for those experiencing Moderate Stress between sex groups and between certain educational qualifications groups.

4. The fourth hypothesis which states that 'there will be significant difference in percentages of heads of primary schools in Kerala experiencing different dimensions of Stress for selected sub-samples based on the basal variables of the study' was rejected.

It was found that the percentage of heads of primary schools experiencing different dimensions of Stress, belonging to different sub-samples based on the basal variables are almost the same.

5. The fifth hypothesis states that 'there will be significant association between (a) each of the basal variables and Stress experienced by the heads of primary schools in Kerala, and (b) each of the basal variables and Professional Efficiency of the heads of primary schools in Kerala'. This hypotheses is only partially substantiated.

It was observed from the study that no association exists between the variables of the study and the basal variables except in the case of educational qualifications and Professional Efficiency of heads of schools.

6. The sixth hypothesis which states that 'there will be significant relationship between Stress and Professional Efficiency of the heads of primary schools in Kerala for the

total sample and for relevant sub-samples is substantiated to a great extent.

It was noticed that Stress and Professional Efficiency of the heads of primary schools are negatively correlated for the total sample and for most of the sub-samples. But there exists no relationship between Stress and Professional Efficiency for heads of schools having no spouse and for post-graduates.

7. The seventh hypothesis states that 'there will be significant difference in relationships between Stress and Professional Efficiency of the heads of primary schools in Kerala for the comparable sub-samples'. This hypothesis is partially substantiated.

The negative relationship between the variables of the study is differing only between sex groups and among certain groups based on age and educational qualifications.

8. The eighth hypothesis which states that 'there will be a most effective subset of dimensions of Stress which can predict the Professional Efficiency of the heads of primary schools in Kerala' is fully substantiated.

The subset of dimensions of Stress containing 'social and familial factors' and 'occupational factors' is the best subset to predict the Professional Efficiency of the heads of primary schools in Kerala.

9. The ninth hypothesis states that 'the variance-co-variance structure of Stress and Professional Efficiency of the heads of primary schools in Kerala can be expressed through linear combinations of the dimensions of Stress and Professional Efficiency. This hypothesis is fully substantiated.

The linear combination of first principal component has 69.8 percent of information contained in the four dimensions of Stress of heads of schools. Similarly the linear combination of first principal component of Professional Efficiency of the heads of schools has 67 percent information contained in the seven dimensions.

10. The tenth hypothesis which states that 'there will be significant association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala' is fully substantiated.

There exists significant association between the set of dimensions of Stress and the set of dimensions of Professional Efficiency of the heads of primary schools in Kerala.

EDUCATIONAL IMPLICATIONS

Based on this study the following suggestions are putting forward which will be helpful for the authorities concerned to improve the present conditions in the primary schools.

1. The study revealed that the heads of primary schools are experiencing Stress and their Stress is negatively correlated with the Professional Efficiency. Since the Professional Efficiency of the heads of schools will affect not only the prospects of his students but also the functioning of the school as a whole. So, steps must be taken to reduce the Stress experienced by the heads of schools.
2. The study showed that the most influencing dimensions of Stress of the heads of schools on their Professional Efficiency is the social and familial factors and occupational factors. So steps should be taken to reduce Stress due to these factors. The work overload of the heads of primary schools must be reduced because, it creates Stress due to occupational factors. Naturally, Stress due to occupational factors will influence a healthy family life as well as social life.

In order to reduce Stress due to occupational factors the heads of schools must be provided with clerical assistants and additional teachers so as to reduce work overload and strengthen their administrative and class supervision work. Better salary rates to the heads of schools and better physical facilities are also recommended. Career stagnation must be reduced by promoting the heads of schools in to supervisory positions of primary

education which will also help to reduce Stress due to occupational factors.

In order to reduce Stress due to social and familial factors activities like social gatherings of family members of the heads of schools, family tours etc. are recommended. Working in social and cultural organisations also help to reduce Stress under this category.

In order to reduce total Stress, Stress due to physiological factors and psychological factors is also to be reduced. Stress due to physiological factors can be reduced by such relaxation exercises as practice of yoga and participation in aquatic and field games. Changes in diet is also recommended. Excessive intake of refined carbohydrates and fatty foods and inadequate consumption of foods having fibre must be changed. Similarly excessive intake of coffee loaded materials which is a stimulant, known to increase anxiety must be discouraged.

Stress due to psychological factors can be reduced by participating in recreation activities, increasing the sense of confidence and resourcefulness and adopting a positive attitude to the work and tasks of the job.

3. It was revealed from the study that the percentage of undergraduate heads of schools experiencing Moderate Stress is higher than those of the graduates. This may be

attributed to the lower levels of education of the undergraduates. So steps should be taken to promote graduate teachers only, to the post of headmaster.

4. It is also suggested that compulsory inservice training should be given to the heads of schools encompassing all dimensions of educational administration which will be helpful to improve their Professional Efficiency.
5. It was observed from the study that many heads of schools are not satisfied with the academic supervision and administrative work and the support system from the Educational Department. Academic supervision and support system from the educational authorities must be strengthened which will help the heads of schools to relive off their stress to a great extent.

SUGGESTIONS FOR FURTHER RESEARCH

It is felt from the study that further research may be conducted in the following areas.

1. The study can be replicated to find the relationship between Stress and Professional Efficiency among heads of secondary schools in Kerala.
2. Studies can be conducted to find out the influence of Stress of primary, secondary and higher secondary school teachers on their teacher effectiveness.

3. Investigation may be conducted about the influence of independent variables such as job satisfaction, burnout etc. on the Professional Efficiency of the heads of primary and secondary schools.
4. The study can be extended to find out the coping techniques used by different categories of teachers experiencing Stress.
5. Studies can be conducted on student Stress due to parental, social and institutional pressure to attain high achievement, characteristics of curriculum, social environment etc.

**A STUDY ON STRESS AND PROFESSIONAL
EFFICIENCY OF THE HEADS OF PRIMARY
SCHOOLS IN KERALA**

ABDUL KADER PARAMBAT, M.A; M.Ed

*THESIS SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY IN EDUCATION*

**DEPARTMENT OF EDUCATION
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2000

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APPENDICES

APPENDIX I
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
STRESS INVENTORY FOR HEADMASTERS (Draft)

Abdul Kader Parambat

Dr. C. Naseema

Instructions

1. Read the statements given below and mark (✓) against the corresponding number in the Response sheet under the category 'Always', 'Sometimes' and 'Never' which you think describes you best.
2. Be frank in your answers. Your answers will be kept strictly confidential and will be used for research purpose only.

Statements:

1. ✓ I can do my work energetically even when the work load is higher.
2. I feel that my efforts are being considered valuable by others.
3. I can create an enthusiastic atmosphere with my students.
4. Attending family problems disturbs my job.
5. I experience head-ache or pain in my head.
6. I am satisfied in the opportunities to utilise my potentiality in my job.
7. I feel excitement in doing job by interacting more with my students.
8. I feel satisfied in my job.
9. ✓ Sometimes I experience indigestion or vomiting.
10. I feel that my work load is heavy.
11. I feel that I have accomplished many worthwhile things in life by this job.
12. I am satisfied in the promotion scope of my job.
13. I feel tiredness or exhaustion without any reason.
14. I feel that my present job does not suit to my qualifications.
15. I feel students blame me for some of their problems.
16. I am satisfied in my job security.
17. ✓ I experience a tendency to eat and drink unusually.
18. I used to think very deeply before any action.

19. I feel my colleagues blame me for some of their problems.
20. I am satisfied in the scope for personal growth in my job.
- 21✓ I feel to smoke excessively.
22. I feel anxiety about the defects in some of my actions and decisions.
23. I am satisfied in the inter communication in my school.
24. I feel satisfied in the supervision by authorities from education department.
- 25✓ I experience less sexual interest.
26. I feel disappointment and worry without any reason.
27. My relationships with my colleagues are warm.
28. I feel satisfied in the cooperation provided by authorities from the educational department.
- 29✓ I feel dizziness always.
30. I am able to think and act normally whenever I face difficult situations.
31. I am satisfied with the public image of my school.
32. I feel satisfaction in the changes and innovations that are being introduced in the school.
- 33✓ I feel decrease in appetite.
34. Whenever I commit mistakes in my activities I loose confidence and become unable to continue it.
35. I feel satisfied in the psychological environment of my school.
36. I am confident that I can settle the disputes in my school.
- 37✓ I feel my muscles pulsating.
38. When I am involved in important activities it may get disturbed by silly interruptions.
39. I can deal with the problems of my students and colleagues effectively.
40. I am satisfied in the capacity of my job to attain my aspiration and ambitions.
- 41✓ I experience sudden pain in different parts of my body.
42. I feel regretful of some of my past decision and actions.
43. I feel worried when friends and colleagues isolates me.
44. I am satisfied in the flexibility and freedom that I get in my job.
- 45✓ I feel a tendency not to get up in the morning.
46. I feel that I am a hot tempered person.

47. I can identify and solve the problems in my house and school.
48. I am satisfied in my salary rates.
- 49✓ I feel sweating and increased heart beat.
50. I can frankly and undoubtedly express my opinions.
51. I feel my job makes me emotionally rough.
52. I feel satisfaction in the infrastructure of my school.
53. I can sleep well usually.
54. I feel that I treat my colleagues with partiality.
55. There were occasions in my professional life when I feel it is difficult to live due to disappointment.
56. I am able to deal emotional problems calmly.
57. I feel that I am not giving enough care and love to my spouse and children because of my workload.
58. I feel less confidence in my ability and skills associated with my job.
59. Working among people causes mental strain for me.
60. I feel disturbed by the caste system prevailing in society.
61. I experience mental tension during this job.
62. I am satisfied with the nature of my work.
63. In friendly talks with my colleagues my familial problems also get mentioned.
64. I feel much disturbed during my work due to the heavy work load.
65. I am satisfied with my capacity to take decisions.
66. I feel that my job is a hindrance for getting enough love and care from my spouse.
67. I feel disturbed by frequent transfers.
68. I feel that I am not getting enough respect from my family members even though I am making money from my job.
69. I am able to inspire my colleagues through my work.

APPENDIX II
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
STRESS INVENTORY FOR HEADMASTERS

Abdul Kader Parambat

Dr. C. Naseema

Instructions

1. Read the statements given below and mark (✓) against the corresponding number in the Response sheet under the category 'Always', 'Sometimes' and 'Never' which you think describes you best.
2. Be frank in your answers. Your answers will be kept strictly confidential and will be used for research purpose only.

Statements:

1. There were occasions in my professional life when I feel it is difficult to live due to disappointment.
2. I am satisfied in my job security.
3. I am satisfied in my salary rates.
4. I feel my job makes me emotionally rough.
5. I feel a tendency not to get up in the morning.
6. I feel satisfied in my job.
7. I can create an enthusiastic atmosphere with my students.
8. I feel less confidence in my ability and skills associated with my job
9. I am able to inspire my colleagues through my work.
10. I feel much disturbed during my work due to the heavy work load.
11. I am satisfied with the nature of my work.
12. I feel that I have accomplished many worthwhile things in life by this job.
13. I am satisfied with my capacity to take decisions.
14. I am able to deal emotional problems calmly.
15. I feel that I am not giving enough care and love to my spouse and children because of my workload.
16. I can sleep well usually.
17. I feel worried when friends and colleagues isolates me.
18. I can deal with the problems of my students and colleagues effectively.
19. I feel sweating and increased heart beat.
20. I am satisfied in the flexibility and freedom that I get in my job.

21. I feel that my job is a hindrance for getting enough love and care from my spouse.
22. I feel that my work load is heavy.
23. I am confident that I can settle the disputes in my school.
24. I feel that my present job does not suit to my qualifications.
25. I am satisfied with the public image of my school.
26. I feel that I am a hot tempered person.
27. I feel that my efforts are being considered valuable by others.
28. I feel anxiety about the defects in some of my actions and decisions.
29. Whenever I commit mistakes in my activities I loose confidence and become unable to continue it.
30. I experience mental tension during this job.
31. I feel satisfied in the cooperation provided by authorities from the educational department.
32. I experience a tendency to eat and drink unusually.
33. I feel satisfaction in the infrastructure of my school.
34. I experience less sexual interest.
35. I feel satisfied in the psychological environment of my school.
36. I can do my work energetically even the work load is higher.
37. I am satisfied in the inter communication in my school.
38. I am satisfied in the capacity of my job to attain my aspiration and ambitions.
39. I experience sudden pain in different parts of my body.
40. My relationships with my colleagues are warm.
41. I am satisfied in the promotion scope of my job.
42. I feel decrease in appetite.
43. In friendly talks with my colleagues my familial problems also get mentioned.
44. I feel disturbed by frequent transfers.
45. I experience head-ache or pain in my head.
46. I can identify and solve the problems in my house and school.
47. When I am involved in important activities it may get disturbed by silly interruptions.
48. I feel satisfied in the supervision by authorities from education department.
49. I am able to think and act normally whenever I face difficult situations.
50. I feel tiredness or exhaustion without any reason.

Appendix III
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

STRESS INVENTORY FOR HEADMASTERS
Response Sheet

1. Name of school:

6. Sex : Male/Female

2. Locality of the school: Grama
Panchayath/Municipality/Corporation

7. Educational qualifications:
Undergraduate
Graduate/Postgraduate

3. Revenue district:

8. Total teaching experince:

4. Management category: Private /
Government

9. Marital status : Married/Single

5. Age of the teacher :

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 1. | | | |
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| 16. | | | |
| 17. | | | |

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 18. | | | |
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| 31. | | | |
| 32. | | | |
| 33. | | | |
| 34. | | | |

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 35. | | | |
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APPENDIX IV
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
PROFESSIONAL EFFICIENCY RATING SCALE FOR
HEADMASTERS (Draft)

Abdul Kader Parambat

Dr. C. Naseema

Instructions

1. Read the statements given below and mark (✓) against the corresponding number in the Response sheet under the category 'Always', 'Sometimes' and 'Never' which you think describes you best.
2. Be frank in your answers. Your answers will be kept strictly confidential and will be used for research purpose only.

Statements

1. I evaluate the functions and goals of the school.
2. I study and interpret the social trends that demand curricular change.
3. I define the role and responsibilities of each of the employees.
4. I assess and analyse the value orientation of the students.
5. I utilise the services of the advisory councils and representatives of the public for analysing the goals and functions of the school.
6. I have full confidence in the subjects that I teach.
7. I wait patiently for the result of my work.
8. I identify and analyse programmes for attaining objectives of the school.
9. I consider the general needs of the students in the instructional programmes.
10. I introduce the new staff to students, to other members of staff and to the community.
11. I review the goals and objectives of the school as an institution.
12. I assess the perception of the public about the needs and scope for the improvement of the school.
13. I always try to increase my knowledge.
14. I consider all my colleagues as equals.
15. I maintain catalogues of instruments and other equipment available in the school.
16. I integrate the goals of the school with needs of the learners.
17. I assign duties to the new staff so as to optimise the goals of the school.
18. I assure the involvement of students while making decisions, regarding various programs in the school.
19. I actively participate in social activities.
20. I treat all my students without partiality.

21. My higher authorities appreciate suggestions put forward by me.
22. I prepare a budget after deciding priority of needs for each programme.
23. I assess whether the curricular activities are adequate enough in meeting the needs and objectives of the learners.
24. I assign duties to experienced teachers so as to fulfill the goals of the school.
25. I supervise the planning, resource mobilisation and evaluation etc. of the co-curricular activities of the school.
26. I work in social organisations.
27. I gladly accept my mistakes pointed out by my students.
28. I do not speak about my colleagues insultingly in the presence of others.
29. I approve the list of requirements of the instruments and other equipment for the school after evaluation.
30. I examine activities that improve instructional programmes.
31. I improve the efficiency of the staff by class observations and discussions with them.
32. I give support to the efficient functioning of the school parliament.
33. I emphasize to my students and teachers about their role in the society.
34. I prepare my lesson plans punctually.
35. I am in favour of giving freedom to my colleagues in their work..
36. I foresee the resource needs of the school for the coming years.
37. I allocate duties to my colleagues so as to attain the instructional goals.
38. I give guidance to each of the staff for improvement in particular areas of his interest.
39. I make proper arrangements for giving information to the students about matters concerning them.
40. I timely inform parents and colleagues the matters that are to be informed them.
41. I use proper teaching methods suitable for each class.
42. I postpone some activities for taking appropriate action at a suitable time.
43. I participate in the planning of new construction works for increasing instructional facilities.
44. I acquire and distribute essential instruments and other equipment for the attainment of instructional goals.
45. I evaluate the results of the inservice training programmes for teachers conducted by different agencies.
46. I create opportunity for discussion by parents and teachers about matters concerning the students.
47. I organise novel schemes and programmes for utilisation of the community resources.

48. I check the note books of my students.
49. I overcome the challenges against my leadership.
50. I systematically arrange the tasks that are to be completed.
51. I encourage the most appropriate teaching methods.
52. I evaluate the activities of the member of the staff
53. In policy making for the promotion and grading of the students I involves along with my colleagues.
54. I take proper steps for the effective functioning of the Parent Teacher Association.
55. As a teacher I have respect for my job.
56. I try to acquire the latest knowledge and skills about school administration.
57. I evaluate the needs of the learners that are useful to the school and the community.
58. I explain the changes in instructional methods to parents and community.
59. I analyse the value orientations of the staff.
60. I organise programmes for promoting understanding and co-operation among students and teachers.
61. I use proper teaching aids in my class.
62. I analyse my value orientation.
63. I examine the techniques used for evaluation process and give necessary directions to the staff.
64. I give opportunities to my colleagues to know what I am expecting from them.
65. I feel happiness in utilising my time and energy for the goodness of my students.
66. I take decision based on specific evaluation of the data.
67. I organise and analyse the data of the outcomes and changes of the instructional programme given to the learners.
68. I give full freedom to my colleagues for the performance of their tasks.
69. I have no hesitation in asking my colleagues about the things that I do not know.
70. I study and understand the legislations and court decisions regarding school administration.
71. I collect and analyse the data connected with learning activities.
72. I allow my colleagues to utilise their own evaluations for solving common problems.
73. I consider my colleagues as my friends.
74. I select and recommend the most effective learning activities.
75. I encourage the programmes suggested by my colleagues.
76. I take initiative to solve the conflicts among my colleagues.
77. I succeed in making my higher authorities to take necessary decisions for the welfare of my colleagues.
78. I consider the individual well-being of my colleagues.
79. I instruct my colleagues to follow the rules and regulations.
80. I ensure that my colleagues are doing their work.

APPENDIX V
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
**PROFESSIONAL EFFICIENCY RATING SCALE FOR
HEADMASTERS**

Abdul Kader Parambat

Dr. C. Naseema

Instructions

1. Read the statements given below and mark (✓) against the corresponding number in the Response sheet under the category 'Always', 'Sometimes' and 'Never' which you think describes you best.
2. Be frank in your answers. Your answers will be kept strictly confidential and will be used for research purpose only.

Statements

1. I identify and analyse programmes for attaining objectives of the school.
2. I organise novel schemes and programmes for utilisation of the community resources.
3. I utilise the services of the advisory councils and representatives of the public for analysing the goals and functions of the school.
4. I feel happiness in utilising my time and energy for the goodness of my students.
5. I ensure that my colleagues are doing their work.
6. I evaluate the activities of the members of the staff
7. I take decision based on specific evaluation of the data.
8. I assess whether the curricular activities are adequate enough in meeting the needs and objectives of the learners.
9. I evaluate the functions and goals of the school.
10. I assure the involvement of students while making decisions, regarding various programs in the school.
11. I consider the general needs of the students in the instructional programmes.
12. I examine activities that improve instructional programmes.
13. I always try to increase my knowledge.
14. I systematically arrange the tasks that are to be completed.
15. I foresee the resource needs of the school for the coming years.

16. I emphasize to my students and teachers about their rôle in the society.
17. I acquire and distribute essential instruments and other equipment for the attainment of instructional goals.
18. I assess and analyse the value orientation of the students.
19. I encourage the most appropriate teaching methods.
20. I maintain catalogues of instruments and other equipment available in the school.
21. I integrate the goals of the school with needs of the learners.
22. I assess the perception of the public about the needs and scope for the improvement of the school.
23. I create opportunity for discussion by parents and teachers about the matters concerning the students.
24. I define the role and responsibilities of each of the employees.
25. I evaluate the results of the inservice training programmes for teachers conducted by different agencies.
26. I wait patiently for the result of my work.
27. I examine the techniques used for evaluation process and give necessary directions to the staff.
28. I explain the changes in instructional methods to parents and community.
29. I evaluate the needs of the learners that are useful to the school and the community.
30. I participate in the planning of new construction works for increasing instructional facilities.
31. I select and recommend the most effective learning activities.
32. I organise and analyse the data of the outcomes and changes of the instructional programme given to the learners.
33. I use proper teaching methods suitable for each class.
34. I allocate duties to my colleagues so as to attain the instructional goals.
35. I improve the efficiency of the staff by class observations and discussions with them.
36. I give guidance to each of the staff for improvement in particular areas of his interest.
37. I make proper arrangements for giving information to the students about matters concerning them.
38. I prepare my lesson plans punctually.
39. I encourage the programmes suggested by my colleagues.
40. I study and understand the legislations and court decisions regarding school administration.

41. I collect and analyse the data connected with learning activities.
42. I use proper teaching aids in my class.
43. I try to acquire the latest knowledge and skills about school administration.
44. I assign duties to the new staff so as to optimise the goals of the school.
45. I take proper steps for the effective functioning of the Parent Teacher Association.
46. I supervise the planning, resource mobilisation and evaluation etc. of the co-curricular activities of the school.
47. I timely inform parents and colleagues the matters that are to be informed them.
48. I give support to the efficient functioning of the school parliament.
49. I introduce the new staff to students, to other members of staff and to the community.
50. I organise programmes for promoting understanding and co-operation among students and teachers.
51. I check the note books of my students.
52. I review the goals and objectives of the school as an institution.
53. I postpone some activities for taking appropriate action at suitable time.
54. I overcome the challenges against my leadership.
55. My higher authorities appreciate suggestions put forward by me.
56. I study and interpret the social trends that demand curricular change.
57. I instruct my colleagues to follow the rules and regulations.
58. I give opportunities to my colleagues to know what I am expecting from them.
59. I give full freedom to my colleagues for the performance of their tasks.
60. I approve the list of requirements of the instruments and other equipment for the school after evaluation.

Appendix VI
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFESSIONAL EFFICIENCY RATING SCALE FOR HEADMASTERS
Response Sheet

1. Name of school:

6. Sex : Male/Female

6. Locality of the School: Grama
 Panchayath/Municipality/Coroporation

7. Educational Qualifications:
 Undergraduate
 Graduate/Postgraduate

7. Revenue District:

8. Total Teaching Experince:

8. Management Category: Private / Government

9. Age of the Teacher :

9. Marital Status : Married/Single

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
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| 14. | | | |
| 15. | | | |
| 16. | | | |
| 17. | | | |
| 18. | | | |
| 19. | | | |
| 20. | | | |

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 21. | | | |
| 22. | | | |
| 23. | | | |
| 24. | | | |
| 25. | | | |
| 26. | | | |
| 27. | | | |
| 28. | | | |
| 29. | | | |
| 30. | | | |
| 31. | | | |
| 32. | | | |
| 33. | | | |
| 34. | | | |
| 35. | | | |
| 36. | | | |
| 37. | | | |
| 38. | | | |
| 39. | | | |
| 40. | | | |

| Sl. No. | Always | Sometimes | Never |
|---------|--------|-----------|-------|
| 41. | | | |
| 42. | | | |
| 43. | | | |
| 44. | | | |
| 45. | | | |
| 46. | | | |
| 47. | | | |
| 48. | | | |
| 49. | | | |
| 50. | | | |
| 51. | | | |
| 52. | | | |
| 53. | | | |
| 54. | | | |
| 55. | | | |
| 56. | | | |
| 57. | | | |
| 58. | | | |
| 59. | | | |
| 60. | | | |

APPENDIX VII

**UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
PROFESSIONAL EFFICIENCY RATING
SCALE FOR HEADS OF SCHOOLS BY TEACHERS**

Abdul Kader Parambat

Dr. C. Naseema

Instructions

1. Read the statements given below and mark (✓) against the corresponding number in the Response sheet under the category 'Always', 'Sometimes' and 'Never' which you think describes your headmaster best.
2. Be frank in your answers. Your answers will be kept strictly confidential and will be used for research purpose only.

Statements

1. My headmaster identifies and analyses programmes for attaining objectives of the school.
2. My headmaster organises novel schemes and programmes for utilisation of the community resources.
3. My headmaster utilises the services of the advisory councils and representatives of the public for analysing the goals and functions of the school.
4. My headmaster feels happiness in utilising his time and energy for the goodness of his students.
5. My headmaster ensures that his colleagues are doing their work.
6. My headmaster evaluate the activities of the members of the staff
7. My headmaster takes decision based on specific evaluation of the data.
8. My headmaster assesses whether the curricular activities are adequate enough in meeting the needs and objectives of the learners.
9. My headmaster evaluates the functions and goals of the school.
10. My headmaster assures the involvement of students while making decisions, regarding various programs in the school.
11. My headmaster considers the general needs of the students in the instructional programmes.
12. My headmaster examines activities that improve instructional programmes.
13. My headmaster always tries to increase his knowledge.
14. My headmaster systematically arranges the tasks that are to be completed.
15. My headmaster foresees the resource needs of the school for the coming years.

16. My headmaster emphasises to his students and teachers about their role in the society.
17. My headmaster acquires and distributes essential instruments and other equipment for the attainment of instructional goals.
18. My headmaster assesses and analyses the value orientation of the students.
19. My headmaster encourages the most appropriate teaching methods.
20. My headmaster maintains catalogues of instruments and other equipment available in the school.
21. My headmaster integrates the goals of the school with the needs of the learners.
22. My headmaster assesses the perceptions of the public about the needs and scope for the improvement of the school.
23. My headmaster creates opportunity for discussion by parents and teachers about the matters concerning the students.
24. My headmaster defines the roles and responsibilities of each of the employees.
25. My headmaster evaluates the results of the inservice training programmes for teachers conducted by different agencies.
26. My headmaster waits patiently for the result of his work.
27. My headmaster examines the techniques used for evaluation process and gives necessary directions to the staff.
28. My headmaster explains the changes in instructional methods to parents and community.
29. My headmaster evaluates the needs of the learners that are useful to the school and the community.
30. My headmaster participates in the planning of new construction works for increasing instructional facilities.
31. My headmaster selects and recommends the most effective learning activities.
32. My headmaster organises and analyses the data of the outcomes and changes of the instructional programme given to the learners.
33. My headmaster uses proper teaching methods suitable for each class.
34. My headmaster allocates duties to my colleagues so as to attain the instructional goals.
35. My headmaster improves the efficiency of the staff by class observations and discussions with them.
36. My headmaster gives guidance to each of the staff for improvement in particular areas of his interest.
37. My headmaster makes proper arrangements for giving information to the students about matters concerning them.
38. My headmaster prepares his lesson plans punctually.
39. My headmaster encourages the programmes suggested by his colleagues.

40. My headmaster studies and understands the legislations and court decisions regarding school administration.
41. My headmaster collects and analyses the data connected with learning activities.
42. My headmaster use proper teaching aids in his class.
43. My headmaster tries to acquire the latest knowledge and skills about school administration.
44. My headmaster assigns duties to the new staff so as to optimise the goals of the school.
45. My headmaster takes proper steps for the effective functioning of the Parent Teacher Association.
46. My headmaster supervises the planning, resource mobilisation and evaluation etc. of the co-curricular activities of the school.
47. My headmaster timely informs parents and colleagues the matters that are to be informed them.
48. My headmaster gives support to the efficient functioning of the school parliament.
49. My headmaster introduces the new staff to students, to other members of staff and to the community.
50. My headmaster organises programmes for promoting understanding and co-operation among students and teachers.
51. My headmaster checks the note books of his students.
52. My headmaster reviews the goals and objectives of the school as an institution.
53. My headmaster postpones some activities for taking appropriate action at a suitable time.
54. My headmaster overcomes the challenges against his leadership.
55. The higher authorities appreciate suggestions put forward by my headmaster.
56. My headmaster studies and interprets the social trends that demand curricular change.
57. My headmaster instructs his colleagues to follow the rules and regulations.
58. My headmaster gives opportunities to his colleagues to know what he is expecting from them.
59. My headmaster gives full freedom to his colleagues for the performance of their tasks.
60. My headmaster approves the list of requirements of the instruments and other equipment for the school after evaluation.

Appendix VIII
Results of the First Principal Component Analysis of All the Subjects

| Stress1 | stress 2 | stress 3 | stress 4 | FPC(stress) | Weighted average of dimensios of stress | Prof_eff 1 | Prof_eff 2 | Prof_eff 3 | Prof_eff 4 | Prof_eff 5 | Prof_eff 6 | Prof_eff 7 | FPC(score (PI) | Weighted average of dimensios of PE |
|---------|----------|----------|----------|-------------|---|------------|------------|------------|------------|------------|------------|------------|-----------------|-------------------------------------|
| 9.00 | 8.00 | 9.00 | 6.00 | 13.96 | 7.58 | 11.00 | 15.00 | 17.00 | 10.00 | 8.00 | 7.00 | 10.00 | 29.83 | 11.30 |
| 5.00 | 12.00 | 9.00 | 9.00 | 17.31 | 9.39 | 13.00 | 21.00 | 18.00 | 11.00 | 10.00 | 8.00 | 8.00 | 34.31 | 13.00 |
| 0.00 | 6.00 | 12.00 | 15.00 | 19.41 | 10.53 | 8.00 | 20.00 | 17.00 | 11.00 | 5.00 | 5.00 | 7.00 | 28.34 | 10.73 |
| 0.00 | 0.00 | 4.00 | 6.00 | 6.25 | 3.39 | 16.00 | 26.00 | 24.00 | 15.00 | 12.00 | 10.00 | 12.00 | 44.25 | 16.76 |
| 4.00 | 5.00 | 6.00 | 10.00 | 13.12 | 7.12 | 13.00 | 22.00 | 20.00 | 14.00 | 9.00 | 9.00 | 11.00 | 37.67 | 14.27 |
| 5.00 | 5.00 | 5.00 | 10.00 | 12.81 | 6.95 | 13.00 | 20.00 | 18.00 | 13.00 | 9.00 | 10.00 | 11.00 | 36.02 | 13.64 |
| 7.00 | 5.00 | 6.00 | 10.00 | 13.64 | 7.40 | 16.00 | 26.00 | 22.00 | 14.00 | 11.00 | 11.00 | 16.00 | 44.43 | 16.83 |
| 4.00 | 15.00 | 17.00 | 20.00 | 30.33 | 16.46 | 11.00 | 18.00 | 18.00 | 11.00 | 9.00 | 6.00 | 12.00 | 32.56 | 12.33 |
| 9.00 | 18.00 | 8.00 | 11.00 | 21.76 | 11.81 | 10.00 | 23.00 | 21.00 | 14.00 | 12.00 | 10.00 | 12.00 | 39.09 | 14.81 |
| 3.00 | 5.00 | 8.00 | 10.00 | 13.92 | 7.55 | 12.00 | 21.00 | 22.00 | 15.00 | 9.00 | 10.00 | 8.00 | 37.36 | 14.15 |
| 7.00 | 10.00 | 8.00 | 14.00 | 19.83 | 10.76 | 14.00 | 20.00 | 20.00 | 13.00 | 10.00 | 6.00 | 7.00 | 34.79 | 13.18 |
| 6.00 | 9.00 | 9.00 | 10.00 | 16.79 | 9.11 | 11.00 | 14.00 | 18.00 | 8.00 | 8.00 | 7.00 | 8.00 | 28.35 | 10.74 |
| 1.00 | 5.00 | 7.00 | 3.00 | 8.06 | 4.37 | 16.00 | 24.00 | 22.00 | 12.00 | 9.00 | 7.00 | 11.00 | 38.99 | 14.77 |
| 2.00 | 6.00 | 6.00 | 6.00 | 10.37 | 5.63 | 11.00 | 17.00 | 17.00 | 8.00 | 9.00 | 10.00 | 11.00 | 31.66 | 11.99 |
| 5.00 | 11.00 | 8.00 | 15.00 | 20.67 | 11.22 | 12.00 | 11.00 | 10.00 | 11.00 | 5.00 | 4.00 | 4.00 | 22.03 | 8.34 |
| 2.00 | 3.00 | 3.00 | 1.00 | 3.92 | 2.13 | 13.00 | 21.00 | 19.00 | 11.00 | 11.00 | 12.00 | 10.00 | 37.14 | 14.07 |
| 5.00 | 3.00 | 1.00 | 2.00 | 4.18 | 2.27 | 13.00 | 22.00 | 20.00 | 13.00 | 9.00 | 11.00 | 11.00 | 37.99 | 14.39 |
| 2.00 | 3.00 | 5.00 | 3.00 | 6.33 | 3.43 | 14.00 | 23.00 | 23.00 | 15.00 | 10.00 | 12.00 | 13.00 | 42.13 | 15.96 |
| 7.00 | 12.00 | 3.00 | 5.00 | 11.87 | 6.44 | 16.00 | 26.00 | 23.00 | 16.00 | 11.00 | 12.00 | 13.00 | 44.92 | 17.02 |
| 8.00 | 5.00 | 2.00 | 3.00 | 6.84 | 3.71 | 16.00 | 26.00 | 24.00 | 16.00 | 10.00 | 12.00 | 12.00 | 44.61 | 16.90 |
| 5.00 | 15.00 | 16.00 | 14.00 | 25.70 | 13.94 | 16.00 | 26.00 | 22.00 | 13.00 | 9.00 | 12.00 | 13.00 | 42.65 | 16.15 |
| 4.00 | 8.00 | 8.00 | 7.00 | 13.34 | 7.24 | 16.00 | 26.00 | 24.00 | 15.00 | 11.00 | 12.00 | 11.00 | 44.25 | 16.76 |
| 0.00 | 4.00 | 7.00 | 7.00 | 10.30 | 5.59 | 10.00 | 17.00 | 19.00 | 14.00 | 9.00 | 8.00 | 10.00 | 33.32 | 12.62 |
| 2.00 | 4.00 | 4.00 | 5.00 | 7.75 | 4.20 | 12.00 | 21.00 | 21.00 | 13.00 | 9.00 | 10.00 | 11.00 | 37.22 | 14.10 |
| 6.00 | 11.00 | 13.00 | 17.00 | 24.70 | 13.40 | 8.00 | 14.00 | 15.00 | 7.00 | 8.00 | 7.00 | 7.00 | 25.29 | 9.58 |
| 3.00 | 7.00 | 12.00 | 4.00 | 12.48 | 6.77 | 12.00 | 20.00 | 17.00 | 9.00 | 10.00 | 8.00 | 12.00 | 33.69 | 12.76 |
| 5.00 | 6.00 | 7.00 | 8.00 | 12.81 | 6.95 | 14.00 | 24.00 | 22.00 | 13.00 | 11.00 | 9.00 | 13.00 | 40.70 | 15.42 |
| 2.00 | 3.00 | 7.00 | 5.00 | 8.73 | 4.74 | 15.00 | 25.00 | 24.00 | 16.00 | 12.00 | 12.00 | 12.00 | 44.53 | 16.87 |
| 2.00 | 9.00 | 7.00 | 11.00 | 15.86 | 8.61 | 10.00 | 16.00 | 17.00 | 9.00 | 8.00 | 8.00 | 10.00 | 29.83 | 11.30 |
| 4.00 | 6.00 | 9.00 | 5.00 | 11.45 | 6.21 | 15.00 | 25.00 | 22.00 | 14.00 | 10.00 | 11.00 | 12.00 | 41.90 | 15.87 |
| 5.00 | 9.00 | 5.00 | 10.00 | 14.69 | 7.97 | 13.00 | 17.00 | 16.00 | 14.00 | 9.00 | 12.00 | 10.00 | 34.73 | 13.16 |
| 2.00 | 5.00 | 7.00 | 2.00 | 7.51 | 4.08 | 8.00 | 24.00 | 24.00 | 16.00 | 10.00 | 8.00 | 11.00 | 38.91 | 14.74 |

| | | | | | | | | | | | | | | |
|------|-------|-------|-------|--------------|--------------|-------|-------|-------|-------|-------|-------|-------|--------------|--------------|
| 6.00 | 13.00 | 15.00 | 19.00 | 28.04 | 15.22 | 6.00 | 11.00 | 14.00 | 8.00 | 6.00 | 5.00 | 7.00 | 21.82 | 8.26 |
| 1.00 | 4.00 | 2.00 | 2.00 | 4.45 | 2.42 | 14.00 | 22.00 | 24.00 | 14.00 | 10.00 | 8.00 | 11.00 | 39.63 | 15.01 |
| 9.00 | 12.00 | 11.00 | 7.00 | 17.52 | 9.51 | 13.00 | 21.00 | 21.00 | 14.00 | 10.00 | 9.00 | 11.00 | 38.01 | 14.40 |
| 1.00 | 9.00 | 5.00 | 3.00 | 8.97 | 4.87 | 15.00 | 24.00 | 21.00 | 14.00 | 12.00 | 9.00 | 13.00 | 41.45 | 15.70 |
| 1.00 | 8.00 | 7.00 | 13.00 | 16.66 | 9.04 | 14.00 | 23.00 | 23.00 | 14.00 | 11.00 | 9.00 | 10.00 | 39.18 | 14.84 |
| 6.00 | 3.00 | 5.00 | 2.00 | 6.29 | 3.41 | 15.00 | 26.00 | 24.00 | 15.00 | 10.00 | 12.00 | 13.00 | 44.17 | 16.73 |
| 3.00 | 7.00 | 5.00 | 2.00 | 7.65 | 4.15 | 16.00 | 24.00 | 21.00 | 14.00 | 11.00 | 8.00 | 12.00 | 40.79 | 15.45 |
| 2.00 | 7.00 | 9.00 | 6.00 | 12.30 | 6.67 | 13.00 | 22.00 | 22.00 | 14.00 | 9.00 | 11.00 | 11.00 | 39.15 | 14.83 |
| 5.00 | 11.00 | 11.00 | 14.00 | 21.40 | 11.61 | 14.00 | 21.00 | 22.00 | 14.00 | 10.00 | 12.00 | 10.00 | 39.50 | 14.96 |
| 6.00 | 12.00 | 8.00 | 12.00 | 19.15 | 10.39 | 11.00 | 18.00 | 20.00 | 13.00 | 8.00 | 7.00 | 8.00 | 32.74 | 12.40 |
| 6.00 | 18.00 | 14.00 | 19.00 | 29.91 | 16.23 | 4.00 | 9.00 | 11.00 | 4.00 | 2.00 | 5.00 | 5.00 | 15.35 | 5.81 |
| 4.00 | 4.00 | 4.00 | 3.00 | 6.65 | 3.61 | 16.00 | 26.00 | 24.00 | 16.00 | 11.00 | 12.00 | 13.00 | 45.31 | 17.16 |
| 8.00 | 5.00 | 3.00 | 9.00 | 11.64 | 6.31 | 16.00 | 24.00 | 22.00 | 16.00 | 10.00 | 11.00 | 13.00 | 42.98 | 16.28 |
| 4.00 | 2.00 | 6.00 | 4.00 | 7.40 | 4.02 | 15.00 | 25.00 | 24.00 | 16.00 | 12.00 | 12.00 | 12.00 | 44.53 | 16.87 |
| 4.00 | 3.00 | 9.00 | 0.00 | 6.45 | 3.50 | 16.00 | 25.00 | 24.00 | 16.00 | 11.00 | 12.00 | 11.00 | 44.21 | 16.75 |
| 7.00 | 7.00 | 8.00 | 13.00 | 17.70 | 9.60 | 10.00 | 19.00 | 20.00 | 10.00 | 7.00 | 9.00 | 9.00 | 32.29 | 12.23 |
| 4.00 | 14.00 | 9.00 | 11.00 | 19.52 | 10.59 | 13.00 | 24.00 | 24.00 | 15.00 | 11.00 | 12.00 | 12.00 | 42.58 | 16.13 |
| 5.00 | 1.00 | 6.00 | 7.00 | 9.26 | 5.02 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 14.00 | 46.02 | 17.43 |
| 0.00 | 2.00 | 2.00 | 2.00 | 3.34 | 1.81 | 16.00 | 26.00 | 23.00 | 14.00 | 10.00 | 12.00 | 14.00 | 44.13 | 16.71 |
| 7.00 | 11.00 | 3.00 | 5.00 | 11.40 | 6.19 | 13.00 | 16.00 | 20.00 | 12.00 | 9.00 | 8.00 | 8.00 | 33.01 | 12.50 |
| 7.00 | 10.00 | 8.00 | 12.00 | 18.39 | 9.98 | 11.00 | 19.00 | 20.00 | 12.00 | 9.00 | 7.00 | 10.00 | 33.82 | 12.81 |
| 3.00 | 9.00 | 6.00 | 14.00 | 17.70 | 9.61 | 12.00 | 16.00 | 22.00 | 14.00 | 10.00 | 10.00 | 10.00 | 35.92 | 13.60 |
| 4.00 | 4.00 | 2.00 | 4.00 | 6.40 | 3.47 | 16.00 | 25.00 | 23.00 | 14.00 | 12.00 | 11.00 | 13.00 | 43.74 | 16.57 |
| 3.00 | 8.00 | 5.00 | 4.00 | 9.56 | 5.19 | 12.00 | 19.00 | 19.00 | 10.00 | 9.00 | 10.00 | 12.00 | 34.78 | 13.17 |
| 4.00 | 6.00 | 6.00 | 6.00 | 10.72 | 5.81 | 14.00 | 24.00 | 22.00 | 13.00 | 10.00 | 11.00 | 11.00 | 40.36 | 15.29 |
| 6.00 | 15.00 | 14.00 | 9.00 | 21.31 | 11.56 | 8.00 | 12.00 | 15.00 | 8.00 | 7.00 | 6.00 | 8.00 | 24.46 | 9.26 |
| 7.00 | 10.00 | 10.00 | 6.00 | 15.04 | 8.16 | 15.00 | 26.00 | 21.00 | 13.00 | 10.00 | 11.00 | 10.00 | 40.86 | 15.48 |
| 7.00 | 13.00 | 4.00 | 9.00 | 15.70 | 8.52 | 12.00 | 15.00 | 20.00 | 11.00 | 11.00 | 9.00 | 7.00 | 32.55 | 12.33 |
| 0.00 | 8.00 | 4.00 | 7.00 | 10.72 | 5.82 | 14.00 | 22.00 | 22.00 | 12.00 | 10.00 | 10.00 | 13.00 | 39.46 | 14.95 |
| 6.00 | 8.00 | 5.00 | 6.00 | 11.51 | 6.25 | 11.00 | 20.00 | 23.00 | 14.00 | 9.00 | 10.00 | 12.00 | 37.91 | 14.36 |
| 2.00 | 5.00 | 7.00 | 16.00 | 17.58 | 9.54 | 12.00 | 22.00 | 22.00 | 14.00 | 12.00 | 9.00 | 9.00 | 38.47 | 14.57 |
| 5.00 | 16.00 | 11.00 | 7.00 | 18.72 | 10.16 | 13.00 | 18.00 | 21.00 | 14.00 | 10.00 | 8.00 | 9.00 | 35.72 | 13.53 |
| 3.00 | 8.00 | 5.00 | 12.00 | 15.31 | 8.31 | 10.00 | 19.00 | 16.00 | 12.00 | 7.00 | 8.00 | 12.00 | 32.18 | 12.19 |
| 4.00 | 5.00 | 6.00 | 3.00 | 8.09 | 4.39 | 10.00 | 13.00 | 19.00 | 10.00 | 8.00 | 8.00 | 8.00 | 29.05 | 11.00 |
| 3.00 | 10.00 | 6.00 | 10.00 | 15.30 | 8.30 | 12.00 | 15.00 | 16.00 | 13.00 | 9.00 | 8.00 | 8.00 | 31.03 | 11.75 |
| 2.00 | 7.00 | 2.00 | 3.00 | 6.75 | 3.66 | 15.00 | 22.00 | 22.00 | 15.00 | 10.00 | 12.00 | 10.00 | 40.70 | 15.41 |
| 7.00 | 14.00 | 12.00 | 15.00 | 24.36 | 13.22 | 13.00 | 20.00 | 19.00 | 13.00 | 10.00 | 8.00 | 9.00 | 35.39 | 13.41 |
| 3.00 | 5.00 | 6.00 | 2.00 | 7.20 | 3.91 | 15.00 | 25.00 | 23.00 | 15.00 | 11.00 | 11.00 | 13.00 | 43.38 | 16.43 |
| 5.00 | 7.00 | 11.00 | 6.00 | 13.78 | 7.47 | 11.00 | 15.00 | 19.00 | 10.00 | 7.00 | 7.00 | 6.00 | 28.89 | 10.94 |
| 2.00 | 3.00 | 2.00 | 2.00 | 4.16 | 2.25 | 16.00 | 23.00 | 22.00 | 15.00 | 10.00 | 10.00 | 12.00 | 41.48 | 15.71 |
| 5.00 | 2.00 | 2.00 | 1.00 | 3.48 | 1.89 | 12.00 | 22.00 | 21.00 | 14.00 | 9.00 | 11.00 | 10.00 | 38.04 | 14.41 |

| | | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 5.00 | 8.00 | 5.00 | 15.00 | 17.81 | 9.66 | 11.00 | 17.00 | 19.00 | 10.00 | 9.00 | 9.00 | 11.00 | 32.86 | 12.45 |
| 4.00 | 11.00 | 11.00 | 12.00 | 19.80 | 10.74 | 12.00 | 20.00 | 17.00 | 13.00 | 9.00 | 7.00 | 9.00 | 33.51 | 12.69 |
| 2.00 | 9.00 | 10.00 | 14.00 | 19.47 | 10.56 | 10.00 | 14.00 | 20.00 | 9.00 | 9.00 | 7.00 | 7.00 | 29.15 | 11.04 |
| 5.00 | 8.00 | 3.00 | 2.00 | 7.50 | 4.07 | 10.00 | 16.00 | 15.00 | 11.00 | 7.00 | 9.00 | 4.00 | 27.77 | 10.52 |
| 2.00 | 9.00 | 9.00 | 6.00 | 13.23 | 7.18 | 14.00 | 16.00 | 19.00 | 11.00 | 9.00 | 7.00 | 11.00 | 33.29 | 12.61 |
| 1.00 | 4.00 | 5.00 | 2.00 | 5.91 | 3.20 | 11.00 | 22.00 | 18.00 | 12.00 | 9.00 | 12.00 | 11.00 | 36.40 | 13.79 |
| 1.00 | 4.00 | 4.00 | 8.00 | 9.74 | 5.28 | 12.00 | 21.00 | 21.00 | 13.00 | 8.00 | 11.00 | 12.00 | 37.55 | 14.22 |
| 3.00 | 5.00 | 2.00 | 3.00 | 5.98 | 3.25 | 16.00 | 24.00 | 22.00 | 15.00 | 11.00 | 9.00 | 12.00 | 41.92 | 15.88 |
| 1.00 | 2.00 | 5.00 | 6.00 | 7.84 | 4.26 | 13.00 | 21.00 | 23.00 | 14.00 | 10.00 | 9.00 | 11.00 | 38.78 | 14.69 |
| 8.00 | 10.00 | 8.00 | 8.00 | 15.68 | 8.51 | 14.00 | 24.00 | 21.00 | 13.00 | 11.00 | 12.00 | 13.00 | 41.37 | 15.67 |
| 9.00 | 14.00 | 14.00 | 12.00 | 23.51 | 12.76 | 6.00 | 16.00 | 18.00 | 13.00 | 7.00 | 6.00 | 9.00 | 28.80 | 10.91 |
| 3.00 | 4.00 | 5.00 | 6.00 | 9.12 | 4.95 | 12.00 | 22.00 | 21.00 | 14.00 | 9.00 | 10.00 | 10.00 | 37.68 | 14.27 |
| 3.00 | 8.00 | 5.00 | 6.00 | 11.00 | 5.97 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 14.00 | 46.02 | 17.43 |
| 7.00 | 10.00 | 10.00 | 10.00 | 17.92 | 9.72 | 15.00 | 26.00 | 24.00 | 15.00 | 11.00 | 12.00 | 12.00 | 44.20 | 16.74 |
| 4.00 | 14.00 | 5.00 | 7.00 | 14.70 | 7.98 | 12.00 | 17.00 | 18.00 | 11.00 | 8.00 | 7.00 | 10.00 | 31.84 | 12.06 |
| 2.00 | 14.00 | 12.00 | 8.00 | 18.47 | 10.02 | 14.00 | 21.00 | 22.00 | 15.00 | 12.00 | 7.00 | 12.00 | 39.54 | 14.98 |
| 3.00 | 3.00 | 10.00 | 7.00 | 11.79 | 6.40 | 13.00 | 22.00 | 21.00 | 11.00 | 8.00 | 8.00 | 9.00 | 35.51 | 13.45 |
| 2.00 | 11.00 | 13.00 | 13.00 | 21.14 | 11.47 | 14.00 | 23.00 | 24.00 | 13.00 | 10.00 | 10.00 | 12.00 | 40.71 | 15.42 |
| 6.00 | 3.00 | 1.00 | 5.00 | 6.51 | 3.53 | 15.00 | 24.00 | 22.00 | 12.00 | 10.00 | 11.00 | 11.00 | 40.36 | 15.29 |
| 4.00 | 5.00 | 3.00 | 6.00 | 8.80 | 4.77 | 15.00 | 26.00 | 24.00 | 16.00 | 11.00 | 12.00 | 11.00 | 44.24 | 16.76 |
| 3.00 | 3.00 | 2.00 | 9.00 | 9.36 | 5.08 | 14.00 | 24.00 | 21.00 | 13.00 | 9.00 | 10.00 | 11.00 | 39.26 | 14.87 |
| 3.00 | 10.00 | 11.00 | 14.00 | 20.59 | 11.17 | 11.00 | 18.00 | 20.00 | 12.00 | 9.00 | 7.00 | 7.00 | 32.38 | 12.26 |
| 6.00 | 9.00 | 5.00 | 3.00 | 9.82 | 5.33 | 14.00 | 26.00 | 23.00 | 14.00 | 11.00 | 7.00 | 11.00 | 40.94 | 15.51 |
| 3.00 | 7.00 | 10.00 | 8.00 | 14.39 | 7.81 | 13.00 | 18.00 | 22.00 | 11.00 | 10.00 | 10.00 | 11.00 | 36.33 | 13.76 |
| 5.00 | 2.00 | 4.00 | 5.00 | 7.32 | 3.97 | 15.00 | 24.00 | 23.00 | 12.00 | 8.00 | 11.00 | 9.00 | 39.35 | 14.90 |
| 4.00 | 10.00 | 8.00 | 12.00 | 17.87 | 9.70 | 10.00 | 14.00 | 16.00 | 8.00 | 5.00 | 7.00 | 8.00 | 26.09 | 9.88 |
| 3.00 | 8.00 | 4.00 | 4.00 | 9.08 | 4.93 | 12.00 | 18.00 | 21.00 | 12.00 | 10.00 | 10.00 | 11.00 | 35.93 | 13.61 |
| 6.00 | 10.00 | 8.00 | 9.00 | 16.06 | 8.71 | 9.00 | 22.00 | 21.00 | 11.00 | 10.00 | 12.00 | 11.00 | 36.76 | 13.92 |
| 5.00 | 13.00 | 4.00 | 5.00 | 12.48 | 6.77 | 13.00 | 20.00 | 22.00 | 12.00 | 9.00 | 9.00 | 10.00 | 36.50 | 13.83 |
| 8.00 | 13.00 | 8.00 | 9.00 | 17.81 | 9.66 | 13.00 | 22.00 | 19.00 | 10.00 | 9.00 | 12.00 | 9.00 | 36.11 | 13.68 |
| 0.00 | 2.00 | 2.00 | 3.00 | 4.06 | 2.20 | 15.00 | 26.00 | 21.00 | 13.00 | 10.00 | 12.00 | 14.00 | 42.57 | 16.13 |
| 5.00 | 11.00 | 7.00 | 10.00 | 16.59 | 9.00 | 12.00 | 18.00 | 22.00 | 13.00 | 7.00 | 8.00 | 9.00 | 34.24 | 12.97 |
| 5.00 | 8.00 | 5.00 | 3.00 | 9.18 | 4.98 | 13.00 | 23.00 | 22.00 | 11.00 | 11.00 | 11.00 | 13.00 | 39.82 | 15.08 |
| 1.00 | 10.00 | 6.00 | 6.00 | 12.08 | 6.55 | 12.00 | 24.00 | 21.00 | 13.00 | 11.00 | 10.00 | 11.00 | 39.20 | 14.85 |
| 6.00 | 5.00 | 1.00 | 4.00 | 6.73 | 3.65 | 13.00 | 24.00 | 22.00 | 16.00 | 11.00 | 12.00 | 12.00 | 42.19 | 15.98 |
| 9.00 | 9.00 | 14.00 | 20.00 | 26.92 | 14.60 | 15.00 | 18.00 | 15.00 | 11.00 | 10.00 | 6.00 | 10.00 | 32.64 | 12.36 |
| 6.00 | 7.00 | 2.00 | 7.00 | 10.31 | 5.59 | 14.00 | 23.00 | 22.00 | 13.00 | 9.00 | 8.00 | 11.00 | 38.52 | 14.59 |
| 5.00 | 2.00 | 4.00 | 3.00 | 5.89 | 3.19 | 15.00 | 23.00 | 20.00 | 11.00 | 10.00 | 9.00 | 9.00 | 37.40 | 14.17 |
| 4.00 | 5.00 | 4.00 | 2.00 | 6.40 | 3.47 | 11.00 | 21.00 | 24.00 | 16.00 | 12.00 | 10.00 | 11.00 | 40.24 | 15.24 |
| 4.00 | 7.00 | 3.00 | 9.00 | 11.89 | 6.45 | 16.00 | 26.00 | 21.00 | 13.00 | 10.00 | 11.00 | 14.00 | 42.61 | 16.14 |
| 1.00 | 14.00 | 11.00 | 13.00 | 21.41 | 11.62 | 14.00 | 23.00 | 22.00 | 14.00 | 8.00 | 9.00 | 10.00 | 38.56 | 14.61 |

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|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3.00 | 1.00 | 1.00 | 3.00 | 3.62 | 1.97 | 10.00 | 15.00 | 16.00 | 8.00 | 9.00 | 7.00 | 11.00 | 28.98 | 10.98 |
| 9.00 | 9.00 | 13.00 | 11.00 | 19.96 | 10.83 | 8.00 | 18.00 | 20.00 | 11.00 | 4.00 | 7.00 | 9.00 | 29.69 | 11.24 |
| 6.00 | 9.00 | 3.00 | 9.00 | 13.17 | 7.15 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 12.00 | 45.34 | 17.17 |
| 4.00 | 10.00 | 6.00 | 7.00 | 13.31 | 7.22 | 13.00 | 20.00 | 20.00 | 9.00 | 9.00 | 10.00 | 9.00 | 34.57 | 13.09 |
| 1.00 | 12.00 | 10.00 | 10.00 | 17.83 | 9.67 | 13.00 | 19.00 | 19.00 | 14.00 | 10.00 | 11.00 | 10.00 | 36.75 | 13.92 |
| 7.00 | 11.00 | 7.00 | 9.00 | 16.22 | 8.80 | 13.00 | 22.00 | 20.00 | 13.00 | 8.00 | 10.00 | 9.00 | 36.60 | 13.86 |
| 3.00 | 0.00 | 2.00 | 4.00 | 4.36 | 2.36 | 14.00 | 23.00 | 23.00 | 13.00 | 11.00 | 11.00 | 12.00 | 41.03 | 15.54 |
| 2.00 | 9.00 | 4.00 | 15.00 | 17.28 | 9.38 | 8.00 | 19.00 | 16.00 | 9.00 | 8.00 | 7.00 | 6.00 | 28.21 | 10.68 |
| 6.00 | 8.00 | 4.00 | 5.00 | 10.31 | 5.59 | 10.00 | 20.00 | 19.00 | 10.00 | 9.00 | 8.00 | 11.00 | 33.38 | 12.64 |
| 3.00 | 9.00 | 3.00 | 5.00 | 9.78 | 5.31 | 14.00 | 26.00 | 23.00 | 15.00 | 12.00 | 12.00 | 13.00 | 44.12 | 16.71 |
| 5.00 | 12.00 | 6.00 | 6.00 | 13.70 | 7.43 | 12.00 | 17.00 | 19.00 | 12.00 | 7.00 | 8.00 | 5.00 | 30.90 | 11.71 |
| 4.00 | 16.00 | 16.00 | 16.00 | 27.44 | 14.89 | 11.00 | 21.00 | 21.00 | 11.00 | 8.00 | 9.00 | 12.00 | 35.68 | 13.51 |
| 8.00 | 14.00 | 15.00 | 16.00 | 26.70 | 14.49 | 12.00 | 21.00 | 20.00 | 14.00 | 9.00 | 11.00 | 10.00 | 37.23 | 14.10 |
| 4.00 | 6.00 | 3.00 | 7.00 | 9.98 | 5.42 | 16.00 | 25.00 | 18.00 | 11.00 | 11.00 | 12.00 | 12.00 | 40.28 | 15.26 |
| 4.00 | 10.00 | 6.00 | 12.00 | 16.91 | 9.17 | 13.00 | 23.00 | 22.00 | 11.00 | 9.00 | 8.00 | 10.00 | 37.02 | 14.02 |
| 5.00 | 11.00 | 8.00 | 9.00 | 16.36 | 8.88 | 13.00 | 21.00 | 21.00 | 13.00 | 10.00 | 7.00 | 7.00 | 35.56 | 13.47 |
| 3.00 | 5.00 | 9.00 | 7.00 | 12.25 | 6.65 | 10.00 | 22.00 | 22.00 | 14.00 | 10.00 | 10.00 | 9.00 | 37.32 | 14.13 |
| 3.00 | 6.00 | 4.00 | 1.00 | 5.98 | 3.25 | 9.00 | 18.00 | 13.00 | 10.00 | 9.00 | 11.00 | 9.00 | 30.19 | 11.43 |
| 2.00 | 5.00 | 5.00 | 9.00 | 11.58 | 6.28 | 14.00 | 21.00 | 20.00 | 12.00 | 8.00 | 11.00 | 11.00 | 37.21 | 14.09 |
| 3.00 | 9.00 | 3.00 | 8.00 | 11.94 | 6.48 | 15.00 | 23.00 | 24.00 | 12.00 | 9.00 | 10.00 | 12.00 | 40.35 | 15.28 |
| 5.00 | 7.00 | 12.00 | 12.00 | 18.57 | 10.08 | 16.00 | 25.00 | 23.00 | 12.00 | 10.00 | 11.00 | 14.00 | 42.58 | 16.13 |
| 4.00 | 12.00 | 14.00 | 11.00 | 21.00 | 11.39 | 11.00 | 15.00 | 18.00 | 10.00 | 8.00 | 6.00 | 9.00 | 29.53 | 11.19 |
| 5.00 | 7.00 | 12.00 | 12.00 | 18.57 | 10.08 | 16.00 | 25.00 | 24.00 | 12.00 | 10.00 | 10.00 | 14.00 | 42.62 | 16.14 |
| 3.00 | 8.00 | 3.00 | 9.00 | 12.19 | 6.61 | 16.00 | 24.00 | 24.00 | 13.00 | 10.00 | 11.00 | 10.00 | 41.58 | 15.75 |
| 3.00 | 8.00 | 5.00 | 9.00 | 13.16 | 7.14 | 15.00 | 23.00 | 24.00 | 11.00 | 10.00 | 9.00 | 12.00 | 39.97 | 15.14 |
| 4.00 | 12.00 | 12.00 | 11.00 | 20.03 | 10.87 | 13.00 | 20.00 | 21.00 | 12.00 | 8.00 | 6.00 | 9.00 | 34.35 | 13.01 |
| 5.00 | 10.00 | 8.00 | 10.00 | 16.61 | 9.01 | 9.00 | 17.00 | 20.00 | 11.00 | 8.00 | 8.00 | 7.00 | 30.78 | 11.66 |
| 4.00 | 7.00 | 5.00 | 5.00 | 9.98 | 5.42 | 13.00 | 16.00 | 18.00 | 13.00 | 8.00 | 10.00 | 11.00 | 33.98 | 12.87 |
| 0.00 | 7.00 | 6.00 | 8.00 | 11.94 | 6.48 | 16.00 | 26.00 | 24.00 | 16.00 | 11.00 | 12.00 | 13.00 | 45.31 | 17.16 |
| 5.00 | 7.00 | 5.00 | 4.00 | 9.43 | 5.12 | 12.00 | 19.00 | 22.00 | 13.00 | 9.00 | 10.00 | 11.00 | 36.77 | 13.93 |
| 8.00 | 9.00 | 8.00 | 8.00 | 15.21 | 8.25 | 6.00 | 15.00 | 12.00 | 6.00 | 9.00 | 9.00 | 8.00 | 24.78 | 9.38 |
| 7.00 | 8.00 | 6.00 | 9.00 | 14.32 | 7.77 | 10.00 | 16.00 | 17.00 | 14.00 | 8.00 | 8.00 | 8.00 | 31.08 | 11.77 |
| 4.00 | 6.00 | 2.00 | 2.00 | 5.90 | 3.20 | 14.00 | 24.00 | 22.00 | 13.00 | 9.00 | 9.00 | 11.00 | 39.30 | 14.88 |
| 4.00 | 10.00 | 8.00 | 11.00 | 17.16 | 9.31 | 14.00 | 24.00 | 19.00 | 13.00 | 10.00 | 12.00 | 9.00 | 38.86 | 14.72 |
| 1.00 | 13.00 | 7.00 | 12.00 | 18.28 | 9.92 | 11.00 | 20.00 | 20.00 | 13.00 | 9.00 | 9.00 | 7.00 | 34.31 | 13.00 |
| 7.00 | 8.00 | 2.00 | 1.00 | 6.64 | 3.60 | 16.00 | 18.00 | 21.00 | 15.00 | 11.00 | 11.00 | 11.00 | 39.37 | 14.91 |
| 2.00 | 11.00 | 9.00 | 11.00 | 17.77 | 9.64 | 13.00 | 19.00 | 19.00 | 11.00 | 9.00 | 8.00 | 9.00 | 33.83 | 12.82 |
| 2.00 | 9.00 | 9.00 | 5.00 | 12.51 | 6.79 | 10.00 | 20.00 | 23.00 | 10.00 | 8.00 | 10.00 | 12.00 | 35.61 | 13.49 |
| 4.00 | 8.00 | 7.00 | 11.00 | 15.73 | 8.54 | 16.00 | 25.00 | 24.00 | 13.00 | 12.00 | 10.00 | 7.00 | 41.35 | 15.66 |
| 4.00 | 6.00 | 5.00 | 9.00 | 12.39 | 6.72 | 8.00 | 17.00 | 17.00 | 9.00 | 8.00 | 6.00 | 8.00 | 28.09 | 10.64 |
| 5.00 | 10.00 | 5.00 | 14.00 | 18.03 | 9.78 | 15.00 | 24.00 | 24.00 | 16.00 | 11.00 | 10.00 | 9.00 | 42.02 | 15.92 |

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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.00 | 13.00 | 1.00 | 1.00 | 7.47 | 4.05 | 16.00 | 24.00 | 20.00 | 15.00 | 11.00 | 10.00 | 11.00 | 41.15 | 15.59 |
| 1.00 | 5.00 | 5.00 | 7.00 | 9.97 | 5.41 | 14.00 | 23.00 | 21.00 | 13.00 | 9.00 | 10.00 | 10.00 | 38.50 | 14.58 |
| 7.00 | 12.00 | 14.00 | 22.00 | 29.42 | 15.96 | 11.00 | 23.00 | 23.00 | 12.00 | 9.00 | 8.00 | 7.00 | 36.00 | 13.63 |
| 4.00 | 7.00 | 4.00 | 3.00 | 8.06 | 4.37 | 12.00 | 17.00 | 17.00 | 12.00 | 12.00 | 10.00 | 8.00 | 33.66 | 12.75 |
| 6.00 | 17.00 | 8.00 | 17.00 | 25.09 | 13.62 | 16.00 | 25.00 | 23.00 | 15.00 | 12.00 | 11.00 | 12.00 | 43.79 | 16.59 |
| 3.00 | 9.00 | 8.00 | 7.00 | 13.64 | 7.40 | 16.00 | 24.00 | 24.00 | 14.00 | 11.00 | 12.00 | 12.00 | 43.36 | 16.42 |
| 2.00 | 6.00 | 5.00 | 4.00 | 8.45 | 4.59 | 15.00 | 19.00 | 21.00 | 12.00 | 10.00 | 7.00 | 13.00 | 37.15 | 14.07 |
| 5.00 | 5.00 | 4.00 | 12.00 | 13.76 | 7.47 | 7.00 | 19.00 | 21.00 | 11.00 | 6.00 | 6.00 | 9.00 | 30.48 | 11.55 |
| 7.00 | 10.00 | 7.00 | 7.00 | 14.31 | 7.76 | 11.00 | 19.00 | 19.00 | 14.00 | 11.00 | 9.00 | 10.00 | 35.63 | 13.50 |
| 4.00 | 6.00 | 2.00 | 12.00 | 13.09 | 7.10 | 16.00 | 24.00 | 23.00 | 14.00 | 11.00 | 10.00 | 12.00 | 42.27 | 16.01 |
| 10.00 | 8.00 | 12.00 | 17.00 | 23.49 | 12.75 | 10.00 | 19.00 | 18.00 | 13.00 | 8.00 | 7.00 | 8.00 | 31.99 | 12.12 |
| 2.00 | 5.00 | 3.00 | 4.00 | 7.02 | 3.81 | 16.00 | 24.00 | 23.00 | 16.00 | 11.00 | 11.00 | 12.00 | 43.39 | 16.44 |
| 5.00 | 7.00 | 6.00 | 12.00 | 15.67 | 8.50 | 16.00 | 25.00 | 21.00 | 15.00 | 8.00 | 10.00 | 13.00 | 41.55 | 15.74 |
| 7.00 | 11.00 | 5.00 | 5.00 | 12.37 | 6.71 | 14.00 | 22.00 | 19.00 | 13.00 | 11.00 | 8.00 | 10.00 | 37.32 | 14.14 |
| 4.00 | 8.00 | 3.00 | 9.00 | 12.36 | 6.71 | 12.00 | 21.00 | 19.00 | 11.00 | 10.00 | 9.00 | 13.00 | 36.36 | 13.77 |
| 4.00 | 6.00 | 5.00 | 5.00 | 9.51 | 5.16 | 11.00 | 21.00 | 20.00 | 13.00 | 7.00 | 11.00 | 11.00 | 36.06 | 13.66 |
| 5.00 | 7.00 | 5.00 | 10.00 | 13.75 | 7.46 | 10.00 | 17.00 | 19.00 | 10.00 | 8.00 | 9.00 | 12.00 | 32.44 | 12.29 |
| 5.00 | 6.00 | 5.00 | 7.00 | 11.12 | 6.03 | 11.00 | 18.00 | 21.00 | 12.00 | 7.00 | 10.00 | 10.00 | 34.11 | 12.92 |
| 5.00 | 10.00 | 9.00 | 10.00 | 17.09 | 9.27 | 12.00 | 19.00 | 19.00 | 11.00 | 7.00 | 11.00 | 9.00 | 33.77 | 12.79 |
| 5.00 | 10.00 | 11.00 | 11.00 | 18.78 | 10.19 | 10.00 | 15.00 | 19.00 | 9.00 | 7.00 | 7.00 | 10.00 | 29.47 | 11.16 |
| 1.00 | 5.00 | 2.00 | 2.00 | 4.92 | 2.67 | 14.00 | 22.00 | 21.00 | 13.00 | 8.00 | 10.00 | 12.00 | 38.39 | 14.54 |
| 4.00 | 9.00 | 4.00 | 8.00 | 12.59 | 6.83 | 15.00 | 25.00 | 23.00 | 14.00 | 11.00 | 12.00 | 14.00 | 43.68 | 16.55 |
| 7.00 | 12.00 | 6.00 | 13.00 | 19.08 | 10.35 | 14.00 | 20.00 | 20.00 | 14.00 | 8.00 | 9.00 | 10.00 | 36.52 | 13.83 |
| 7.00 | 11.00 | 9.00 | 12.00 | 19.34 | 10.49 | 15.00 | 25.00 | 24.00 | 14.00 | 12.00 | 12.00 | 12.00 | 43.75 | 16.57 |
| 5.00 | 5.00 | 7.00 | 9.00 | 13.06 | 7.09 | 15.00 | 23.00 | 21.00 | 13.00 | 10.00 | 9.00 | 10.00 | 38.90 | 14.73 |
| 1.00 | 9.00 | 3.00 | 6.00 | 10.16 | 5.51 | 16.00 | 26.00 | 24.00 | 15.00 | 12.00 | 10.00 | 13.00 | 44.59 | 16.89 |
| 1.00 | 4.00 | 3.00 | 8.00 | 9.25 | 5.02 | 14.00 | 22.00 | 20.00 | 13.00 | 10.00 | 11.00 | 13.00 | 39.42 | 14.93 |
| 2.00 | 8.00 | 8.00 | 7.00 | 13.00 | 7.05 | 17.00 | 18.00 | 22.00 | 13.00 | 10.00 | 8.00 | 10.00 | 37.62 | 14.25 |
| 1.00 | 5.00 | 5.00 | 1.00 | 5.66 | 3.07 | 12.00 | 23.00 | 22.00 | 14.00 | 11.00 | 12.00 | 9.00 | 39.58 | 14.99 |
| 4.00 | 10.00 | 6.00 | 9.00 | 14.75 | 8.00 | 10.00 | 21.00 | 22.00 | 14.00 | 8.00 | 11.00 | 10.00 | 36.86 | 13.96 |
| 3.00 | 8.00 | 8.00 | 6.00 | 12.45 | 6.76 | 12.00 | 23.00 | 22.00 | 14.00 | 11.00 | 12.00 | 9.00 | 39.58 | 14.99 |
| 7.00 | 19.00 | 11.00 | 16.00 | 26.94 | 14.62 | 9.00 | 23.00 | 23.00 | 13.00 | 12.00 | 11.00 | 13.00 | 39.79 | 15.07 |
| 3.00 | 10.00 | 4.00 | 3.00 | 9.30 | 5.04 | 14.00 | 22.00 | 20.00 | 11.00 | 9.00 | 8.00 | 12.00 | 36.89 | 13.97 |
| 3.00 | 6.00 | 5.00 | 5.00 | 9.34 | 5.07 | 15.00 | 24.00 | 23.00 | 15.00 | 11.00 | 10.00 | 13.00 | 42.61 | 16.14 |
| 3.00 | 1.00 | 2.00 | 1.00 | 2.67 | 1.45 | 14.00 | 26.00 | 24.00 | 14.00 | 10.00 | 10.00 | 13.00 | 42.69 | 16.17 |
| 1.00 | 3.00 | 2.00 | 3.00 | 4.70 | 2.55 | 14.00 | 25.00 | 24.00 | 15.00 | 12.00 | 12.00 | 10.00 | 43.07 | 16.31 |
| 5.00 | 8.00 | 5.00 | 9.00 | 13.50 | 7.32 | 11.00 | 17.00 | 18.00 | 11.00 | 12.00 | 7.00 | 7.00 | 31.88 | 12.08 |
| 4.00 | 11.00 | 4.00 | 11.00 | 15.69 | 8.51 | 13.00 | 22.00 | 20.00 | 11.00 | 9.00 | 11.00 | 10.00 | 36.88 | 13.97 |
| 7.00 | 10.00 | 7.00 | 4.00 | 12.15 | 6.59 | 13.00 | 21.00 | 14.00 | 12.00 | 8.00 | 9.00 | 8.00 | 32.76 | 12.41 |
| 2.00 | 10.00 | 6.00 | 11.00 | 15.85 | 8.60 | 13.00 | 21.00 | 19.00 | 13.00 | 9.00 | 11.00 | 10.00 | 36.84 | 13.95 |
| 3.00 | 11.00 | 9.00 | 10.00 | 17.22 | 9.34 | 15.00 | 25.00 | 21.00 | 16.00 | 10.00 | 11.00 | 11.00 | 41.94 | 15.89 |

| | | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 5.00 | 9.00 | 5.00 | 1.00 | 8.22 | 4.46 | 15.00 | 24.00 | 24.00 | 13.00 | 10.00 | 12.00 | 13.00 | 42.56 | 16.12 |
| 5.00 | 9.00 | 5.00 | 6.00 | 11.81 | 6.41 | 14.00 | 18.00 | 21.00 | 11.00 | 9.00 | 8.00 | 9.00 | 34.58 | 13.10 |
| 7.00 | 9.00 | 4.00 | 6.00 | 11.67 | 6.33 | 12.00 | 19.00 | 20.00 | 12.00 | 9.00 | 7.00 | 8.00 | 33.53 | 12.70 |
| 3.00 | 4.00 | 3.00 | 3.00 | 6.00 | 3.25 | 16.00 | 25.00 | 23.00 | 16.00 | 12.00 | 12.00 | 13.00 | 44.87 | 17.00 |
| 2.00 | 5.00 | 6.00 | 7.00 | 10.62 | 5.76 | 13.00 | 24.00 | 16.00 | 11.00 | 10.00 | 11.00 | 8.00 | 35.84 | 13.58 |
| 2.00 | 4.00 | 2.00 | 4.00 | 6.06 | 3.29 | 14.00 | 24.00 | 22.00 | 13.00 | 11.00 | 11.00 | 9.00 | 40.04 | 15.17 |
| 2.00 | 9.00 | 7.00 | 12.00 | 16.58 | 9.00 | 11.00 | 21.00 | 19.00 | 12.00 | 9.00 | 9.00 | 12.00 | 35.65 | 13.50 |
| 5.00 | 2.00 | 3.00 | 0.00 | 3.25 | 1.76 | 15.00 | 25.00 | 24.00 | 15.00 | 12.00 | 11.00 | 13.00 | 44.13 | 16.72 |
| 1.00 | 4.00 | 8.00 | 2.00 | 7.36 | 3.99 | 11.00 | 16.00 | 17.00 | 10.00 | 10.00 | 8.00 | 9.00 | 30.99 | 11.74 |
| 2.00 | 6.00 | 4.00 | 10.00 | 12.28 | 6.66 | 15.00 | 21.00 | 22.00 | 12.00 | 11.00 | 8.00 | 9.00 | 39.09 | 14.81 |
| 8.00 | 10.00 | 6.00 | 15.00 | 19.75 | 10.71 | 12.00 | 20.00 | 22.00 | 10.00 | 10.00 | 9.00 | 10.00 | 35.70 | 13.52 |
| 1.00 | 2.00 | 1.00 | 0.00 | 1.59 | 0.86 | 14.00 | 25.00 | 24.00 | 16.00 | 11.00 | 12.00 | 13.00 | 44.11 | 16.71 |
| 7.00 | 8.00 | 6.00 | 12.00 | 16.48 | 8.94 | 11.00 | 16.00 | 19.00 | 11.00 | 10.00 | 9.00 | 9.00 | 32.51 | 12.31 |
| 1.00 | 2.00 | 3.00 | 4.00 | 5.44 | 2.95 | 15.00 | 25.00 | 23.00 | 15.00 | 12.00 | 11.00 | 12.00 | 43.40 | 16.44 |
| 2.00 | 2.00 | 8.00 | 6.00 | 9.47 | 5.14 | 11.00 | 22.00 | 23.00 | 12.00 | 8.00 | 10.00 | 12.00 | 37.62 | 14.25 |
| 2.00 | 6.00 | 7.00 | 4.00 | 9.42 | 5.11 | 15.00 | 25.00 | 22.00 | 14.00 | 9.00 | 12.00 | 10.00 | 41.21 | 15.61 |
| 3.00 | 7.00 | 5.00 | 12.00 | 14.84 | 8.05 | 12.00 | 19.00 | 23.00 | 13.00 | 9.00 | 10.00 | 9.00 | 36.48 | 13.82 |
| 1.00 | 3.00 | 2.00 | 6.00 | 6.86 | 3.72 | 15.00 | 24.00 | 23.00 | 14.00 | 9.00 | 10.00 | 13.00 | 41.49 | 15.72 |
| 1.00 | 6.00 | 7.00 | 3.00 | 8.53 | 4.63 | 15.00 | 20.00 | 23.00 | 13.00 | 9.00 | 9.00 | 13.00 | 39.07 | 14.80 |
| 5.00 | 13.00 | 14.00 | 21.00 | 28.83 | 15.64 | 12.00 | 17.00 | 22.00 | 12.00 | 9.00 | 6.00 | 9.00 | 33.46 | 12.67 |
| 3.00 | 7.00 | 8.00 | 13.00 | 17.02 | 9.23 | 10.00 | 18.00 | 16.00 | 9.00 | 9.00 | 8.00 | 10.00 | 30.64 | 11.61 |
| 5.00 | 12.00 | 9.00 | 13.00 | 20.19 | 10.95 | 12.00 | 17.00 | 16.00 | 9.00 | 9.00 | 8.00 | 9.00 | 30.66 | 11.61 |
| 2.00 | 8.00 | 3.00 | 7.00 | 10.58 | 5.74 | 13.00 | 20.00 | 20.00 | 14.00 | 10.00 | 10.00 | 12.00 | 37.89 | 14.35 |
| 1.00 | 3.00 | 2.00 | 2.00 | 3.98 | 2.16 | 15.00 | 26.00 | 22.00 | 16.00 | 10.00 | 12.00 | 13.00 | 43.78 | 16.58 |
| 5.00 | 6.00 | 9.00 | 7.00 | 13.06 | 7.09 | 12.00 | 22.00 | 19.00 | 13.00 | 11.00 | 11.00 | 9.00 | 37.26 | 14.11 |
| 2.00 | 6.00 | 6.00 | 8.00 | 11.81 | 6.41 | 11.00 | 21.00 | 22.00 | 11.00 | 9.00 | 10.00 | 14.00 | 37.46 | 14.19 |
| 4.00 | 12.00 | 10.00 | 15.00 | 21.94 | 11.90 | 13.00 | 22.00 | 19.00 | 11.00 | 8.00 | 10.00 | 11.00 | 36.11 | 13.68 |
| 5.00 | 7.00 | 6.00 | 13.00 | 16.39 | 8.89 | 12.00 | 20.00 | 22.00 | 11.00 | 10.00 | 8.00 | 6.00 | 34.37 | 13.02 |
| 6.00 | 11.00 | 5.00 | 7.00 | 13.64 | 7.40 | 10.00 | 17.00 | 20.00 | 11.00 | 9.00 | 10.00 | 11.00 | 33.59 | 12.73 |
| 1.00 | 4.00 | 2.00 | 7.00 | 8.05 | 4.37 | 16.00 | 25.00 | 24.00 | 16.00 | 11.00 | 12.00 | 11.00 | 44.21 | 16.75 |
| 2.00 | 2.00 | 7.00 | 8.00 | 10.42 | 5.65 | 16.00 | 24.00 | 24.00 | 16.00 | 12.00 | 10.00 | 14.00 | 44.47 | 16.85 |
| 2.00 | 6.00 | 4.00 | 4.00 | 7.97 | 4.32 | 13.00 | 15.00 | 20.00 | 13.00 | 9.00 | 11.00 | 9.00 | 34.37 | 13.02 |
| 4.00 | 8.00 | 8.00 | 6.00 | 12.62 | 6.85 | 16.00 | 21.00 | 20.00 | 16.00 | 10.00 | 11.00 | 11.00 | 40.26 | 15.25 |
| 3.00 | 7.00 | 3.00 | 3.00 | 7.41 | 4.02 | 12.00 | 20.00 | 21.00 | 14.00 | 10.00 | 7.00 | 12.00 | 36.83 | 13.95 |
| 3.00 | 6.00 | 9.00 | 6.00 | 12.00 | 6.51 | 12.00 | 22.00 | 18.00 | 11.00 | 9.00 | 8.00 | 10.00 | 34.65 | 13.13 |
| 3.00 | 3.00 | 7.00 | 11.00 | 13.22 | 7.17 | 13.00 | 16.00 | 18.00 | 10.00 | 9.00 | 8.00 | 11.00 | 32.48 | 12.30 |
| 8.00 | 9.00 | 6.00 | 7.00 | 13.53 | 7.34 | 14.00 | 19.00 | 18.00 | 12.00 | 11.00 | 6.00 | 6.00 | 33.23 | 12.59 |
| 6.00 | 10.00 | 7.00 | 10.00 | 16.29 | 8.84 | 12.00 | 21.00 | 18.00 | 11.00 | 10.00 | 8.00 | 12.00 | 35.28 | 13.36 |
| 2.00 | 8.00 | 9.00 | 14.00 | 18.52 | 10.05 | 15.00 | 21.00 | 23.00 | 15.00 | 12.00 | 9.00 | 12.00 | 41.02 | 15.54 |
| 1.00 | 5.00 | 4.00 | 4.00 | 7.33 | 3.98 | 16.00 | 26.00 | 22.00 | 14.00 | 11.00 | 12.00 | 12.00 | 43.42 | 16.45 |
| 4.00 | 9.00 | 13.00 | 15.00 | 21.98 | 11.93 | 16.00 | 24.00 | 15.00 | 12.00 | 9.00 | 12.00 | 14.00 | 39.04 | 14.79 |

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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 12.00 | 13.00 | 4.00 | 10.00 | 17.28 | 9.37 | 12.00 | 22.00 | 23.00 | 14.00 | 10.00 | 12.00 | 9.00 | 39.19 | 14.84 |
| 6.00 | 4.00 | 4.00 | 3.00 | 7.00 | 3.80 | 15.00 | 23.00 | 21.00 | 13.00 | 11.00 | 11.00 | 11.00 | 40.30 | 15.27 |
| 6.00 | 18.00 | 15.00 | 26.00 | 35.42 | 19.22 | 14.00 | 24.00 | 23.00 | 12.00 | 9.00 | 12.00 | 13.00 | 41.03 | 15.54 |
| 1.00 | 2.00 | 1.00 | 2.00 | 3.03 | 1.64 | 15.00 | 22.00 | 22.00 | 13.00 | 10.00 | 10.00 | 12.00 | 39.90 | 15.11 |
| 1.00 | 10.00 | 4.00 | 9.00 | 13.27 | 7.20 | 9.00 | 16.00 | 20.00 | 10.00 | 8.00 | 8.00 | 9.00 | 30.65 | 11.61 |
| 8.00 | 10.00 | 10.00 | 14.00 | 20.96 | 11.37 | 9.00 | 15.00 | 13.00 | 9.00 | 8.00 | 8.00 | 10.00 | 27.46 | 10.40 |
| 1.00 | 8.00 | 3.00 | 4.00 | 8.25 | 4.48 | 15.00 | 24.00 | 23.00 | 16.00 | 10.00 | 11.00 | 12.00 | 42.64 | 16.15 |
| 5.00 | 6.00 | 7.00 | 11.00 | 14.97 | 8.12 | 12.00 | 21.00 | 20.00 | 14.00 | 9.00 | 9.00 | 11.00 | 36.86 | 13.96 |
| 4.00 | 6.00 | 9.00 | 10.00 | 15.04 | 8.16 | 16.00 | 22.00 | 21.00 | 12.00 | 8.00 | 10.00 | 13.00 | 39.13 | 14.82 |
| 3.00 | 7.00 | 3.00 | 7.00 | 10.28 | 5.58 | 15.00 | 25.00 | 22.00 | 13.00 | 12.00 | 12.00 | 12.00 | 42.59 | 16.13 |
| 4.00 | 4.00 | 7.00 | 4.00 | 8.82 | 4.79 | 14.00 | 17.00 | 21.00 | 13.00 | 11.00 | 9.00 | 9.00 | 36.01 | 13.64 |
| 7.00 | 7.00 | 9.00 | 6.00 | 13.15 | 7.14 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 13.00 | 45.68 | 17.30 |
| 5.00 | 10.00 | 2.00 | 2.00 | 7.95 | 4.31 | 14.00 | 25.00 | 22.00 | 14.00 | 11.00 | 9.00 | 11.00 | 40.83 | 15.47 |
| 5.00 | 8.00 | 7.00 | 7.00 | 13.03 | 7.07 | 9.00 | 17.00 | 18.00 | 11.00 | 8.00 | 6.00 | 10.00 | 30.32 | 11.48 |
| 7.00 | 9.00 | 9.00 | 13.00 | 19.12 | 10.37 | 12.00 | 20.00 | 20.00 | 10.00 | 11.00 | 12.00 | 9.00 | 36.00 | 13.63 |
| 5.00 | 5.00 | 2.00 | 3.00 | 6.33 | 3.43 | 14.00 | 25.00 | 21.00 | 16.00 | 11.00 | 10.00 | 11.00 | 41.56 | 15.74 |
| 0.00 | 8.00 | 6.00 | 9.00 | 13.13 | 7.12 | 13.00 | 18.00 | 19.00 | 11.00 | 8.00 | 12.00 | 9.00 | 34.45 | 13.05 |
| 6.00 | 11.00 | 12.00 | 17.00 | 24.22 | 13.14 | 12.00 | 17.00 | 19.00 | 12.00 | 9.00 | 9.00 | 11.00 | 34.02 | 12.89 |
| 3.00 | 9.00 | 14.00 | 16.00 | 23.01 | 12.49 | 4.00 | 13.00 | 16.00 | 9.00 | 6.00 | 7.00 | 6.00 | 23.40 | 8.86 |
| 2.00 | 5.00 | 3.00 | 7.00 | 9.17 | 4.98 | 16.00 | 26.00 | 24.00 | 15.00 | 12.00 | 12.00 | 12.00 | 44.95 | 17.03 |
| 6.00 | 8.00 | 12.00 | 15.00 | 21.37 | 11.60 | 10.00 | 20.00 | 20.00 | 11.00 | 8.00 | 10.00 | 9.00 | 33.81 | 12.81 |
| 2.00 | 8.00 | 10.00 | 9.00 | 15.41 | 8.36 | 10.00 | 21.00 | 18.00 | 10.00 | 6.00 | 8.00 | 11.00 | 32.32 | 12.24 |
| 5.00 | 9.00 | 12.00 | 12.00 | 19.51 | 10.59 | 13.00 | 21.00 | 21.00 | 11.00 | 9.00 | 11.00 | 7.00 | 35.82 | 13.57 |
| 9.00 | 13.00 | 9.00 | 8.00 | 17.74 | 9.63 | 12.00 | 22.00 | 23.00 | 12.00 | 9.00 | 11.00 | 14.00 | 39.40 | 14.92 |
| 3.00 | 7.00 | 7.00 | 12.00 | 15.81 | 8.58 | 11.00 | 19.00 | 19.00 | 13.00 | 10.00 | 10.00 | 9.00 | 34.89 | 13.22 |
| 2.00 | 7.00 | 6.00 | 3.00 | 8.69 | 4.71 | 15.00 | 26.00 | 24.00 | 15.00 | 11.00 | 12.00 | 14.00 | 44.88 | 17.00 |
| 4.00 | 6.00 | 6.00 | 14.00 | 16.47 | 8.94 | 12.00 | 24.00 | 21.00 | 13.00 | 11.00 | 9.00 | 11.00 | 38.85 | 14.72 |
| 8.00 | 10.00 | 11.00 | 17.00 | 23.61 | 12.81 | 11.00 | 21.00 | 19.00 | 13.00 | 10.00 | 11.00 | 8.00 | 35.74 | 13.54 |
| 2.00 | 6.00 | 3.00 | 4.00 | 7.48 | 4.06 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 14.00 | 46.02 | 17.43 |
| 3.00 | 7.00 | 7.00 | 7.00 | 12.22 | 6.63 | 10.00 | 15.00 | 15.00 | 9.00 | 7.00 | 7.00 | 7.00 | 26.90 | 10.19 |
| 7.00 | 9.00 | 6.00 | 10.00 | 15.51 | 8.42 | 14.00 | 22.00 | 20.00 | 12.00 | 8.00 | 11.00 | 13.00 | 38.31 | 14.51 |
| 1.00 | 4.00 | 3.00 | 12.00 | 12.13 | 6.58 | 14.00 | 20.00 | 21.00 | 11.00 | 10.00 | 10.00 | 12.00 | 37.51 | 14.21 |
| 2.00 | 4.00 | 3.00 | 2.00 | 5.11 | 2.77 | 16.00 | 26.00 | 24.00 | 16.00 | 12.00 | 12.00 | 13.00 | 45.68 | 17.30 |
| 1.00 | 5.00 | 3.00 | 3.00 | 6.13 | 3.32 | 16.00 | 23.00 | 21.00 | 13.00 | 8.00 | 10.00 | 11.00 | 39.25 | 14.87 |
| 2.00 | 5.00 | 5.00 | 4.00 | 7.98 | 4.33 | 13.00 | 20.00 | 22.00 | 12.00 | 11.00 | 6.00 | 9.00 | 35.83 | 13.57 |
| 5.00 | 9.00 | 10.00 | 7.00 | 14.95 | 8.11 | 8.00 | 20.00 | 21.00 | 11.00 | 9.00 | 7.00 | 9.00 | 32.73 | 12.40 |
| 4.00 | 7.00 | 13.00 | 14.00 | 20.33 | 11.03 | 11.00 | 24.00 | 22.00 | 10.00 | 9.00 | 10.00 | 8.00 | 36.30 | 13.75 |
| 6.00 | 11.00 | 8.00 | 8.00 | 15.81 | 8.58 | 13.00 | 23.00 | 22.00 | 11.00 | 10.00 | 10.00 | 13.00 | 39.11 | 14.81 |

