Chapter - II

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CHAPTER – II

REVIEW OF RELATED RESEARCHES

2.1 Introduction:

Field of 'Meditation' is comparatively emerging field from research point of view. Though the phenomenon seems to be an ancient one, scientific studies on it are not that old. Researcher tried to scan the literature and earlier studies. Voluminous literature is there in different languages, particularly in 'Sanskrit', in descriptive form. Investigator felt that it was necessary to go through only research work done in the field. Thereafter it was decided to find out the latest researches. Hence studies reported in this chapter covers the period from 1970 A.D. to 1988 A.D.

These studies mainly cover the area of Meditation. Many researches have tried to find out the impact of meditation on various variables. Table 2.1 gives a bird's eyeview about these variables and researches.

It could be seen from table 2.1 that 69 studies are reported. Many variables have been examined to facilitate the understanding. These variables were classified in seven broad categories tentatively. These categories were as under.
As it is apparent from the table that most of the variables were affected positively by meditation. Some variables did not yield positive impact of meditation. To get the clear ideas of these studies some of the researches are presented here. For the remaining studies only conclusions are reported.

2.2 Studies on Meditation:
### 2.2.1. Physiological conditions

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable impact of</th>
<th>Study done at/year</th>
<th>Researchers</th>
<th>Impact positive, negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Physiological condition</td>
<td>1984, Dublin, Ireland</td>
<td>Palomonte M.H.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3.</td>
<td>Hemisphere &amp; Meditation</td>
<td>1981</td>
<td>Earle Jonathan P.</td>
<td>Negative</td>
<td>Not significant</td>
</tr>
<tr>
<td>4.</td>
<td>Physiological condition</td>
<td>1982, Los Angeles</td>
<td>Craddock, Steven G.</td>
<td>Positive</td>
<td>Significant</td>
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<tr>
<td>5.</td>
<td>Internal physiological changes</td>
<td>1982</td>
<td>Farrow, et al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7.</td>
<td>Physiological condition</td>
<td>1992, New Zealand</td>
<td>Throll D.A.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9.</td>
<td>Electro cortical activity</td>
<td>1979, France</td>
<td>Paty J. Brenat</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Physiological conditions:

9 Studies are included in this category. 70% of these studies are on physiological conditions. Except Hemispher and Meditation in all most all the studies the impact of meditation on physiological condition is found to be positive. That means meditation works as a good treatment for physiological condition. Other traits like Reflex time and Homeostasis were also found to be affected significantly by meditation on positive side. This means any person practicing meditation can get benefits. Hence meditation can safely be used for the process of development. Many physiological activities could be enhanced by meditation.

Dalmonte "W. (1964) has tried to study the impact of meditation on electrocortical activity:

A literature review on meditation suggests that the state effects at meditation appear to include decreased electrocortical arousal. There is also evidence that meditators more readily demonstrate alpha and that activity than non-meditators, even when not meditating. It is not clear whether prospective meditators as a group already processed this characteristic or whether the state effects of meditation practice eventually generalized to become traits. However, certain individuals, namely the psychologically healthy and those with a capacity for relaxed absorbed attention, appear to be more favourably
disposed to meditation. Meditators appear to show both stronger orienting and recovery responses to stressors while meditating than controls. Meditation practice may begin with left hemisphere-type activity, which gives way to functioning more characteristic of the right hemisphere. However, it appears that during advanced meditation (no thoughts) both left and right hemisphere activity are already inhibited or suspended. Depending on the individual in experienced meditation may report sleep, hypnagogic reverie, trance, or abreaction, during practice.

The same researcher, Delmonte M.M. (1964) while working at St. James' Hosp. Health Care and Psychosomatic Unit, Dublin, Ireland has published a report about the research on 'Psychological' responses during meditation and Rest: Feedback and self Regulation.'

Warshar, Dobar (1980) experimented on 14 male university student over a 6 weeks period to examine the short and long range effects of Transcendental Meditation on the neuromuscular system while no significant differences in reflex time where observed in pre- and post-treatment, a significant reduction in reflex time was found.

Puente, Antonio, E. (1981) has tried to study the impact of meditation on psychological investigation.

In Exp. I, 47 community volunteers (mean age 26-8 yrs) were randomly assigned to Transcendental Meditation (TM).
H. Benson's (1975) relaxation response (RRR), or no treatment (NT) instruction. Respiration rate, heart rate, EMG, EEG and skin conductance level were recorded during the practice of each technique, 1 week after termination instruction. While TM, and NT exhibited different psychological patterns, none of the techniques showed a clear superiority in reducing psychological arousal.

Farie Jonathan B. (1981) has tried to study the impact of meditation on consciousness. Reviews the role both hemispheres play in producing meditative states at consciousness in terms of mental activity and meditation, excitatory phenomena, attention and meditation, mental task and meditation after effects and electro-physiological evidence. It appears that the phenomenological and psychological data on meditation does not fully support the right hemisphere hypothesis. However, the literature does suggest that in the early stages of meditating relative right hemisphere activation may be induced through the control of attention, the use of visual imagery and the inhibition of analytical thought. The degree of meditation may vary according to the type of meditation they are engaged in, the particular object(s) at meditation they are utilizing and on individual differences.

Tharoll, D.A. (1982) has tried to study the impact of meditation on progressive relaxation. Measured oxygen consumption, tidal volume, respiration rate, heart rate, and systolic and diastolic blood pressure in 39 Ss (aged 17 - 46) before they learned
Transcendental Meditation (TM) or Jakobsen's Progressive Relaxation (PR). Ss were tested immediately after learning either technique and again 5, 10 and 15 weeks later. While there were no significant difference between groups for any of the physiological variables at pre-test, the TM group displayed more significant decreases during meditation and during activity than did the PR group. Both groups displayed significantly lowered metabolic rates during TM or PR. The generally more significant and comprehensive results for meditators were explained primarily in terms of the greater amount of time the TM group spent on their technique, plus the differences in the 2 techniques themselves.

Credidio, Steven G. (1982) has tried to study the impact of meditation on comparative effectiveness at patterned biofeedback. Examined whether relation pattern of frontalis EMG decreases and peripheral skin temperature increases could be attained more effectively through biofeedback or meditation training. 59 yrs. old females were randomly assigned to 1 or 3 groups. Patterned biofeedback, clinically standardized meditation, or control prior to training Ss were administered the Eysenck personality inventory. Each was seen weekly for sessions. Subjective experiences and time spent practicing of home were also recorded results indicate that the meditation group showed significantly lower EMG levels at the end of treatment than did the control group. The biofeedback group had difficulty in patterning the 2 feedback signals simultaneously. Extroverts in the control group
had the highest EMG levels. The most positive subjective reports come from Ss in the meditation group. It is suggested that meditation offers a viable alternative as a relaxation procedure, requiring little time to learn and devoid of any performance criteria levels.

Farroul Then T. & Beber J. (1982) has tried to study the impact of meditation on suspension:

Observed over 3 experiments of 134 subjects. 545 criterion meeting episodes of breath suspension during Transcendental Meditation (TM). The frequency and length of these breath suspension episodes were substantially and significantly greater for TM Ss than for control Ss relaxing with eyes closed. Voluntary control of respiration was most probably eliminated as an explanation of this phenomenon by the experimental design and by the use of a variety of non-intrusive respiration transducers, including a 2-channel magnetometer. When 11 of the TM Ss were instructed to press an event mark button after each episode of a pure consciousness experience, the temporal distribution of button presses was significantly related to the distribution of breath suspension episodes. This indicated that breath suspension is a physiological correlate of some, but not all, episodes of the pure consciousness experience. In an extensive study of a single advanced meditator who was 26 yrs. old, pure consciousness experiences were also associated with the following, reduced heart rate; high basal skin resistance.
stable phasic skin resistance, markedly reduced mean respiration rate, mean minute ventilation, and mean metabolic rate, and consistent changes in EEG power and EEG coherence, an indicator of long-range spatial order in the CNS.

Carruthers, "Alcolem F. (1981) has tried to study the impact of meditation as voluntary control of the involuntary nervous system:

Discusses how autogenic training (AT) and meditation can be used in the prevention and treatment of diseases such as cardiovascular disorders, migraines, and hypertension. AT evolved from experiments with hypnotic in which attempt were made to reduce the patients' dependence on the therapist. Six physiological steps were devised: heaviness and warmth in the limbs, regulation of cardiac activity and respiration, abdominal warmth, and cooling of the forehead. AT can be taught in a short period of time and can be practiced almost anywhere. In both AT and Siddha meditation, there is a slowing of the heart rate, reduction of blood pressure, and increase in cortical discharges in the brain. These discharges can be motor or sensory. They represent an unloading of brain disturbing material that has accumulated throughout life, reducing anxiety and other neurotic symptoms and sometimes curing psychosomatic disorders.

Paty, L. Brenot, Ph. Tignol, J. and Bourgeois, M. (1978) has tried to study the impact of meditation on electrocortical activity: Presents the findings of a study of electrocortical
activity (i.e., spontaneous EEG activity, evoked potentials, and the slow potentials developed during sensorimotor conditioning). Concomitant with induced modifications in the state of consciousness, 15 patients were examined during deep (sophronic) relaxation, and 10 patients during transcendental meditation. The changes recorded in these electrocortical indicators justify their use as objective criteria for modifications of the state of consciousness. A multi-parametric approach is necessary in order to take into account both widenings and restrictions of the field of consciousness on the one hand and stability or variability of the level of vigilance on the other. The ideas that changes take place in the state of consciousness itself are called into question and it is suggested that what have been called modifications of the conscious state are in fact more likely a change in the mental "frame" or "set" brought about by particular exercise that effectively modify vigilance, attention, sensorimotor activity level and motivational variables.
### 2.2.2. Psychological responses:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on</th>
<th>Study done at/ year</th>
<th>Researchers</th>
<th>Impact positive, negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Psychological responses</td>
<td>1984, Dublin Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Psychological responses:

Out of two studies included in this category, most of studies are on psychological health. Impact of meditation on psychological health is found to be positive. That means meditation works as a good medicine for people having problems of mental health. In this section other studies were also found to be affected significantly by meditation on positive side. These means any person practicing meditation can get benefits in finding solutions for the problems in the area of mental health.

Delmonte, M.M. (1984) has tried to study the impact of meditation on psychological responses:

40 teamed non meditators (NMs mean age 22.1 yrs) and 12 female experienced transcendental meditators (ETMs; mean age 28 yrs) were randomly assigned to 4 experienced cells devised for order and exception effects. Ss were presented with a rationale either favourable or unfavourable to meditation and were continuously monitored on 7 psychological measures (heart rate (HR), digitized skin temperature (DST), skin conductance level (SCL), digital blood volume (DBV), frontalis EMG (FEMG), systolic blood pressure (SBP) and diastolic blood pressure (DBP) during both meditation and rest. Each S was her own control in an AB-AB. Experimental paradigm comparing meditation to rest. Findings indicate small but significant condition effect for all variable.
except DBP. Both the NMs and ETMs, showed lower psychological arousal during meditation than test for SBP, HR, SCL, DBV, DSK and FEMG. ETMs, showed only marginally more condition effects than NMs. For NMs deliberately fostering positive expectations of meditation was associated with lower physiological arousal in terms of DBR, HR, and SCL. Findings suggest that both cultic and non-cultic meditation are associated with lesser physiological activation than eyes closed rest. ETMs tended to become more relaxed over meditation trials, while NMs showed opposite trend.

Turnbull, Michael J. and Norris Hugh (1982) have tried to study the impact of meditation on self-identity indices and personality:

A role construct repertory grid and the Eysenck Personality Questionnaire (EPQ), were completed by 7 University students, once before and twice after starting the regular practice of transcendental meditation (TM) comparison Ss did not learn TM and were assessed in the same ways at the same times. Initially the 2 groups differed only in that meditation Ss tended to judge other people to be more unlike their ideal selves than did comparison Ss. This difference was maintained with meditation Ss, the grid results showed a systematic pattern of significant changes, over the 3 tests. Meditators came to perceive their actual-selves as being increasingly similar to their ideal- and social-selves and developed a more strongly defined concept of their actual-selves. EPQ results showed
increased extraversion in meditations. Comparison Ss did not show consistent or significant changes between tests on any measure. Ss practicing TM appeared to have experienced consistent and definable changes of a generally beneficial nature, suggesting the value of TM as for each S was completed by a "significant other" designated by the S experimental and control group were not significantly different on any of the pretest measures and at post-testing no significant difference between the 2 groups were found.

2.2.3: Behaviour:

<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Variable impact of meditation on...</th>
<th>Study done at/year</th>
<th>Researchers</th>
<th>Impact</th>
<th>Survey Remarks</th>
</tr>
</thead>
</table>

Behaviour:

Out of three studies included in this section the first two could be considered as negative behaviours. Generally smoking behaviour is not socially positive one though accepted.
The other two studies are related to learning activities. In all situations meditation has brought a positive impact on these behaviours. This means one can use meditation to get rid of negative habits like smoking. It is also found meditation facilitates learning.

Cohen, Bernard B. (1984) has tried to study the impact of meditation on combined approach using hypnosis and behavioural techniques:

Treated 5-30-51 yrs. old smokers, who had been smoking 16-30 yrs., with meditation-hypnosis and behavioural techniques in an attempt to control smoking behaviour. Ss completed a smoking questionnaire that assessed CNS stimulation, oral stimulation, relaxation, stress, addiction and habit factors of their smoking behaviour characteristics. Ss were then hypnotized and exposed to aversive conditioning and positive conditioning. Ss were taught to meditate and were asked to keep along to record the frequency and quality of the meditation hypnosis sessions, the member of cigarettes smoked and environmental factors, present, when they smoked. Result for the 350 who were seen for 4 or more sessions indicates a significant decrease in smoking behaviour and beneficial results from meditation-hypnosis. A 2-mo-follow-up showed that all 5 Ss were still smoking although 2 of the Ss who were seen for 4 or more sessions were smoking at a reduced rate. All Ss had moderate-to-severe social and family stressors and
4 of them listed 'stress outlet' as a major factor at smoking. It is concluded that, even when an individualized approach and a combination of techniques are used, long term success in smoking cessation cannot be achieved if the patients are under severe stress and have little or no social support.

Delmonte, Michael M. (1984) has reported a study about factors influencing the regularity of meditation practice in a clinical population as per this report:

38 outpatients (mean age 36 yrs.) suffering from psychosomatic and neurotic complaints completed measures including the Marlowe Crowne Social Desirability Scale, Eysenck's Personality Inventory Form A, Rosenberg Self-esteem Scale and Rotter's Internal-External Locus of control scale. High pretest scores on sensitization, suggestibility, introversion, neuroticism, and perceived symptomatology predicted lower practice frequency. Gender, expectation, credibility, locus of control and self-esteem were unrelated to outcome. By 2 yrs., 54% of the Ss had stopped meditating. Meditation appeared to be more rewarding for Ss with milder complaints.

Referring David L. and Bowman Mary J. (1981) have tried to study the impact of meditation on relation exercise. 11 yrs. old participated in either the treatment group and practiced H Benson's (1975), meditation relaxation technique or in the no treatment group and relaxed for the same 20 min. sessions over a 5 day period. Non attending behaviour levels were recorded.
during the treatment period. The test- for pre-to post test mean change differences of non attending behaviour for the 2 groups reflected a significant reduction in the number of non attending behaviours for the treatment group.

2.2.4. Positive Traits:

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable impact</th>
<th>Study done at/year</th>
<th>Researchers</th>
<th>Impact Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Peace, co-operation and understanding</td>
<td>1984, Santacruz</td>
<td>Nelson Alan</td>
<td>Positive Sig.</td>
</tr>
<tr>
<td>2.</td>
<td>Positive Personality traits</td>
<td>1979, California</td>
<td>Walsh Roger</td>
<td>Positive Sig.</td>
</tr>
<tr>
<td>5.</td>
<td>Personality</td>
<td>1980, Ireland</td>
<td>Dalmona M.L.</td>
<td>Positive Sig.</td>
</tr>
<tr>
<td>7.</td>
<td>Personality</td>
<td>1982, Canada</td>
<td>Kline, Kenneth S.</td>
<td>Positive Sig.</td>
</tr>
</tbody>
</table>
Positive Traits:

In this category 8 studies are included. Two studies are related to learning activity. Impact of meditation on positive traits is found to be positive. All studies were found to be affected significantly by meditation on positive side. It is also found that meditation facilitates learning. Thus learning process can be accelerated by inducing practice of meditation. Moreover, processes like ESP, creativitv and relaxation can also be accelerated by practicing of meditation.

Nelson, Alan (1984) has tried to study the impact of meditation on contemplation and non violence: addresses ways that contemplation, prayer and meditation foster the personal, global, psychological, and spiritual transformation that is needed to help individual approach the nuclear crisis more responsibly and discusses the dynamics necessary for prayer and peace that are part of psychological and spiritual growth. It is suggested that; that which fosters prayer foster peace. What brings psychological and spiritual peace also facilitates relation and global peace. Prayer and peace, facilitate and are facilitated by awareness, openness, service, morality, love and holiness. It is argued that given their preventive practice in spiritual tradition, prayer and meditation can also help facilitate cooperation and understanding so helpful for global peace.
Walsh, Pogar (1979) briefly highlights findings of meditation research over the past 70 yrs. Empirical research began in the early 1960s with most results indicating various degrees of psychological control, such as slowing heart and respiration rates, and reduction in GSR. EEG patterns also appeared to slow down during meditation, with greater display of synchronization. Other subjective findings were enhanced perceptual clarity, heightened awareness, desensitization of formerly stressful stimuli, an altered sense of time and consciousness, and regression in service of ego (or openness to new cognitive experiences). However, meditation research is still in its early stages of development, and findings are tentative at best.

West, Michael A. (1980) has tried to study the impact of meditation on psychosomatics:

- Defines meditation as an exercise (which can include repetitive movement) that involves the individual directing attention/awareness on a single object, concept, sound or experience. Meditation's historical context and its use in the western world as a relaxation technique are discussed.
- Research findings in 4 areas are reviewed: the psychological correlates of meditation, personality change associated with learning and regularly practicing meditation, the use of meditation as a therapy, and the use of meditation stress-related disorders. It is suggested that the very act of meditation reduces arousal and increases relaxation because: (1) the
repetition of a single stimulus (mantra) produces habituation of the orienting reaction and sleep onset, (2) the eyes are closed and therefore block external stimuli, (3) the setting itself is usually quiet and (4) the meditators have expectations of deep relaxation and states of peace.

Nash, Garroll B. (1982) has tried to study the impact of meditation on Hypnosis. Investigated whether ESP is greater during hypnosis or during transcendental meditation using 22 Ss enrolled in a para psychology course in an adult education program. Ss were tested for their ability to receive impressions viz., ESP at a painting reproduction looked at by the instructor. Results suggest that ESP occurs more frequently during hypnosis than during transcendental meditation.

Dalmonte, M. L. (1980) made a study on Personality Scores taken prior to meditation initiation were used to predict responses to meditation. The Eysenck Personality Inventory, the Repression - sensitization scale, Rotter's Internal External Locus of control scale, and the Barber suggestibility scale were completed by 24 prospective meditators, (mean age 29 yrs.) Ss were recontacted after 18 months and grouped according to how frequently they meditated - "regulars" (RMs) "Irregulars" (IMs) and "dropouts" (D's). Eight Ss remained "uninitiated" preinitiation score and frequency of meditation practice were analysed. Frequency of meditation was negatively correlated
with both neuroticism (NE) and sensitization (SE). NE and SE were positively correlated independently of meditation practice. Prospective DOS scored significantly higher on both NE and SE. Than prospective regular meditators than the uninitiated Ss and were significantly more neurotic than Eysenck's (1963) norms. Scores of DOS and uninitiated Ss were significantly different from Eysenck's norm for NE, DOS and uninitiated Ss did not differ significantly with regard to NE and SE. Meditators to be were significantly more NE than uninitiated Ss and than Eysenck's norms. The maintenance at the practice of meditation was not related to gender, but DOS tended to be younger compared to other groups.

Ramakrishna Rao, K. Pukhan, Hanalyn and Krishna Rao, R.V. have done some work in India. They have worked on Patanjali Yoga and ESP. Ramakrishna Rao discusses the psychological processes believed to be involved in Patanjali Yoga and reports result of experiment conducted to determine whether meditation would help people achieve better scores in laboratory tests designed to measure ESP. 50 Ss (aged 18-60 yrs.) with various degrees of proficiency in yoga and meditation were administered forced choice and free-response ESP tests just before they began meditation and again they had meditated for at least 30 min. Results show that Ss obtained significantly better ESP scores after they meditated than before. This was true in forced-choice tests that involved blind matching of 50 ESP cards against 3 concealed key cards, picture enclosed in a sealed opaque envelop.
Rivers, Stephen M. of Sopnos, Nicholas P. (1981) have tried to study the impact of meditation on personal variables predicting voluntary participation in an alteration:

Hypothesized that Ss who volunteered to learn meditation would score higher than non volunteers on absorption and hypnotic susceptibility and that psychological well being variables and absorption would product Ss tendency to continue meditation. 47. Students were assessed on absorption, hypnotic susceptibility, and 3 measures of psychological wellbeing (self esteem, depressive affect, psychosomatic symptoms) and than invited to learn meditation. Those completing the training program also completed follow-up questionnaire. Analysis indicated that (a) meditating volunteers, (b) 91% at the volunteers had stopped meditating 1 month after training and (c) the pretest self-esteem and psychosomatic symptoms measures predicted attrition from meditation.

Kline, Kenneth C. Doncherity Edward M. and Farley, Frank H. (1982) have tried to study the impact of meditation on self/actualization, and global personality:

Investigated the effectiveness of transcendental meditation (TM). When used as an adjunct to a remedial out-patient program. The MMPI, as a measure of global personality, characteristics, and the Tennessee self-concept scale (TSC), as a measure of self actualization, were administered to 11 recovering alcoholics, and individuals with general emotional
problem (mean age 35.9 yrs.) participating in a 3 month program of transcendental meditation and to 12 control Ss (mean age 37.6 yrs).

2.2.5. **Negative Traits:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Study done at/year</th>
<th>Researchers</th>
<th>Impact</th>
<th>Survey/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Stress</td>
<td>1984</td>
<td>D. Frew</td>
<td>Positive Sig.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Trait Anxiety, 1981, S.W.</td>
<td>Texas U.</td>
<td>Elly Sheiles</td>
<td>Positive Sig.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Neuroticism</td>
<td>1960, Canada</td>
<td>O'Haire et al.</td>
<td>Positive Sig.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Mental Retardation</td>
<td>1961, Southern California</td>
<td>Eyerman James</td>
<td>Positive Sig.</td>
<td></td>
</tr>
</tbody>
</table>
In this category 9 studies are included. 50% of these studies are on 'Anxiety'. Except autonomic responses in almost all the studies the impact of meditation on anxiety is found to be positive. That means meditation works as a good medicine for anxiety. Other negative traits like neuroticism, mental retardation, insomnia, tension and pain distress were also found to be affected significantly by meditation on positive side. This means any person practicing meditation can get benefits in such conditions. This also means that meditation seems to have therapeutic value for negative traits. Hence meditation can safely be used as a treatment device for many psychological ailments.

Dr. Frew (1984) made a study about the effect of meditation practice on employees' health in the work setting. He found that meditators reported more job satisfaction, improved performance, less desire to change jobs, better inter-personal relationships and decreased climbing orientation than non-meditating colleagues. Two studies by R. Peters and associates (1977) showed that somatic symptoms and performance improved less with the practice of meditational relaxation than did behavioural symptoms and measures of well being. An investigation by D. Carrington et al. (1980) indicated that meditation and progressive muscle relaxation treatment groups reported significant improvement in stress symptoms only the meditational groups, however, reported significantly more symptom reduction.
than controls. The study also replicated the finding by Peters et al. that less frequent practice may be as effective as frequent practice. It is noted that, although their may be a beneficial role for meditation, these findings await further replication and that it would therefore, be premature to conclude that meditation practice reduces occupational stress.

Elling Sheila, Thomas, Anne and Gallaher, Michael (1981) conducted a research in which they assigned 61 undergraduate volunteers to clinical standardized meditation (CSM) quiet sitting (SIT), or wait list groups and 19 others to open focus (OF) or wait list groups. Ss were tested before training and again 8 weeks later with such measures as the state - Trait Anxiety Inventory, Roter's Internal External Locus of Control Scale and the Myers Briggs Type Indicator (MBTI). All groups but wait list decreased significantly on Trait Anxiety. All groups became non-significantly more internal on locus of control. On the MBTI, meditation Ss were more Introverted than extroverted intuitive than sensing, feeling than thinking and perceiving than judging. All groups became more intuitive, approaching significance for CSM only. OF became significantly more extroverted than both CSM and SIT, and CSM significantly more Ss than wait list. Practice time correlated with anxiety reduction for the combined treatment groups. More evidence was found for correlations of practice time and outcome with growth or expectancy of benefit.
Lintel, Albert J. (1980) has tried to study the impact of meditation on physiological anxiety responses.

In the first experiment, the spontaneous HRV of 7 transcendental meditators and 7 non-meditators were measured in a sequence of 5 conditions: stress (shock avoidance) rest, meditation (meditators) or test/eyes closed (non-meditators), stress (shock avoidance) rest. In Experiment II, the spontaneous HRV of 7 meditators and 7 non-meditators was measured in a sequence of 3 conditions: rest-meditation or rest/eyes closed - rest. ANOVA did not yield significant differences between meditators and non-meditators although analysis did verify that shock avoidance task effectively produced anxiety. It is concluded that transcendental meditation is not an effective means of reducing autonomic responses to stress under the present testing conditions.

O'Haire, Trula D. and Marcia, James E. (1980) have tried to study the impact of meditation on personality characteristics.

The three groups of Ss aged 18-33 yrs. with varying degrees of experience in meditation, 132 with interest only, 78 with 6 months 3 yrs., and 36 with more than 3 yrs. were compared on several personality measures (e.g. Eysenck Personality Inventory, Torrence Tests of Creative Thinking, Myers Briggs Type Indicator) Meditators maintained stricter vegetarian diets and need less sleep than non-meditators. Highly experienced female meditators were highest in figured originality.
No differences were found in ego strength or cerebral dominance except for an overall tendency toward right-hemispheric functioning. In Jungian typology, non-meditators preferred intuition and perceiving more than meditators across all Ss a pattern of introversion, feeling, judging and intuition was found. Meditators were lower on neuroticism than non-meditators.

Eyerman, James (1981) has reported a case study of 26 yrs. old moderately mentally retarded woman who was taught the transcendental meditation technique. She experienced spontaneous improvements in her verbal and social behaviour and physiological functioning over a period of 9 yrs. while practicing the technique.

Hilts, Walter W. and Farrow, John T. (1981) have tried to study the impact of meditation on acute experimental pain. 15 advanced meditators and 15 controls were administered the cold pressor test before and after a 20 min. period of transcendental meditation (TM) or relaxation verbal reports of the intensity of pain sensation and pain distress were obtained at intervals during the cold pressure trial. Skin resistance and heart rate were measured throughout. The mean distress level for the TM group was significantly lower than for controls during both trials. The mean pain sensation level for the TM group did not differ significantly from controls during either trial. Heart rate and skin resistance changed for both groups in the expected manner, with no significant differences between groups.
Hewitt, Jay and Miller, Ralph (1981) have tried to study the impact of meditation on relative effects of other activities. Undergraduates rated extent of relaxation and enjoyment of inter-personal relations for each day during a 4 week baseline period. The following week, Ss engaged in a different activity on each of 4 day for 20 min. meditation, progressive relaxation, enjoyment of other as much as possible, and sitting down and trying to feel good. This sequence was repeated for 2 weeks. At the end of each day Ss rated their relaxation and degree of enjoyment for other people. Analysis indicated that meditation produced significantly lower ratings of tension than did the baseline or control condition. Meditation, however, was not better than some alternative technique (e.g., concentrating on trying to enjoy oneself or others), and Ss were more likely to engage in these alternative techniques than in meditation. Meditation had no effect on ratings of social relations.

Throll, D. (1981) has tried to study the impact of meditation on progressive relaxation. Administered the Eysenck Personality Inventory, the state Trait Anxiety Inventory and 2 questionnaires on health and drug usage to 39 European 18-41 yrs. old before they learned transcendental meditation (TM) or progressive relaxation (P.R.). Ss were tested immediately after they had learned either technique and then retested 5, 10 and 15 weeks later. There were psychological variables at pretest. However, at post-test the TM group displayed more significant and
comprehensive results (decreases in Neuroticism/stability, Extroversion/Introversion and drug use) than did the P.R. group. Both groups demonstrated significant decreases in state and Trait Anxiety. The more pronounced results for meditators were explained primarily in terms of the greater amount of time that they spent on their technique plus the differences between the 2 techniques themselves.

2.2.6. Learning:

<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Variable</th>
<th>Study done at/year</th>
<th>Researcher</th>
<th>Impact positive or uncertain</th>
<th>Survey Remarks</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cognitive effects</td>
<td>1980, Canada</td>
<td>Julie et.al.</td>
<td>Positive</td>
<td>Significant</td>
<td></td>
</tr>
<tr>
<td>3. Concentration ability</td>
<td>1980, West Germany</td>
<td>Sabel, Bernard</td>
<td>Negative</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Negative traits:

In this category 3 studies are included. All studies are on learning. Except concentration ability in almost all the studies the impact of meditation on learning is found to be positive. That means meditation works as a good helper for learning. Other traits like creative Intelligence, Creativity, Memory and cognitive effects were also found to be affected.
significantly by meditation on positive side. That means any person practicing meditation can get benefits. It is also found that meditation facilitates learning.

Julle, John C., and Sereda Lynn (1980) have tried to study the impact of meditation on positive effects. They examined the effects of 2 types of meditation on a variety of cognitive measures. An attempt was made to overcome methodological weakness common to research on meditation by employing random assignment of Ss to conditions and including a pseudomeditation control condition. 16 18-32 yrs. old Ss were given pretest and post-tests of short and long term memory and attention the Nelson-Denny Reading Test and Raven's progressive matrices. After the pretest each S (except controls), was given individual training in transcendental meditation, Savasana Yoga, or pseudomeditation and was asked to practice the meditation twice a day. Individual diaries monitored their practice. Control S were given no special treatment. Results indicate that the practice of meditation had no systematic effect on the variables assessed. In each group fewer than 60% of the Ss completed the practice of meditation. ANOVA indicated that the drop-outs were significantly younger than those who completed the study.

Frumkin, L.I. and Pagano, R.E. (1979) have studied the effect of T.M. on Memory. He used pretest treatment and post-test design for the study.
During the treatment phase, TMs practiced TM for 20 min, and non-TMs relaxed with eyes closed. Although the 2 groups level shown no significant difference in pre-test performance. TMs performed significantly better than did non-TMs on the post test. However, this experiment lacked such controlled as individual administrations of the task, extrinsic, rewards, spacing and adequate practice. Employing these controls Exps. II and III with a total of 41 TMs and non TMs attempted to replicate the finding of Exp. I. However, post test results show that the TMs performed significantly worse than the non TMs. Taken together, the 3 studies illustrate the need for controlled research when investigating the effects of meditation on behaviour. Findings also suggest that the effects of meditation may depend on which hemisphere is dominant in performing the task.

Sabel Bernard A. (1980) took two groups for the experiment TM was used.

One group meditated for 20 min, while the other read a text quietly. Both groups were tested before and after treatment to measure their concentration ability. Meditation had no measurable short term effects on concentration and the Ss experience at meditation was not correlated with the concentration score.
2.2.7 **Miscellaneous:**

<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Variable impact of meditation on...</th>
<th>Study done at/ year</th>
<th>Researcher</th>
<th>Impact positive or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Suggestibility</td>
<td>1977, Czechoslovakia</td>
<td>Destalck</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2.</td>
<td>Perception</td>
<td>1979</td>
<td>Holman et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3.</td>
<td>Mindfulness</td>
<td>1979, Burre WA</td>
<td>Karnifield Rack</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>5.</td>
<td>E.S.P. rating</td>
<td>1979, Campbell U.</td>
<td>Palmer et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8.</td>
<td>Suggestibility</td>
<td>1981, Dublin Ireland</td>
<td>Walmonte M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9.</td>
<td>Zen and Indian Yoga Meditation</td>
<td>1976, Japan</td>
<td>Fishher et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>11.</td>
<td>Expectation and Meditation</td>
<td>1981, India</td>
<td>Delmonte M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>12.</td>
<td>Voluntary participation in attraction</td>
<td>1981, Canada</td>
<td>Rivers Steffen M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
As in case of other variables meditation brought positive impact on varied of processes. Only in case of Alcoholics it was not found useful. Alcoholics did not show any positive result. One more striking study in this section is about 'Rorschach responses.' As a matter of fact few studies are found in this area. Particularly in this study the results were positive and encouraging.

Destalck et al. (1979) has tried to study the impact of meditation on yoga exercises. Monitored EEG, EMG and GSR during 3 sessions of meditational respiration in one subject. Important elements of the exercises were "pranayama bhasrila" (rapid breathing at a rate of 1-6 breaths/sec.) holding the breath and chanting the syllable 'Om'. In the EEG, slow theta and delta rhythms were present, alpha amplitude increased hold, and high amplitude beta rhythms was present. During chanting of 'Om' there was a progressive contraction of muscles proceeding from the abdomen to throat. GSR showed an iso-electric line during almost the entire period of apnea and considerable functions that meditation exercises lead to a narrowed state of consciousness characterized by increased suggestibility.

Holeman, Richard and Seeler, Gary (1979) made a study about the effect of sensitivity training and TM on perception of others.
As per their report participants involved in a sensitivity training programme and 19 transcendental meditation program participants were administered a specifically constructed semantic differential prior to participation and again six week later. Results suggest that meditation may increase rated perceptions of others.

Kornfield, Jack (1979) has tried to study the impact of meditation on Phenomenological study. Collected data on direct experiments of students during insight meditation (Vipassana) in which concentration is focused on breathing and somatic functions. Questionnaire responses suggested that unusual visual and auditory aberrations were the norms. Meditation may be viewed as a series of mental exercises in which 'mindfulness' is more than a process of simple relaxation.

Spanos, Nicholas N. Gottlieb, Jack and Rivers Stephen W. (1980) investigated about the effect of short term meditation practice on hypnotic responsivity. As per their report 81 male undergraduate were pre-tested on absorption and 3 measures of hypnotic responsiveness and were than randomly assigned to 1 of 3 conditions meditation for 8 sessions, attendance at lectures on hypnosis for 8 sessions and no treatment. Ss were post tested on absorption, hypnotic responsivity and Harvard Group scale of Hypnotic susceptibility. From A measures, degree of meditating remained stable across seasons, and
meditating Ss were much more luckily than those who listened to lectures to report instruction into their attending. Neither the meditation nor the listening treatments enhanced hypnotic responsivity or absorption.

Palmer, John Shamash, Karen and Israelson, Kathy (1979) have tried to study the impact of meditation on ESP ganyfeld. 20 graduates of transcendental meditation were tested in a single session free-response experiment while experiencing 35 min. of perceptual deprivation (ganyfeld). Immediately afterwards, they completed a rating scale describing their experiences and expectations and blind rated the target pictures and 3 controls in terms of their imagery. The mean ESPZ score was in the promising direction, but was not significant. However, average ratings of the Ss transcripts by 2 independent judges produced a mean Z-scores in the promising direction that was significantly higher than the mean based on the Ss' ratings. This illustrated the effect that judging can have on the outcomes of free response ESP experiments. When the experimental rating scale was factor analyzed 2 factors emerged that reflected the degree to which S reported being in an altered state of consciousness during the experiment. One of these scales, representing the hypnagogic nature of the experience, correlated positively and significantly with the ESP scores based on the independent judges ratings. This correlation confined the findings that the most extreme ESP deviations occurred among Ss reporting the most pronounced alterations of consciousness.
Spanos, Nicholas P., Stam, Headorikus J., Rivers Stephen M., and Radtke, H. Lorraine (1980) have tried to study the impact of meditation expectation and performance on indices of non-analytic attending. Following pretests on the Eysenck Personality Inventory and Scale of Hypnotic Susceptibility as measured by the Harvard Group Scale of Hypnotic Susceptibility, 34 undergraduates attended non-analytically for 2013 min. sessions and were then post-tested. Sessions were defined as meditation for 11 Ss and as a study in attention style for 12 Ss, 11 Ss served as no treatment controls. Meditators and attenders did not differ in their rate of signalling intrusions into their attending and neither treatment affected hypnotic susceptibility or personality dimension scores. Ss defined as motivated to participate in the study did not differ initially in rate of intrusions from Ss who were unmotivated. At the end of the study, however, motivated Ss reported fewer intrusions than unmotivated Ss. Intrusion rate correlated significantly with hypnotic susceptibility.

Brown, Daniel P. and Engler, Jack (1980) have tried to study the impact of meditation on the stages of mindfulness. Give an empirical approach to the validation of subjective reports of stages of mindfulness meditation among different levels of practitioners by comparing Porschach responses. The Beginners groups, who received basic training in both inner and outer awareness, showed unremarkable protocols except of a slight
decrease in productivity. The samadhi group, who concentrated on a single object without distraction, showed significant un-productivity and paucity of associative elaborations. This was because of perceptual layering (noticing pure perceptual features). The insight group showed increased productivity and richness of associativeness and conceptual elaborations. The advanced group usually perceived inkblots as an interaction of form, energy, and space. The higher level, the Master's group demonstrated integration of all 10 cards into one universal theme or concept.

Delmonte M.M. (1981) has tried to study the impact of meditation on suggestibility. Tested 36 Ss (mean age 27.7 yrs.) with the Barber Suggestibility Scale for hypnotic suggestibility during both meditation and rest. Ss acting as their own controls were significantly more suggestible during meditation than during rest.

Fischer, Roland (1986) has tried to study the impact of meditation on some Japanese Zen and Indian Yoga. Some Japanese Zen and Indian Yoga meditation techniques are cartographed on a arousal. Certain Psychological characteristics and experimental dimensions of these hypometabolic states are discussed and it is proposed that observer- observe interactions or trans-substantiation (commonly termed 'reality) may not be subject to Boedelian restrictions if they process in hyper and hypnearoused states. The meaning of aroused non-
Delmonte, M. (1981) has tried to study the impact of meditation on expectation. 94 prospective meditators (mean age 28.9 yrs) were administered two 14-items questionnaires to ascertain their present perceived selves and their expectation at Transcendental Meditation (TM) before two introductory against studying TM. Those who took it up were older, had more negatively perceived selves, and had higher expectations. A more positively perceived self at retest and high expectations at the three testing periods were related to a high frequency of TM practice. Frequent practice in turn, was related to improved perceived self and increased expectation scores on follow-up younger Ss were frequently had more likely to report on improved perceived self compared with their initial scores.

2.3. CONCLUSIONS OF SOME OTHER RESEARCHES ON MEDITATION:

Homeostasis:

1. T.M. group returned to their pre-running temperature, more quickly.
2. T.M. technique enhances one's ability to cope with a changing environment both physically and emotionally.
3. Some people who practice T.M. continue to meditate regularly yield a group of people whose autonomic homeostasis differ from that of irregular meditators and non-meditators.
4. Increased temperature homeostasis in people who practice the T.M. technique is sufficiently encouraging.
verbal and logically non-Aristotelian state cannot be conveyed to individuals in a non-aroused state. The converse is also true when the relationship of arousal levels is reversed.

Becker, David E. and Shapiro, David (1981) have tried to study the impact of meditation on physiological response. They attempted to replicate and extend the findings of R.K. Wallace (1979) and J.F. Banquet, 30 experienced Zen, Yoga, and Transcendental Meditation (TM) meditators with average length of experience at 7, 5, 5 and 7 years respectively and 20 college students controls were presented with auditory clicks during meditation. EEG alpha suppression and skin conductance response both showed clear habituation that did not differ among groups thus failing to replicate the earlier studies.

Amodeo John (1981) has tried to study the impact of meditation on focusing applied to a case of disorientation. He describes a case of the family who experienced temporary disorientation during some of the 40 min. meditation sessions with the author. During meditation, S developed a strong tendency to dissociate from her current experience that sometimes produced an intense fear. Focusing appears to have the effect of "grounding" her experience of meditation.
Psychological health:

1. T.I. is an easily learned, non-time consuming activity.
2. Therapists might profitably teach the technique to clients manifesting well defined behavioural symptoms, e.g., depression, lucidal, thoughts academic deficiencies and sexual difficulties.
3. Another potential application of T.I. that is of particular contemporary importance is its relevance to combating drug abuse among young people.

Classroom behaviour:

1. The science of creative intelligence and its practical application.
2. The T.M. program appears to bring about improved academic performance and to reduce anxiety levels.
3. They may also be helpful in improving students classroom behaviour.

Creativity:

1. T.M. practice enhances the creative potential as measured by the verbal tests of creative thinking.
2. T.M. practice improves performance on tests of creativity.
Academic Attainment:

1. The practice of the T.M. technique is in part of function of some of the following qualities developed as a result of the practice integrated behaviour, more productive activity increased flexibility in adapting to a novel situation.

2. Increased perceptual ability, faster reaction, increased energy and efficiency, reduced tension (lower anxiety) and decreased inhibition.

3. Increased motivation and academic performance.

Self-actualization:

1. The T.M. group scored significantly higher than the control in the ability to express feelings in spontaneous action.

2. T.M. increases tolerance for verbal aggression.

3. T.M. influences one's willingness to disclose aspects of the self to others.

4. T.M. is state of relaxation.

Personal adjustment:

1. Persons interested in meditation did not differ significantly on these scales from persons uninterested in meditation or from an unselected norm group with a mixture of interest levels.
2. Interested in meditation are either more self actualized or more neurotic than the average person.

**Insomnia:**
1. This study are encouraging for a variety of responses.
2. T.M. program was dramatically successful in treating insomnia.
3. T.M. technique is easy to learning; takes little time both to learn and practice.
4. T.M. does not induce any unfavourable side effects.
5. T.M. could therefore be universally and easily applied as a non-drug treatment for insomnia under most circumstances.

**Treatment for Insomnia:**
1. T.M. program is a successful treatment for Insomnia.
2. It was also found that the positive effects of T.M. on insomnia remained stable over the lapse of time.
3. Study also revealed that no negative side effects were there on the subjects performing T.M.

**Neuroticism:**
1. Regular practice of the T.M. technique brought about a significant decrease in neuroticism.
1. The regular practice of T.M. apparently enables an individual to naturally develop a more stable and integrated self-concept. Thus his psychological health spontaneously improves.

2. Regular practice of the T.M. technique appears to increase fluid intelligence during late adolescence, obviously well effectiveness in whatever he undertake throughout his adult life.

**Trait anxiety:**

1. T.M. reduces anxiety particularly the amount of anxiety generally felt by an individual.

2. T.M. technique should improve health and performance in a variety of situations, both mental and physical.

**State anxiety:**

1. The T.M. technique by introducing physiologically quiescent state, appears to lower anxiety levels and reduce the effect associated with potentially stressful situation.

2. Meditators feel more self confident have a higher self regard and feel more autonomous, lowering of anxiety through T.M. may lead to increased energy, self sufficiency, and flexibility in dealing with an increasingly complex environment.
Mental health:

1. T.M. program is helpful in altering a better mental health in the normal individuals.

2. T.M. technique effectively reduce the anxiety resulting from a demanding and potentially anxiety provoking situations of modern life.

Paired associate Learning:

1. T.M. program would enhance retention of material, gave results in the direction of confirmation.

2. T.M. group showed significantly superior short-term and long-term retention and recall.

3. T.M. group also acquired material more efficiently.

4. Preliminary findings should employ groups match for age, sex and most importantly intelligence to control for differences in learning ability between groups due to the self selection of those who choose to

Performance on learning task:

1. The T.M. technique may be aiding in this filtering process by reducing "noise" in the nervous system, as well as by enhancing the selectivity and effectiveness of attention.

2. This intriguing results implying the expansion of one's ability to learn and to focus attention effectively as a consequence of practicing the T.M. technique.
Creativity:
1. Increased creativity and intellectual performance and particularly noteworthy benefits.
2. T.M. leads to self actualization. T.M. and creativity are positively related.
3. T.M. program does lead to self actualization.
4. T.M. has been shown to be of great general benefits to the individual.
5. The differences in creativity found between the two groups demand exploration in greater detail in well controlled.

Academic achievement:
1. T.M. improves practical performance in general.
2. T.M. technique to treat such special problems as hyperactivity and emotional disturbances might profitably be researched.
3. T.M. technique produces increased general intelligence and more accurate perceptual motor performance.

Personality Traits:
1. The effects of practicing the T.M. technique seen to grow over time.
2. The T.M. program produces significant reductions in negative personality traits.
3. T.M. program produces significant improvements in positive
traits resulting in a continuous balanced, holistic growth of the entire personality.

Psychological health:

1. Regular practice of T.M. technique reduces anxiety, depression and neuroticism and increase self actualization.
2. Long-term meditators show a more developed state of psychological health than the general population.
3. T.M. program appears to bring positive psychological benefits.
4. T.M. provide the necessary condition perhaps the "proper condition.

Intelligence:

1. The regular practice of the T.M. technique produced significant increases in intelligence and significant decreases in neuroticism and somatic neurotic stability.
2. T.M. technique produces a unique physiological state of deep rest.
3. During T.M. brain waves become more coherent.

Personality function:

1. The training in meditation reduced anxiety and increased the degree of concentration and span of attention.
2. It is argued that self initiated concentration on different body parts brings changes in the physiological events which lead to changes in cognitive and personality functions.
**Personality traits:**

1. Individual practicing T.M. regularly have better mental health, better adjustment.

2. They also possess positive personality traits as compared to non-meditators.

**2.4. SUMMARY:**

Sixty Nine studies on meditation were reviewed. In only six studies negative results were reported. In all other studies positive impact of meditation on various variables was found. Particularly meditation seems to have positive impact on mental health.

All the studies done to find out the impact of meditation on anxiety showed very encouraging results. Studies showed clearly that meditation decreases the level of anxiety significantly. Though studies on frustration were not there but there were few studies on tension and stress. Here also it was found that meditation brought out positive results.

Thus, the investigator was inspired to see the result of meditation on anxiety frustration, emotional maturity and security - insecurity. Results were found to be encouraging, that to check the impact investigator replicated the same study with one more variable. Data and analysis of both these studies are presented in the next chapter.