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METHODOLOGY
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METHODOLOGY

This chapter deals with the objectives set based on the stages referred to in the model (chapter 2) and also the hypotheses formulated correspondingly. Details in regard to the tests developed on distress symptoms, stressors, stress control, stress reaction and coping behavioural pattern are provided. Given further in this chapter include subject item matrix (SIM), procedure adopted for selection of subjects and experimentation besides the yoga package that was administered to the subjects.

3.1 Objectives

While the general objective set for the study was to assess the effectiveness of yoga on stress management, the specific objectives formulated for the study included:

i) To study the concept of stress in Patanjali yoga system.

ii) To assess the effectiveness of yoga on distress symptoms.

iii) To study the change in the number of stressors after practice of yoga.

iv) To assess the effectiveness of yoga on the level of control over stress situations.

v) To study the influence of yoga on reaction associated with stress situations and

vi) To study the impact of yoga on coping pattern.
3.2 Hypotheses

The study is based on pre-yoga and post-yoga experimental design. Some specific hypotheses were formulated based on the literature available and also the research gaps in the subject and they are as follows:

i) Practice of yoga would result in lesser incidence of distress.

ii) Yoga would reduce the symptoms, intensity and frequency of occurrence of distress symptoms.

iii) Yoga would help in the reduction of the number of stress situations.

iv) The extent of control over the stress situations will be higher among persons practising yoga.

v) Exposure to yoga would lead to positive reaction to stress situation.

vi) Extent of coping up with stress situations would be higher among yoga followers.

3.3 Selection of Subjects

Initially, 520 male participants of various training programmes organised during 1992-93 at the National Institute of Rural Development and other training Institutions located in Hyderabad were selected. A preliminary enquiry was made with all 520 participants in respect of their age group (35-50 years), interest in the therapeutic exercises of yoga, earlier exposure to yoga and the absence of psycho-somatic problems. It was found that a sample of 362 participants satisfied all the four criteria viz, they belonged to the age
group of 35-50 years, had interest in therapeutic exercises of yoga, no prior exposure to yoga and did not complain of psycho-somatic problems. However, only 250 out of 362 participants did not have any psycho-somatic problems as examined by a qualified physician whose help was sought for clinical confirmation.

3.4 Distress symptoms Test:

Based on both experience and literature available* on the subject under consideration, a distress symptoms test was initially developed consisting of 30 items encompassing three basic dimensions viz., 1) mood and disposition, 2) visceral and 3) muscular-skeletal symptoms which denote the experience or feeling of depression, sleeplessness, excitement, stomach upset, digestive problem; palpitation and other symptoms often experienced by the distressed people in general. The list was finalised by incorporating another 10 items** as suggested by the experts in the field of psychology in the Osmania and Madras Universities, who were consulted for this specific purpose.

All the 250 subjects consisting of an almost equal number of both executives and academicians, were asked to indicate their degree of distress through a scale ranging

* as discussed in 'Control of stress and tension' by Girdano (1986).

** These ten items are separately shown with an asterisk in the questionnaire appended.
from never, sometimes, often to always. It was initially decided to include the participants who experienced distress ‘always’ in respect of at least five out of 40 items for the purpose of the study, but it was found that they constituted only a microscopic minority—21 out of 250. In view of this, the participants who tickmarked the ‘often’ category at least in respect of five out of 40 items were also included. Thus, for measuring distress, the participants who indicated that they experienced distress often or always (at least five in respect of 40 items) were included for the purpose of this study while the remaining were dropped. In this exercise, it was found that as many as 118 subjects satisfied this criterion whereas the remaining 132 subjects were having distress in the ‘normal’ measure and hence did not need the yoga package.

Of these 118 subjects, 62 subjects volunteered to form the experimental group for the purpose of the study while the remaining 56 subjects agreed to serve as a control group. However, a sample of 25 executives and as many academicians was drawn randomly from experimental group. Similar procedure was adopted in respect of control group also. Thus, the sample size finally obtained is 100 subjects, 50 each of experimental and control groups*—consisting of 25 Executives and as many Academicians in each group.

* Data relating to important socio-economic characteristics of the selected subjects are given in Appendix III. It may be found from this that the both the groups were alike on these socio-economic characteristics before the yoga package was administered to the experimental group.
3.4.1 **Subject-Item Matrix (SIM)**

In order to facilitate a better appreciation of the changes in the intensity of occurrence of the distress, a matrix was constructed considering the subject-item as the unit. This matrix primarily depicts the movement of subjects (items) from pre-yoga period to post-yoga period.

**Procedure for construction of SIM**

The experimental subjects are expected to fall in the 'never' frequency category from 'always', 'often' and 'sometimes' categories as a result of exposure to yoga package. Hence the movement of the subjects (or subject items) among the four categories was traced and the total number of steps actually made was worked out. Similarly, the total number of steps to be made in order to be in the 'never' frequency category was also worked out.

For example, a subject who was originally in the 'always' distress category with reference to an item has to make three steps to fall in the 'never' frequency category. Similarly, the subjects who were originally in the 'often' and 'sometimes' categories have to make two steps and one step each. The subjects who were in the 'never' category, before yoga exposure, on an item are considered to have made 'zero' step each if they remained to stay at the same position.

* The categories used are never, sometimes, often and always.
Following the same logic, sliding back cases were assigned negative score. Separate matrices on these lines were constructed for experimental group executives, experimental group academicians, control group executives and control group academicians, each group consisting of 25 members. Subject-Item Matrices (SIMs) at the aggregate level (both executives and academicians) were also prepared.

3.5 Stress test

This test is meant for measuring stressors (not stress). The most widely used measurement tool for this is Social Readjustment Rating Scale (SRRS) which was developed by Thomas Holmes and Richard Rahe (1967). It was based upon the theory that "life change" causally associated with subsequent illness. Keeping in view the Indian conditions a stress developed by Latha (1984) consisting of 52 items was modified by incorporating 32 new items and deleting 9 items resulting in 75 items. The basis for effecting these changes is the suggestion given by the subject matter specialists (belonging to the area of psychology). According to them, the nine deleted items do not adequately reflect the content of the underlying dimension in question and in view of this 32 items were added so as to ensure that an equal number of items is obtained in each of the three stress intensity categories viz., mild, moderate and severe.*

Appendix IV presents the details in with regard to the items borrowed, deleted and incorporated.
Thus, the test includes 75 items reflecting the stress situations, classified into mild, moderate and severe categories consisting of 25 items each, normally experienced by the people.

The subjects were asked to react to each of the 75 items in terms of 'yes' or 'no'. While the former answer indicates his experience during the past one year with reference to a particular stress situation, the latter denotes the absence of it. Further, the subjects who endorsed the applicability of the stress situations were required to indicate the amount of control they exercised over the situation in terms of either 'full control', or 'partial control', or 'no control'.

A simple scoring procedure was adopted in which a score of one unit was given to the subjects who mentioned first category (full control), while a score of two units assigned to a partial control response. At the other extreme, subjects who mentioned that they did not exercise any control over stress situation were given a score of three units. Thus, for a subject the maximum score on the stress symptoms will be the number of items he has tick-marked out of 75, multiplied by the corresponding score assigned to the stress control category. The overall numerical value so arrived at in respect of each subject is called Stress Control Index (SCI).
The bi-polar adjectives as adopted by Latha (1984), describing the nature and reaction to each of the 75 stress items including pleasure – displeasure, excited – dejected, relaxed – agitated, calm – frenzied, happy – sad, optimistic–pessimistic were also administered for the subjects of this study.

3.6 Coping Behaviour Pattern Tests

The selection of 40 items included in studying the coping behaviour pattern of the subjects is based on literature review including mostly the work done by Latha (1984) coupled with the discussion held with the subject–matter specialists. As per the procedure adopted in the study, the subjects were required to rate each coping behaviour item according to the degree in which they were able to cope with each of the 40 identified distress situations which are in the form of five point Likert Scale items. A total score was computed based on the responses given by a subject on all the 40 items. As the maximum score for each item being '5' and minimum '1', the total maximum possible score for the subject is 200 while the minimum is 40.

A further classification was made of these 40 items into those which are problem oriented coping and affective oriented coping in nature. The number of items falling in the two categories are 13 and 27 respectively. A further sub-classification was made of these 27 items falling in the
latter category of affective oriented type into adaptive and mal-adaptive coping items. While eight items fall in the former category, the remaining 19 items constitute the latter. The basis for this classification was the judgement given by 15 subject matter specialists approached for this purpose.

The subjects were requested to indicate their behaviour pattern on a five-point scale consisting of the categories of 'never', 'very rarely', 'sometimes', 'very often' and 'always' in respect of each item. The data obtained on these lines both for pre-yoga and post-yoga periods were analysed using the scores of 1, 2, 3, 4 and 5 respectively for the categories referred to above. Total scores for each behaviour pattern (item) for the group of subjects as a whole was computed for both the time periods. Typical behaviour patterns identified based on the difference between the scores of post-yoga period and pre-yoga period, called the Yoga Effectiveness Score (YES) in respect of experimental group are the base for discussion that follows.

As regards the nature of the analysis carried out, both rank order correlations for examining the identical nature of the ranking order of the total scores for different CBP items for two points of time were computed besides assigning of ranks for the differences in the total scores in the case of experimental group. As for the control group,
only rank order correlations were computed as the latter kind of analysis is not appropriate as the differences in the scores do not mean anything in the absence of exposure to yoga.

3.7 **Statistical tools applied**

Paired t-tests were carried out for assessing the significance of the difference in the score from pre-yoga to post-yoga period with reference to the dimension under question*. Rank correlations were computed for examining the ranking pattern obtained for the coping behaviour pattern at two points of time.

*The paired t-test was carried out with the following statistical hypotheses.

**Null-Hypothesis:** \( H_0: \) There is no significant decline in the frequency of occurrence of distress symptoms.

**Alternative-hypothesis:** \( H_1: \) There is significant decline in the frequency of occurrence of distress symptoms.

The formula for paired 't' test is as follows:

\[
\frac{\text{Average score BETY} - \text{Average score BETY}}{\sqrt{\text{SD of difference in the average score}}} \sqrt{n-1}
\]

where 'n' is the number of subjects.
3.8 Procedure adopted for experimentation:

The 50 subjects who constituted the experimental group for the study were initially trained in preliminary yoga asanas to facilitate body flexibility. They were introduced to yoga package consisting of asana, pranayama and meditation and advised daily practice of these for one hour.

Training sessions lasted six months involving 25 sessions. Apart from this, fortnightly sessions were conducted to explain the concepts of yoga philosophy and yoga principles, their utility and impact on the individual in day-to-day life. The subjects in the experimental group were given exposure to yoga daily for one hour for six months. After six months the subjects were asked to practise yoga daily for an hour and they were suggested to follow the yoga principles in their day to day life and yoga philosophy in the social situations (which are necessary and sufficient conditions for deriving fuller benefit of yoga).

3.9 Yoga package:

3.9.1 Yoga practices:

Discussed below is the yoga package developed by the investigator for this study which is based on extensive review of literature on yoga subject (Hatayoga, Pradeeptika, Garanda Samhita and Patanjali's Yoga Sutras), other scientific works on yoga (Barote 1973, Date et al., 1969 and Udupa
K.N. 1989) and also in consultation with Director of Vemana Yoga Research Institute, Government of Andhra Pradesh, at Secunderabad, who is known as an authority in yoga.

The Investigator initially introduced selected yoga asanas, pranayama and meditation to the distress symptoms subjects in general. This was followed by individual coaching in regard to the aspects mentioned above. This is done with a view to paying special attention to each subject and also attend to the individual needs. Do’s and dont’s to be followed while practising yoga were explained to the subjects in detail.

(a) Pre-conditions to practice:

1. The ideal time to practise yoga is 4.00 am to 6.00 am. (i.e., from Brahma Muhurtha (4.00 am.) till the sunrise (6.00 am.).

2. Yoga practice should be performed with empty stomach.

3. Practice should be done with calm and quiet mood and it should be on a thin carpet or a soft mat in a separate place where there is no disturbance.

4. It is advisable to complete bath before starting practice.

5. Possible minimum dress while practice.

6. Daily practice for one hour is essential.

7. Indoor practice and provision for cross ventilation.

Note: The Appendix-11 spells out the yoga package containing the rationale, advantages etc., that was given to the distress symptom patients.
(b) \textit{Asana}

Asana is acquired first voluntarily and then it may be controlled below the level of consciousness.

Not to start with the idea of learning some complex asanas but to discover one's own body, understanding and guiding it to reduce any tension.

Thought process is not allowed in asana.

Awareness of breath is advocated.

Slow and smooth movement while assuming or to release of any asana.

Practice should not cause any exhaustion at any level rather it should lead to sense of wellbeing.

Breathing is not controlled voluntarily in asanas. Generally it is allowed to be adjusted by the body itself during the movements.

 Pleasant pain sensation should be the upper limit in the final posture at maintenance time.

Whenever necessary, certain asanas were simplified or modified to suit the individual's needs.

(c) \textit{Pranayama}

One has to remain in convenient meditative asana.

Eyes to be closed moderately.

Inhalation in \textit{puraka} and exhalation in \textit{rachaka} is slow, smooth and without any haste, flow and force of air is kept uniform.

Every \textit{puraka} and \textit{rachaka} must end quitely, pleasantly and without any strain.

Try to give always longer time to \textit{rachaka} than \textit{puraka}.

\textit{Jalandhara Bhandha} is applied during Kumbhaka.

Abdomen should be kept little contracted inwardly and should be maintained throughout the practice.
Meditation:

One has to remain in convenient meditative asana.
Two minutes watch the breath.
Five minutes recite 'Omkaras' loudly.
Fifteen minutes recite 'Omkaras' mentally.
Relax few minutes before going back to normal routine.

After each session, the subjects gave a feedback of their practice. If they had any problems in terms of pains etc., when they were practising yoga, they were asked to abandon the practice for that day.

As mentioned earlier, initially 62 subjects attended the training sessions and 12 subjects dropped by the 3rd, 4th and 6th sessions. The remaining 50 subjects underwent all 25 sessions. The training classes were held at N.I.R.D., in Hyderabad.

3.10 Time schedule of the research work done at different phases of investigation

<table>
<thead>
<tr>
<th>Nature of work done</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline distress assessment with the help of distress symptom test to each individual by the Investigator.</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Diagnosis of each subject by a physician to avoid chronic disease patients.</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Nature of work done</td>
<td>Duration</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Pre-test I</strong></td>
<td></td>
</tr>
<tr>
<td>Phase III Administration of schedule to each individual by the Investigator.</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Phase IV Yoga package for experimental group</td>
<td></td>
</tr>
<tr>
<td>i) Yoga principles and basic skills together for four sessions.</td>
<td></td>
</tr>
<tr>
<td>ii) Yoga practices</td>
<td>25 weeks</td>
</tr>
<tr>
<td>Each individual was trained separately for 10 weekly sessions</td>
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</tr>
<tr>
<td>iii) Yoga philosophy</td>
<td></td>
</tr>
<tr>
<td>Important concepts in yoga philosophy were explained to the subjects after one month in eight fortnightly sessions.</td>
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<tr>
<td><strong>Training withdrawn</strong></td>
<td></td>
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<tr>
<td>Practice of the yoga techniques and discussion of the principle and philosophy of yoga concepts for twelve fortnightly sessions. (2 hours each session)</td>
<td>25 weeks</td>
</tr>
<tr>
<td><strong>Post-test I</strong></td>
<td></td>
</tr>
<tr>
<td>Phase V Administration of schedule individually by the Investigator</td>
<td>3 weeks</td>
</tr>
</tbody>
</table>

Total duration approximately 17 months.

(Audio cassettes were specially prepared by the Investigator to facilitate the ideal home practice of subjects. This cassette was given to every subject on completion of 25 weeks with an intention that the subjects would adhere to the same rhythm, respiratory pattern and sequence.
of practice in the absence of Investigator during home practice). After the stipulated practice sessions, similar schedule (as canvassed at the pre-test time) was administered to both the control and experimental group subjects. The Investigator got a feed back also from the subjects about the advantage they obtained in health and life styles as a consequence of exposure to yoga system.