

**Full Length Research Paper****Rehabilitation of Socially Disadvantaged and Deaf Mute Subject by Yoga****Arvind V Patil***Department of Physical Education, Gulbarga University, Gulbarga- 585 106 (Karnataka)***Abstract**

*This study was designed (a) To evaluate autonomic parameters in two categories of subjects (age range 12 to 17 years), viz. community home girls (HG, n=20) who were admitted due to problems in adjusting in society, and deaf and mute subjects (Dm, n=28) with appropriate age-matched, control groups i.e. children staying at home and those normal subjects. (b) To compare the effect of yoga with games (n= 14 each) in the HG group and the effects of yoga with gardening (n=12 each) in the Dm group. Polygraphic recordings were made of respiration, ECG, and skin resistance. The community home group were randomly assigned to yoga and games groups and followed up after six months, while for the deaf and mute group subjects were randomly assigned to yoga and physical activity group with a follow up after three weeks. In the first comparison community home girls had significantly faster, irregular breathing (indicative of anxiety) and lower skin resistance, while deaf and mute children had faster, irregular breathing and higher heart rates and diastolic blood pressure values. In the second comparison the yoga groups of both categories of subjects showed a decrease in breath rate, which became more rhythmic. Hence a yoga program including relaxation and awareness is useful in the rehabilitation of these subjects.*

**Key words:** *Community home, deaf and mute, autonomic measures, Yoga.*

**Introduction**

Mental arousal may be correlated with diverse factors related to family or environment, as well as the status of one's physical and mental health. For example children in a community home in Finland were described as physically normally developed but were socially and emotionally disturbed (Ahvenainen, Lindholm, & Nikkanen, 1984). A report on physiological measures showed that the resting electrical activity of selected facial and back muscles was significantly higher in community home boys than in a control group of the same age in an ordinary school (Rauhala, Alho, Hanninen, & Helin, 1990). Another group of subjects who were reported to have significantly greater levels of anxiety than usual is subjects with impaired vision. This greater anxiety was specially related to physical threat (Ollendick et al., 1985). The practice of yoga is known to reduce autonomic arousal (Wallace et al., 1971; Joseph et al., 1981). Increased physical activity has been shown to reduce autonomic reactivity to mental stressors.

The present report compares the autonomic arousal of two groups of subjects, i.e. socially disadvantaged community home girls (Telles et al., 1997) and physically disadvantaged deaf and mute subject. Both groups were compared to their respective control groups. The second part of the report describes and compares the use of yoga with games or physical activity such as gardening.

**Method****Subjects and design of the study**

In part 1 there were 20 community home girls with ages ranging from 12 to 17 years. They all had a history of difficulty in adjusting at home or in society. A comparison was made with 20 age-matched girls ( $\pm$  6.0 months) who were attending a regular school and staying at home. Also twenty eight deaf and mute children of the same age-range were compared with all equal number of age and sex matched subjects could hear and speak normally. In part 2 community home girls were divided into pairs matched for age and period of stay in the community home. Subjects of a pair were randomly assigned to yoga and games. The follow up was carried out after 6 months. Also, 24 deaf and mute children were divided into pairs matched for age, sex. Subjects of a pair were randomly assigned to yoga and games groups. The record was carried out after 21 days.

**Measurements**

Measurements for part 1 were made under identical conditions. A moderately lit, sound attenuated small house was used for recording. After 15 minutes of rest assessments were made for 10 minutes while subjects were seated at no difficulty. A 10-channel polygraph (Polyrite Recorders and Medicare, Chandigarh, India) was used to record the Electrocardiogram (ECG), respiration, and the skin resistance. The ECG was recorded using standard limb lead 1 configuration. Skin resistance was recorded using silver chloride disc electrodes filled with electrode paste, and placed in contact with the volar surfaces of the distal phalanges of the index and middle fingers of the left hand. A constant current of 10 microamperes was passed between the electrodes. Respiration was recorded using a volumetric pressure transducer. Subjects were asked to stand erect and transducer was fixed around the trunk, approximately 5 cm below the lower costal margin. The blood pressure was recorded with a sphygmomanometer.

Yoga techniques included Simple *yogasanas*, postures which are maintained for as long as possible (50 minutes) and guided relaxation in *shavasana* (10 minutes). The games session included jogging in place. Rapid bending forward and backwards, twisting, and bending sideways (40 minutes) as well as games such as relay races in which all the girls had to take an active part for 20 minutes. The physical activity program consisted of working in the garden, with comparable physical exercise as that of the yoga program, involving a similar amount of bending or stretching.

### Data Analysis:

Polygraphic data were scored blind as follows. The heart rate in beats per minute was obtained by counting the number of QRS complexes in successive 60-sec epochs continuously. The skin resistance (in kilo ohms) was sampled at 20-sec intervals continuously. The breath rate in breath cycles per minute was obtained by counting the breath cycles in 60-sec epochs continuously. For each subject the average of values obtained during the 10-min recording session were analyzed. In Part I of the study comparisons were made using the Mann Whitney U test. In part II comparisons between yoga and the corresponding group were made using the Wilcoxon signed ranks test.

### Results

Part I (see Table 1): The community home group had significantly faster breath rates and lower skin resistance values than the regular school group. The group with deaf and mute subjects had significantly higher heart rates, breath rates and higher diastolic blood pressure values than the group with normal vision.

**Table 1.** Percentage change in autonomic parameters in community home and deaf and mute subjects with reference to their respective control groups

Groups	Heart rate	Breath rate	Skin resistance	Systolic BP	Diastolic BP
Community Home (n=20)	+2.4	+22.9*	-40.6*	--	--
deaf and mute (n=28)	+8.8	+18.8*	+29.0	+2.0	+14.4

+, - indicates increase, decrease respectively \* indicates significant difference compared to the control

Part II (see Table 2 below): Both the community home groups (yoga, games) showed significant reductions in heart rate through the magnitude of change was similar to non significant decrease in breath rate following 6 months of the programs. The yoga group alone showed a decrease in breath rate though the magnitude of change was similar to the non- significant decrease in breath rate seen in the games group. In the deaf and mute subjects the yoga group showed a significant decrease in breath rate.

**Table 2.** Percentage changes in autonomic parameter in both groups of community home and deaf and mute subjects.

Groups	Heart rate	Breath rate	Skin resistance
Community Home			
Yoga (n=14)	-17.3*	-5.3*	-15.7*
Games(n=14)	-13.8*	-5.8*	-20.0
Deaf and mute (n=28)			
Yoga (n=12)	-7.0	18.2*	-48.3
Activity (n=12)	-0.2	-6.1	+5.9

+, - indicates increase, decrease respectively \* indicates significant difference when data from at the start and end of the programs compared

### Discussion

Part 1 of the study showed that community home girls had significantly higher heart rates and lower skin resistance values than girls of the same age who were living at home. Also the deaf and mute subjects had significantly higher heart rates, breath rates and diastolic blood pressure values compared to children with normal subjects. Part 2 of the study showed that within both categories of subjects (community home, deaf and mute) the yoga groups showed significant reductions in breathe rates. In the community home group both yoga and games group showed decreases in heart rates. It was interesting to note that the changes in skin resistance occurred in opposite directions for the yoga and non-yoga groups of both categories of subjects. The community home girl's yoga group showed an increase in skin resistance, while the games group showed a decrease in skin resistance. The reverse was true for the deaf and mute subjects.

Both the community home and deaf and mute subjects showed signs of physiological arousal. These results were similar to previous reports on community home boys (Rauhala et al., 1990) and the visually impaired (Wycherley & Nicklin, 1970). The most obvious difference between the groups was that the community home group had a lower skin resistance than normal and the deaf and mute had a higher skin resistance than normal. Both categories of subjects reduced their breath rates following yoga. Visual inspection of the records of both categories of subjects showed that both the Community Home and deaf and mute subjects showed more irregular

breath patterns than the corresponding control subjects. Fear and anxiety were likely bases for irregular breathing i.e., very rapid and jerky (Ax, 1953; Bloch et al., 1991). The fear and anxiety of the community home group were believed to be related to social insecurity, whereas that of the deaf and mute subjects was attributed to fear of physical injury in the unfamiliar laboratory setting (Ollendick et al., 1985). Also there was a difference in skin resistance values the community home yoga group showed an increase, whereas the deaf and mute yoga group showed a decrease in skin resistance values. This was especially interesting as the community home group had a lower skin resistance to begin with, while that of the deaf and mute was higher than the control initially. Hence it appeared that the practice of yoga not only reduced arousal but also served to normalize other functions in both categories of subjects

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