

ABSTRACT

INTRODUCTION

The current education system's focus has been on logical and scientific thinking right from the primary level. During this process, the vital part of education: detachment has been ignored. Concentration and detachment are the key processes of education for the comprehensive development of personality in the teenagers as per Swami Vivekananda. Yoga, an ancient science, in its original form consists of diverse practices, such as physical postures (*āsanas*), regulated breathing (*prāṇāyāma*), meditation, understanding the spiritual basis of life and ethical practices. Recent studies have shown Yoga based add-on programs in Modern education, enhance psychological well-being.

LITERARY RESEARCH

In this chapter of literary research, attempts were made to understand *prajñā* (awareness), from ancient Indian scriptures. This chapter elucidates the role of *prajñā* in development of mind and its different aspects (*antaḥkaraṇa*), and removal of impurities (*smṛtimāla*) leading to a state of mastery over the mind (*sthithaprajñā sthithi*). Relevant *slokas* are presented text-wise, and a coherent discussion has provided for the same. Finally, with the theoretical model which depicts the whole concept to understand the process of the cognitive refinement was summarized.

REVIEW OF SCIENTIFIC LITERATURE

Review of scientific literature enumerates working memory, yoga, mindfulness and its relevance to adolescents. Evidence shows that working memory skills are closely

linked to performance on scholastic tests. Further working memory is highly predictive measures of literacy, mathematics, and language comprehension. Yoga has been found to be beneficial for even mentally challenged and healthy adolescents on cognitive function. Cyclic Meditation (CM) is a unique practice which incorporates mind and body movements, along with awareness is a potential for prevention of clinical levels of psychopathology and improving overall psychological well-being in healthy individuals. Further mindfulness-based intervention has shown significant enhancement of mental health and well-being. More research is needed to understand the influence of yoga practices on the working memory in adolescents. Further to our knowledge outshoot of a yoga-based intervention, the mindfulness has not explored over working memory.

AIM

The primary aim was to explore the efficacy of yoga on working memory among adolescents.

OBJECTIVES

1. To establish normative data for working memory task in Indian adolescents.
2. To explore the relationship between yoga related psychological states and working memory in healthy adolescents.
3. To evaluate the effect of intense yoga based personality development program on psychological domains and working memory in healthy adolescents.
4. To examine the immediate outcome of cyclic meditation on working memory and state anxiety in healthy adolescents.

METHODS

SUBJECTS

The source of subjects was from Yoga based Personality Development Camps (YPDC) held at S-VYASA Yoga University and age range from 12 to 16.

DESIGNS

The research designs consisted of incorporating different research designs. To establish the normative data for working memory test and understand relationship between working memory, a cross-section design has been testified. A pre-post design used to evaluate the effect of yoga on the first and tenth day of the YPDC on working memory. Self as control design was executed to understand the immediate effect of CM on working memory and state anxiety.

INTERVENTIONS

Yoga based Personality development camp (YPDC) consisted of training in different yoga-based techniques for approximately eight hours a day, for ten days. It included specialized yoga module for overall personality development such as *Yogāsanas*, breathing practices, eye-cleansing techniques, meditation, emotional culturing sessions, Vedic chanting, and yogic games. Further, the training also included guided relaxation and Cyclic Meditation (CM).

CM is a unique practice which incorporates mind and body movements, along with awareness. CM is an effective training especially for novices has been scientifically evaluated to a greater extent. Cyclic meditation is a technique which combines "stimulating" and "calming" practices, based on a statement in ancient yoga texts

suggesting that such a combination may be especially helpful to reach a state of mental equilibrium.

ASSESSMENT TOOLS

Working memory consists of different domains such as Verbal, Non-Verbal and Spatial. Hence, multidimensional assessments of working memory were administered to understand all areas of working memory. Mindfulness has described as a state or trait in which an individual becomes increasingly aware and attentive at the moment, which can be enhanced through yoga practices. Further majority of cognitive functions were influenced due to anxiety level. Hence, State Anxiety Inventory, State Anxiety Inventory-Short Form, Child and Adolescent Mindfulness Measure, and State Mindful Attention Awareness Scale were used to understand the underlying process of effect of yoga practices on working memory.

DATA EXTRACTION AND ANALYSIS

The data were collected using self-reported questionnaire and computers based assessment. All statistical analyses were performed using Statistical Package for Social Sciences, SPSS (version 16.0). Correlation, Independent sample *t*-tests and Paired sample *t*-tests procedure, were used for statistical analyses.

RESULTS

- 1) The correlation between mindfulness and spatial memory was positive and significant. Further state anxiety has shown a significant negative relationship between spatial memory. State mindfulness had a positive and significant correlation with the Corsi forward (Forward Corrected $r=.35$, $p<0.01$ and forward block span $r=.31$, $p<0.01$).and Corsi backward (backward corrected $r=0.26$, $p<0.01$ and backward block span $r=0.26$, $p<0.01$). Further state mindfulness has

an inverse and significant correlation with the State anxiety ($r=-.49$, $p<0.01$). Furthermore, state anxiety scores were inverse and significant relationship with the Corsi forward (forward corrected $r=0.20$, $p<0.01$ and forward block span $r=0.20$, $p<0.01$) and Corsi backward (Backward Corrected $r=0.21$, $p<0.01$ and Backward Block Span $r=0.19$, $p<0.05$).

- 2) CM session showed a significant increase in non-verbal memory score by 20.06% whereas the Supine Rest (SR) session showed a significant change in non-verbal memory scores by 17.77%. Further subgroup analysis showed a significant increase in the non-verbal memory score by 25.65% following CM session and 17.84% in SR session in boys. Furthermore, result had shown a significant increase in the non-verbal memory score by 11.21% following CM session and 17.85% in SR session in girls. Verbal memory has shown non-significant change following both sessions and in the subgroup analysis.
- 3) CM session showed a significant reduction in the state anxiety score by 4.27% in the total group, whereas in girls sub-group 7.85%. SR session showed decrease in the State anxiety score by 3.24% in the total group, whereas in girls sub-group 7.54%. State anxiety has shown non-significant change following both sessions in boys.
- 4) A significant enhancement of spatial memory and mindfulness after intense ten days yoga program. Further state anxiety has reduced significantly following yoga-based intervention. There is a significant improvement in the scores of Corsi Forward Correct 8.67%, Corsi Forward Block Span 8.33%, Corsi Forward Total Score 18.54%, Corsi Backward Correct 6.33%, Corsi Backward Block Span 6.36%, Corsi Backward Total Score 9.82%. Further result has shown significant

enhancement of State Mindfulness 6.96%, and dispositional mindfulness 3.98%.

Furthermore, there was a significant reduction in State Anxiety 11.46% following 10 days of yoga based personality development camp.

CONCLUSIONS

This study offered initial information on the possible interaction between mindfulness and state anxiety in working memory. Further, results confirmed the effect of yoga on enhancing working memory and mindfulness. Furthermore, results have shown promising immediate effects of yoga based relaxation technique on state anxiety and non-verbal memory. Although the current study provides initial insight into the role of yoga in working memory, further research is necessary to explore the applications.