Discussion and Interpretation

Chapter V

Effect on Alpha EEG

Results of the present study lead to the acceptance of the hypothesis that there is a significant effect of prayer along with meditation on Alpha EEG. It was found in the present research that the mean value of post measure (M=11.43) is higher than the mean value of pre measure (M= 10.92). The difference in mean values is statistically significant (Z = 2.67, p<.01) in Group I. Thus, a clear basis is obtained to state that there is a significant positive effect of prayer along with meditation on Alpha EEG.

Similarly, in Group II results confirm the hypothesis that there is a significant effect of meditation on Alpha EEG. The mean value of post measure (M=11.56) is higher than the mean value of pre measure (M= 10.54). This difference in mean values is statistically significant (Z = 3.23, p<.01). Thus, there is a clear basis to state that there is a significant positive effect of meditation on Alpha EEG.

The present study revealed a significant increase in Alpha waves as an effect of interventions in both groups. Increase in Alpha waves show the relaxation and decrease in stress level. This suggests an improvement in psychophysiological relaxation. Statistical analysis shows that the intervention significantly affects the Alpha waves. Similar results were also reported by Shashi (2011), who found that the electroencephalogram (EEG) increases during the practice of ‘OM’ Chanting meditation. Researches have shown that meditation positively affects alpha frequencies. Khare and Nigam (2000) found that Alpha frequencies were significantly higher in meditators.
High coherence has been observed in left frontal lobe among long term meditators. Further, a positive correlation has also been noticed between feeling of bliss and frontal theta power (Aftanas & Golocheikine, 2001).

Lutz, Greischar, Rawlings, Ricard and Davidson (2004) found in their research that mental training can produces the short –term and long- term neural changes. Generally alpha waves are an indicator of relaxed state of mind. Meditation is a mental exercise in which alpha waves are increase. Alpha state makes an individual aware of his environment, which also creates a relaxed alertness. In a study Nautiyal (2012) reported that practice of Osho Nadabrahma Meditation for 45 days showed a significant change in Alpha waves among students. Thus, researches have revealed that the ‘OM’ Meditation affects the Physiological as well as Psychological state of an individual.

**Effect on Galvanic Skin Response (GSR)**

Another finding of the present research is that there is a significant effect of prayer along with meditation on galvanic skin response ($Z = 4.10$, $p<.01$) in Group I. Therefore, the hypothesis that there is a significant effect of prayer along with meditation on galvanic skin response was accepted. In Group II results lead to the acceptance of another hypothesis that there is a significant effect of meditation on galvanic skin response. Thus, a clear basis is obtained to state that there is a significant positive effect of meditation on galvanic skin response ($Z = 2.68$, $p<.01$).

Results of the present study revealed a significant increase in galvanic skin response values as an effect of interventions which suggested the relaxation. Statistical analysis shows that the interventions significantly affect the galvanic skin response. Increased galvanic skin response value shows the relaxation and decrease in stress level.
Meditation is associated with relaxation. Low skin resistance shows stress. Prior researches showed high skin resistance among Transcendental Meditation practitioners (Bagga & Gandhi, 1983; Bono, 1984). Lubin and Johnson (1966) found in this study that states of relaxation reaches maximum during sleep, accompanied by high skin resistance. Meditation practice produces a relaxation response even in the adolescents. Researches show that adolescent students who participated in mindful awareness practices had decreased the level of stress and anxiety (Schonert-Reichl & Lawlor, 2010), decreased aggressive behavior (Birnbaum, 2005; Napoli, 2001), and decreased bullying (Napoli, 2001).

Shashi (2011) found increment in GSR after practice of OM chanting meditation. Thus, OM meditation also affects sensitivity and skin resistance. OM gives peace and calmness in human mind.

Meditation decreases stress and anxiety. College students who are trained in Transcendental Meditation showed a significant reduction in stress, depression, anxiety and perfectionist thoughts. (Burns, Lee & Brown, 2011)

In meditation, the brain waves slow down, the body relaxes, the mind becomes calm and the stress of daily life gets reduced. To explore the effect of meditation (Nad-Yoga) on stress and anxiety level of college going students. Sao and Kumar (2011) conducted a study and in results a significant reduction for stress and anxiety (p<0.01) was observed. Overall meditation (Nad-Yoga) reduces the level of anxiety and stress.

**Effect on Attention Regulation**

Another important finding of the present research is that prayer along with meditation significantly affects the attention regulation of an individual. The mean value of post measure (M= 48.23) is higher than the mean value of pre measure (M= 40.72) in Group I. This difference
in mean values is statistically significant (Z= 6.36, p<.01). Therefore, the hypothesis that there is a significant effect of prayer along with meditation on attention regulation was also accepted.

In Group II result indicates the significant effect of meditation on attention regulation (Z= 4.74, p<.01). So, the hypothesis states that there is a significant effect of meditation on attention regulation is accepted. The mean value of post measure (M=40.21) is higher than the mean value of pre measure (M= 35.10) in Group II. Thus, a clear basis is obtained to state that there is a significant positive effect of meditation on attention regulation.

So far as previous literature is concerned, these findings are in agreement with those of the previous researches. After the prayer and meditation session subjects are more relaxed and they felt alertness. Chanting ‘OM’ mentally causes increased alertness (Delius & Kellerová, 1971). There is already widespread acceptance that attention is a core process in concentrative meditational practices (Carter et al. 2005). In meditators some brain regions like cortical regions and superior frontal sulci were found thicker. These brain regions are related to attention, sensory processing and introspection (Lazar et al, 2005). Most of these regions identified were in the right hemisphere. Meditation requires focused attention which is associated with changes in attentional processing and brain structures. Additionally, it has been observed that focused attention meditation increases activation in the brain regions which are related to attention. These brain regions are superior frontal sulcus, dorsolateral prefrontal cortex and intraparietal sulcus (Brefczynski-Lewis, Lutz, Schaefer, Levinson & Davidson, 2007).

Vedic chanting affects the cognitive abilities which are related to memory and sustained attention. In a research Sripad, Nagendra and Bhat (2006) found a significant increment in scores of memory test. Further, they observed a significant reduction in total error and total time taken for the cancellation test. Rosaen and Benn (2006) found that students who interviewed about
their experiences with Transcendental Meditation reported increased states of restful awareness, energy and concentration, metacognition/ self-awareness, flexibility of response, and academic achievement.

Beauchemin, Hutchins and Patterson (2008) suggested that mindfulness meditation increased students' attention for social and academic activities by modulating anxiety responses and decreasing dysfunctional self-focus characterized by criticism and negative self-talk. Students' gains in self-awareness and emotional self-regulation have an impact on academic achievement as well as classroom conduct. Adopting yoga way of life (asanas, chanting of mantra, meditation and puja) is more beneficial for visual and verbal memory (Rangan, Nagendra & Bhat, 2009).

In a study conducted by Kumar and Telles (2009), it was found that Dharana (focusing on the symbol OM) influences selective attention and concentration. Mindfulness-Based Cognitive Therapy improves attention and behavior among adolescents with reading disorders, by reducing these adolescents’ level of state and trait anxiety (Semple, Lee, Rosa & Miller, 2010). Further, it has been found that concentrative meditation improves attentional alerting and conflict monitoring. Results revealed that adolescents who meditated regularly developed stronger attention and improved executive functioning compared to either non-meditators or their own scores at pretests (Baijal, Jha, Kiyonaga, Singh & Srinivasan, 2011).

In another research Sandhu and Kaur (2012) analyzed the impact of verbal and non-verbal meditative stimulus in the vigilance of female college students. Results indicated a significant difference between pre and post measure of vigilance (Total Cancellation, Correct Responses and Errors) of the subject with Verbal and Non-Verbal meditative stimulus (p<0.01).
Thus, the impact of meditative stimulus on vigilance is reflected in significant difference between pre and post measure.

Repetition of ‘OM’ increases alertness, concentration and memory, as it increases peace and calmness in human mind. Joshi (2012) found that Nadishodhana Pranayama and ‘OM’ chanting causes a significant positive effect on memory of the students. Among undergraduates focused meditation training is an effective way to manage emotions and to regulate attention (Menezes et al, 2013).

Previous researches showed tremendous benefits of meditational practices on human functioning. Few researches showed beneficial effects on attention. In a research Prakash et al. (2010) found that Vihangam yoga practitioners have better performance in different parameters of attention when measured by Digit Forward-Backward tests, Digit Symbol Substitution tests. They also found that long-term practitioners have better span of attention and better alteration ability in attention. Another study confirm the findings of the present research that attention regulation and academic performance can be improved through regular practice of meditation (Kanakadurga & Vasanta, 2013).

**Effect on Emotional Intelligence**

Another finding of the present research is that after intervention, mean scores of emotional intelligence increased in both groups. Results of the present study lead to the acceptance of the hypothesis that there would be a significant effect of prayer along with meditation on emotional intelligence (Z= 6.34, p<.01) and also leads to the acceptance of the hypothesis that there would be a significant effect of meditation on emotional intelligence (Z= 4.50, p<.01). Result shows the significant improvement in emotional intelligence scores in both groups.
Results show that in Group I, prayer along with meditation have affected the different parameters of emotional intelligence like self-awareness, empathy, self-motivation, emotional stability, managing relation, integrity, self-development, value orientation, commitment and altruistic behavior. Introspection report and feedback given by participants after intervention, reflects changes or improvement in above mentioned parameters of emotional intelligence. This validates the present results.

In Group II, meditation affects only self-awareness, empathy self-motivation, emotional stability and commitment. More improvement is seen in some parameters of emotional intelligence in Group I in comparison to Group II. This may be because in Group I meditation is given along with prayer. Through regular practice of prayer and meditation tension and negative emotions like egotism etc. are removed and mind feels calm and relaxed. These changes affect the thinking and behavior of an individual. Prayer is a type of confession. It is a very effective mean of washing out all the impurities, strains and stress.

Previous research findings supported the results of present research. Practice of mindfulness meditation develops the parts of the prefrontal cortex responsible for emotional balance, fear modulation, insight, sensory awareness, intuition, response flexibility, interpersonal attunement, empathy, and morality (Siegel, 2009).

Researches showed that meditation practice increases emotional intelligence (Chu, 2009; Smith, Baer, Krietemeyer, Hopkins & Toney, 2006), empathy (Murphy & Beddoe, 2004; Slagter, Dunne, Lutz & Davidson, 2008), sociability (Spates & Hanley, 1978), joy, happiness, positive thinking (Chang et al, 2004) and moral development. These practices also helps in management of negative emotions (Schwartz, Shapiro & Bonner, 1998) and improves social relationships (Spates & Hanley, 1978).
Meditation increases positive affect and decreases negative affect. Mindfulness meditation shifts people's ability to use emotion regulation strategies in a way that enables them to experience emotion selectively (Farb et al., 2010). Similarly, Holzel et al. (2011) found that meditation and mindfulness practices were strongly correlated with gains in attention, body awareness, emotional regulation, and changes to perceptions of the self. Feelings, emotions and values plays an important role in an individual’s well-being and achievement in the whole life (Ediger, 1997).

The sound ‘OM’ brings mental peace and calm. Kumar, Guleria and Khetrapal (2014) concluded in their research that listening to ‘OM’ sound recruits neural systems implicated in emotional empathy.

Prayer and meditation enhances emotional intelligence and with emotional intelligence individual learns how to recognize and manage emotions. Children with aversive and negative thinking can learned how to control and understand emotions. These practices helps them in forming and maintaining a healthy relationship in society and also enables them to live a happy life (Werner & Smith, 1982).

Another research by Sharp (2010), has been concerned with how prayer can help one to manage one’s emotions. Sharp views prayer as an imaginary social support interaction that facilitates the expression of individual emotion management strategies. One is thus able to vent negative emotions by obtaining positive assessments of such actions, and thereby reduce situational threats. Bremner, Koole and Bushman (2011) recently confirmed Sharp’s hypotheses. They were able to show that prayer helped people cope with anger that was aroused due to frustrations and incitements that were independent of what was prayed for. These findings are supported by the present research findings that prayer along with meditation is more effective in
increasing emotional intelligence and positive emotions than meditation alone. Prayer relieves a person from his/her negative emotions, facilitating his/her meditational state. Therefore, in the present study a significant effect of prayer along with meditation was found on different parameters of emotional intelligence in comparison to the effect of meditation only.

Prayer along with meditation makes one look at one’s emotions more clearly and objectively. It also teaches one to explore each aspect of one’s emotions, and not run away from them. Recent research by Sao, Biharia and Sao (2011) explored the effect of ‘OM’ chanting and Pranakarshan Pranayama on emotional maturity. Result shows the significant effect of practicing ‘OM’ chanting and Pranakarshan Pranayama on emotional maturity.

Generally, there is accumulating evidence that experiences which are related to positive emotions like hope, joy and happiness have a positive effect in comparison to the experiences which are related to negative emotions like anger and anxiety on academic achievement and learning of students (Burić & Sorić, 2012; Burić, Sorić & Penezić, 2011; Pekrun, Goetz, Frenzel, Barchfeld & Perry 2011; Petrešević & Sorić, 2011; Goetz, Preckel, Pekrun & Hall, 2007; Pekrun, Elliot & Maier, 2006; Schutz & Davis, 2000).

In another study Deb (2014) found that low emotional intelligence, negative emotional states, interpersonal relationship problems are the main factors for poor psychological well-being.

During prayer and meditational practices, mind makes one see the extent to which one is responsible for one’s own mental suffering. One’s miseries, fears and tensions are all self-generated. When one understands these mental processes, one loses one’s hold upon them. Prayer and meditation practices work as a coping strategies in daily life situations. These practices teach people to cooperate instead of competing with situations.
Effect on Psychological Well-being

The present study has highlighted that prayer along with meditation affects psychological well-being of students. The mean value of post measure is $M = 16.80$ that is higher than the mean value of pre measure ($M = 14.92$). This enhancement in psychological well-being scores is statistically significant ($Z = 4.43, p < .01$). Result confirms the acceptance of the hypothesis that there would be a significant effect of prayer along with meditation on psychological well-being. In Group II result indicates no significant effect of meditation on psychological well-being. Comparison of both intervention group i.e. prayer along with meditation group and only meditation group. Prayer along with meditation group showed significant enhancement in psychological well-being of students whereas only meditation intervention group showed no significant enhancement.

Prayer along with meditation has been found to affects the different parameters of emotional intelligence, which has been proved to plays an important role in well-being. Previous researches show that emotional intelligence is a significant predictor of psychological well-being. Hence it was hypothesized that prayer along with meditation would have significant effect on psychological well-being and the hypothesis was proved. Bar-On (2005), the fathers of emotional intelligence, implies that increase in emotional intelligence can lead to increase in aspects of human performance as well as overall satisfaction with oneself and with others as well.

Emotions have an important role in the determination of psychological well-being (Diener & Suh, 2001). It has been observed that people who experiences good (positive affect) mostly and unpleasant emotions (negative affect) only occasionally have satisfaction with life and their psychological well-being is also high (Fierro, 2006). People’s evaluation about
psychological well-being is a cognitive part of life satisfaction (Diener & Suh, 2001). Satisfaction with life and psychological well-being are the indicators of healthy mental functioning (Argyle, 1987).

Emotional capabilities are significant predictors of health and well-being (Hertel, Schutz, & Lammers, 2009; Khantzian, 2003). High self-acceptance, personal growth and life purpose have been observed in those people who have the ability to maintain positive emotions in daily life situations. These type of people also have the ability of eliminating negative emotions (Landa, Martos and Lopez-Zafra, 2010). Prayer and meditation practices enables an individual to cope with the negative life events. Prior researches also suggest that individuals with high emotional intelligence reported high psychological well-being in comparison to those who are low in emotional intelligence. A positive correlation has been found between psychological well-being components (life satisfaction, self-esteem and self-acceptance) and emotional intelligence (Carmeli, Yitzhak-Halevy & Weisberg, 2009).

Previous researches show that the greater use of meditation and worship source increases the relaxation which is directly associated with the well-being of one’s lives. People who participated regularly in religious settings like prayer, meditation etc. (Larson & Larson, 1991), spend more time on spiritual activities and activities which are related to religion (Hill & Pargament, 2003) are mentally healthy. Parsian and Dunning (2010) conducted a study on adults and found that spiritual practices enables them to cope with the negative life events.

Less smoking and alcohol consumption has been observed among those people who prayed for their health. These people also have better health related behavior (‘O’Connor, Pronk, Tan & Whitebird, 2005). Religious attendance may boost happiness by helping people in building social networks which provide social support and friendship (Lim & Putnam, 2010).
Moreover, religious attendance can promote healthy personal lifestyles that in turn are beneficial to mental health (Ellison & Jeffrey, 1998).

Ishwar and Nishad (2010) found that adolescent students who practiced yogic concentrative meditation experienced gains to both psychological well-being and leadership skills. Huppert and Johnson (2010) proved in their research that students who practice concentrative meditation regularly have stronger gains than those who are not regular in practice. Schoormans and Nyklicek (2011) concluded that time spent on meditation was the only multivariable predictor of both lower perceived stress and higher mindfulness.

Even though prayer and meditation is usually recognized as a spiritual practices, it has tremendous benefits. Garg and Chitransh (2011) conducted a study on housewives and showed that well-being was higher among the mantra chanting practitioner group than mantra chanting non-practitioner group. Meditation enhances not only well-being but other prosocial characteristics also.

Prayer and meditation improve one’s life by providing both psychological and emotional benefits that changes life in a positive manner. In a study Davidson and McEwen (2012) showed that emotional abilities are associated with stress management and self-awareness, which showed improvement in interpersonal functioning (Snyder, Shapiro & Treleaven, 2012).

Spiritual practices like prayer and meditation give a positive view towards the future life. People who daily participate in spiritual practices feels the presence of a supreme being or power. When people are in stressful situation or suffer ill health these spiritual practices help them and give the peace of mind. Spiritual practices change individual’s view towards life by making them optimistic. When they are not feeling well these practices helps them to believe that
they will get better very soon. Fraser (2013) said, meditation is real inner disarmament. With regular meditation practice one tends to enjoy greater physical well-being and better health.

Meditation creates changes not only in the physical and mental body but also creates changes in relationships with others by making one’s aware of every thought, emotion and action. Prayer and meditational practices makes one conscious of one’s thought patterns, emotional patterns and reaction patterns. This awareness creates understanding of self, when one understands the self, one starts understanding about others. This understanding helps solve many of life problems, especially the ones concerning with relationships with others.

Findings of the present research also confirm the conceptual framework which investigator has planned before the study. During Prayer and meditation alpha waves and galvanic skin response become high. High alpha waves show the relaxation and high galvanic skin response shows the decrease in stress level. Mind feels relaxed and calm. This enhances emotional stability, empathy, self-awareness, positive thinking, altruistic behavior and self-confidence. It also increases mental concentration, attention and cognitive functions; reduces susceptibility to stress. These physical and psychological changes lead to enhancement in positive emotions, happiness and satisfaction, which are the indicators of psychological well-being. Thus, prayer and meditation promote complete health and well-being in an individual.

Findings of the present study are also consistent with the bio-psychosocial model of health. This model shows the mind-body relationship. In the present study, result shows the changes in alpha waves and galvanic skin response as physical changes and shows the changes in attention regulation, emotional intelligence and psychological well-being as psychological changes.
Thus, the results from this study provide important contribution to research related to university students. Findings of present study suggest that students who regularly participate in prayer and meditation are more emotionally stable and have more satisfaction with life. They are mentally healthy.