Conceptual Framework of the study

Chapter - I

In the present scenario, everywhere we find suffering, pain, disharmony, frustrations, stress, conflict, feeling of insecurity and distrust. In the present society, all kind of ills and miseries are caused by the selfishness present in human beings. “Human being has become narrow minded and self-centered to the extent that he does not hesitate to torture others for the sake of his happiness (Sidhaye & Anaspure, 2010).”

In the words of famous Psychologist Goleman (1995) “a blend of spiritual awareness, mindfulness, and emotional intelligence is required because it enhances the quality of life not through trapping, but by adding spice to the small moments of every day.”

“Prayer and meditation have been referred to as two sides of the same coin: prayer can be taken as an active communication with the Supreme Power, and meditation is listening the Supreme Power. However, a great deal of overlap is found between these two terms. When the person, involved in prayer, calms the mind to receive inspiration, it is called Receptive Prayer and in practice it is very similar to meditation. In another type of meditation repetition of a mantra, or phrase is done to empty the mind. It is similar to the custom in some religions of the repetition of a certain prayer to achieve a state of calmness, as Catholics do when saying a rosary” (Stanley, Wainapel & Avital Fast, 2003).
The Concept of Prayer

*Prayer is asking God for something, Meditation is listening to God.*

Prayer helps an individual to find an inner sense of meaning. “Prayer is a form of religious practice in which through deliberate practices, individual seeks to activate a volitional rapport to God. Prayer may be either individual or communal and takes place in public or in private and may involve the use of words or songs. When language is used, prayer may take the form of a hymn, incantation, formal creedal statement or a spontaneous utterance in the praying person” (Michaelseblux, 2011). Coe (1916) said that it is very difficult to discriminate the history and psychology of religion and the history and psychology of prayer. Prayer is the centre (Hodge, 1931), soul and essence (James, 1902) of all religions.

Meaning of Prayer

Das and Anand (2012) quoted, “Spiritual Science Research Foundation (2012) explained that the word prayer or prarthana (in sanskrit) is the combination of two words pra and artha which means pleading fervently. In other words, when with intense yearning one asks God for something it is called prayer. Upasna is to sit near, have nearness or company. Through nearness or company of something or someone, natural qualities of the other, come to that person who is involved in upasna. Benor (2000) said that without utilizing known physical means of intervention if one or more persons influence another living system it is known as healing or prayer. Khoo (2008) said that when one raises one’s voice to God, it is called Chants. It is a vocal meditation in which one sings the prayer. Chant is the breath made available in tone. In Chanting, spirit is discovered in sound.”
Definitions of Prayer

“Prayer is a form of communication, a way of talking to God or to the saints.”
Richert (2011)

The root of prayer lies in interior silence. Prayer involves thoughts or feelings expressed in words. In one expressions, when one express one’s own thoughts or feelings in words it is called prayer, while in deep prayer there is no role of words, emotions and thoughts.

Types of Prayer

Richert (2012) described “five major types of prayer. These are:

1. Prayer of Petition:

Petition means asking for something. This type of prayers is very common. In this type of prayer, one asks God or Supreme Being for things he/she needs. It is one’s willingness to accept God’s will, whether He directly answers one’s prayer or not. The line ‘Thou will be done’ means that one accepts that God’s plan for one, is more important than what the desires of one.

2. Prayer of Praise and Adoration:

In this prayer one praises the greatness of God or Supreme Being, and one acknowledges one’s dependence on him in all things. This prayer focuses on God and His eternal characteristics like His glory, majesty and power; His mercy and grace; His beauty and love. Personal devotional prayer is an example of this type of prayer.
3. Prayer of Expiation and Penitence:

In a prayer of expiation and penitence, one acknowledges one’s sinfulness and asks God for His mercy and forgiveness. This type of prayer is also an example of personal prayer.

4. Prayer of Love:

This type of prayer expresses one’s love to God. Acts of trusts and charity are the best examples of this prayer.

5. Prayer of Thanksgiving:

This prayer includes saying ‘thanks to God’. One should be thankful to God throughout the day for the good things. Grace before Meals is a good example of this type of prayer. This prayer should be a part of every prayer. Learning to be thankful is one of the best ways to combat depression and self-pity.”

There are various types of prayer but in every type one connects oneself with the God, sometimes to ask for fulfilment of needs and sometimes to show obligation to fulfill those needs. Prayer shows the individual’s acceptance of God’s will.

“Prayer is an important tool towards the path of Devotion. The Rajo-Tama around the person is destroyed through prayer because prayer attracts the subtle divine frequencies towards the person. Thus, the whole environment around the person becomes more Sattvik. As the Sattva component in the environment increases, it reduces the negative thoughts of the person and that person becomes Sattvik. This is because the mind is influenced by the external environment. Prayer increases the particles of the Sattva component in the vital body sheath. The particles of the Sattva component in the mental body sheath also increases when one pays gratitude. Thus,
prayer complemented with gratitude, results in spiritual purification of the vital body and mental body sheaths (Spiritual Science Research Foundation, 2012).”

Science of Prayer

Prayer is most devoted and purest form of love to divine, to the Supreme Being God. God is the generator of this world, the organizer of life on this earth and the destroyer of unwanted as well. Human being believe in this strong power that surrounds him all the time, all the while and hence seek His blessing and guidance in the form of prayer.

Spiritual Science Research Foundation (2013), “One’s hands in prayer with the thumbs gently touching the mid-brow region or the Ādnyā-chakra (the spiritual energy centre at the mid-brow region). When one bows his head in this prayer position, it awakens the spiritual emotion. This, in turn, activates the appropriate subtle frequencies of deities from the Universe. These divine frequencies come in through one’s fingertips, which act as receptors. These divine frequencies are then channelized into one’s body through the thumb to the Ādnyā-chakra (the spiritual energy centre at the mid-brow region). The result is an increase in the positive spiritual energy, which makes one feel lighter or gives relief from symptoms of physical or mental distress.”

Source: Spiritual Science Research Foundation (2013)
**Benefits of Prayer**

Prayer is like a tool for purification. Prayer causes the direct effect on physical health (e.g., lower blood pressure) as well as on mental health. According to Pargament (1997), “prayer serves multiple functions, not only in coping with the sorrows and distresses of life but also in better dealing with all the good things that happen. For some, it provides a sense of secure closeness to God and related enriching experiences. In other words, prayer offers the individual a means of dealing with both negative and positive experiences in the present and the projected future.” Prayer not only brings psychological benefits but physiological changes also. Tartaro (2005) reported in his research that the effects of the frequent use of prayer can be seen on cortisol. A very frustrating computer task was given to subjects and it was found that those who were highly involved in prayer showed lower cortisol level than those who prayed little or not at all.

**The Concept of Meditation**

Concept of Meditation is very wide because it focuses on psychological, physiological and spiritual aspects of an individual. “Meditation is generally an internal, personal practice and done without any external involvement, though many practitioners of meditation may rely on external objects such as candle flames as point on which to focus their attention as an aid to the process. Meditation often involves invoking or cultivating a feeling or internal state, such as compassion, or attending to a specific focal point (Bedakelian, 2011; Ovcharov, 2011).”
Meaning of Meditation

“The English word meditation has originated from the Latin root word meditari, which means ‘to heal’. The practice of meditation is related to a person’s - physical, mental, and spiritual well-being. The English connotation of the word meditation is therefore more associated with healing and relaxation” (Adiswarananda, 2013).

Definitions of Meditation

“Meditation refers to a family of self-regulation practices that focus on training attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities such as calm, clarity, and concentration (Walsh and Shapiro, 2006).”

Kumari (2014) quoted “Dhyana is the generic Sanskrit term for meditation, which in the Yoga Sutras refers to both the act of inward contemplation in the broadest sense and more technically to the intermediate state between mere attention to an object (dharana) and complete absorption in it (samadhi).” Meditation is a state of mind where no thought is coming from the senses (Eliade, 1993).

Types of Meditation

Cahn and Polich (2006) quoted, “meditative styles can be usefully classified into two types-mindfulness and concentrative- depending on how the attentional processes are directed. Most meditative techniques lie somewhere on a continuum between the poles of two general methods (Andresen, 2000; Shapiro & Walsh, 1984; Wallace, 1999). Mindfulness practices involve allowing any thoughts, feelings, or sensations to arise while maintaining a specific attentional stance: awareness of the phenomenal field as an attentive and nonattached observer without judgment or analysis. Examples
include Zen, Vipassana, and the Western adaptation to mindfulness meditation (Kabat-Zinn, 2003). Concentrative meditational techniques involve focusing on specific mental or sensory activity: a repeated sound, an imagined image, or specific body sensations such as the breath. Examples include forms of yogic meditation and the Buddhist Samatha meditation focus on the sensation of breath.”

“Although these perspectives make it difficult to classify a given meditative practice as purely mindfulness or concentrative meditation, the two styles overlap in their approach toward similar goals. The former requires the maintenance of attention in a state of open perceptivity, and the latter requires narrowing of attentional focus. Mindfulness-based practices tend to encourage a continual return to an attentive set that is characterized by open, nonjudgmental awareness of the sensory and cognitive fields and include a meta-awareness or observation of the ongoing contents of thought. Concentrative techniques incorporate mindfulness by allowing other thoughts and sensations to arise and pass without clinging to them and bringing attention back to a specific object of concentrative awareness to develop an internal witnessing observer. Thus, the methods used to elicit specific states differ across practices, but the results similarly produce reported trait changes in self-experience: eliciting shift toward expanded experience of self not centered on the individual’s body schema and mental contents (Cahn & Polich, 2006).”

References to OM Mantra in the Scriptures

Pradipaka (2013) quoted Patanjali Yoga Sutras:

\[
\text{षुष्णम् सन् तिष्ठलं वासमध्यमं,}
\]

\[
\text{तस्यावाचः प्रणक्रं तंजापस्तदर्थभवनं।। योग सूत्र 1(२७-२८)
}\]
“The basic mantra is OM or AUM, which in Hinduism is known as the ‘Pranava mantra,’ the source of all mantras. If there is no religious preference then the sound vibration ‘OM’ is a universally recognized mantra. It is the representation of the Supreme Being. The sound of OM is also called Pranava, meaning that it sustains life and runs through Prana or breathes. The AUM is composed of three letters, A, U, and M. These symbolize the practitioner’s impure body, speech, and mind” (Gurjar & Ladhake, 2008). “Omkar recitation, the first pronunciation A creates the vibrations, which effect on the spinal cord to increase its efficiency. The second pronunciation U creates the vibrations in the throat and affects the Thyroid Glands, whiles the last pronunciation M, brings the vibrations to the brain, thereby activating the brain centers, as a result of which, the efficiency of brain increases. Therefore the effect of Om chanting increases the concentration, memory, receiving power of brain and ultimately decreases the level of fatigue.” (Sharma, 2010)

Chinmayanand (1984) emphasized the importance of OM by saying that in one sound ‘OM’ past, present and future are included. According to Sivananda (2011), “the rhythm of repetition of OM causes stillness in the mind. Chanting of OM sets up harmonious vibrations in the mind or subtle body elevate the mind to magnanimous heights of divine splendor and eventually raise the consciousness to the state of turiya wherein the meditator loses his individual consciousness and merges himself into the Supreme Soul, the all-pervading Brahmic Consciousness. The mysterious vibrations produced by the chanting of OM will produce one-pointedness of mind and harmony in the annamaya, pranamaya and manomaya Koshas (food sheath, vital sheath, and mental sheath) and make the mind in tune with the Infinite”.
Scientific Studies on OM Meditation

According to Telles and Desiraju (1993), cortical areas that is very important in attention is positively affected by OM (a meaningful symbol). Nagendra and Nagarathna (2000) said that modern illness is an important cause of stress. Telles, Nagarathna and Nagendra (1995) reported in their research that those who are practicing meditation from five to twenty years have increased mental alertness and they were found relaxed during chanting of OM.

“Scientific studies on OM suggest that the mental repetition of OM results in a physiological state at one time characterized by reduced physiological alertness, increased sensitivity as well as synchronicity, as well as changes at specific levels along the auditory pathway suggestive of increased sensitivity to sensory transmission (Kumar, Nagendra, Manjunath, Naveen & Telles, 2010).” Singh (2011) found in his research that pranayama that is a type of meditation not only decreases depression but positively increases the self-concept. Hagelin (2010) reported in his research that brain coherence is positively affected by the regular practice of meditation.

Science of Meditation

Kondaveti and Jha (2012) said “that meditation influences the activity in different parts of the brain. Following are some of changes found in the activities of the brain.

Increased activity in left pre-frontal cortex: The Pre-Frontal Cortex, known as the Inhibitory Centre, is that part of the brain which makes one stop and think about things. During meditation, scientists have observed increased activity in the left pre-frontal cortex, the part of the brain responsible for happiness, relaxation and emotional
balance; and decreased activity in the right pre-frontal cortex, which is associated with depression and anxiety. This reduces production of a stress hormone called Cortisol. This also makes the meditators recover faster from negative events, and maintain higher levels of certain immune cells.

**Decreased activity in frontal cortex:** Frontal cortex is involved in thinking process of reasoning and planning. Hardly any activity is seen in this part of the brain, during meditation; providing it with much needed rest, so that it can function more efficiently when required.

**Decreased activity in parietal lobe:** The parietal lobe is responsible for processing sensory information about the surrounding world. It keeps one in time and space orientation. During meditation, this part of the brain slows down, creating a sense of timelessness.

**Decreased activity in thalamus:** Thalamus is the organ that injects all sensory data deep into the brain. In meditation, the flow of incoming sensory information reduces dramatically, thus opening one’s thalamus to receive extra-sensory information.

**Meditation and the Autonomic Nervous System:** Meditation reduces the activity of Sympathetic nervous system, effectively dilating the blood vessels, and reducing production of stress hormones such as adrenaline, Non-adrenaline and Cortisol. This helps in reducing hypertension, atherosclerosis, constriction of blood vessels, and thickening of coronary arteries.

**Structural changes in the Brain:** Meditation exhibit thicker gray matter in the frontal portion of the brain that is responsible for attention and sensory processing. This improves a meditator’s performance in tasks requiring sustained attention.
**Meditation and Hormone Production:** Meditation controls the person’s blood chemistry, by increasing or decreasing the production of some important hormones. Some of these are:

(a) **Serotonin:** Meditation increases the production of Serotonin in the gastrointestinal tract. Serotonin is known as the ‘happiness hormone’ and plays an important role in one’s well-being.

(b) **DHEA (De-Hydro-Epi-Androsterone):** DHEA helps in the prevention and treatment of cancer, cardiovascular diseases and diabetes. Enhanced levels of DHEA make people feel and look better. Anxiety and stress lower down normal DHEA levels in the bloodstream, while meditation elevates these levels.

(c) **Endorphins:** Endorphins are produced by the Pituitary gland and the Hypothalamus. They help reduce pain, enhance pain-threshold, and promote well-being. Endorphin levels are increased substantially during meditation.”

Meditation makes one aware of one’s true self. These practices make one capable to see the world around in an expansive manner. “Practice of meditation leads to better brain functioning, improved ability to focus, higher level of creativity, deeper relaxation, improvement in perception and memory, higher level of intelligence. Meditation causes natural change in breathing, decreased stress hormone, normal blood pressure and reduced cholesterol. Increased self-actualization, increased strength of self-concept and increased productivity, improve relations at work. This results in increased relaxation and decreased stress leading to improved health and more positive health habits.” (Summerfield, 2011)
Meditation and Electroencephalogram (EEG)

The EEG is a direct measure of central nervous system activity. Electrodes placed on the scalp can pick up voltage changes from the brain that seems to vary with the alertness of the organism. “It is well known that the brain is an electrochemical organ; electrical activity emanating from the brain is displayed in the form of brainwaves. There are four categories of these brainwaves, ranging from the most activity to the least activity. When the brain is aroused and actively engaged in mental activities, it generates beta waves. These beta waves are of relatively low amplitude, and are the fastest of the four different brainwaves. The frequency of beta waves ranges from 15 to 40 cycles a second. The next brainwave category is alpha. Where beta represented arousal, alpha represents non-arousal. Alpha brainwaves are slower and higher in amplitude. Their frequency ranges from 9 to 14 cycles per second. A person who takes time out to reflect or meditate is usually in an alpha state. The next state, theta brainwaves, is typically of even greater amplitude and slower frequency. This frequency range is normally between 5 and 8 cycles a second. The final brainwave state is delta. Here the brainwaves are of the greatest amplitude and slowest frequency. They typically center around a range of 1.5 to 4 cycles per second” (Hemalatha, Keerthana & Suganya, 2014). Interestingly, the deepest stage of sleep (as defined by the difficulty of arousing the organism) is associated with fast, low-amplitude waves in the cortex similar to those seen during full alertness. This has been called paradoxical sleep. It is often accompanied by rapid eye movements (REM), deep relaxation in the neck muscles, regular (4 to 8 Hz) theta waves from the
hippocampus, and reports of dream activity on waking (Dement & Kleitman, 1957; Jouvet, 1967).

**Figure 1.1:** Electroencephalographic (EEG) records during excitement, relaxation and varying degrees of sleep. Alpha waves are most prominent in the relaxed state.

![EEG records](image)

*Source:* Penfield, Theodore, Erickson & Thomas (1941).

If a sudden stimulus is presented to a relaxed or sleeping animal, the animal orients toward the stimulus and the EEG changes from slow, synchronized activity to the fast, low-amplitude activity associated with alertness. This is variously known as EEG arousal, desynchronization, or alpha blocking. If the stimulus is presented again and again, the EEG arousal generally becomes smaller and the animal ceases to orient toward the stimulus. This decrease in response with stimulus repetition is termed habituation.

There are also systematic changes in EEG activity during meditation. They are most prominent when recorded from electrodes placed on the back of the head (Kamiya, 1968). A number of studies have investigated EEG activity during
meditation. Most of these agree that during both Yoga and Zen meditation there is unusually abundant and high-amplitude alpha activity (Anand, Chinna & Singh, 1961; Kasamatsu & Hirai, 1966; Okuma, Kogu, Ikeda, & Sugiyama, 1957; Wenger & Bagchi, 1961).

Meditation stabilizes the autonomous nervous system. During meditation, the brain’s activity alters significantly. In a research conducted by Othmer, Othmer and Marks (1991), a significant positive effect of 15-18 Hz EEG normalization training was found on specific learning disabilities, on headache syndromes, on certain adverse behaviors and on sleep disorders.

**Galvanic Skin Response (GSR)**

Das and Anand (2012) quoted, “Galvanic Skin Response is a type of electrodermal response. A transient change in certain electrical properties of the skin associated with the sweat gland activity and elicited by any stimulus that evokes an arousal or orienting response, known as the galvanic skin response (GSR). It is a change in the electrical properties of a person’s skin caused by an interaction between environmental events and the individual’s psychological state. GSR is a method of capturing the autonomic nerve response as a parameter of the sweat gland function (i.e., measuring the electrical resistance of the skin). As stress level increases, changes in the electrical resistance of the skin are detected by GSR sensors. GSR varies with its moisture level. So skin conductance is used as an indication of psychological or physiological arousal. Although there are no absolute levels of GSR indicative of high workload or stress, GSR is a good relative indicator of stress. The galvanic skin response feedback instrument measures skin conductivity from the fingers and/or
The GSR is highly sensitive to emotions in some people. Since GSR reflects sweat gland activity it is related to changes in the sympathetic nervous system. The activity of the sweat glands in response to sympathetic nervous stimulation (increased sympathetic activation) results in an increase in the level of conductance (Fuller, 1977).”

“A transient increase in skin conductance is proportional to sweat secretion (Darrow, 1964). When an individual is under mental stress, sweat gland activity is activated and increases skin conductance” (Lee, Jo & Lee, 2011). “The hands and feet, where the density of sweat glands is highest, are usually used to measure GSR. There are two major components for GSR analysis. Skin conductance level (SCL) is a slowly changing part of the GSR signal, and it can be computed as the mean value of skin conductance over a window of data. A fast changing part of the GSR signal is called skin conductance response (SCR), which occurs in relation to a single stimulus. Widely used parameters for GSR include the amplitude and latency of SCR and average SCL value” (Puranik & Kataria, 2012).

During the practice of meditation, a strong increase in the electrical resistance of the skin i.e. galvanic skin response, is found due to decreased perspiration, which in turn results from a lessening of anxiety. Shashi (2011) found that OM chanting increased the level of EEG and GSR.

Attention Regulation

“Attention is not a unitary process. Different types of attentional processes have been found to include processes like selective attention and vigilance. Selective attention is based location, feature, or object. Attention is a process of selecting
information from the visual field for further processing (Srinivasan, 2008).” Attention being a pre-perceptive process, is affected by the features of the environment as well as by the motives and other physical and psychological conditions of the observer. Attention is paid to one stimulus or pattern of stimuli at a given instant while others are ignored, which are in the margin of attention.

**Definitions of Attention**

Defining attention James (1890) said that “It is the taking possession by the mind, in clear and vivid form, of one out of several simultaneously possible objects or train of thoughts, focalization and concentration of consciousness. It implies withdrawal from something in order to deal effectively with others.”

Jong (1993) quoted, “In modern attention theories the concept of attention refers to the control and regulation of (Mental) processes (Neumann, 1987; Norman & Shallice, 1986). For academic achievement the regulation of processes in the working memory system seems of special importance. Working memory is used for the temporary storage and processing of information (Baddeley, 1986). It is required in a wide range of school tasks including counting (Logie & Baddeley, 1987), reading (Baddeley, 1986) and arithmetic (Hitch, 1978) etc.”

Baijal and Srinivasan (2009) quoted, “Different types of attention might have different relationships to awareness. One way to characterize attention would be in terms of focused attention and distributed attention (Chong & Treisman, 2005; Demeyere & Humphreys, 2007; Treisman, 2006). Distributed attention involves processing at larger spatial scales whereas focused attention is typically associated with processing at smaller spatial scales (Treisman, 2006). The distributed attention
mechanisms involve parallel processing that contrasts with the focused attention mode that individuates objects (Treisman, 2006).” Different cognitive processes are associated with different frequencies (Klimesch, 1999a; Singer, 1999). Tasks related to attention and alertness involves alpha oscillations (Klimesch, 1999b).

“Meditation is considered a technique of training attentional networks of the brain. The evidence comes from the studies that show improvements in allocation of attention and executive control due to mental training (Jha, Krompinger & Baime, 2007; Slagter et al., 2007; Brefczynski-Lewis, Lutz, Schaefer, Levinson & Davidson, 2007).” Meditation help one in understanding one’s mind and transforming it from negative to positive, disturbed to peaceful, and unhappy to happy (Srinivasan & Baijal, 2007).

**Meditation and Attention**

Mind often acts in a completely uncontrolled way, bouncing from one thought to another, producing emotional and physical reactions. Meditation is about letting the mind rest. “The cognitive function that meditation affects the most is attention. Meditation is a form of attention training and also train attentional systems. As physical training strengthen body muscles, mental training involved in meditation reinforces brain attentional circuits. Meditation recruits attentional brain areas involved in learning” (Braboszcz, Hahusseau & Delorme, 2010).

Meditational practice sharpens one’s concentration and thinking power. Raffone and Srinivasan (2009) quoted, “The regulation of attention is a central feature of different meditation methods (Davidson & Goleman, 1977). Meditation practices can be classified into two main styles-focused attention (FA) and open monitoring (OM)-
depending on how the attentional processes are directed (Cahn & Polich 2006; Slagter, Dunne, Lutz & Davidson, 2008). In the FA (concentrative) style, attention is focused on a given object in a sustained manner. The second style, OM (mindfulness-based) meditation, involves the non-reactive monitoring of the content of ongoing experience, primarily as a means to become reflectively aware of the nature of emotional and cognitive patterns”. Raffone and Srinivasan (2009) said that when all mental content, including perception, sensation, cognition and affects is perceived and is monitored from moment to moment, it is a state of mindfulness (Kabat-Zinn, 2003).

Braboszcz, Hahusseau and Delorme (2010) quoted, “Lutz, Greischar, Rawlings, Ricard and Davidson (2004) found in their research that brain activity varies based on expertise. These results suggest that meditation is a technique that is learned and perfected over years of practice. According to Lutz, Slagter, Dunne and Davidson (2008), meditation practices involve at least three attention regulation subsystems. First, meditation involves intense object based concentration. Selective attention- or orienting- is the selection of specific information from the flow of sensory input and involves cortical structures known to gate information, such as the temporal-parietal junction, the ventrolateral prefrontal cortex, the frontal eye field, and the intraparietal sulcus (Corbetta & Shulman, 2002). Second, meditation imposes continuous monitoring of the focus of attention. Sustained attention-or alertness-is the maintenance of a state of high sensitivity to a perceived stimulus or mental object over time and most likely involves sustained synchronous activity between the thalamus and the right frontal and right parietal cortical structures—also known as the thalamo-cortical loop (Berger, Kofman, Livneh, & Henik, 2007; Coull, 1998; Posner &
Finally, meditation also involves transient attention shifts, as when one disengages attention from a source of distraction and redirects it to the intended object of concentration (Cahn & Polich, 2006; Lutz, Slagter, Dunne & Davidson, 2008). This involves executive attention-or conflict monitoring-which is the monitoring and resolution of conflicts among thoughts, feelings, and mental plan. This function is managed by the dorsal anterior cingulate cortex and the dorsolateral prefrontal cortex, structures that have also been shown to be activated when one is self-conscious (Ridderinkhof, Van Den Wildenberg, Segalowitz, & Carter, 2004; Weissman, Roberts, Visscher, & Woldorff, 2006).

In the present investigation cognitive level of attention has been used for the purpose of study which pertains to the control and regulation of processes in working memory (Das-Smaal, de Jong & Koopmans, 1993) and was referred to as attention regulation. Some psychologists have found that attention and awareness are closely related while some argue that for being aware attention is necessary (Dehaene, Changeux, Naccache, Sackur & Sergent, 2006).

**Emotional Intelligence (EI)**

According to Mayor & Salovey (1995) “emotional intelligence consists of abilities such as being able to motivate one and persist in the face of frustration; to control impulses and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to empathize and to hope”. Epstein (1999) said that a group of mental capability which helps someone in recognizing and understanding not only one’s own feeling but others also. Creative ideas and healthier actions are risen by emotional intelligence.
“Emotional Intelligence may be defined as the ability to perceive, understand, integrate and manage one’s own and other people’s feelings and emotions, and to act upon them in a reflective and rational manner (Chartered Management Institute 2004). Palmer, Walls, Burgess and Stough (2001) found that when applied to the workplace, emotional intelligence involves the capacity to effectively perceive, express, understand and manage emotions in a professional and effective manner at work (Chin, Anantharaman & Tong (2011).”

According to Gottman (1997), “the concept of emotional intelligence involves three things. First, we must know our emotions and how to manage them. That includes the ability to control impulses, delay gratification, and cope with life’s ups and downs. Second, we must be able to recognize emotions in others, respond empathically to them, read their social cues. Third, we must be able to motivate ourselves in an optimistic fashion and be confident of our feelings, our accomplishments, and our abilities as we go through the world.”

The Importance of Emotional Intelligence

Maintaining physical and emotional balance in oneself is a key to longevity. Emotions play an important role in an individual’s daily life. In one way emotions can lead to an increased morale, but on the other way emotions can be destructive. In academic and workplace settings negative emotions like anxiety, anger, fear and hostility uses more energy and lowers the morale which in turn leads to apathy and absenteeism (Bagshaw, 2000). Emotional intelligence plays an important role in academic and workplace settings (Brackett, Rivers & Salovey, 2011); it is also more important at all levels in the workplace than technical skills and IQ (Goleman, 1998).
Martinez-Pons (1997) found in his research that task mastery is positively related with emotional intelligence and symptoms of depression are negatively associated with emotional intelligence. Further, Schutte et al. (1998) said that less impulsivity, greater optimism, and less depression are related to the one’s emotional intelligence.

Mayer and Salovey (1997) theorized that personal well-being can be enhanced by enhancing emotional intelligence. Emotional intelligence correlates positively with academic achievement (Parker, Summerfeldt, Hogan & Majeski, 2004; Ashtaputre, 2012). The concept of emotional intelligence can be applied in educational situations. Children with high emotional skills are more capable of concentrating on problems and using problem solving skill that increases their cognitive abilities (Soltanifar, 2008). Boyatzis and McKee (2005) pointed out that there are four important domains in emotional intelligence. These domains are: self-management, self-awareness, relationship management and social awareness.

**Psychological Well-being**

Well-being involves individual’s pleasure and subjective satisfaction which depends upon the psychological status of the individual and his/her environmental conditions. “Well-being may be defined as a subjective, positive emotional state with general life satisfaction. It involves the way the individual feels about himself or herself due to achievement of goals in life” (Diener, 1984). Therefore, the most common and comprehensive indicator of the sense of well-being includes life satisfaction which refers to an individual’s own global judgment of his/her quality of life, feeling of contentment and happiness. Various domains of the feelings of
satisfaction are recreation, love, marriage, money, friendship and so forth. Life satisfaction denotes personal appreciation of life. This kind of well-being is substantially subjective.

Psychological well-being includes how people evaluate their lives. These evaluations may be in the form of cognition or in the form of affect. According to Aristotle (1947), “both the general run of man and people of superior refinement say that the highest of all goods achievable by action is happiness (eudaimonia) … but with regard to what happiness is they differ, and the many do not give the same account as the wise”.

Psychological well-being is therefore represented by the level to which people show sentiments and positive attitude towards various aspects of their lives. Psychological indicators of well-being are diverse as mental health; self-concept; feeling of satisfaction and happiness. In recent time, subjective well-being is used as psychological term for happiness.

Banavathy and Choudry (2014) quoted that psychological well-being is the counterpart of subjective well-being in the eudaimonic tradition. Ryff (1995) define eudaimonia or psychological well-being ‘as the striving for perfection that represents the realization of one’s true potential’. Ryff (1989) identifies six characters of it viz. self-acceptance, purpose in life, personal growth, autonomy, environmental mastery and positive relationships. Well-being or wellness is often referred to as “wholeness of body, mind and spirit in terms of health, prosperity and self-actualization” by Maslow (1968). Tatarkiewicz (1976) wrote that for being happy individual should be satisfied from one’s own life as a whole.
Varshney (2007) quoted, “a feeling of satisfaction with life is an important factor for a general sense of well-being (Neugarten, 1982) and has been emphasized in research related to subjective well-being. Life satisfaction often refers to the attitudes that individuals have about their past, present as well as future in relation to their psychological well-being (Chaddha & Van Willigen, 1995).”

Checola (1975) said that well-being is one of the most important goals which all individuals strive for. Life satisfaction shows individual’s personal evaluation or appreciation towards his/her life. This type of well-being is subjective in nature (Summer, 1996). According to Veenhoven (2004), “it includes satisfaction with aspects of life and satisfaction with life as a whole. Satisfaction with aspects of life is concerned with different domains of life such as its comforts and its challenges. The sense of enjoyment of life (commonly referred as satisfaction, happiness and joy) or subjective appreciation of life is also conceptualized as an indicator of well-being.”

Diener (1984) reported, “happy people tend to have high self-esteem, a satisfying love relationship, a meaningful religious faith and sufficient social activities. Happy people may have greater self-confidence, sociability or better social relationship and characteristics of those high in well-being.” According to Dalai Lama (2000), “the very purpose of life is to seek happiness. Happiness is determined more by one’s state of mind than by external events. Success, material pleasure, recognition may result in a temporary feeling of elation but one returns to his baseline.”

In context of psychology happiness has been cited as a psychological state and an ultimate goal of human behavior. Psychological indicators refer explicitly to the subjective perception. It was defined as personal satisfaction relevant to expression of
emotional and sentiments, personal development and achievement, self-concept etc. Hall (1976) asked people what they thought were the most important sources of satisfaction in their lives and found that most often mentioned domains were health, family, home-life, money, living standards, social relationship, social values, housing and work.

Jung (1964) asserts that psychological well-being results when a person experiences the sense of unity and harmony that endures within him, not affected with the outer chaos, changes or fragmentation of his life. An individual’s ability for feeling and expressing human emotions, giving and receiving love and warmth, achieving a sense of fulfillment and purpose, developing psychological hardiness shows the emotional health of an individual (Hawks, 1994). Those who have high emotional health finds life beautiful and feels connectedness. They not only have the full acceptance of self but accept others also.

A corner stone of spiritual well-being is that people have a need for transcendence. A human person’s sense of well-being depends in part upon seeing purposes for which to live that lie beyond oneself, goal to pursue or their transcendent meaning to life’s activities. High spiritual well-being therefore, could be understood as a type of happiness or contentment that is by-product of attending to meaning that lie in a health beyond oneself. Low spiritual well-being could be seen as distress caused by an unfulfilled need for transcendence.

**Theories of Well-being and Life Satisfaction: Indian Perspectives**

According to Kiran Kumar (2003), “There are both material and spiritual worldview regarding well-being and life satisfaction in Indian society, which leads to
different perspectives: Hedonic, Transcendental and Collective (Kiran Kumar, 2002a, b, 2003, 2004).

**Hedonic View**

There existed an exclusively materialistic view according to which fulfillment of desires, particularly of sensory nature, is the sole criterion of happiness and well-being. Material enjoyment (Ihika Bhoga) is the criterion of happiness and satisfaction according to this perspective, which involves maximizing pleasure and minimizing pain. Man should do whatever is possible to enhance pleasure and avoid pain and any action done for the sake of pleasure is justified.

As issue related to the hedonic view is whether material enjoyment can really bring happiness and well-being. Many studies conducted on subjective well-being (Diener, 2000; Diener & Diener, 1995) show that economically poor and rich nations do not differ significantly in the index of life satisfaction. A number of cross national studies have revealed that national wealth and economic growth has no positive correlation beyond a certain point with indices of life satisfaction and happiness and they follow the law of diminishing returns beyond a certain point. Diener and Diener (2002) observed that some reorientation is needed in material goals, from acquiring money to enjoying the process of work and contributing to society.

**Transcendental View**

According to this perspective happiness and well-being is subjective in the sense that they do not depend on any objective conditions of reality, including one’s state of body and mind. It is interesting to note that even western researcher have documented
the limitations of the materialistic outlook in experiencing happiness and well-being and have shown concern for subjective well-being.

The basis of this view is the holistic vision (held by the ancient sages and seers). That vision was born out of the experience of pure consciousness, suddha chaitanya, as the substratum of phenomenal reality. This vision is the essence of Vedic and Upanishadic tradition of India. The transcendental view involves an analysis of the nature and conditions of happiness, satisfaction and fulfillment. Anand and Stitaprajnatva are the defining characteristics of happiness and well-being from the transcendental perspective. It is the ideal upheld in our traditions as the goal in achieving well-being (Kiran Kumar 2003, 2004). Thus real happiness can be achieved only by emotionally stable and balanced persons. This shows the importance of balanced persons. This shows the importance of balanced life style in the experience of happiness or the ultimate satisfaction.

**Collective View**

This lies between the hedonic and the transcendental perspective. It is socially oriented and is governed by the concept of dharma. Dharma connotes precepts that aim at securing the material and spiritual sustenance and growth of the individual and society (Kuppuswamy, 1977).

The above three perspectives are not only rooted in a world view, they also involve a particular view of human nature which can be placed on a continuum of evolution. The Indian thinkers consider man not only as an ‘organism’ having animal characteristics, but also as a ‘being’ who has potentialities to achieve ‘divinity’. Thus depending on one’s evolutionary status people may consider pursuit of desires (kama),

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pursuit of wealth (artha), pursuit of values (dharma) and pursuit of liberation (moksha) as the key note of their lives. Indian sages and seers observed that pursuit of desires and wealth to the exclusion of pursuit of values and of liberation is a sign of a lower level of evolution (Kiran Kumar, 2003).

Upnishad sages treat bliss (ananda) as the original condition of human beings and equated with pure consciousnesses or the transcendent self (the atman). However the different concepts of happiness and well-being are related to different sheaths or self-sense (Kiran Kumar, 2003).

The Taittiriya Upnishad has elaborated that happiness; joy and well-being are the moments when there is an unobstructed manifestation of ananda (bliss), which is our original or true nature. It is the opaqueness of our mental faculties that obstruct the manifestation and experience of ananda. The principle that is responsible for opaqueness, inertia, dullness, darkness, depression, etc., is called tamas. The principle that is responsible for brightness, illumination, transparency, etc., is called sattva. Greater is the transparency of the mental faculties, i.e., sattva, greater is the experience of ananda (Kiran Kumar, 2002). The Indian traditional perspective offers an ideal state of human functioning and constitutes health and well-being as a state of mind (somewhat equivalent to the concept of subjective well-being) which is peaceful, quiet, serene and free from the conflicts and desires. The Indian notion of a healthy person is of an auto locus person (swastha) who flourishes on the recognition of life force derived from the material reality (mahabhutas) and, therefore, offers remedies for being healthy by opening a dialogue with its environment and recognition of order (dharma) in the entire life world (sristi). The nutrition (ahar), world of leisure (vihar)
and thoughts \((vichar)\) need to be synchronized in proper order. Health and well-being are both personal as well as social.

The conceptualization of the state of well-being is closer to the concept of mental health and happiness, life satisfaction and actualization of one’s full potential. Verma and Verma (1989) have defined general well-being as the subjective feeling of contentment, happiness, satisfaction with life’s experiences and of one’s role in the world of work, sense of achievement, utility, belongingness and no distress, dissatisfaction or worry.

Therefore, it can be concluded that well-being, good life and life satisfaction at any age are to be achieved more in terms of minimization, restraint and detachment from bodily need fulfillment rather than maximization, indulgence and striving for need fulfillment. The ultimate or ideal satisfaction is to be contented within self, with the realization of transcendent self.”

**Neuroscience of Psychological Well-being**

Huppert (2009) described “the neuroscience of psychological well-being. This includes:

**Patterns of Brain Activation**

Davidson and his colleagues found large individual differences in baseline levels of asymmetric activation in prefrontal cortex, related to a person’s typical emotional style. Individuals with a positive emotional style show higher levels of left than right prefrontal activation at rest (using EEG or fMRI), while those with a negative emotional style tend to show higher levels of right than left prefrontal activation at rest (Davidson, 1992; Tomarken, Davidson, Wheeler & Doss, 1992; Urry et al., 2004).
Davidson and colleagues have also found that, independent of emotional style, induced negative mood increases relative right-sided activation, whereas induced positive mood increases relative left-sided activation (Davidson, 2005; Davidson, Chapman, Chapman, & Henriques, 1990).

**Neurochemical Effects**

Exposure to stressors activates the hypothalamic-pituitary-adrenal (HPA) axis, as evidenced by increased secretion of the stress hormone cortisol. However, individual differences in psychological well-being (including self-esteem and emotional style) can modulate stress-induced elevations in cortisol (Jacobs, Delespaul, Derom, Van Os, Myin-Germeys, & Nicolson, 2007; Polk, Skoner, Kirschbaum, Cohen & Doyle, 2005; Pruessner, Hellhammer, & Kirschbaum, 1999; Smyth, Ockenfels, Porter, Kirschbaum, Hellhammer, & Stone, 1998). Levels of cortisol secretion vary markedly throughout the day. A healthy pattern involves a post-awakening peak and a 20-fold decrease later in the day (Clow, 2004). Several studies have found that this healthy pattern is associated with high scores on measures of well-being (positive affect, optimism, psychological well-being), but not with scores on measures of ill-being (negative affect, pessimism, anxiety, and fear) (Lai et al., 2005; Ryff et al., 2006; Steptoe, Gibson, Hamer, & Wardle, 2007; Steptoe & Wardle, 2005). Thus, the association between well-being and the cortisol cycle has been demonstrated not to be the inverse of the known association with stress or distress. Both positive and negative states are associated with the cortisol response, but independently of each other.

Another neurochemical associated with mental states is serotonin (5HT). Serotonin levels are reduced in depression, and most modern anti-depressant drugs,
known as serotonin reuptake inhibitors (SSRIs), act by increasing the amount of serotonin available to brain cells. In a study of 254 healthy adults who made daily ratings of their mood, Flory, Manuck, Matthews, and Muldoon (2004) found that serotonin level was related to positive mood averaged across seven days, but not to negative mood, although it was related to a measure of neuroticism. Results revealed that deficiencies in serotonergic function may reflect the relative absence of positive mood. Besides this these findings support the idea that mental well-being and ill-being have different neurobiological as well as behavioral effects.”

Spirituality is significantly positively related with mental health and self-concept but highly with self-concept than with mental health (Upmanyu, Dwivedi, Khan, Gulati & Bjawa, 2011). Well-being is positively correlated with spiritual intelligence among senior citizens and young adults, higher the spiritual intelligence of the individual higher the well-being of the person (Hingar, Mathur & Sharma, 2011). In a research Fry (2000) found that religion and spirituality relevant variables like religious involvement, religious salience, personal meaning and spiritual practices were the significant predictors of well-being. In a survey conducted by Zangma (2012), it was found that psychological well-being is affected by spirituality, stress, sense of satisfaction, social support and emotional well-being.

The present researcher is interested in investigating the effect of prayer and meditation (verbal chanting of ‘OM’) on Alpha EEG, GSR, attention regulation, emotional intelligence and psychological well-being under scientifically controlled conditions. In the present study researcher used the prayer of penitence and
thanksgiving; in the meditation researcher used the verbal chanting of ‘OM’ meditation. Therefore, the investigator formulated the following problem:

**STATEMENT OF THE PROBLEM**

Is there any effect of prayer and meditation (verbal chanting of ‘OM’) on alpha electroencephalogram, galvanic skin response, attention regulation, emotional intelligence and psychological well-being of university students?

**OBJECTIVES OF THE STUDY**

Following objectives were taken into consideration for the study:

(A) To study the effect of prayer along with meditation (verbal chanting of ‘OM’) on Alpha EEG, GSR, attention regulation, emotional intelligence and psychological well-being.

(B) To study the effect of meditation (verbal chanting of ‘OM’) on Alpha EEG, GSR, attention regulation, emotional intelligence and psychological well-being.

**JUSTIFICATION OF THE PROBLEM**

In present time human life has become extremely stressful. There is cut-throat competition in all the fields such as Education, Business, and Sports etc. Performance of students depends upon a number of factors such as availability of good environment for study, reading material, physical strength etc. Besides these factors psychological factors play an important role in determining the performance of students. Among the psychological factors motivation, pre-competitive stress, means of control of attention and concentration play an important role.

Through prayer and meditation a person is expected to get mental peace. Prayer and Meditation affect the emotional intelligence, attention regulation and
psychological well-being of an individual. So, here in the present study the researcher would examine the effect of prayer (penitence and thanksgiving) and meditation (verbal chanting of ‘OM’) on Alpha EEG, GSR, attention regulation, emotional intelligence and psychological well-being of university students. Prayer (penitence and thanksgiving) mainly focused on pleading and thanksgiving. Meditation (verbal chanting of ‘OM’) as taken in this research is a concentrative type of meditation that involves focusing of attention on breath and internal or external chanting (or mantra).

OPERATIONAL DEFINITION OF THE TERMS

**Prayer:** Prayer is asking God for something with intense yearning. It includes respect, love, pleading and faith. Prayer is a central expression of faith.

**Meditation:** “Meditation refers to a family of self-regulation practices that focus on training attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities such as calm, clarity, and concentration (Walsh & Shapiro, 2006).”

**Alpha Electroencephalogram (EEG):** “The brain generates rhythmical potentials which originate in the individual neurons of the brain. These potentials get summated as millions of cell discharge synchronously and appear as a surface waveform, the recording of which is known as the electroencephalogram” (Gupta, 2011). Rest and relaxation is often associated with slow (8 to 12 Hz), synchronized, higher-amplitude alpha waves.

**Galvanic Skin Response (GSR):** “A transient change in certain electrical properties of the skin associated with the sweat gland activity and elicited by any stimulus that
evokes an arousal or orienting response, known as the galvanic skin response (GSR)” (Das & Anand, 2012).

**Attention Regulation:** It refers to the control and regulation of mental processes of the working memory system which includes the temporary storage and processing of information. This system is mainly used in the tasks which are related to counting, reading and arithmetic etc.

**Emotional Intelligence:** Goleman (1995) “defined emotional intelligence as a degree of emotional intelligence is awareness of one’s own and other people’s feeling such as sympathy, compassion, motivation and the ability to respond to pain and pleasure appropriately.”

**Psychological Well-Being:** Psychological well-being refers to how people evaluate their lives and this indicates the psychological satisfaction.