SUMMARY

Cognition is the physiological process of knowing including awareness, perception, reasoning, and judgment. Cognitive functions are mainly categorized into memory, attention, creativity, and intelligence. However, of these abilities, attention is the basic cognitive skill on which other higher order mental processes depend. Of all the tasks the human brain performs, perhaps none is more consequential for the performance of other tasks than attention. When human beings attend, they perceive. When human beings attend and perceive, they remember. When human beings attend, perceive, and remember, they learn. When human beings learn, they can act deliberately and with forethought (Parasuraman, 1998). In short, perceiving, thinking, learning, deciding, and acting require that we budget our “attention”.

Attention is not only just noticing the incoming stimuli, rather it involves a number of processes including filtering out perceptions, balancing multiple perceptions, and attaching emotional significance to these perceptions (Ratey, 2001). The ability to show attention to certain things is vital to life. It is necessary to keep individuals from becoming overloaded with information (Reed, 2004). It is needed to carry out any task from the simplest to the most complex. It increases our efficiency to do any task. Sensory discrimination can also be improved by attention. Attention is a prerequisite for acquisition of any kind of skill. Thus, every act needs attention for its successful performance.

But the dawn of the new millennium is witnessing an unprecedented spread of cognitive dysfunctions such as decline in memory, distraction in attention, and attention related disorders in every corner of the globe. Stressful and sedentary lifestyle as a result of rapid modernization may be the root cause. Today’s world is changing rapidly and dramatically over the past decades. The ability to tune out distractions and focus on what is important is getting more difficult in this modern world. People are busier than ever, always trying to do two or more things at the same time. This multitasking is actually creating more troubles in focusing attention and shutting out irrelevant information and because of this, those involved in multitasking often experience more stress. Even after the multitasking ends, fractured thinking and lack of focus persist. The
increasing use of technology and multimedia devices is making the young, developing brains to become habituated to distractions and to switch tasks, and less able to sustain attention. An inattention “epidemic” seems to have spread all over the human population on the planet earth. Research in the area of attention, specifically from the viewpoint of improving it, has thus become important and essential.

Modern therapeutics though has a spectrum of drugs such as modafinil (Caldwell, Caldwell, Smythe, and Hall, 2000; Turner, Robbins, Clark, Aron, Dowson, and Sahakian, 2003; Marchant, Kamel, Echlin, Grice, Lewis, and Rusted, 2009), flumazenil (Smolnik, Pietrowsky, Fehm, and Born, 1998; Dehghanpisheh, Kazemi, and Amini, 2010), memantine (Schulz, Jobert, Coppola, Hermann, and Pantev, 1996; Wesnes, Aarsland, Ballard, and Londos, 2014), caffeine (Putz-Anderson, Setzer, and Croxton, 1981; Smith 2009), and nicotine (Wesnes and Warburton, 1978; Lawrence, Ross, and Stein, 2002) for the management of attention related disorders, but they are having serious side effects and habit forming nature. Therefore, it is need of the hour to think from the Ayurvedic point of view for a better management of cognitive disorders. In the last few years, there has been an exponential growth in the field of herbal medicine, and these drugs are gaining popularity in both developing and developed countries because of their natural origin and less side effects (Fatima, Agarwal, and Singh, 2012). Shankhapushpi is one such herbal plant of the Ayurvedic system of medicine, which has been mentioned as under “Medhya Rasayana” means “rejuvenating to intellect or brain. Earlier work on this plant conducted by many researchers as well as in the department of Psychology, M.D.University, Rohtak clear-cut indicates the memory enhancing potential of this plant. (Priyanka and Batra, 2003; Priyanka and Batra, 2004; Kapse and Nesari, 2005; Batra, 2008; Batra, Kumar, Rawat, and Batra, 2008; Sharma, Bhatnagar, and Kulkarni, 2010; Rawat and Kothiyal, 2010; Kothiyal and Rawat, 2011; Shweta and Batra, 2012). It can be inferred from the memory enhancing potential of this plant that if this plant can enhance memory, it is quite possible that attention also must be getting affected by it. Any improvement in attentional processes would have its implications in improving all other cognitive abilities. Therefore, to continue the previous work and to deeply probe the mechanism of action of this plant, attention has been specifically chosen in this study as dependent variable. There is not even a single study on this plant which refers directly to the area of attention. Further, most of the earlier studies
conducted on this plant have used animal models. Very few studies reported its effect directly on human beings. Moreover, in many studies, Shankhpushpi has been studied as an ingredient of a herbal formulation. Studies reported the effects of this plant alone are very few. This makes it important to conduct the studies using only Shankhpushpi on human beings as an independent variable in order to get clearer picture of its effects.

Keeping in mind all these limitations of previous researches and wide implications of research in the area of attention, it was thought worthwhile to investigate the following problem.

**Problem**

“To study the effect of Shankhpushpi (Convolvulus pluricaulis) on attentional processes.”

**Objectives**

1. To assess the effect of Shankhpushpi on attentional processes.
2. To compare the relative efficacy of Shankhpushpi on various measures of attention.
3. To assess the duration dependent effect of Shankhpushpi on various measures of attention.
4. To verify the residual effect of Shankhpushpi on attentional processes.

**Hypotheses**

1. The Shankhpushpi would enhance the attentional processes.
2. Longer the duration of administration of Shankhpushpi, more the enhancement of attentional processes.
3. There would be a linear relationship between the attentional processes enhancement and duration of administration of Shankhpushpi.
4. The longer the duration of administration of Shankhpushpi, more would be the residual effect.

To test the hypotheses, a double – blind, pre – post, placebo – controlled, parallel group design was employed in a form of 2X5 factorial form. A sample of total 150 Ss,
belonging to an age group of 19 to 25 years, having 15 Ss in each of the ten groups (5 control and 5 experimental), was administered with either Shankhapushpi powder or ordinary powder for five different durations i.e. 10, 20, 40, 80, and 160 days. Four types of attentional processes i.e. Sustained, Selective, Alternating, and Divided were studied in this piece of research work. The subjects were tested on these tasks before starting the treatment and immediately after the treatment. Residual effects were also tested. For this purpose, each subject was tested three times again at a gap of 20, 40, and 80 days after the first post test. The results were analyzed for statistical significance using two-way ANOVA followed by Duncan’s range test (DRT).

As the first hypothesis of the study predicted that, “the Shankhapushpi would enhance the attentional processes”, F-values, on all the four tasks i.e. Sustained, Selective, Alternating, and Divided attention task, being significant across treatments support this hypothesis. Thus, Shankhapushpi has been found to positively influence the attentional processes studied in this research work.

Secondly, it was hypothesized that, “longer the duration of administration of Shankhapushpi, more the enhancement of attentional processes”. A consistent increase in the mean ‘D’ scores with an increased duration on all the tasks was observed. F-values across durations were also found significant in each case. DRT results indicated that the higher durations of 80 days (in case of sustained and selective attention) and 160 days (in case of alternating and divided attention) produced better increase in comparison to shorter durations of 10, 20, and 40 days. Thus, second hypothesis also got proved.

The next hypothesis of the study was that, “there would be a linear relationship between the attentional processes enhancement and duration of administration of Shankhapushpi” has not proved true in this present study. No linear trend was found between attentional processes enhancement and duration of Shankhapushpi administration. Thus, in the light of these findings, this hypothesis has been rejected.

Last hypothesis of the study was related to residual effects. Results indicated very little residual effect i.e. just for 20 days after stopping Shankhapushpi administration, only in
larger durations i.e. 80 days in case of sustained attention task and 160 days in case of rest of the tasks.

Concludingly, it can be said that Shankhpushpi had a significantly positive effect on all the attentional processes undertaken in this study. Longer durations were found to be more effective.