CHAPTER 7

DISCUSSION

7. Discussion:

Recapitulating the results; with regard to the scores of 'Self-concept', there was no effect on the aforesaid scores in the humming group whereas the chanting group had a significant improvement in self-concept scale. However, it was also reported that humming prosody and chanting of a Mantra have similar effects on sustained attention and humming has no effect on response interference. In the other hand, there was no difference between Chanting Mantra and Humming Mantra groups in both domains of PANAS. A humming prosody and mantra chanting demonstrated a similar effect on the amelioration of a positive Emotional personality among adolescents.

Adolescence is a sensitive period for emergence of anxiety (Leigh & Clark, 2018). Anxiety and peer relations are major concerns in early adolescence (Erath et al., 2007). Difficulty in emotional regulation is closely associated to both social and generalized anxieties among adolescents (Mathews et al., 2014). Self-concept is impacted with transition in middle school children (Onetti et al., 2019). The concept of mindfulness has lately gained a lot of attention due to its capacity to influence self-regulatory processes (Baldus et al., 2018).

Chanting has been used for ages to overcome psychological and emotional disturbances (Perry et al., 2021), but the individual component of chanting that is *Chandas* or prosody has not been studied so far. We attempted to specifically understand the impact of *Chandah* (rhythm or pauses) used in chanting with four groups to eliminate the factors of words, their meanings. In the current study, we evaluated the effect of humming of "Totakam" *Chandah* on anxiety among children aged between 12 and 14 years.

As enumerated earlier, there was a significant improvement in self-concept scores in the humming and chanting groups. There was also a significant reduction in anxiety in the chanting group when compared to the other three groups in between-group analysis. There were no changes in the anxiety levels of the children allocated to the humming group, however, the chanting group showed improvement in the Spence Children's Anxiety Scale. As per our knowledge, this is the first scientific effort made to explore and analyse the impact

of *Chandas* on domains such as anxiety, mindfulness, and self-concept. We specifically chose this age group as young adolescence is such a vulnerable age where all sorts of delinquent behaviour tend to increase (Moffitt, 1993).

Although we managed to get a sample size of 138 students to have a minimum of 30 in each group, we could not randomize them as they were in 4 different sections and moving them for intervention was not allowed by the school management which was one drawback of the study. Furthermore, since the subject was new to the school management and not much work is out there for reference, we got permission to conduct our study only for 30 days which is not sufficient to notice the significance of our intervention. In spite of the above challenges, this study will make a firm base for further research on *Chandas* and its impact in various domains

During adolescence, middle school children experience immense biological and social role transformation (Sawyer et al., 2018), causing difficulty in coping with academic challenges (Tu et al., 2020).Chanting has so far proved its worth with enhancing memory, attention, and academic performance (Ghaligi et al., 2006), but the individual component of chanting has not been explicitly studied. We attempted to study the prosody/*chandah* aspect of chanting, which is the rhythm and pauses used in Sanskrit shloka chanting. We wanted to identify the effect of prosody alone, irrespective of language, and the verse's meaning on similar parameters hypothesizing that there will be improvement in attention and response inhibition in children of this age group. Our study's findings showed that both Humming prosody and chanting a mantra in prosody had an equivalent impact in middle school children in sustained attention showing that rhythm has its impact irrespective of the verse or meaning of the verse. We also observed improvement in response interference within the group, and higher statistical significance was found in the Chanting group compared to the Humming group.

While in Stroop mistake scores, a significant difference was found again in Humming and Chanting groups.

As per the author's knowledge, this study is the first attempt to investigate *chandas* as a useful tool to enhance cognitive abilities in children, especially in middle school, where vulnerability tends to grow, impacting academic motivation (Martin & Steinbeck, 2017). Although preliminary, we managed to get a sample size of 138 students and 30 or more in each group for reliable results; we could not randomize children as per groups and instead randomly allocated groups to different sections in a grade due to limitations in school hours, which was a drawback of our study. Along with this, we could only give the intervention for 30 days as this was the amount of duration permitted by the authorities.

This study would build a firm basis for researchers to incorporate all the limitations of our study and explore *chandas* and their maximum capacity. As per the knowledge of the authors, the current study is the first attempt to explore the effect of prosody/*Chandas* i.e., the rhythm used to chant mantras. There are several studies on chanting suggesting they induce a psychotherapeutic effect (Gao et al., 2017), enhance mood and social cognition(Perry et al., 2016b), memory (Kalaivani, 2018) and improve performance IQ (Chamoli et al., 2017). The study recruited subjects in their early adolescence which is 11 to 13 years, it being a critical period of changes in behaviour, moods, and relationships causing emotional turbulence(Scott-Parker, 2017). We had 4 parallel groups (Simmons & Blyth, 2017) Humming the prosody without the verse, (Blanco et al., 2015) Chanting a Mantra (prosody and verse),(Branje, 2018) reading an English phrase, and (Lanthier et al., 2014) silently sitting group to appreciate the effect of only Chanda/prosody without verse. The results of our study showed augmentation of Positive emotional personality in adolescence in both *Chandah* Humming (prosody alone, no verse) and Chanting a Mantra (prosody with verse) when compared to English phrase and silent sitting groups, which is in line with a study conducted by G. Perry et al., where positive

affect increased more with vocal chanting than silent chanting (Perry et al., 2016a). However, there was no statistical difference discerned between the humming and chanting groups, thus proving that it is the rhythm in which a mantra is chanted that has an impact on the spoken verse. Studies undoubtedly show chanting has a positive effect on brain activities (Gao et al., 2017) but *Chandah* is certainly a subtler way of impacting the mind by regulating feelings and enhancing positive emotions and may also alter the brain activity and autonomic variations as a long term effect, which is yet to be explored.

Our results also conveyed that there was no statistical significance in the negative effect parameter of the PANAS scale. There were a couple of limitations to our study. It wasn't a randomized control trial as the school had four sections and did not allow us to shuffle children for randomization and intervention. No objective parameters like EEG or fMRI were taken. This study aimed at establishing the efficacy of the intervention as no preliminary study has been done before *Chandas*. The subjects were not stratified based on their gender, as females tend to face more negative affect than males, which can also be considered as a limitation to the study. Another study is underway considering existing limitations.

There were no dropouts in the study which can be considered as strength. Secondly, a robust research method to explore the components of chanting by having four groups to eliminate the element of language, spoken verse, chanting of mantra and the Chanda/prosody alone was used in the study. Also, the study had adequate samples to show the improvement in the positive and negative affect in children and differentiation between the groups. More studies are warranted on *Chandas* with robust research methods, and objective tools like fMRI and EEG to further validate the results of the study. This will in turn augment our understanding of *Chandas*/Sanskrit Prosodies and also their potential to enhance mental wellbeing. We also hope that this study further encourages researchers to experiment with *Chandas* on children

with special needs and behavioural disorders to have a tool to bridge their emotional and cognitive gaps which will be cost neutral as well as easy to incorporate.