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BOOSTING PSYCHOLOGICAL WELL BEING OF ADOLESCENT: PSYCHONEUROBIC INTERVENTION VERSUS MINDFULNESS TRAINING

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Abstract

Dwelling on the mental health issues of society in general and youth in particular, the WHO report (2009/10) estimated that approximately one in five young people under the age of 18 experience some form of developmental, emotional or behavioural problems. With an estimated 1.2 billion young people aged 10-19 years in the world, the problem requires substantial consideration of mental health experts, behavioural scientists and policy makers. With this consideration, the present study attempts to investigate the effectiveness of two types of intervention strategies– Psycho-neurobics and Mindfulness meditation on the psychological well-being of high school students aged 15 to 17 years in Delhi-NCR, India. The quasi-experimental design examined the effect of 4 months mindfulness training and psycho-neurobic training as compared to control group on pre-identified adolescent exhibiting low psychological well-being. Analysis of Variance and Pearson correlation revealed both treatment groups experienced significant increase in psychological well being. However, significant difference emerged in improvement trajectory of different domains of psychological well-being where psycho-neurobic treatment yielded greater effectiveness. The study empirically demonstrates psycho-neurobics as an effective intervention that can be integrated with school curriculum in Indian subpopulation.

Keywords
Psycho-Neurobics, Mindfulness, Psychological Well-being, Adolescent, School-based Intervention

1. Introduction

The nature of difficulties and life challenges faced by adolescents are of much higher gradient than before, yet they are provided less guidance and intervention for their personal development (Pajares & Urdan, 2005; Suresh, Jayachander & Joshi, 2013). Owing to the dual effects of traditional and modern values as well as practices, the growth trajectory of next generation is exposed to an entirely different context (Yi, 2013).In the Indian sub-continent, home to the largest population of adolescents, complex economic, social, political, cultural and environmental contexts create a wide range of challenges (UNICEF report card for children, 2012). Additionally, some risk factors in the Indian adolescent's life are disintegration of joint families and the traditional social support systems (Vranda,2015), poverty and social stress (Kuruvilla & Jacob, 2007), social hierarchies (Jiloha, 2007) and friction between parents and children (Das, 2000) among others. Considering that such a large population is at the threshold of suffering from mental illness, there is an urgent requirement of immediate attention for some intervention strategies.

National Research Council and Institute of Medicine Committee on the Prevention of Mental Disorders and Substance Abuse Among Children,Youth, and Young Adults (2009) empirically attests that many of the mental, behavioural and psychological problems among children and adolescents can be prevented by early age interventions. Identifying their naturalistic setting to address the ramifications of childhood exposure to stress and trauma, schools have long been considered an ideal setting for 'frontline' providers (Burns et al. ,1995). Several school based mental health reforms like 'MindMatters' (Rowling, 2007) and'Resource Adolescent Program' (Shochet, Dadds, Holland, Whitefield, Harnett &Osgarby, 2001) in Australia, 'Coping Power Program'(Lochman& Wells, 2002), 'I Can Problem Solve' (Shure, 2001) and 'Good Behavior Game' (Embry, 2002) in the USA have demonstrated varying degree of success in such universal and indicated preventive intervention.

In case of the Indian sub-continent, there is a need to devise similar initiatives which are sensitive to the traditional beliefs and practices around wellness and psychological well-being. In India, 'Wellness' holistically is understood in terms of a combination of physical, mental, emotional and spiritual elements (Rice, 2003). Mental illnesses and psychological

problems are attributed to a variety of factors like unhealthy diet; disrespect to gods, elders and teachers; supernatural forces like effects of ancestral spirit, forest divinities, and evil eye; breach of taboo; past life activities; faulty bodily activity and humor imbalances (Balodhi,1999; Kapur, 1979; Prasadarao&Sudhir, 2001; Ramu& Venkataram,1985; Weiss, Sharma, Gaur, Sharma, Desai &Doongaji, 1986). According toLichtenstein, Berger and Cheng (2017), 75% of the patients take recourse to folk or religious healing before resorting to psychiatric services. In spite of marked differences between indigenous healing practices and traditional psychology, the western study of mental illness has rarely considered cultural or contextual factors in its conceptualization, diagnoses and treatment. (Mezzich, Berganza&Ruiperer,2001).

Critics argue that when conventional psychological intervention fail to take into account the holistic understanding of health, it can result in underutilization of services and early termination of therapy (Juntunen& Morin, 2004). Researches in the area likewise indicate that the American Indian students experience pressure to assimilate the American dominant culture, while remaining loyal to their own traditions (Werdel, 2010). Compared to their European-American colleagues, reluctance to utilize university counselingservice was also observed in Latino and African-American students (Ford, 2008). Goforth (2007) asserts that in Canadian residential school systems, treatment of Aboriginals as a monolithic entity and dis-consideration of their unique worldview has negative impacts. According toSingleton (2010), the Yoga practice from India, which is increasingly practiced in the West as a way of cultivating aspects of overall psychologicalwell-being, is primarily limited to postural yoga, even though that has never been the primary feature of Indian yoga. Despite strong preference towards religious healing and indigenous practices instead of availing psychiatric resources to ensure psychological wellness, there is dearth of interventions employing the frameworks posited by indigenous health system, like Ayurveda for school-based intervention. Some interventions in India like SEHER, the adolescent health programme, meaning ‘dawn’ in Hindi, ‘Strengthening Evidence base on school-based intErventions for pRomoting’, in the state of Bihar and SHAPE (School HeAlth Promotion and Empowerment) in the state of Goa have adopted conceptual framework and delivery specifically for the Indian students (Shinde et al., 2017). However, the traditional Indian practices for wellness have been sparingly utilized. Lack of replication or validation studies further weaken the empirical support for such interventions. Keeping in view the paucity of such interventions, the present paper attempts to study the effects of two kinds of interventions: the (1) Psychoneurobic intervention, which is based on Indian *kundalini jagran* of *Chakra* system

and restoration of balance in *panchmahabhoota* and the (2) Mindfulness meditation intervention, based on the Eastern Buddhist tradition of *satipatthana sutta*, on psychological well-being amongst the Indian adolescent. Social experiment was done to determine their efficacy on the psychological well being of adolescent in accordance to the eudaimonic perspective propounded by Ryff (1989). The following section explains the conceptual differentiation of the two techniques along with the theoretical foundations informing Ryff's model before expatiating on the experimental process.

Chandrashekhar (2015) explains Psychoneurobics as the "process of taking energy present in the universe by mental prowess and then transferring it into brain and neuro-system for healing purpose". A tripartite approach of healing, psychoneurobics comprise of Easy neurobics (neuro-muscular-respiratory actions), Sound neurobics (vibration through vowel chanting), and Light neurobics (visualization of different colors). Restoration of balance among the seven energy centres (*chakras)* and five elements (*panchmahabhoot)* of human body are considered important pre-requisites for holistic wellness.

Body organs and their associated functions deviate from their optimal course when their vibrations do not harmonize with energy of their respective colors or there is imbalance in the energy flow among the five elements composing human body (Azeemi&Raza, 2005; Hassan, 2000; Hirschi& Weiser, 2000). Through combination of Light neurobics, Sound neurobics and Easy neurobics, the practitioner engages in series of strategies which includes varied spiritual hand gestures called *mudras*, guided imagery, healing cabins with monochromatic colors, and mantra-induced meditative state. Looking at the available literature, there is extensive research body propounding support for the individual components. In a study by Gurjar, Ladhake and Thakare (2009), where they used waveforms of frequency modulation for analysis, results indicated that repetitive chanting of '*Om*', the primordial sound considered the most powerful *mantra*, had calming effect on physiology.'*Mudra',* which symbolizes various feelings, emotions and representatives of various states of being, involves a mental state of humility and expansion of awareness (Mohini, 2015; Saraswati, 1999). Gul, Nadeem and Aslam (2015) also endorse the use of chromo-therapy as complementary and alternative medical system for management of various ailments ranging from stress to cancer. With the assimilation of the Light neurobics sharing similar tenets with chromotherapy, Sound neurobics with its emphasis on *holy* vibration and Easy neurobics, postulating *mudras* as a prior physical state to be presumed before engaging in the former two, Psychoneurobics help attain dynamic balance of 'mind-body-spirit' (Chandrashekhar, 2017).

Psychoneurobic practice has effectively been used with diverse population. Some areas where psychoneurobic intervention has demonstrated positive outcomes include stress management for adult female and improvement in memory performance in high school students (Amarnath, 2017). Significant reduction in pre-operative anxiety levels of patients undergoing cataract surgery was also observed after patients received psychoneurobics and counseling services rather than only counseling services (Agrawal Gupta, 2018). Mishra (2018) has utilized psychoneurobics in his pilot study for management of hypertension.

Mindfulness can be defined as "moment-by-moment awareness" (Germer, Seigel& Fulton, 2005) or as a 'state of psychological freedom that occurs when attention remains quiet and limber, without attachment to any particular point of view' (Martin,1997). Mindfulness finds its roots in ancient spiritual traditions, and is most systematically articulated and emphasized in at least 2550 years old Buddhist spiritual tradition. The ultimate goal state for a being, prescribed by practitioners in the tradition, is *nirvana* - attaining liberation from suffering. At the process level, mindfulness is practiced against psychological backdrop of contemplating key three aspects of Buddha's teachings, namely impermanence (*anitya),* suffering (*dukkh)* and non-self (*anatta*) (Collins,1998). In late 1970s, mindfulness meditation began to be studied as an intervention to enhance psychological well-being. The two essential elements of mindfulness, as identified by Keng (2011) are awareness of one's moment-to-moment experience nonjudgmentally (*sati*) and with acceptance (*upasampada)*. They are also regarded as potentially effective antidotes against common form of psychological distress- rumination, anxiety, worry, fear, anger- many of which involve the maladaptive tendencies to avoid, suppress, or over-engage with one's distressing thought and emotions (Hayes & Feldman, 2004; Kabat-Zinn, 1990).

Researchers theorize that mindfulness meditation promotes metacognitive awareness, decreases rumination via disengagement from perseverative cognitive activities and enhances attentional capacities through gains in working memory. These cognitive gains, in turn, contribute to effective emotion regulation strategies (Davis & Hayes, 2012).

In a study of Chinese college students, those students who were randomly assigned to participate in a mindfulness meditation intervention had lower depression and anxiety, as well as less fatigue, anger and stress-related cortisol compared to a control group (Tang et al., 2007). Other arenas where mindfulness meditation has demonstrated positive outcomes include reduced ruminations (Chambers, Yee Lo & Allen, 2008), enhancement in cognitive flexibility and attentional functioning (Moore & Malinowski, 2009) and increased working memory capacity over time in military set-up (Jha et al., 2010).

Review of studies of psychological well being present two competitive approaches to well-being that have emerged as competing opponents in the research area: the hedonistic approach of subjective well-being (Diener, 1994; Diener& Lucas, 2000) and the Eudaimonic approach of psychological well-being (Ryff, 1989; Ryff& Singer, 1998). The Multi-dimensional model propounded by Ryff and Singer (1998) was derived not only from Aristotle's view of the highest human good involving virtue and the realization of one's potential, but also from the works of psycho-dynamically and humanistically oriented psychologists such as Jung, Maslow, Allport, Rogers and life span developmental theorists such as Erikson, Buhler, Neugarten and Jahoda (Ryff & Singer, 1996). The points of convergence from their seminal theories lead to formulation of six core dimensions namely: Autonomy, Environmental Mastery, Personal Growth, Positive Relations, Purpose in Life and Acceptance. For the present study, framework of Psychological well-being by Ryff (1989) was used to determine effectiveness of two interventions due to the comprehensive theoretical framework and greater similarity to traditional definition of 'wellnesses in India.

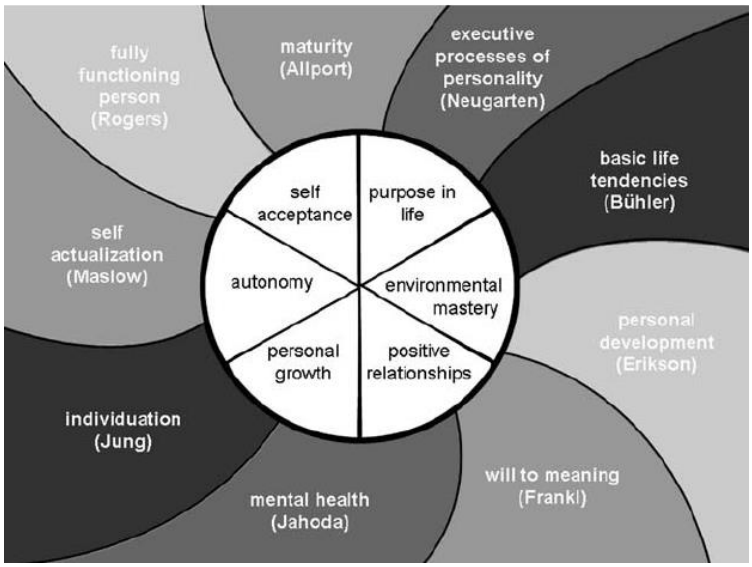


Figure 1:*Core dimensions of psychological well-being and their theoretical foundations* [adapted from 'Psychological Well-Being: Meaning, Measurement, and Implications for Psychotherapy Research', Ryff and Singer, 1996]

Looking at the available literature, there is disconcerting dearth of intervention studies, which take into consideration effectiveness of psychoneurobic and mindfulness meditation on the psychological well-being of adolescent population. Therefore, the objective of the present study is to bridge the research gap by examining the effect of four month

intervention using the two respective intervention strategies and statistically determining their efficacy. Three null hypothesis being considered for the same are as under.

H_o1: There will be no significant difference in the total scores of psychological well-being scale taken prior to and after the four-month psychoneurobic intervention.

H_o2: There will be no significant difference in the total scores of psychological well-being scale taken prior to and after the four-month mindfulness meditation intervention

H_o3: There will be no significant difference in the psychological well-being of participants in the three groups after the intervention.

2. Method

Sample: 60 participants, both male and female, aged between 15 to 17 (grade 10^{th} to 12^{th}) were selected from a group of 300 students in a school set-up who were administered with Psychological well being scale (Ryff,1995). The students were trifercated into three groups- intervention group 1, which received psychoneurobic intervention; intervention group 2, which received mindfulness meditation intervention, and control group, which received no intervention.

Tool:

Psychological well-being scale: The Ryff scale of Psychological well-being is developed by Dr. Carol Ryff & Keyes, University of Wisconsin. The 42-item scale has 6 sub-scales, each having 7 items. The items are scored on a 6-point scale ranging from Strongly Agree to Strongly Disagree. For each category, a high scoreindicates that respondent has mastery of that area in his/her life. The following 6 components of psychological functioning are

- Self acceptance: A positive attitude towards oneself and one's past life.

- Positive relationship : High quality, satisfying relationships with others.

- Autonomy: A sense of self determination, independence and freedom from norms.

- Purpose in life: Having life goals and a belief that one's life is meaningful.

- Environmental Mastery: The ability to manage life and one's surrounding.

- Personal Growth: Being open to new experiences as well as having continued personal growth.

The internal consistency coefficient are very high (between 0.86 and 0.93) and test-retest reliability coefficient of a sub sample of the participants over 6 week period was also high (0.81-0.88). Internal consistency coefficient for Ryff's six sub-scales range from 0.82 to 0.90.

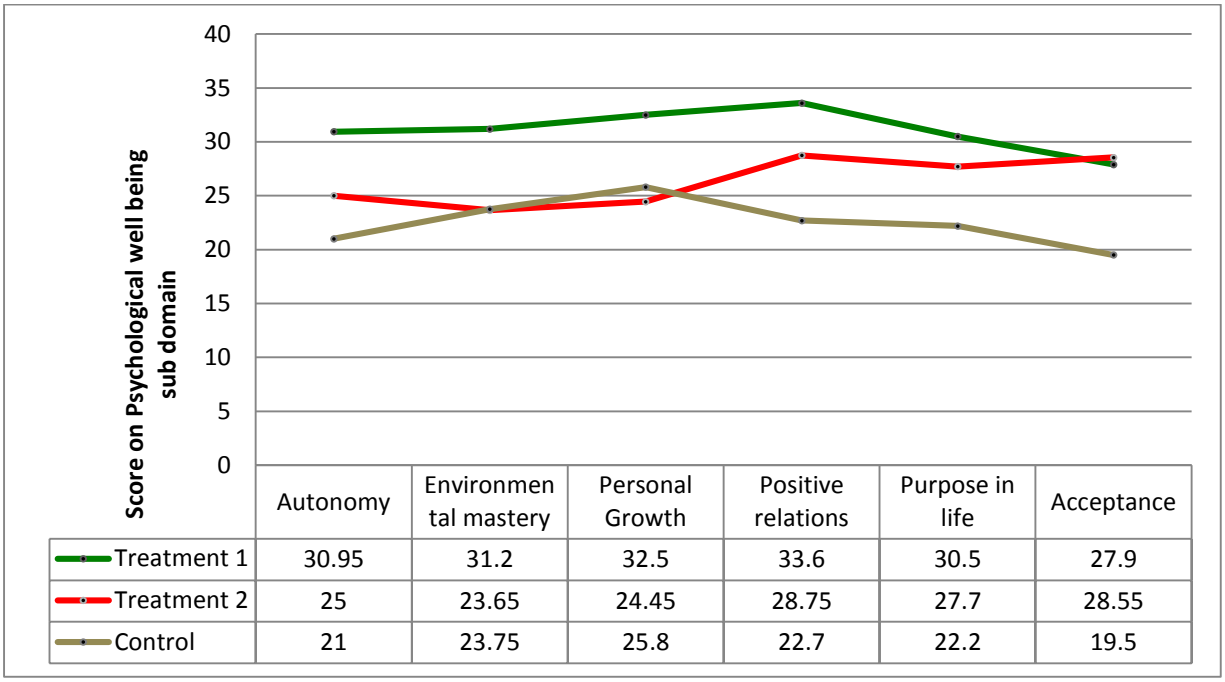
Neurobic machine: It measures the electro dermal activities occuring due to changes of bio-electrical impulses in Central nervous system due to mood swings or agitated mind. Also called mental thermometer, it ranges from 0-100, where lower scores reflect calmness of mind/mood.

Procedure: Two schools in Delhi-NCR were contacted and procedure and goal of the intervention was explained to authorities. Group administration of Psychological well being sub scale was done in students' respective class. 210 students from grade 10^{th} to 12^{th} participated out of which, 60 students scored either 150 or less,which was set as a baseline of poor psychological well-being. Signed consent form from students as well as their parents was procured as per ICMR guidelines. Thereafter, students were allocated to one of three groups. They received 1 hour intervention once a week for four months under field experts and practiced respective interventions half an hour everyday by themselves. Scores on Psychological well-being were taken before the intervention and then after four months intervention.

Statistical analysis: The data were analyzed using Statistical Package for Social Sciences (SPSS) 21 for Windows (SPSS, Inc., Chicago, IL, USA). Prior to data entry, the inventory was checked for completeness. Descriptive statistics (including means and standard deviations) were calculated for all scales and subscales.One way ANOVA was applied to assess effectiveness of treatment. Pearson correlation was also computed to access psychological well being score with psychoneurobic score.

3. Results and Discussion

Table 1:*Means of Psychological well-being sub-scales in the two intervention groups as well as control group*



	Autonomy	Environmental mastery	Personal Growth	Positive relations	Purpose in life	Acceptance
Treatment 1	30.95	31.2	32.5	33.6	30.5	27.9
Treatment 2	25	23.65	24.45	28.75	27.7	28.55
Control	21	23.75	25.8	22.7	22.2	19.5

Table 2:*Mean difference value of multiple comparison (ANOVA)*

Psychological Well being (Sub scales)	**Psychoneurobic Intervention**	**Mindfulness meditation Intervention**	**Control**
Autonomy	11.95**	02.80	3.40
Environmental Mastery	07.85**	03.30	0.15
Personal Growth	05.00**	03.40	1.50
Positive Relation	06.60*	05.90	0.80
Purpose in life	13.10**	04.65**	3.40
Acceptance	10.15**	05.90**	0.50
Total	**54.65****	**25.95****	**5.00**

* : p< 0.05 level of significance ; **: p<0.01 level of significance

The result table 1 clearly indicates that both the Psychoneurobic intervention and Mindfulness training performed better than the control group. Thus both the intervention spanning four months were potent in boosting psychological well-being.

For the Psychoneurobic intervention, Analysis of variance (table 2) indicates that mean difference was significant for subscale Autonomy[$F_{2,57}$= 11.95, p < .01], Environmental mastery [$F_{2,57}$= 7.85, p < .01], Personal growth [$F_{2,57}$= 5.00, p < .01], Positive relation [$F_{2,57}$= 6.60, p < .05] , Purpose in life [$F_{2,57}$= 13.10, p < .01], Acceptance [

$F_{2,57}$= 10.15, p < .01]. The mean score of participantsafter four month was 186.65±13.59, which is 41.40% more than the mean score prior to intervention. The difference is statistically significant [$F_{2,57}$= 54.65, p < .001]. Thus hypothesis 1 is proved.

For the Mindfulness training intervention, Analysis of variance (table 2) indicates that mean difference was significant for subscale Purpose in life [$F_{2,57}$= 4.65, p < .01] and Acceptance [$F_{2,57}$= 5.90, p < .01]. However, the difference in Autonomy [$F_{2,57}$= 2.80, n.s.], Environmental mastery [$F_{2,57}$= 3.30, n.s.], Personal growth [$F_{2,57}$= 3.40, n.s.] and Positive relation [$F_{2,57}$= 5.90, n.s.] was not significant statistically. The mean score of participants was 158.1±13.32, which is 19.64% more than the mean score prior to intervention. The difference is statistically significant [$F_{2,57}$= 25.95, p < .001]. Thus, hypothesis 2 is partially proved.

One way ANOVA revealed that total mean score on psychological well being was greater for psychoneurobic intervention group rather than mindfulness training group. The difference was statistially significant [$F_{2,57}$= 28.55, p < .001]. Thus, hypothesis 3 is also verified and Psychoneurobic intervention affirming greater psychological well being, which is also indicated from Table 1 graphical representation of mean scores post intervention.

The pearson correlation is neurobic score with psychological well being was *r=-0.588*, which is a moderate negative correlation. The b coefficient from linear regression analysis was -.0860, which was significant at 0.001 level. Thus, hypothesis 4 is also verified. It points out that lower neurobic score is associated with greater psychological well-being. Higher neurobic score is associated with high stress level as well in an Indian female sample (Amarnath, 2017).

t-test on dependedent means revealed that one tailed mean difference for psychoneurobic intervention was t = -5.80, which was significant at 0.05 level, but for mindfulness training intervention was t = -0.81,which was not significant at 0.05 level of significance. Thus, hypothesis 5 is partially verified with psychoneurobic intervention giving statistically significant outcomes.

4. Conclusion and future scope

Young adulthood is a period in which the foundation for future education, job, major life roles and workings towards long term productive goals are established. Similarly, it is an important period for the development of preventive interventions which are designed to prevent the development of more serious psychopathologies in adulthood. This stage plays a significant role in the study of developmental psychopathology because after this

maturational interval, it is difficult to change some behavior and emotional patterns. This period especially significant for the occurance or intensification of different forms of behavioral and emotional disorders, such as internalizing problems (depression, bipolar disorder), externalizing problem (delinquency, voilence), addictive disorders (alcohol abuse) and suicide (Trama & Modi, 2016). Developmental challenges have become more salient as their growth trajectory is exposed to entirely different context owing to the traditional and modern value juxtaposition. Thus, even the interventions aimed to enhance their well being must incorporate facilitative aspects of both indigenous and modern models of psychological well being.

There is a general consensus that any therapeutic model which having wider empirical support would be superior to ones less prevalent ones. Although, it has helped eliminate redundant treatment models, using it as a rule of thumb may not be helpful. A lot of indigenous models are not only at par, but possibly have greater efficacy, since it is resonant with native belief system.

In the present study, while, statistically both the interventions bring about significant improvement in the overall psychological well being after four month intervention, further data analysis reveal that in psychoneurobic intervention, there was significant improvement in each sub-scale of psychological well being, which was not the case with mindfulness training. Mean comparison of post-intervention score of both treatment groups also indicated signficant difference in two groups, with psychoneurobics demonstrating greater effectiveness.

It is important to note that there are certain terminologies and belief system behind the psychoneurobic practice, which have been quoted by Indian sages in ancient scriptures and are either present in such texts or have been practiced and passed down through local traditions, like faith base mysticism. The bridging between modern medicine with eastern spirituality system can help discover diverse healing methods, which should not be contingent only on statistical evidences. Concepts like Chakras (energy vortices) are believed to be part of *Yoga Upnishads* and in *Yoga sutras* of Patanjali (since around 2000-6000 BC), Similarly, in Indian scriptures, the sacred syllable ‘Om’is the premordial sound which signifies the Supreme Power. The description of ‘Om’ have been taken from four *Upnishads*, the *Bhagvad Gita* and Patanjali’s *Yoga Sutras*. Practicing *Udgita Pranayam*in which ‘Om’ sound is hummed is believed to induce state of psychological and physical well-being. In a study to test its potency, repetition of Om was compared with repetition of One. While both sessions resulted in difference in autonomic and respiratory responses, only in repetition of

'Om', there was reducation in skin resistance (Telles, Nagarathna & Nagendra,1998). In Svetasvatara Upnishad, the five elements comprising the body are earth, water, fire, air and space. It is beleived that a balance among all these five elements is paramount for the psychological and physical well being and imbalance in them result in dissonance of min-body-soul. Although, research corraborating with spiritual premises are scarse, easy neurobics and particular *hastmudras* are recommended for realigning these five elements in balance. Thus, even sans evidence, they formulate integral part of psychoneurobics.

Youth are in desperate need of the skills, knowledge and competencies to moderate the worldliness of our age with the understanding that can only come from the wisdom and spiritual intelligence (Lateef,2009). Their psychological well-being is a mandate for strong nation and psychologically resilient world. The need of the time is to understand that faith based indigenous practices may not only be at par with other popular practices in psychotherapeutic literature, but might even demonstrate greater efficacy. As the need to shift from medical curative model to holistic preventive model is getting realized, different cultures can benefit from exploring the traditional forms of fostering resilience at physical, mental, psychological as well as spiritual level. Further scope can be to investigate applicability and feasibility of different native practices on varied population.

5. Limitation

Some limitations of the study include nature of sample. The spiritual beliefs of the students were pre-screened to ensure their resonance with tenets of the two interventions. The efficacy of intervention among non-believers or students affiliated to different belief system remains to be empirically determined. Since, many aspects of the tripartite approach of psychoneurobics are deeply embedded in indigenous faiths of India, generalizability of research findings cannot be done to non-Indian students. The period of four months for interventions was determined on the basis of school calendar. The study could not include any delayed feedback after the intervention ended as the subsequent months were earmarked for examination preparation and final semester exams. Only a replication over more time points, during and after the intervention can establish stronger support of the psychoneurobic intervention. In the Indian sub-culture, home constitutes an important system. The focus of present research was primarily adolescent, but during the course of research, it was realized that psycho-education of parents prior to intervention may have ensured greater support and understanding from familial set-up.

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