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OBJECTIVE MEASUREMENT OF OUTCOME OF MENTAL HEALTH INTERVENTIONS IN ADOLESCENTS

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ABSTRACT

This before-and-after interventional study (without controls) was conducted on 30 male and 30 female junior college students in a metropolitan city to objectively measure the effect of interventions on the happiness level of junior college students. After explaining the study to students and their parents, written informed consent was obtained from parents as well as students who were willing to participate in the study. After taking pre-intervention readings on Neurobics Machine readings, a two-hour intervention was carried out to improve the way students perceived their feelings about themselves and their surroundings. Subsequently, post-intervention readings were recorded using the same Neurobics Machine. The pre-and post-intervention difference in the mean values of Neurobics Machine readings was significant (paired t-test value=2.076; p=0.042), indicating that the intervention was effective in improving the way students perceived their feelings about themselves and their surroundings. There was no significant gender difference (paired t-test value=0.535; p=0.596). The findings indicate that as compared to males, female participants had a higher level of happiness, both before and after intervention. The methods available to measure subjective wellbeing are potentially biased because of their excessive dependence on self-reported variables. The Neurobics Machine seems to be a cost-effective objective method to measure wellbeing.

KEYWORDS: Meditation, Mental health intervention, Neurobic Machine, Yoga.

INTRODUCTION

Adolescents belong to the age group of 10-19 years and are on the threshold of adulthood.[1] Adolescents experience a multitude of physical, hormonal, psychological, behavioural and social developmental changes.[2] Adolescence is also the period of impulsive actions influenced by peers and media[1] that are accompanied by stress on the adolescents and their family members.[3] Though adolescents yearn for independence in their lifestyle choices, most do not have the knowledge and life skills to lead an independent existence.

Risk factors in the Indian adolescent's life include reduced parental guidance and intervention for their personal development,[4, 5] traditional and modern values as well as practices,[6] disintegration of joint families and the traditional social support systems,[7] poverty and social stress,[8] social hierarchies[9] and friction between parents and children.[10]

Several school based mental health programmes in the developed countries[11-15] have suggested the need for preventive intervention. At community level, psychological problems in indigenous cultures are attributed diverse factors, such as, ancestral spirits, evil eye, past life activities and humor imbalances.[16-18] Studies conducted on aboriginals in Canada have reported difficulties in incorporating into the "Westernized" culture, while trying to retain own traditions.[19] When intervention programmes do not consider the traditional concepts of health, it can result in under-utilization of services and early cessation of treatment.[20] Yoga is a self-healing technique, but is largely limited to practice of postural yoga.[21]

Studies using meditation as an intervention have demonstrated reduced depression and anxiety levels; diminished fatigue, anger and stress-related cortisol;[22] increased cognition and attention;[23] and increased working memory capacity.[24] An Indian study[25] reported that students exposed to psychoneurobic intervention and mindfulness training performed significantly better than the control group and that both

these interventions increased psychological well-being.

"Subjective well-being" reveals an overall self-assessment of the quality of an individual's life. Methods for measuring subjective well-being include the Cantril Ladder; an overall life satisfaction question, as adopted in the World Values Survey; UK Office of National Statistics (ONS) experimental evaluative subjective well-being question and the 7-point "Delighted-Terrible" scale.[26-28] The Cantril Ladder (or Cantril's Self-Anchoring Ladder of Life Satisfaction) is a user-friendly visual scale, which measures subjective well-being and life satisfaction by asking participants to envision the most optimistic and pessimistic scenarios of their lives along with their aspirations for the future as well as the fears associated with that future. The participants are then are presented with a series of pictures of a ladder (the top and bottom of the eleven-step ladder represent the most optimistic and pessimistic scenarios, respectively) and asked to mark where they see themselves in the past, present, and future.[29,30] The Cantril's Ladder method is often utilized in studies that subjectively measure well-being and to determine the validity of other measures.[31,32]

Subjective methods are potentially biased because they excessively rely on self-reported variables. Hence, objective methods need to be used to measure well being. The objective dimensions of wellbeing are defined in terms of quality of life indicators, such as, material resources (income, food, housing) and social traits (education, health, political voice, leisure time, social networks and connections).[33] The Neurobic Machine objectively measures the state of positive or negative mental thoughts in an individual based on the galvanic skin resistance of the body, which is inversely proportional to the frequencies of brain waves created in the left and right hemispheres of the brain.

The purpose of the present study was to objectively measure the effect of interventions on the happiness level of junior college students using the Neurobics Machine.

MATERIALS AND METHODS

This before-and-after interventional study (without controls) was conducted on 60 junior college students in a metropolitan city in Western India in 2019. The study was explained to students of either sex, aged between 15 and 18 years and their parents. Written informed consent was obtained from parents as well as students who were willing to participate in the study. Those students did not give written informed consent (along with that of their parents) and students with history of any type of mental disorder were excluded from the study.

Neurobics Machine (Invisible Doctor Services, Faridabad, Haryana, India) was used. As per information provided by the manufacturer, for persons aged over 12 years, the readings (1-20), (20-50) and (75-100) were to be categorized as "most happy", "happy" and "depressed", respectively. Thus, a lower reading on the Neurobics Machine indicated a higher level of happiness. The Neurobics Machine readings were recorded before the intervention ("pre-intervention readings"). A two-hour intervention (comprising explanation of the concept of body and mind; yoga, music therapy, breathing exercises and meditation) was carried out which aimed at improving the way students perceived their feelings about themselves and their surroundings. Experts were involved in conducting yoga, breathing exercises and meditation. Subsequently, readings were recorded after the intervention ("post-intervention readings") using the same Neurobics Machine.

The data were entered in Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) and analyzed using SPSS statistical software Windows Version 25.0 (IBM Corporation, Armonk, NY, USA). Mean and standard deviation of readings were calculated. The paired t-test was used for statistical analysis and the statistical significance was determined at $p<0.05$.

RESULTS AND DISCUSSION

Thirty female (50.0%) and thirty male (50.0%) students participated in the study.

Pre-and post-intervention differences in readings: The pre-and post-intervention difference in the mean values of Neurobics Machine readings was 2.72. Paired t-test value = 2.076; p value = 0.042, indicating significant difference at $p<0.05$, which means that the intervention was effective in improving the way students perceived their feelings about themselves and their surroundings. Mind relaxation techniques facilitate identification of emotional problems that affect relationships and communication, which have a positive effect on moods of individuals.[34]

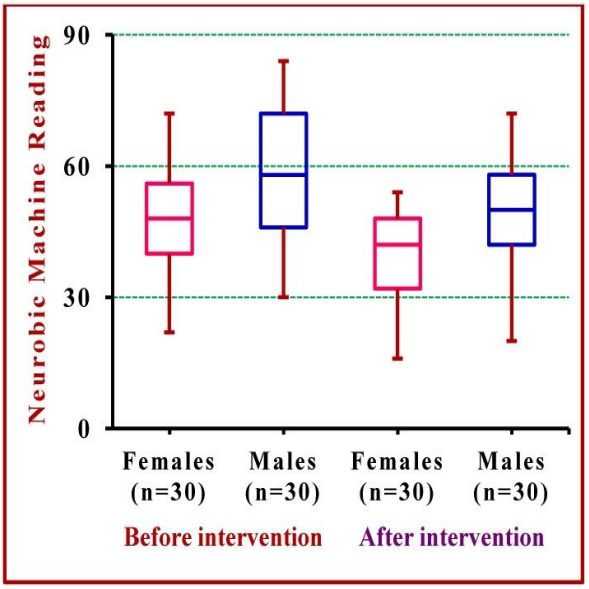

Fig: Gender differences in Neurobic Machine readings.

Gender differences in readings: The difference in the mean values of Neurobics Machine reading was 3.333 and 2.1 for females and males, respectively. Paired t-test value = 0.535; p value = 0.596. Thus, there was no significant gender difference at $p<0.05$, despite females showing higher difference in the mean values of Neurobics Machine readings (3.333), as compared to males (2.1). The minimum, first quartile, median, third quartile and maximum readings on the Neurobics Machine were lower for females as compared to that of their male counterparts, both before and after intervention. (Fig.) Since lower readings on the Neurobics Machine indicated a higher level of happiness, these findings suggest that as compared to males, female participants had a higher level of happiness, both before and after intervention.

CONCLUSION

The significant pre-and post-intervention difference in the mean values of Neurobics Machine readings implies that the intervention was effective in improving the way students perceived their feelings about themselves and their surroundings. Though there was no significant gender difference, the findings indicate that as compared to males, female participants had a higher level of happiness, both before and after intervention. The methods available to measure subjective wellbeing are potentially biased because of their excessive dependence on self-reported variables. The Neurobics Machine seems to be a cost-effective objective method to measure wellbeing.

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