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Effectiveness of Intellectual Learning in Dentistry Practices on self-esteem, negative affectivity, social inhibition and cognitive functions in undergraduate students

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Article History:	ABSTRACT
Received on: 09.10.2018 Revised on: 14.03.2019 Accepted on: 17.03.2019	The present study was an experimental (pre and post without control) design where the participants served as self-control. ILDP is a four-day workshop designed for first-year BDS students at Vishnu Educational Development & Innovation Centre (VEDIC), Hyderabad. Psychological parameters like self-esteem, negative affectivity and social inhibition were assessed. Cognitive parameters like reaction time, spatial and verbal memory and academic performance in the MCQ test were assessed before and after the ILDP program. Our study provides first scientific evidence for the beneficial effects of the ILDP program as there was a significant improvement in the self-esteem and decrease in the negative feelings and social inhibition. These changes contributed to the increase in the cognitive performance of the students. We recommend adoption of the ILDP program in the regular curriculum for the benefit of the college students in general.
Keywords: Intellectual Learning in Dentistry Practices, Memory, Self-esteem	
	

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INTRODUCTION

The young adults who are joining in the professional courses from plus two levels are in the transition stage. They undergo high levels of stress as the professional curriculum is entirely different from that of plus two. Most of the students were identified with lack of self-confidence, to face the

challenges. Hence, they require proper guidance and training to improve their self-confidence. A workshop on Intellectual Learning in Dentistry Practices (ILDP) for the first year BDS students had been designed and arranged at VEDIC from December 2016 onwards. ILDP is a student intervention on nurturing their self-confidence to speak effectively, to motivate and encourage them to improve their learning capabilities, to self-discipline themselves and focus towards their career (Thomas et al., 2006; Margaret et al., 2010; Richard et al., 2005). The present study was undertaken to observe the effectiveness of Intellectual Learning in Dentistry Practices on self-esteem, negative affectivity, social inhibition and cognitive functions in undergraduate dental students.

MATERIALS AND METHODS

Study Design

Experimental (pre and post without control) design. Participants served as self-control.

Participants, inclusion and exclusion criteria

Fifty male and female college students were included in the study after obtaining informed consent. Apparently healthy, willing participants within the age group of 18-24 were included in the study.

Intellectual Learning in Dentistry Practices (ILDP)

ILDP is a four-day workshop designed for first-year BDS students at Vishnu Educational Development & Innovation Centre (VEDIC), Hyderabad. During the program, the day will start by waking the student at 5:30 in the morning and starting the exercise and yoga sessions. From 9:00 am sessions will begin. In the sessions, the students were trained and nurtured through active, experiential, problem-based, solution-based and inquiry-based learning and SWOT analysis. The students also experience the positive edge reinforcement through presentations, team building activities, role plays. The interpersonal skills were developed through smart thinking, team performance and assessments. The communication skills of the students were improved through discussions, continuous evaluation and feedback in these four days. The discussions focus on the planning of the career and setting the goals. The program also consists of think, read, write & discuss a model which will help them enhance their learning capabilities. The students also trained in grooming, body language, facing an interview, Public speaking. At the end of the program, the students were clear about their future plans and their self-esteem levels will be increased and they will learn to work as a team.

Outcome measures

Psychological parameters

Assessment of self-esteem

Self-esteem was measured using the Rosenberg Self-esteem scale (Rosenberg, 1965). It is a ten-item self-administered questionnaire to assess the positive and negative feelings of the participants. The participants have to rate his feelings on a four-point Likert scale.

Assessment of negative affectivity and social inhibition

Negative affectivity and social inhibition are assessed by using DS 14 (Type D-scale). It is a self-administered questionnaire which consists of 14 questions. Seven questions for negative affectivity and seven for social inhibition. The participants have to grade on a five-point Likert scale (Denollet, 2000).

Cognitive parameters

Assessment of auditory and visual reaction time

Reaction time was assessed using RT apparatus purchased from Anand Agencies, Pune. It provides red light as a visual stimulus and tone sound as an auditory stimulus. The right hand and left-hand response for the auditory and visual stimulus was recorded (Archana Rajagopalan *et al.*, 2017).

Assessment of spatial memory

20 power point slides presentation was prepared and projected using a liquid crystal display (LCD) on the screen. Each slide consists of a simple line diagram which is easy to reproduce. Diagrams which could be verbally described like a square, circle, rectangle and pyramid were not included for testing. After showing all the 20 slides, a mathematical problem (e.g., $8-7+3-2+16+12-1+7$) was projected on the screen and asked to solve the problem. Later the participants were asked to recall all the 20 slides projected and draw on a paper within a minute. The correct answer was given a score as "1", and an incorrect answer was scored as "0". Different sets of drawings were used during pre and post assessments.

Assessment of verbal memory

20 power point slides were prepared and projected using liquid crystal display (LCD) on the screen. Each slide consists of a three letter word like for example ZOL. After showing all the 20 slides, a mathematical problem (e.g., $9-4+3-1+22+14-1+3$) was projected on the screen and asked to solve the problem. Later the participants were asked to recall all the 20 slides projected and recollect and present the same on a paper within a minute. The correct answer was given a score as "1", and an incorrect answer was scored as "0". Different sets of drawings were used during pre and post assessments.

Assessment of 100 pen dexterity test

100 pin dexterity test was performed to assess the speed of coordinated movements. The test requires smooth plastic pad containing fine pierceable 100 holes in it and 100 push pins. This set is provided to each participant and is assigned with a task to pin all 100 push pins to the pad. The time required to complete the task was recorded using a stopwatch. The value was expressed in seconds.

Multiple Choice Questions: A topic in Physiology Jaundice was taught to the dental students for one hour. Immediately after the lecture, the students were assessed using 30 multiple choice questions related to the topic taught. Further, the students attended the ILDP program for four days. After four

days on the fifth day, Jaundice class was again taught to the students with the same content, same faculty, and same presentation and after the lecture, the second assessment was conducted with 30 multiple choice questions. The second assessment questions were different than those given in the first assessment.

Data analysis: Data was analyzed using SPSS 20.0 Data was expressed as Mean and SEM. Student t-test was applied to observe the significance of the difference. A probability value of less than 0.05 was considered significant.

Ethical Consideration: The study protocol was approved by The Institutional Research Committee. Informed consent was obtained from all the participants.

RESULTS

Table 1: Self-esteem, negative affectivity, social inhibition of the participants before and after the ILDP program. (Data was expressed as Mean and SEM). (*P<0.05 is significant, **P<0.01 is significant, *P<0.001 is significant)**

Parameter	Before (n=50)	After (n=50)	P value
Self-esteem	22±0.54	31±0.67	<0.0001***
Negative affectivity	7±0.25	5±0.23	<0.0001***
Social inhibition	9±0.07	4±0.17	<0.0001***

There was a significant increase in the self-esteem score, followed by the ILDP program. A significant decrease in the negative affectivity and social inhibition was observed followed by the ILDP program. There was a significant increase in the auditory and visual reaction times both right and left responses followed by the ILDP program. Spatial and verbal memory scores were significantly improved followed by the ILDP program. The speed of coordinated movements was significantly fol-

lowed by the ILDP program. There was a significant improvement in student performance in the MCQ test.

DISCUSSION

The present study was undertaken to observe the effectiveness of Intellectual Learning in Dentistry Practices on self-esteem, negative affectivity, social inhibition and cognitive functions in undergraduate dental students. There was a significant decrease in the negative affectivity and social inhibition and significant improvement in the cognitive functions followed by the ILDP program. Further, the academic performance of the students was extremely well after the program. Self-esteem is an important psychological feature which is related to depression (Deb et al., 2009). Individuals with low levels of self-esteem are at risk for depression. Depression is a silent killer, and depressed individual looks at himself in a different way which further decreases the self-esteem (Prinz, 2012). Hence, there is a need for conducting a program to improve the self-esteem of the students. Negative affectivity and social inhibition are two personality traits which have a negative impact on the brain structures related to cognition like the amygdala, fusiform gyrus, insula and hippocampus (Kret et al., 2011). The individuals with these two traits are considered as Type D personality, and it was reported that they are at risk for coronary heart diseases (Denollet et al., 2001; Pedersen et al., 2003). Hence, identifying and counselling these individuals is highly recommended. ILDP program is designed to identify and also to help them to manage these individuals. There was a significant decrease in both negative affectivity and social inhibition followed by ILDP program. Reaction time assesses the sensory and motor systems of the central nervous system (Mohan et al., 1984). 100 pin dexterity tests assess the speed of coordinated movements. There was a significant improvement in the auditory, visual reaction time and speed of coordinated movements followed by the ILDP program. There was a significant improvement in spatial and verbal memory which may be due to a decrease in the

Table 2: Cognitive functions of the participants before and after the ILDP program.(Data was expressed as Mean and SEM). (*P<0.05 is significant, **P<0.01 is significant, *P<0.001 is significant)**

Parameter	Before (n=50)	After (n=50)	P value
Auditory reaction time (Right response) (ms)	0.242±0.00198	0.221±0.00325	<0.0001***
Auditory reaction time (left response) (ms)	0.357±0.01782	0.270±0.01329	0.0002***
Visual reaction time (Right response) (ms)	0.009±0.0005	0.007±0.0002	0.0021**
Visual reaction time (left response) (ms)	0.011±0.00042	0.009±0.00028	0.002**
Spatial Memory	12±0.42	16±0.28	<0.0001***
Verbal Memory	11±2	14±3	<0.0001***
100 pin dexterity test (Sec)	318±3.96	268±2.55	<0.0001***
MCQ test scores	16±0.42	23±0.57	<0.0001***

scores of negative affectivity and social inhibition which has a negative impact on cognitive areas of the brain. There was an overall improvement in the academic performance which is evident with an increase in the increase in the student performance in the multiple choice questions examination. The timings followed during the program will help the student to manage the time in their routine life which is most essential for a health care professional.

CONCLUSION

The present study provides scientific evidence for the beneficial effects of the ILDP program on psychological and cognitive functions of the students. We recommend further detailed studies to recommend the adoption of the ILDP program in all the professional courses for the benefit of the students in general.

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