INTRODUCTION

Emotions are consequential of one’s perception in relation to environmental assets. Based on context and the extent of experiences, a relative affect is conceived. These may be constructive, positive, or contrary. Positive affect refers to the extent to which an individual subjectively experiences positive moods such as joy. Goldstein and Nagliery[1] claimed that the aspect of pleasure, positive affect may overlap with “positive emotions” but are not identical. Affect induces resultant emotional response. On considering the stimulating response of affect, an experiment involved sorting of the emotional faces by 3–4-year-old patients. Facilitation was only observed in context to “happy faces” by participants, as stated in research by Qu and Zelanzo[2] in 2007. Evidently, positive affect was preferred over negative or neutral ones. Fredrickson propounded the domain of positive emotion consisted joy, interest, contentment, and love.[3] It is significant to consider that learning and assimilation regarding pleasurable activities, is a natural human tendency but compromised in affective disorders.[4] Affect, arousal (emotional), emotional response, and emotional regulation are sequential processes. Increased emotional response toward negative affect accompanied with dysfunctional emotional regulation if one of the prominent symptoms of affective disorders such as depression.[5]

Positive affect generation from “Fake, Fake and Duchenne Smile” and “improvising the pleasurable activities” in association with generating positive emotions, positive affective states are generally determined through self-reports.[6–7] The review literature supports various ways of positive affect generation, such as timed

Key words: Children, depression, interest, pleasurable, positive affect, psychotherapy, smile

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Positive affect generation from “Fake, Fake and Duchenne Smile” and “improvising the pleasurable activities” in association with generating positive emotions, positive affective states are generally determined through self-reports.[6–7] The review literature supports various ways of positive affect generation, such as timed
viewing of pleasant pictures, compliments, receiving gifts, reflection of positive emotion, encouragement, or affectionate touch. A study facilitated that immediate positive affect can be inducted through compliments and gifts in adolescents that promoted creativity and facilitated problem-solving. Stimulation and recurrence of positive affect results in cognitive flexibility, openness to information, and improvement in interpersonal problem-solving attribute. It also accelerates the coping processes and behavior, promoting health psychology.

A case study conducted in patients of multiple sclerosis, also experiencing depression suggests that telephonic psychological therapy based on models of positive affect and optimism was effective in reduction of depressive symptoms. Individual therapy targeting at cultivating positive behaviors or positive feelings do enhance well-being and alleviate depressive symptoms, provided that these interventions are continued for longer periods. Folkman and Moskowitz suggested that the positive affect has adaptive functions during chronic stress, resulting in coping processes.

Positive affect may be induced. Induction is about bringing or ascending any process to threshold level, so as to be carried further. A very common example is heating a pan of water, heat is administered from a stove and water gets warm. Here, with the basic principles, induction of heat can be achieved through conduction (direct contact), radiation (warm effect, indirect), and convection (warm effect). Similarly, positive affect can be induced in following ways. It is to noted that “Fake, Fake and Duchenne Smile” is introduced the very first time in the literature.

**Indirect method – physiological repetition of smile as “Fake, Fake and Duchenne Smile”**

Customarily, happiness and feelings of pleasure are exhibited through an immediate smile. Often, it is known as a real smile or Duchenne smile. The basis of such induction is the generation and repetition of just “Duchenne smile” expression in children during psychotherapy session. This technique is based on the intentional physiological movement of facial muscles involved in triggering a smile. Evidently, repetitive “smile” facial muscular movement stimulates positive affect. Initial smile expressions are “fake” but at the third or fourth step, a Duchenne smile is generated. The core basis of this process is the generation of a real smile, generally produced during felt positive affect. Involvement of physiological and neurological stimulation of the patient is the goal of this process (the stepwise procedure is in method section).

**Direct method “improvisation of pleasurable activities”**

Improvisation is an initial most step involving immediate gathering, linking of information available or additionally provided. This is continued by dialogue formation and enactment in any drama play. The most significant factor in improvisation is the spontaneous acknowledgment and expression either through verbal or action mode. Improvisation during a psychotherapy session is promising and has to be specifically applied. The activity “Improvisation of pleasurable activities” involves the enactment of activities which are pleasure causing in individuals. Considering an instance, playing badminton was individual’s pleasure causing activity. But due to anhedonia, the activity in obstructed. Improvisation means enactment of “playing badminton” included with the facial expressiveness corresponding to emotions felt. The therapist has to both execute pleasurable activities (experienced by the individual) during session with the patient and further provide the direction to initiate them on daily basis in actualization.

Bornstein, Harrison, and Zanjonc suggested that people tend to prefer stimuli to which they are repeatedly exposed. This effect is known as a mere exposure effect. Repetitive stimulation triggers the intrinsic motivation causing aspects for enhancing the execution pertaining to interest areas and pleasurable activities.

**Duchenne smiles and positive affect**

A Duchenne smile is generally a signal, a nonverbal cue that defines positive affect generation at that moment. Facial muscular movements define the emotions felt by an individual. Discrete emotion theory suggests that facial expressions display emotions. A tool called, Facial Action Coding System, classifies and labels observable human facial movements in respect to muscular motion. Its components are assigned as AU or action units. AU 6 denotes orbicularis oculi, muscle present in eyes orbiting area and cheek raiser. Moreover, AU 12 refers to zygomaticus major, the muscle that pulls lip corners. AUs 6 and 12 acts in combination to generate a Duchenne smile. For instance, facial region of muscles, zygomaticus, is associated with display of positive felt emotion during pleasurable acts. Contrary, the negative reaction and expression are associated corrugator region (part of AU 4) of facial muscles. Positive emotions such as happiness and pleasure can be customarily be exhibited as Duchenne smiles. A Duchenne smile is a sign of felt positive emotion, as suggested by evidence.

Research-based study of the emotional expression and brain physiology in the measures of cerebral asymmetry and subjective reports of positive emotions was conducted by Ekman et al. in 1990. It was concluded that a smile in which the muscle orbiting the eye was active in addition to the muscle that pulls the lip corners up (Duchenne) occurred during pleasant films and smiling patterns with inactive muscle orbiting eye (non-Duchenne) were displayed during unpleasant ones. Research shows that processing facilitation of stimulus processing leads
to physiological responses indicative of positive affect as well as self-reports of higher liking. Furthermore, the study was concluded by electromyography activity over zygomaticus region and participants’ self-report of positive reaction,²⁴

Facial feedback and facial configuration represent valid analogs of basic emotional expressions. Participants displaying Duchenne smiles reported more positive experience during pleasant scenes and humorous cartoons were presented.²⁶ Accompanied by autonomic arousal while viewing positive scenes. Also to be noted that Duchenne smiles can be both felt and posed and may not be the only basis of judging genuineness and amusement.²⁵ The major evidence lies in favor of display of Duchenne smile as an expression of positive affect.

Emotional arousal and emotional regulation
Emotion is a multifaceted phenomenon that involves physiological arousal, neurological activation, cognitive appraisal, attention processes, and response tendencies together with regulation of all in a broad concept.²⁶ Arousal is a significant component in context to emotions. Considering emotions, level of arousal is higher in anger, fear or joy, and low in sadness.²³ The ability to regulate and respond effectively toward the emotional contexts is defined as emotional regulation. Patients with mood disorders have ineffective regulation of emotions, that leads to frequent uncontrolled emotional outbursts. Studies on dysfunctional emotional regulation approach suggest that rumination and suppression of emotions increases the depression symptoms.²⁷ Irregular functionality of emotions often results in noncompetent ways to manage emotions in children who are prone to the development of depression. In addition, it conflicts the emotional goals during difficult environmental demands.²⁸

Depression
Depression is a mood disorder. Biological (such as familial transmission/genetics), psychological, environmental, and social risk factors interact among each other in a variety of ways to increase the chances of depression. Medical illnesses may increase the risk of depression. Traits include feelings of consistent negative mood or sadness, low self-esteem, anhedonia, sleep disturbance, and changing eating habits, for at least 2 weeks.²⁹ Diagnosis of mild-to-moderate or severe stage depends on the intensity of functional impairment caused in individuals. Evidently, symptoms in children differ, as compared to those in adults. For instance, depressed children display behavioral issues often with externalizing aspects such as irritating behavior. The treatment plan may include either the application of psychological therapies or pharmacological therapies, sometimes a combination of both. Also to be considered that positive affect is significantly reduced in depression.²⁹

Objectives of the study
a. To outline the method of positive affect generation through “Fake, Fake and Duchenne smile” and “improvisation of pleasurable activities”
b. To compare the pre and post scores of psychotherapy including “Fake, Fake and Duchenne Smile” and “improvisation of pleasurable activities” in depressed patients (9–12 years).

METHODS
Sample
Fifteen participants were screened in the age group of 9–12 years. Out of them, 6 participants were considered for the study. Four participants from a psychiatric hospital (outpatient setting) and two from a private school were selected on the basis of their symptoms described by informant (parents) or teachers and self. Informed consent from parents and authorities was obtained. The participants reported depressive symptoms from the past 2 weeks. It is to be noted that these participants were not under any other intervention for any psychiatric illness. Children’s depression inventory (CDI)³⁰ (Kovacs 1992) was administered to diagnose depression. There are five subscales in CDI, such as anhedonia, interpersonal problems, ineffectiveness, negative self-esteem, and negative mood. Shortlisted participants had CDI scores (baseline scores) ranging from 10 to 22.

Research design
The study is based on pre- and post-experimental research design. Purposive or judgemental sampling was done in schools and psychiatric hospital.

Procedure
On considering the baseline preintervention scores within the range (mild to moderate), participants underwent psychological intervention sessions for 10 weeks, one session per week. The duration of each session was 25 min approximately. These participants were given intervention sessions at their respective institutions. During the individual sessions, participants were instructed following ways for positive affect induction along with few other activities. The specific and main activities are described as follows:
1. Fake smile, Fake smile and Duchenne smile – the basis of this activity is display of smile. Physiological movement of facial muscles that stretches the upper lip corner, which is zygomaticus major in coordination of orbiculais oculi during a “real smile.” As described in the following stages, step 1 and 2 are only the movement of zygomaticus, which is an unreal smiling expression. As observed, the movement of orbiculais muscle of the eye orbit area and cheek raiser appeared along with the zygomaticus in step 3 and step 4. This may be defined as display of emotional expression of being genuinely happy. Following are the detailed stages:
Participants were individually asked to:

- Step 1: “Smile” (a fake expression)
- Step 2: “Smile again” (fake expression)
- Step 3: “Smile, showing your teeth” (partial fake expression/partial Duchenne)
- Step 4: “Smile and show your teeth” (Duchenne/real smile).

Step 4 is accompanied by therapist expression of smile, (this is a Duchenne smile). During this activity, few participants displayed Duchenne smile at third step only. Duration of this step was merely 10 s. There is a humorous context in the activity.

This step has a mild emotional arousal initially in participants while smiling (Duchenne smile). Gradually, this mild intensity of Duchenne smile production was increased to moderate one as further sessions progressed. It was observed that the participants had better emotional expression of smile as the psychological intervention proceeded.

2. Improvisation of pleasurable activities/interests: This can be considered a direct method of induction. The conversation between the therapist and the participant has to be based on generating interest areas of the participant. In most cases, the individual may not aware of the factor or process that will interest him or her. Unawareness regarding intrinsic motivation areas may be a barrier, but this is often observed in depressed patients. Informant (generally parent of the individual) can be asked regarding the participant’s interest areas such as playing activities or any other engross areas that the participant did earlier but stopped doing them gradually for a definite period. Common areas of interest in children of similar age might range from outdoor or indoor games, general play (hide and seek, pithu gram, etc.), drawing, dancing, TV, online games, appreciation from authority figures (teachers, parents), naturalistic based (sowing, planting, spending time with pets, making soils, and shaping play). Following are the steps followed in performing activity:

- Therapist may start with just one interest/pleasurable activity, with an objective to generate as many as they can. Talking or drawing pictures depicting themselves while performing those activities enhances pleasure in activities
- The participant has to improvise the same. Therapist has to carefully observe the participant’s corresponding facial expression.

It is to be noted that during the session, good amount of time has to be engaged in stressing intrinsic motivation to execution of interest areas. The main goal here is to engage the participant in the mild positive or neutral feelings that would emerge during this entire talk and depiction of interest area(s). The therapist has to consider extracting the interest areas, and this activity may be repeated every alternate session. Another simultaneous observation of the therapists’ has to keep on pointing out and noting down the corresponding facial expressions of participant. Relevant statements such as “I see, you are interested in doing this,” “it seems that you like playing like this,” like this can be replaced with whatever participant has made. The action comments are to be about acknowledgment, not necessarily praising the individual.

RESULTS

Shortlisted participants repeated these activities “improvising your interest/pleasurable activities” (on alternate basis) and “Fake, Fake and Duchenne Smile” (each session), as a part of the psychological intervention. The activities intend to inculcate the positive affect. Preferably, it temporarily shifts the rumination thinking pattern to neutral and positive affect types. Positive affect allows cognitive flexibility and expands attention. The participants showed improved attentiveness and adaptiveness, in terms of behavioral modification at home and school, as sessions progressed. Approach behavior was noted by the authority figures such as from parent and teacher feedback reports. The eye contact of the participant was enhanced gradually while interacting during the intervention. Physiological aspects of alertness were noticed. “Fake, Fake and Duchenne smile” act stimulates the positive emotion through participant’s experience of happiness, momentarily. Compared to significant reduction of positive affect in depression, an intentional step to create Duchenne smile may prove beneficial in emotional arousal, though it is a slow and gradual process. Results direct that psychological intervention with stimulation of positive affect will be beneficial for alleviating childhood depression. The subscales of CDI such as anhedonia, impersonal relations, and ineffectiveness were low in postassessment. There was a considerable amount of reduction in scores, indicating alleviating depression symptoms.

Statistical analysis

Participants (n = 6) underwent an intervention for 10 weeks. Children Depression’s inventory (Kovacs 1992) was used to measure the depression scores. CDI was assessed at the baseline session (preintervention) and at the 10th session (postintervention). The following table represents pre- and post-scores of participants. T-value was calculated and described later in this section.

Table 1 shows the age/sex, pre- and post-scores of depression on CDI.

\( T \)-test

\( T \)-test was conducted to compare pre- and post-scores of depression scores in the participants. The calculated values are represented in Table 2.
The paper outlines, what and how, administered activities lowered postintervention depression scores in participants. The steps involved in physiological repetitive movements of facial muscles (as described) that were able to mildly increase the emotional arousal component of positive affect state in depressed patients. As observed and self-reported by them. Second, reviving interest, by discussing or depiction and execution, has a vital place in the intervention plan. This study may prove significant if done on a large sample. This is effective in mild-to-moderate cases of depression, which may not straightaway be applicable to the major depressive disorder. Yes, if initiated from achieved moderate level from severe depression, this may prove fruitful. This current study may require biofeedback techniques or brain imaging to support the efficacy caused during/after these acts in psychological interventions along with the self-reports of participants. There is a scope in taking this research further to alleviate the symptoms of mood disorders in children and to enrich their mental health.

**Limitations**

a. Sample size was small  

b. Inclusion of control group would have been an advantage  
c. Implementation of FACS can also be used in the experiment in determining Duchenne/non-Duchenne expressions.

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**Conflicts of interest**

There are no conflicts of interest.

**REFERENCES**

1. Goldstein S, Nagliery JA. Encyclopaedia of Child Behaviour and Development. New York: Springer, 2011.  
2. Qu L, Zelanzo PD. The facilitative effect of positive stimuli on 3 year olds flexible rule use. Cogn Dev 2007;22:456-73.  
3. Fredrickson BL. What good are positive emotions? Rev Gen Psychol 1998;2:300-19.  
4. Deci EL, Ryan RM. Intrinsic Motivation & Self-Determination in Human Behaviour. New York: Springer; 1985.  
5. American Psychiatric Association Washington DC. Diagnostic and Statistical Manual of Mental Disorders-IV-TR. New Delhi: Jaypee Brothers; 2005.  
6. Fredrickson BL. The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. Am Psychol 2001;56:218-26.  
7. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. J Pers Soc Psychol 1988;54:1063-70.  
8. Soussignan R. Duchenne smile, emotional experience, and autonomic reactivity: A test of the facial feedback hypothesis. Emotion 2002;2:52-74.  
9. Greene TR, Noice H. Influence of positive affect upon the creative thinking.

### Table 1: Age/sex, Pre-Post scores of depression on Children’s depression inventory

| Participants | Age/sex | Preintervention scores (baseline) | Postintervention scores (10th session) |
|--------------|---------|-----------------------------------|---------------------------------------|
| A            | 11/male | 14                                | 2                                     |
| B            | 9/male  | 15                                | 7                                     |
| C            | 12/female | 20                              | 8                                     |
| D            | 10/male | 14                                | 8                                     |
| E            | 9/male  | 10                                | 4                                     |
| F            | 9/male  | 22                                | 11                                    |

| Group | Mean | n  | SD  | t     | Level of significance |
|-------|------|----|-----|-------|-----------------------|
| Prescore | 15.83  | 6  | 4.40 | 4.12  | At P=0.002 (P<0.05)   |
| Postscore | 6.67   | 6  | 3.20 |       |                       |

Table 2 shows the group category, mean scores (M), number of participants (n), standard deviation, t value, and level of significance. There was significant difference in the pre-post scoring. For postintervention, the mean score was 6.67 and preintervention mean was 15.83. The SD values were 4.40 (pre) and 3.20 (post). Specifically, t value is 4.12; df 10, at probability value 0.002 (P < 0.05), thus significant. These results suggest that positive affect induction techniques in psychological interventions have a significant effect in lowering depression symptoms in patients.

**DISCUSSION**

The prime focus of the execution of positive affect-based psychological intervention is to stimulate emotions through “improvising your interest” and “fake, fake and Duchenne smile” in depressed patients. This experiment is at a stage where it can be taken as ahead it has proven promising. “Fake, Fake and Duchenne Smile” is introduced the first time in depression treatment. Further explorations can be done through biofeedback or brain imaging techniques to consider associated changes occurring in the prefrontal cortex of depressed patients. Facilitation of activities (physiological movement) supports the positive affect stimulation.[34] The facilitation was well supported by participants’ reporting self appreciation respectively. The repeated exposure expedites processing of stimulus, stimulus recognition and clarity (Bornstein 1992). It is worth to induce positive affect/slow and gradual repetition of positive affect during intervention sessions stimulates positive emotions in children with mild-to-moderate depression. Furthermore, it is crucial for the therapist/authority figures to take a record of the repetition, execution of interest areas at home or school every alternate day.

**CONCLUSIONS**

Positive affect is an important factor in positive emotion. Although in depressed participants, positive affect is reduced.
and problem solving in children. Psychol Rep 1988;63:895-8.
10. Isen AM. An influence of positive affect on decision making in complex situations: Theoretical issues with practical implications. J Consum Psychol 2001;11:75-85.
11. Aspinwall LG. Rethinking the role of positive role of positive affect and self-regulation. Motiv Emot 1998;23:1-32.
12. Aspinwall LG, Taylor SE. A stitch in time: Self-regulation and proactive coping. Psychol Bull 1997;121:417-36.
13. Taylor SE, Aspinwall LG. Mediating and moderating processes in psychosocial stress: Appraisal, coping, resistance and vulnerability. In: Kaplan HB, editor. Psychosocial Stress: Perspectives on Structure, Theory, Life-Course, and Methods. San Diego, CA: Academic Press; 1996. p. 71-110.
14. Hart SL, Vella L, Mohr DC. Relationships among depressive symptoms, benefit-finding, optimism, and positive affect in multiple sclerosis patients after psychotherapy for depression. Health Psychol 2008;27:230-8.
15. Sin NL, Lyubomirsky S. Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. J Clin Psychol 2009;65:467-87.
16. Folkman S, Moskowitz JT. Positive affect and the other side of coping. Am Psychol 2000;55:647-54.
17. Bornstein RF. Exposure and affect: Overview and meta-analysis of research, 1968-1987. Psychol Bull 1989;106:265-88.
18. Harrison AA. Mere exposure. Advances in Experimental Social Psychology. Vol. 10. New York: Academic Press;1977. p. 39-83.
19. Zajonc RB. Attitudinal effects of mere exposure. J Pers Soc Psychol 1968;9(2 Pt 2):1-27.
20. Ekman P. Emotion in the Human Face. 2nd ed. New York: Cambridge University Press; 1982.
21. Ekman P. An argument for basic emotions. Cogn Emot 1992;6:169-200.
22. Ekman P, Friesen WV. Facial Action Coding System: A Technique for the Measurement of Facial Movement. Palo Alto, CA: Consulting Psychologists Press; 1978.
23. Ekman P, Davidson RJ, Friesen WV. The duchenne smile: Emotional expression and brain physiology. II. J Pers Soc Psychol 1990;58:342-53.
24. Winkielman P, Cacioppo JT. Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation elicits positive affect. J Pers Soc Psychol 2001;81:989-1000.
25. Krumhuber EG, Manstead AS. Can duchenne smiles be feigned? New evidence on felt and false smiles. Emotion 2009;9:807-20.
26. Thompson RA. Emotion regulation: A theme in search of definition. Monogr Soc Res Child Dev 1994;59:25-52.
27. Compare A, Zanbo C, Shonin E, Van Gordon W, Marconi C. Emotional regulation and depression: A Potential mediator between heart and mind. Cardiovasc Psychiatry Neurol 2014;2014:324374.
28. Thompson RA, Calkins SD. The double edged sword: Emotional regulation for children at risk. Regul Processes 1996;8:163-82.
29. Nutt D, Demyttenaere K, Janka Z, Aarre T, Bourin M, Canonico PL, et al. The other face of depression, reduced positive affect: The role of catecholamines in causation and cure. J Psychopharmacol 2007;21:461-71.
30. Kovacs M. The Children’s Depression Inventory (CDI) Manual. North Tonawanda, NY: Multi-Health Systems, Inc.; 1992.
31. Derryberry D, Tucker DM. Motivating the focus of attention. The Heart’s Eye: Emotional Influence in Perception and Attention. San Diego: Academic Express; 1994. p. 167-96.
32. Morgan CT, King RA, Weisz JR, Schopler J. Introduction in Psychology. New Delhi, ND: Tata McGraw Hill; 2002.
33. Isen AM. The influence of positive & negative affect on cognitive organization: Some implications for development. Psychological and Biological Approaches to Emotion. New York: Academic Press; 1990. p. 75-94.
34. Siddiqui SV, Chatterjee U, Kumar D, Siddiqui A, Goyal N. Neuropsychology of prefrontal cortex. Indian J Psychiatry 2008;50:202-8.