AUGMENTED REALITY BASED ART THERAPY FOR BORDERLINE PERSONALITY FEATURE OF SELF DESTRUCTION IN YOUNG ADULTS

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ABSTRACT

Objectives: *The present research studied the efficacy of augmented reality-based art therapy for the management of borderline personality feature of self-destruction.*
Design of the study: *Quantitative pretest-posttest randomized controlled trial design was used.*
Place and Duration: *This study was conducted in Karachi, Pakistan in 2021, over duration of four months.*
Sample and Method: *Purposive sampling technique was used to recruit 20 adolescent males (n=5) and females (n=15) aged 18-36. The participants were divided into treatment group and control group. The treatment group had 14 therapy sessions and one follow-up session. Both groups filled the Borderline Symptoms List at pre- and post-intervention.*
Results and Conclusion: *Results of the study show significant decrease in self-destruction of treatment group participants from pre- to post-intervention, as compared to control group. This study has some advanced implications for mental health practitioners and researchers, highlighting how augmented reality-based art therapy can be used to effectively reduce self-destruction behavior in individuals with borderline personality disorder.*

Keywords: *Borderline personality; Self destruction; Art therapy; Augmented reality; Adolescents*

INTRODUCTION

Recent research places Pakistani adolescents as having an 18% prevalence rate for borderline personality features with a 22:17 percent male to female ratio (Husain, 2018). Borderline personality features can be categorized as a persistent pattern of instability in interpersonal relationships and self-image, marked impulsivity, recurrent suicidal behavior and deliberate self-harm, chronic feelings of emptiness, and frantic efforts to avoid real or imagined abandonment (Bohus et al., 2007). These features are made apparent by behaviors such as anger outbursts, crying spells, irritability, affective instability, impulsivity, reckless driving, alcohol or other substance use, cutting or burning oneself, etc. (Baryshnikov et al., 2016; Martino et al., 2020). Moreover, psychotic features, such as hallucinations, delusions, and paranoia, have also been found to be a relatively salient feature of borderline personality disorder (Chanen et al., 2020).

One predominantly common feature of borderline personality disorder, also the topic of the present study, is that of self-destruction and self-harm, categorized as deliberate attempts to harm oneself as either an expression of emotional dysregulation, emotional reactivity, impulsivity, or sensation and attention-seeking (Baryshnikov et al., 2016). Suicidal behavior can include attempts to commit suicide, suicidal ideation, suicide planning, and different forms of self-harm, most common of which are burning or cutting oneself (Baryshnikov et al., 2016).

A promising treatment option for borderline personality disorder in specific, and cluster B and C personality disorders in general, has proven to be art psychotherapy (Haeyen et al., 2018). Art therapy, in place of purely verbal forms of therapy, is an experiential therapeutic entry for the patients, leading them toward better emotional awareness and emotional regulation (Lamont et al., 2009). Moreover, art therapy not only reduces psychopathology and maladaptive behaviors, but also leads to improved sensory perception, better personal integration, improved emotional regulation, improved impulse control, and the development of insight and comprehension regarding one's problems (Haeyen et al., 2018). The underlying mechanism of action of art therapy is the focus on non- verbal communication and the facilitation of a trusting and safe environment where individuals can express strong emotions (Harnden et al., 2004). Research into application of art therapy for borderline personality disorder shows positive reports for the acceptability and efficacy of this approach from people with lived experience of personality disorders who say that art therapy helped them in the expression and regulation of their emotions, improved their

self-image and autonomy, and gave them insight regarding their patterns of feelings, behaviors, and thoughts (Morgan et al., 2012).

In art therapy, creative expression in a variety of modalities is used to facilitate therapeutic growth. For a client to optimally benefit from this form of therapy, they need to feel comfortable with and connected to the therapist and the therapeutic space (Rodgers, 2000). For this purpose, many therapists begin in a modality where the client feels most comfortable, and for many in the younger generation, this comfort comes in the form of digital technology which they use abundantly in their everyday lives (McAdams, 2021).

Creative digital technology used for therapeutic purposes with clients includes mobile applications for art making, such as, video editing, animation, digital drawing or digital doodling, collage, and photography, etc. (Carlton, 2014). Digital methods give the capacity to integrate a wider variety of creative elements that clients cannot achieve with traditional methods, such as darkroom photography, thus, enabling clients to gain a deeper self-understanding using a wider array of creative options than was previously available to them (Wolf, 2007). Moreover, pioneering research by Hartwich and Brandecker (1997) showed that computer-based art therapy was better suited and more effective for individuals with borderline personality disorder, as compared to traditional art therapy. This was so because the digital medium brought on a less severe breakdown of the patients' defense mechanisms, as compared to traditional medium like paint and paper.

Augmented reality is a digital technology which has seen many recent advancements and public interest. It uses computer generated information to augment and enhance the real-world environment and impose artificial images onto real-time real-world images through AR tablets, AR mobile phone cameras, AR glasses, etc. (Charalambous & Ioannou, 2020). Numerous studies conducted with augmented reality showcase its efficacy for the treatment of various mental and physical health disturbances such as anxiety, phobias, depression, eating disorders, autism spectrum disorder, self-help, speech therapy, pain management, rehabilitation of stroke patients, etc. (Charalambous & Ioannou, 2020; Hutson, 2022; Perera, et al., 2022). Use of augmented reality as a creative medium for therapeutic interventions has even proven to be useful for the treatment of more serious disorders, such as schizophrenia, trauma, and personality disorders by virtue of foremost induction of mindfulness (Vold & Hernández-Orallo, 2021; Gillouin et al., 2023).

In such, the present research proposes two hypotheses:

H1: There will be a significant reduction in post-intervention self-destruction behavior of the participants in the experimental group as compared to pre-intervention phase.

H2: There will not be a significant change in post-intervention self-destruction behavior of the participants in the control group as compared to pre-intervention phase.

METHOD

The present research was conducted with the aim of exploring the use of augmented reality-based expressive art therapy to reduce the severity of borderline personality feature of self-destruction in post-test of the participants. A randomized controlled trial was conducted with residents of Karachi city, targeting via purposive sampling on social media platforms such as WhatsApp, Facebook, Instagram, etc. The participants who scored 50 or above on the self-report borderline symptoms checklist were then approached as the sample frame.

Initial sample frame obtained after screening consisted of 36 individuals, from which 3 dropped out after request for online consultation, 3 moved to another city, 4 opted for psychiatric help, 5 requested for immediate therapy and were, thus, provided further referrals, and 1 was previously diagnosed with borderline personality disorder and was taking psychiatric medications. The remaining 20 individuals were recruited for the research's final sample (aged 18-36, males n=5, and females n=15). Half of the sample was randomly assigned to the intervention group and half was assigned to the control group. The inclusion criteria did not have limitations regarding gender or socioeconomic status; however, it did require the participants to have a minimum academic qualification of Intermediate and to not have prior diagnosis of borderline personality disorder.

The intervention group participants were provided with fourteen psychotherapy sessions at Umeed-e-Nau clinic at the Institute of Professional Psychology, Bahria University, Karachi Campus, and Bahria University Health Sciences, and at clinic of House of Pebbles.

Measures

Borderline Symptoms List (BSL)

The Borderline Symptoms List (Bohus et al, 2007) was used as self-report measure to assess the participants' level of borderline personality features. It is comprised of 95 total items which are rated using a 5–point Likert scale where 0 = not at all and 4 = very strongly. The test is reported to have internal consistency Cronbach's α = 0.97. Moreover, BSL has seven subscales, namely, self-perception, affect regulation, dysphoria, loneliness, intrusions, hostility, and the self-destruction subscale which measures aspects of suicidal ideation, self-harm behavior, longing for death, and fascination with death using 12 items with a Cronbach's α = 0.94.

Assemblr Studio: Easy AR Maker (android version 4.1.7)

Assemblr studio was used to make augmented reality within the sessions. It is a free android application for turning 2-D and 3-D images into augmented reality. The application was designed by Assemblr (2018) and consists of a marker less based type of augmentation. Rather it uses basic templates and camera picture upload options, transforming a simple image into augmented reality format. It also provides drag and drop options and does not require any coding.

3-D Pen/ Doodling pen

A digital 3-D pen was used to contrast art in the sessions. It was a portable and handheld type of machine.

Procedure

Approval to conduct this research was taken from the board of the Institute of Professional Psychology, Bahria University, Karachi Campus. The participants were then approached via advertisement on social media platforms highlighting awareness regarding borderline personality features and the objectives of the present research. The sample frame consisted of 36 individuals which were then screened for the inclusion criteria using the Borderline symptoms list. The final 20 participants were then randomly divided into two equal groups, namely the treatment group and the control waiting-list group. The final 20 participants were all made privy to the details and purpose of the research and their consent was taken. Confidentiality was maintained and the participants retained the right to withdraw their participation at any point in the

study, as well as remain able to decide not share details of specific traumatic or hurtful life events. Moreover, the researchers took all necessary steps to ensure safety of the participants' wellbeing.

The experimental group's treatment plan for augmented reality-based art therapy interventions comprised of 14 weekly individual standard sessions. Each session was of approximately 90 minutes, duration of which was divided into 5 minutes initial check-in to reflect participant's outer world, 30 minutes for making art, 30 minutes for discussing the art, 10 minutes to wrap up the session, and 5 minutes final check-out to reflect on the session's interventions, explorations, and learning.

The treatment plan was divided into three levels. Level one comprised of three primary intervention-based sessions designed to help build rapport and have the participants get familiar with intervention's concept. Level two, lasting from session four to session twelve, dealt with gradually evolving the participants' perceptual continuum to a developmental continuum where the individual would be able to make desired changes and recreate their thoughts, feelings, and behaviors. The third and final level included sessions thirteen, fourteen, and the consequent follow-ups. Its purpose was to reflect upon the participants' learning so far and to sum up the termination phase of therapy. The follow-up session took place three weeks after the unilateral termination of the regular sessions. Here the participants were required to complete the Borderline Symptoms List (Bohus et al., 2007), and if it was assessed that a participant needed further therapeutic help, they were provided with referrals to professionals. The control group participants were also assessed for post-test borderline symptoms at this point of time. After the completion of the study, the results were coded and analyzed using SPSS version 22.0.

Definitions of some terminologies were used in the session plans are: Hardware – all technological devices used for art making; Activity – the activities participants were asked to do in session; Interaction – the physical surrounding through the participant interacted with their hardware, and; Dialogue – the communicational process retrieved from the internal dialogue of the individual following the incorporation of hardware, activity, and interaction in each session.

Session Plan

Session 01 – GROW (The Kitchen Table Classroom, 2019). The aim of this session was to develop rapport with the participant through semi structured

interview and goal setting. The objective of the session was to explore the concept of personal change in clients via art medium where they drew the word GROW and self-reflected from their onwards.

Session 02 – Scribble zoom in and out (Khat & Macklin, 2019). The aim of the session was to facilitate the process of catharsis, and have the client engage in and explore their impulsivity and curiosity. Moreover, childhood insecurities and traumas were explored in this session as well and the artwork was used to discuss the participant's self-perception of change.

Session 03 – Blind Contour Drawing (Hu et al., 2021). The aim of the session was to psychoeducate the participant with the primary goal of using blind contour drawing to draw attention towards differences of perceptions and conceptualization of information. The objective of this intervention was to help the participant become aware of their own judgmental reactions in different life circumstances.

Session 04 – Self-Awareness via Johari's window (Batool, 2018). The aim of the session was to introduce the concept of thought modification via developing insight through blind spots, in a nonjudgmental and nonthreatening manner. The objective of the session's activity was to help the participant become self-aware and to bring positive change in self-development.

Session 05 – My Life Outline (Batool, 2018). The aim of the session was to address self-harming behavior in session by identifying distressing elements in the participant's life, and to learn to better cope with these distressing elements in a nonjudgmental manner. The objective was to have the participant become able to identify different distressing and pleasant moments in their life, eventually leading to development of insight and stability in mood regulation.

Session 06 – Free Flow Writings without stimulus (Batool, 2018). The aim of the session was to channel emotional distress, negative thoughts, and self-destructive behavior. It was based upon the presumption that, while everybody has something to say and the ability to say it, the mental wellspring may be blocked by apathy, self-criticism, resentment, anxiety about deadlines, fear of failure or censure, or other forms of resistance. Objective was to explore and discuss features of personality malfunctions.

Session 07 – Draw what you hear (Chowdhury, 2019). The aim of the session was to provide the participant with cathartic medium to anchor their self, with respect to emotional distress and mood regulation. The objective was that via this

integration of the self, the participant would then be able to regulate their free affirmative emotions.

Session 08 – Draw your breath (Batool, 2018). The aim of the session was to strengthen self-awareness, which eventually helped the participant to maintain mood, regulate self-image, and possibly reduce self-harm. Objective was to help the participant feel relief by the end of the session.

Session 09 – Body Healing in Ink (Batool, 2018). The aim of the session was to reduce the participant's aggressive and suicidal impulses, thus, helping them better cope with their self-destructive behavior. In this manner, the objective of the session was to utilize and project participant's aggression in making art in a nonjudgmental manner.

Session 10 – Paint inside a Heart (Khat & Macklin, 2019). The aim of the session was to provide the participant with a nonthreatening and nonjudgmental medium through which they may process the emotions being experienced in that moment. The objective of the session was to bring into awareness the participant's own emotional burdens and help them create a positive self-image.

Session 11 – Sculpture of Anger (Godfrey, 2008). The aim of the session was to have the participant become aware of their emotional distress and the ways in which they manage that distress. To attain this goal, the participant was asked to create an art form sculpture that most resembled their anger in real life. By the end of session, the participant was then able to become self-aware of their aggression and frustration, which automatically led to a reduction in tendency to self-harm and helped them better regulate their mood.

Session 12 – Words of Mind Haiku (Stephenson & Rosen, 2015). The aim of the session was to provide the participant with a unique way to become mindful of their progress, enabling them to manage their borderline personality features in healthy way. The objective of the session was to have the participant self-reflect and then accept their self-image. By the end of the session, the participant was able to write their creative thoughts in form of poems, helping them to understand compassion and self-regulation.

Session 13 – Recollection of Moments (Filmore, 2019). The aim of the session was to reflect upon the growth and improvement observed by the participant as well as the therapist. In the session, progress exhibited by the participant was discussed and goals of the therapy process were reviewed. At last, one final objective was to ready the participant for termination of therapy.

Session 14 – What I Have. Aim of the session was to talk about the developmental continuum of the participant, to explore their awareness and acceptance of recreational thoughts while taking examples from their real-life scenarios. Therapy was terminated and closure was provided.

Follow-up session. It took place three weeks after the termination session. In the follow-up session, the participants completed formal post-Intervention assessment of the Borderline Symptoms List (Bohus et al., 2007). Moreover, if required, further referrals and psychiatric consultations were made for the participant with their agreement.

Statistical Analysis

The pre- and post-intervention assessments of the treatment group and the control group for the Borderline Symptoms List (Bohus et al., 2007) was scored. The results were coded and exported to SPSS, version 22.0. The data was then analyzed with paired sample analysis to explore the possible significant differences between scores of BSL of treatment group as compared to control group.
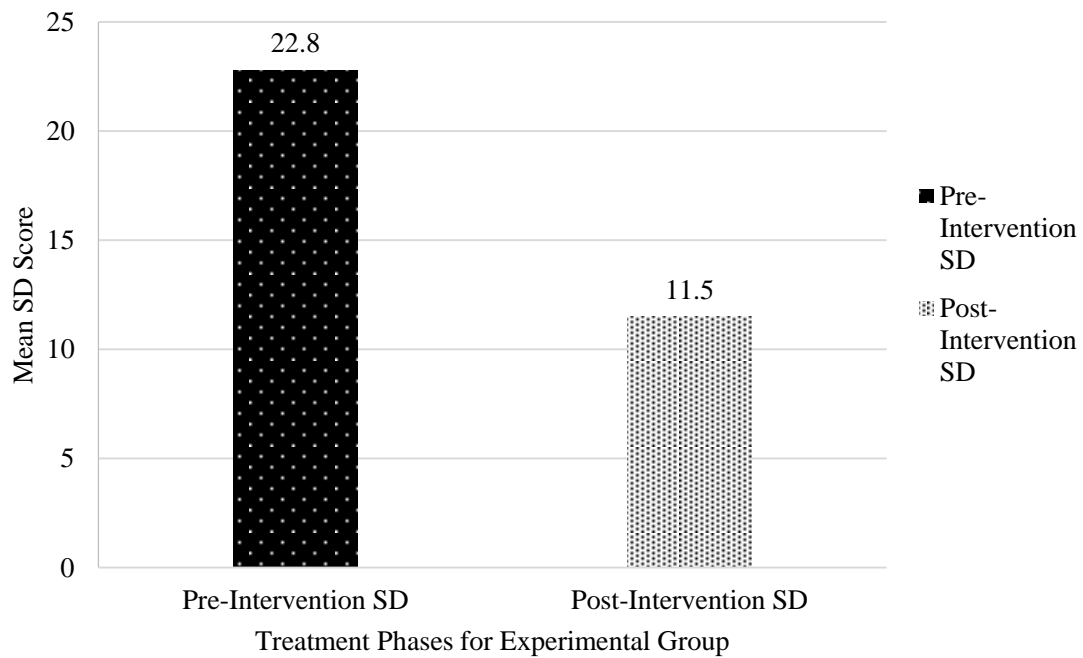
RESULTS

Table 1
Paired sample analysis for Borderline Personality Feature of Self Destruction Pre- and Post-Intervention of Experimental Group (n = 10)

Variables	*N*	Pre-Intervention		Post-Intervention		*t*	*Df*	*p*	*LL*	*UL*
		M	*SD*	*M*	*SD*					
SD Feature	10	22.80	6.89	11.50	3.34	10.46	09	0.00	17.86	27.23

Note. This table demonstrates the research hypothesis H1 showing reduction in SD from Pre- to Post-Intervention for Experimental Group. SD Feature = Self-destruction Feature.

Figure 1

Bar graph of paired sample analysis for Borderline Personality Feature of Self-Destruction behavior Pre- and Post-Intervention of Experimental Group (n = 10)

Note. This figure demonstrates a bar graph illustration of the research hypothesis H1 showing reduction in SD from Pre- to Post-Intervention. SD = Self-destruction.
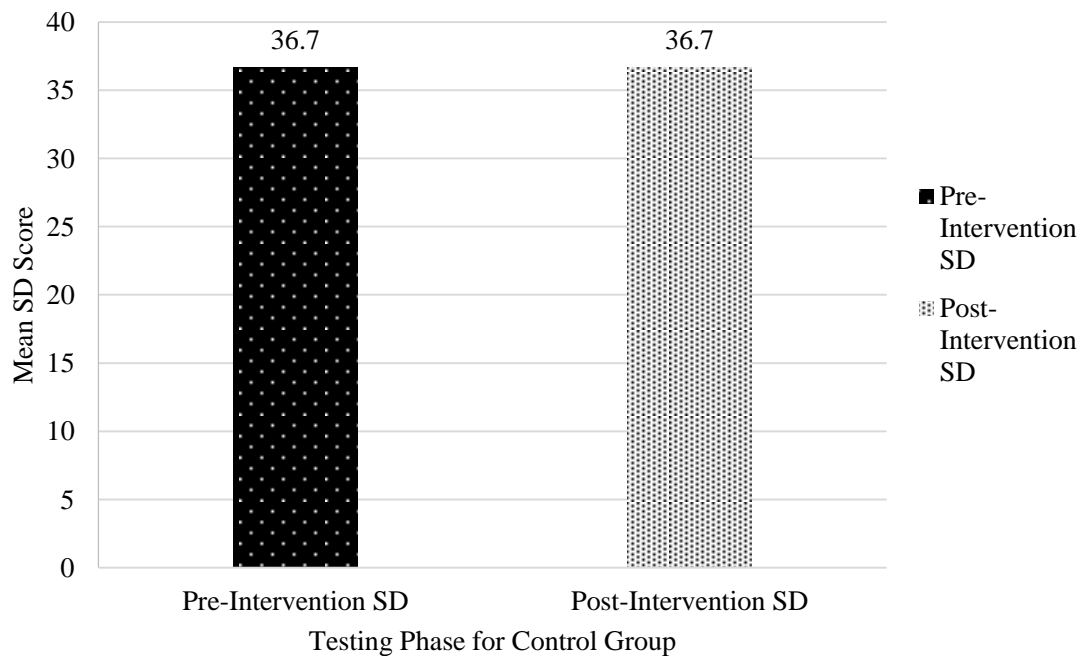
Table 2

Paired sample analysis for Borderline Personality Feature of Self Destruction Pre- and Post-Intervention of Control Group (n = 10)

Variables	N	Pre-Intervention		Post-Intervention		t	Df	p	LL	UL
		M	*SD*	*M*	*SD*					
SD Feature	10	36.70	4.64	36.70	4.56	0.28	09	0.78	4.45	0.28

Note. This table demonstrates the research hypothesis H2 showing no significant change in SD Feature from Pre- to Post-Intervention for the Control Group. SD Feature = Self-destruction Feature.

Figure 2

Bar graph of paired sample analysis for Borderline Personality Feature of Self-Destruction behavior Pre- and Post-Intervention of Control Group (n = 10)

Note. This figure demonstrates a bar graph illustration of the research hypothesis H2 showing reduction in SD from Pre- to Post-Intervention. SD = Self-destruction.

DISCUSSION

The core aim of art based augmented reality therapy in the present research was to improve emotional and behavioral well-being of individuals with borderline personality features. The participants reported having had difficulty in communicating and processing their adverse life events, their lived trauma, and their emotional distress, and thus, used to engage in self-destructive behaviors and self-harm as a mechanism of coping. Individuals with borderline personality features find that they cannot verbalize adverse life events due to judgmental self-opinion and a disturbed self-image. Hence, being able to portray these experiences through art was considered as being more directly reflective and indicative of their 'being' and personhood, as compared to words. Augmented reality-based art therapy aided the participants to externalize, i.e., project their inner self in a nonjudgmental manner, and helped them explore their presenting problems in an in-depth and structured yet nonthreatening way, and without the risk of their defenses breaking down severely and abruptly (Bucciarelli, 2019; Hartwich & Brandecker, 1997). This process of externalization facilitated the participants' process of therapy and personal growth, enabling them to aptly encounter their cognitive, emotional, and behavioral difficulties, while also making it easier to transfer newly acquired skills to the real-world setting.

This process of augmented reality-based art therapy did indeed lead to a significant change in the participants' self-destructive behavior. The pre-intervention scores of the participants mean 22.80, reduced to a mean 11.50 in the post-intervention phase, p 0.001. Contrarily, no significant change was observed in the self-destructive behavior scores of the control group from pre- to post-intervention phase. The difference in the mean of experimental group's pre- and post-intervention scores clearly reflect the extent to which the experimental group received advantage through the augmented reality-based expressive art therapy as an approach to manage their symptoms and overcome their mental stress. Kaimal and Arslanbek (2020) also commented that art therapy is comprised of such self-expression that it allows an individual to minimize negativity and paranoid behavior by overcoming and reducing their mental complexities.

Moreover, the usage of augmented reality tools, such as the 3-D pen and Assemblr studio, led to greater efficacy of therapeutic interventions. Using the 3-

D pen allowed the participants to feel more enthusiastic about exploring their creativity, ultimately resulting in reduction of their stress and apprehensiveness. The Assemblr studio induced self-observational skills within the participants, allowing them to better explore and modify their thoughts and actions. Moreover, while being immersed in and connected with an AI generated world, the participants experienced the illusion of the real world, helping them to transfer their learning into real-life setting more easily.

Conclusion

The present study's findings show that the adaptation of technological environment and its integration in art-based therapeutic conditions may help adolescents with borderline personality features to overcome their self-destructive behaviors. Art, declared as a form of self-expression, can help in providing support to maximize individual capabilities, helping them to stay away from negativity and self-harm, and to overcome their psychological complexities. The findings also indicate that augmented reality is beneficial in a way that it guides in knowing the capabilities of a person, and, when integrated into expressive arts therapy, it may maximize creative capacity of an individual to deal with certain illnesses, such as, borderline personality disorder. Therefore, the use of such technology based therapeutic interventions can assist psychopathological therapists to ensure mental wellness of patients suffering from personality disorders.

Limitations and Recommendations

This study is only limited to borderline clients as far as the current findings have been concerned. Further due to dropout the sample is also very small, further research should be done with larger sample. Findings showed that augmented art therapy is effective with borderline clients; it is recommended that augmented art therapy should be used as therapeutic tool along with other therapies.

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