Original Research Article

Evaluation of Systems Training for Emotional Predictability and Problem Solving (STEPPS) in Egyptian Patients with Borderline Personality Disorder

Abstract

Background: Recently, there has been tremendous progress in the treatment of this malady with various techniques of psychotherapy that were shown to be effective in RCTs. One of these techniques is System Training for Emotional Predictability and Problem Solving (STEPPS), which is a group psychotherapy approach developed in the 1990s at the University of Iowa in the US. Our study's objective was to assess the effectiveness of STEPPS in treatment of patients with borderline personality disorder in Egyptian Arabic speaking community and to evaluate the association between baseline clinical characteristics, treatment response, and early treatment cessation to understand which patients' characteristics make them suitable or not for this new treatment.

Methods: This research was performed in Neuropsychiatry Department of Tanta University Hospitals. Fifty-six patients were collected from the inpatient and outpatient departments. The study, however, was conducted as an outpatient program in the above-mentioned settings during the period from April 2019 to December 2020. Patients with BPD were assigned at their convenience or according to immediate availability of treatment slot either to Group-I receiving STEPPS (n=27, with only 20 subjects completing the course) or Group-II receiving usual treatment ―TAU‖ (n=29 of which 20 patients remaining till the end of the trial).

Results: STEPPS patients showed better improvement of BEST in comparison to TAU with significantly lower mean of total score of BEST that retained its significant lower values at the 6 months follow-up after treatment period. The decrease in the mean of BEST scores in the Experimental group in comparison to TAU was also significant for the mean values of all BEST subscales, significant variations was maintained at 6 months follow up between Experimental and TAU cases among all BEST subscales. STEPPS patients had better improvement of emotion regulation in comparison to TAU wih significant lower mean of total score of DERS that retained its significantly lower values at the 6 months follow-up after treatment period. The decrease in mean of DERS scores was significant for the mean value of all DERS subscales in the STEPPS group in comparison to TAU. Again, the outcomes obtained at the end of treatment year were all maintained at 6 months follow up with statistically significant differences between STEPPS and TAU patients among all DERS subscales. STEPPS patients showed better improvement of quality of life in comparison to TAU as shown in the statistically significant higher mean of total score of quality of life that retained its statistically significant higher values at the 6 month follow up following treatment year. The STEPPS group had significantly increased mean quality-of-life scores in comparison to TAU in the mean values of all quality-of-life subscales. Again, the outcomes obtained at the end of treatment year were all maintained at 6 months follow up with statistically significant differences between STEPPS and TAU patients among all quality-of-life subscales. Although STEPPS patients showed definitive improvement on the Filter Questionnaire in post-test in comparison to baseline test, the differences were not statistically significant in most of the filters.

Conclusions: STEPPS as a sole (not add-on) intervention proved superior efficacy in comparison to TAU (cognitive behaviour therapy) for treating patients suffering from borderline personality disorder in Tanta University Hospital, as evidenced by the lower

attrition rate of borderline patients who received STEPPS therapy in comparison to those who were managed by TAU. Patients in the STEPPS group had better improvement of emotion regulation, borderline symptoms and quality of life in comparison to TAU as demonstrated in the significantly lower mean of total score of DERS scale, BEST scale and the significantly higher mean of total score of WHO quality of life scale, both at the end of the treatment period after 6 months of follow up. Improvement in schema questionnaire in STEPPS group was limited as schema is rigid and need more duration to be changed.
Keywords: Problem Solving (Stepps), Systems Training for Emotional Predictability, Borderline Personality Disorder

Introduction:

Borderline personality disorder (BPD) is a chronic psychiatric disorder characterized by pervasive patterns of affective instability, instability of interpersonal relationships, self image disturbances, suicidal behaviour (suicidal ideation and attempt) and marked impulsivity, that cause significant distress and impairment in the patients' life. Due to anomalies in neurobiological systems subserving emotional regulation and stress responsibility, individuals with BPD are predisposed to emotional hyperarousal. As a result of anomalies in brain systems that mediate social cognition, attachment, and social reward, they are also predisposed to social and interpersonal stresses (Kulacaoglu and Kose, 2018).

It is most often linked to anxiety, mood, eating disorders, and drug abuse. PTSD is frequent, but not ubiquitous, in people with BPD. Characteristics include severe and sustained functional impairment as well as a high risk of suicide with a death rate between 8% and 10%, which is 50 times that of the normal population. (Leichsenring et al, 2011).

In epidemiological studies of adult populations in the United States, the median prevalence of BPD was 1.4%. In addition to considerable health care expenses, the illness is also associated with impairments in social and vocational functioning, which result in unemployment and lost wages. Consequently, the costs of this condition are multidimensional, including personal, economic, family, and social expenses. (Meehan et al, 2018).

Over the last few decades, a variety of psychiatric therapies have been developed for individuals with BPD. Most empirical evidence supports dialectical behaviour therapy, mentalization-based treatment, and schema-focused therapy. These new treatment approaches are highly beneficial and have enhanced BPD therapy in a variety of ways. Yet, for many individuals with BPD, these services remain inaccessible. The programmes implementation in mental health care settings is difficult as they are lengthy and labor-intensive. (Bos et al, 2010).

Blum et al. (2002) created Systems Training for Emotional Predictability and Problem Solving (STEPPS), an easy-to-implement group therapy approach. The program is simple and straightforward to learn by therapists from a variety of backgrounds. According to studies, it was more effective than standard therapy in lowering borderline symptoms and enhancing quality of life and global functioning. (Blum et al, 2008; Bos et al, 2010; Bos et al, 2011).

Since patients with BPD suffer from problems in emotional regulation and impulsivity, the use of the STEPPS program that entails training for emotional predictability and problem solving may help in treating these patients.

Our study's objective was to assess the effectiveness of STEPPS in treatment of patients with borderline personality disorder in Egyptian Arabic speaking community and to evaluate the association between baseline clinical characteristics, treatment response, and early treatment cessation to understand which patients' characteristics make them suitable or not for this new treatment.

Patients and Methods:

A comparative cohort study design was used.

This research was performed in outpatient clinics of neuropsychiatry department & psychiatry, neurology and neurosurgery centre in Tanta University Hospital.

Sample size and treatment allocation: Fifty five patients with BPD enrolled to outpatient treatment facilities in Tanta University Hospitals were assigned at their convenience or according to immediate availability of treatment slot either to group-I including 26 cases, divided into 4 groups each containing 6-7 patients with 2 facilitators, receiving STEPPS program for 20 weeks, or group-II including 29 patients receiving treatment as usual ―TAU‖ defined as ongoing outpatient psychotherapeutic treatment from original referral sources for the same period. During treatment period there were drop out cases (6 cases from group-I and

9 cases from group-II) so forty patients only were included in the study 20 patients for each group.

Sampling design: All patients fulfilling the inclusion criteria and willing to participate in the study were included. The study was conducted during the period from April 2019 to December 2020.

Inclusion criteria: 1-Age between from 18 to 45 years. 2-Both genders. 3-Diagnosis of BPD according to DSM-5.

Exclusion criteria: 1-Patients having psychotic psychiatric disorders. 2-Organic or neurological disorders. 3-Subjects with intellectual disability and other causes of cognitive impairment. 4-Having current (past month) substance abuse or dependence. 5-Inability to provide informed consent. 6-Participated in STEPPS previously.

Data collection tools and techniques:

The following techniques and tools were used: I- Semi-structured interview questionnaire using Tanta psychiatric case taking sheet to collect a. Sociodemographic data as sex, age, educational level, residence, occupation and marital status. b. Medical, psychiatric and drug history. c. Physical and neurological examination.

II- Socioeconomic status was particularly assessed by El-Gilany et al, (2012) socioeconomic status scale. This scale is composed of seven domains with a total score of 84. It utilizes the total family income in non-monetary terms such as family possessions, ownership of 81 agricultural land, and non-agricultural land for housing, ownership of other houses etc. The scale consists of Educational and cultural, Family members, Economic, Occupation, Family possession, Health sanitation, and Health care domains. It hereby classifies subjects into high, middle, low, and very low levels depending on the quartiles of the score calculated.

III- Structured Clinical Interview (SCID-I) and (SCID-II) [First et al, 1997; First et al, 2002]: The Arabic version (Hatata et al, 2004).

The SCID-I/SCID-II for DSM-IV is a semi-structured clinical interview performed by experienced physicians and aimed to generate psychiatric diagnoses in accordance with DSMIV/DSMIV-TR (American Psychiatric Association, 2000) diagnostic criteria. 15 minutes to two hours are required for administration. The SCID is meant to begin with introductory open-ended questions for each topic area (e.g., ―Have you ever had…? ‖), followed by a series of planned, verbatim questions. At the conclusion of each module, the SCID instructs interviewers to ask as many additional questions as necessary to ensure the legitimacy of their evaluations. Interviewers are also urged to validate their assumptions wherever feasible with further data.

The score summary sheets document any SCID Axis I and/or Axis II diagnoses; additional interviewer diagnoses; an indication of psychosocial and environmental problems (Axis IV); and a rating for the Global Assessment of Functioning (GAF) Scale, Axis V. Although the SCID was initially meant to be administered face-to-face, research indicates that computer-assisted administration and telephone administration provide equivalent diagnoses (Cacciola et al, 1999). Contrary to its name, the format is considered semi-structured since, in addition to the answers to scripted questions, an examination of collateral data and clinical judgement are necessary to evaluate whether diagnostic criteria have been satisfied.The framework of the interview itself assures comprehensive coverage of diagnostic options and decreases the likelihood of clinical judgement errors or the introduction of cultural/social biases. (Torres et al, 2007).

Dozens of research have demonstrated the therapeutic reliability of the SCID, and hundreds more have examined its efficacy, one example is the study of Zanarini et al. (2000). The tests also have shown high validity (Basco et al, 2000).

IV- Psychometric Assessment

1- The Borderline Evaluation of Severity Over Time (BEST): (Blum et al, 2009)

In this study the BEST was administered at baseline and weekly till week 20 and after 6 months in the STEPPS group and in the beginning, after 20 weeks, and after 6 months in the TUA groups.

BEST was created to assess the BPD-typical thoughts, feelings, and behaviors. During a randomised controlled study (RCT) of STEPPS for individuals with BPD, data were obtained. The instrument demonstrated a moderate degree of test-retest reliability, strong internal consistency, and high discriminant validity. The correlation between its 15 individual items and the total score was at least modest. Additionally, the BEST was sensitive to clinical change as early as week 4 of the RCT and had a strong correlation with other measures of disease severity. In conclusion, the BEST scale is both accurate and valid for evaluating severity and change in BPD patients (Pfohl et al, 2009).

The BEST was created to supplement the STEPPS therapy program. Due to the importance of self-evaluation in STEPPS, it was determined that participants need a brief, self-rated, symptom-based assessment that could be completed at the start of each session to provide a "snapshot" of the individual's present condition: that is, has the patient been more emotionally stable, less impulsive, or less likely to have self-harmed since the last session? Additionally, was the individual more likely to have implemented STEPPS program-taught skills? The scale consists of fifteen elements and three subscales. Each item is scored using a Likert-type scale. Subscale A (Thoughts and Feelings) consists of eight questions that measure mood reactivity, unstable relationships, identity disturbance, emptiness, paranoia, and suicide ideation. subscale B (Behaviors Negative) make up the following four questions, which assesses negative activities such as self-injury. These subscale items are evaluated from 1 (None/Slight) to 5 (Extreme). Subscale C (Behaviors Positive) included the last three questions, which evaluates activities such as adhering to therapeutic goals. These items are ranked on a scale from 5 (Almost Always) to 1 (Almost Never). The A and B subscales are derived from the DSM-IV criteria. The two subscales were designed to distinguish between Thoughts and Feelings (A) and the disorder's usual Negative Behaviors (B). It was thought that negative behaviors (B) undergo more rapid improvement than thoughts and feelings (A) as the STEPPS program developed, and that when individuals noticed an improvement in their subscale B score, they were encouraged to use the newly taught behavioural skills. To acknowledge positive behaviors' acquisition, Section C was added, as well as reinforcing the usage of new skills before observing progress in A and B, as subscale C scores were anticipated to improve first.

(one case mentioned, ―How can we receive credit for our positive actions?‖). Therefore, it was believed that observing this shift (i.e., progress in C) encourages the continuous application of new abilities, which would eventually be reflected in improvements in B and A. It was also believed that patients would be disheartened if their anticipated use of new abilities did not result in improvement. Consequently, the progress in C motivates people to continue utilising the abilities, despite the lack of progress in A and B. The total for each subscale is determined to score the BEST. The total from subscale C is then subtracted from the sum of A and B. A 15-point adjustment factor is added to the final score, which can vary from 12 (best) to 72 (worst) (Blum et al, 2002).

In our study, we have translated the BEST scale into Arabic after obtaining permission from the authors Blum et al. (2002). The scale was then validated in the Egyptian culture and reviewed by an expert in clinical psychology who evaluated the items comprehension, as well as their semantic, linguistic and conceptual equivalence before finally being back-translated. The reliability of the scale in its Arabic format was again tested using Cronbach's Alpha through the following process:

a) Pilot study in which the Arabic version was used containing 30 patients.

b) Cronbach's Alpha was calculated to be 0.873 (significant if > 0.7)

2- Arabic translation of Difficulties in Emotion Regulation Scale (DERS): (Gratz and Roemer, 2004), Arabic version was utilized (Abdelkarim et al, 2017).

The DERS offers one of the most thorough assessments of emotion dysregulation. This tool includes 36 self-report points endorsed on a five-point scale ranging from ―almost always 91–100%‖ to ―almost never; 0–10%‖ and analyze challenges associated with the flexible multidimensional control of emotion , including six subscales: 1) (non-acceptance subscale) non-acceptance of or negative reaction to emotions; 2) (goals subscale) challenges engaging in goal-oriented behaviour when experiencing negative emotions; 3) (impulse subscale) challenges controlling impulsive behaviour when experiencing negative emotions; 4) (awareness subscale) lack of awareness to emotion; (strategies subscale) perceived inability in coping with negative emotions; and 6) (clarity subscales) confusion regarding one's emotions [Skutch et al, 2019].

The DERS and its subscales exhibited strong internal consistency with Total DERS $\alpha = .93$ in a large collegiate sample and all subscales $\alpha > .80$, significant correlations with other emotion regulation measures, and significant correlations with self-reported self-harm history and intimate relationship abuse. In addition, a small subsample demonstrated sufficient to excellent four- to eight-week test-retest reliability for the scales, with interclasses coefficients of $\rho I = .88$ for Total DERS and $\rho I = .57$ to .80 for the six subscales.

The tool was translated to Arabic after permission from the author. The reliability of the scale in its Arabic format was again tested using Cronbach's Alpha through a pilot study in which the Arabic version was used containing 30 patients. Cronbach's Alpha was calculated to be.
0.847 (significant if > 0.7)

3-The Filters Questionnaire (Blum et al, 2009):

The cases ‘affinity for maladaptive schemas (Young et al. 2003)
– referred to as ‗filters ‘throughout STEPPS – which often characterize BPD, is monitored within the STEPPS programme. Therefore, this questionnaire was administered to the patients in the STEPPS group at the beginning, and at the end of the program, The Filters Questionnaire is a self-report questionnaire of 60-items similar to the Likert scale that STEPPS participants fill out to identify negative and distorted ideas based on 10 cognitive schemas: Emotional Deprivation, Mistrust, Abandonment, Failure to Achieve, Defectiveness, Vulnerability to Harm, Subjugation, Self-Sacrifice, Entitlement, and Unrelenting Standards. As part of the STEPPS protocol, time was allowed during these sessions for the completion of this measure, which is also a fundamental component of the skills training. This questionnaire tackles these 10 ineffective filters with 6 questions for each filter. Each question is graded on a scale of 0 to 4, resulting in a total score for each filter from 0 and 24. Higher scores represent a greater prevalence of that particular filter in the patient ‘s day to day functioning.

Before we embarked on the study, we had translated the schema questionnaire into Arabic with evaluation of the individual items comprehension within the context of the Egyptian culture including semantic, linguistic, and conceptual evaluation. It was then back translated and compared to the original test before being ultimately introduced to the patients. The reliability of the Arabic questionnaire was also tested using Cronbach's Alpha through a pilot study in which the Arabic version was used on 30 patients. Cronbach's Alpha was found to be 0.78.

4-The World Health Organization Quality of Life (WHOQOL): (Skevington et al, 2004)

The WHOQOL assessment is a tool for measuring quality of life (QOL) that was created by the WHO in collaboration with 15 centers throughout the world. It examines the individual's perceptions of QOL within the context of his or her values, culture, and personal objectives,

concerns, and standards. (Skevington et al, 2004), in order to make efforts to develop the culturally sensitive and comparable assessment instrument (WHOQOL Group, 1994).

The WHOQOL-BREF instrument, a condensed version of the QHOQOL100, consists of 26 items that assess the following four major domains: – (1) physical health, (2) psychological health, (3) social relationships, and (4) environment – All of which are measured using a five-point scale for each subitem. The WHOQOL-BREF was validated by Trompenaars et al (2005).

The reliability of the scale in its Arabic format was again tested using Cronbach's Alpha through a pilot study in which the Arabic version was used containing 30 patients (Ohaeri and Awadalla 2009). Cronbach's Alpha was calculated to be 0.741 (significant if > 0.7)

The STEPPS Program:

The program was bought with permission of the authors Blum et al (2002), submitted to Arabic translation to be used in the study in January 2019. After that, several training sessions were held online for the facilitators by an expert trainer of the STEPPS program, before and during application of the program. The 20-week outpatient cognitive-behavioral skills-based programme is provided in a group environment with two-hour weekly sessions guided by two facilitators who adhere to a planned lesson plan. Several training sessions were held with the trainer and facilitators online before and during application of the program. The programme is completely manualized and intended for easy classroom or seminar delivery. Each session focuses on either behavioural skills or emotion management and includes homework tasks. STEPPS does not include individual therapy and is referred to as an ―adjunctive‖ program as it is added to the present treatment that group members are getting (e.g., medications).

The program has 3 main components: (1) Awareness of Illness, (2) Behaviour management skills, and (3) Emotion management skills. The term BPD is renamed Emotional Intensity Disorder (EID), which appears to more accurately describe the experience of persons with BPD. The STEPPS program is described in more detail by Blum et al (2009). The systems component is implemented with a two-hour session that educates family members, friends, healthcare professionals, and correction workers, about the disorder and the program.

In the first session, introduction of the participants and cofacilitators occurs, followed by completion, scoring, and recording of the BEST scale. Then, the guidelines for participating in STEPPS program were reviewed as well as the concept of BPD, including diagnostic criteria and introduction of Emotional Intensity Disorder as an alternate ―diagnostic‖ label. In this session also, identification of reinforcement team (support system members with whom they choose to share BPD information, the skills they are learning, and how what they have learned can be reinforced by the team). Every group member outlines his or her individual objectives. (e.g., social, personal, vocational/educational).

In the second week, completion of the BEST (From this point forward, participants complete the BEST prior to each subsequent session) and completion of schema questionnaire and education about schemas (cognitive filters) in BPD are done. By contrast, session 3 is allocated for the description of distancing from emotional intensity, and relaxation breathing are carried out; each subsequent session begins with a different relaxation exercise.

In the following two sessions, introduction to the Emotional Intensity Continuum is conducted. These two sessions also teach the communicating of feelings, physical sensations, thoughts, filters,

behaviours, and action urges more accurately. Beginning with session 5, the relaxation exercise is followed by a review of each participant ‘s use of the Emotional Intensity Continuum and specific STEPPS skills.

In session 6 to 8, the challenging of maladaptive filters is taught by identifying common cognitive distortions and replacing them with more accurate and functional alternative

thoughts, followed by teaching distracting behaviours and positive affirmations to reduce emotional intensity in the next 2 session, before ultimately, teaching the management of problems using specific problem solving paradigms in sessions 11 and 12.
Session 13 is dedicated for identifying problematic lifestyle behaviours (eating, sleeping, exercise, etc.) and discussing the need for balance. Participants complete a questionnaire to identify areas of difficulty. Each participant identifies a problem area on which to work. In session 14, however, specific goals are set for one previously identified problematic behaviour, which are worked on in the remaining weeks.
In session 15 and 16, Healthy lifestyle is discussed such as eating, sleep behaviours, healthy exercise, leisure, and physical health behaviours. This is followed in session 17 by teaching skills to reduce self-harm behaviours, where participants use the Emotional Intensity Continuum to identify antecedents to self-harm and other abusive behaviours. Finally, discussion of interpersonal boundaries and solicitation of relationships is done in sessions 18 and 19, before ending the program by comparing the initial and termination schema (i.e., cognitive filters) questionnaire, and evaluating the group‘s progress and use of skills.
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Treatment as usual (TAU):
Treatment as usual was defined as ongoing outpatient treatment from original referral sources which were mainly cognitive behavioural therapy based relapse prevention groups three times per week or individual addiction counselling combined with twelve step meetings when needed.
TAU therapists were two master level psychiatrists, one master level clinical psychologists.
During the COVID-19 pandemic and associated lockdown, we were forced to use telemedicine techniques to convey the STEPPS program and for remote assessment of the patients. In some of our groups it was used as early as the fifth or the sixth week of treatment. We had to use online applications such as Zoom to carry out interviews and meetings, WhatsApp to arrange schedules and share printed material and images. Emails were also utilized to deliver homework and other materials.

Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 24.0 Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median.
Significance of the obtained results was judged at the 5% level. P value was significant when was <.005

Results:

A) Demographic characteristics (Table 1):

The subjects in this study were all female, with no significant difference in between groups regarding age (mean age of 24.68 ± 4.32) for STEPPS group and (24.63 ± 4.54) for TAU group. Although one male was diagnosed, he could not be enrolled in the study, lest subjects of the opposite sex should identify with him as outlined by the program manual.
The sample was matched with no significant difference between STEPPS group and TAU group regarding age, marital status, work, education or past history of chronic medical conditions (e.g., Diabetes Mellitus, hypertension, cardiac problems).

Table 1: Comparison between the two studied groups according to demographic data

variables	STEPPS (n = 20)		TAU (n = 20)		P
	No.	%	No.	%	

Age	24.68 ± 4.32		24.63 ± 4.54		^{t}p= 0.949
SES	60.50 ± 14.00		60.85± 12.32		^{t}p= 0.933
Marital Status Single Married Divorced	12 7 1	60.0 35.0 5.0	12 6 2	60.0 30.0 10.0	^{MC}p=0.712
Work student employed Un employed	11 9 3	55.0 45.0 15.0	8 8 5	40.0 40.0 25.0	^{MC}p=0.635
Education High School Undergraduate Postgraduate	9 8 3	45.0 40.0 15.0	10 8 2	50.0 40.0 10.0	^{MC}p=0.601
Family history of psychitric Yes	8	40.0	7	35.0	p =0.107
Family history of PBD Yes	7	35.0	5	25.0	p =0.476

$^{\chi 2}$p: Value for Chi square test, ^{FE}p: Value for Fisher Exact for Chi square test MC: Monte Carlo for Chi square test ^{t}p: Value for Student t–test.

B) Comparison between the two studied groups according to current psychiatric history (Table 2):

Comorbid psychiatric illnesses that were assessed by psychiatric interview and mental state examination followed by Arabic version of Structured Clinical Interview (SCID-I) & (SCID-II) for confirmation of other personality disorders.

Psychiatric comorbidities included mood disorders (major depressive disorder and bipolar affective disorder), anxiety disorders (generalized anxiety disorder, social anxiety disorder and panic disorder), post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), and eating disorders (one case suffering from bulimia nervosa in the STEPPS group and one case suffering from anorexia nervosa in the TAU group) with no significant difference between the two groups regarding each axis I disorder or total number of comorbid disorders.

Four patients from the STEPPS group had comorbid personality disorder other than BPD (2 cases with histrionic personality disorder, one with narcissistic personality disorder and one with antisocial personality disorder), while six patients of the TAU group had another personality disorder (4 suffering from histrionic personality disorder, one with comorbid and obsessive personality disorder and one with antisocial personality disorder) with no significant difference in between the two groups.

The sample was matched regarding the past history of psychiatric hospital admission and there was no significant difference between STEPPS group and TAU group regarding the mean number of hospital admissions.

Table 2: Comparison between the two studied groups according to psychiatric history.

Psychiatric History	STEPPS (n = 20)		TAU (n = 20)		p
	No.	%	No.	%	
Co-morbid psychiatric illness Mood Disorders	7	35.0	6	30.0	p=0.828
Anxiety Disorders	1	0.0	3	15.0	FEp=0.231
PTSD	2	10.0	4	20.0	FEp=0.895
Adult ADHD	3	15.0	0	0.0	FEp=0.487
Eating Disorder	1	5.0	1	5.0	FEP=1.000
OCD	3	15.0	3	15.0	FEP=1.000
Personality Disorder other than BPD	5	20.0	5	30.0	p=0.465
Total Comorbid Psychiatric Illnesses Min. – Max. Mean ± SD.	0.0 – 3.0 0.95 ± 0.85		0.0 – 3.0 1.05 ± 0.95		MWp=0.611
Median	1.0		1.0		
Psychiatric Hospital Admission Yes	7	35.0	5	25.0	□2p=0.476
No. of Hospital Admissions Min. – Max. Mean ± SD.	0.0 – 4.0 0.65 ± 1.05		0.0 – 4.0 0.70 ± 0.37		MWp=0.273
Median	0.0		0.0		

□2p: Value for Chi square test, FEp: Value for Fisher Exact for Chi square test, MWp: Value for Mann Whitney test.

C) Comparison between the two studied groups according to current psychiatric medication (Table 3):

Nearly half of the patients in each group were receiving current psychotropic medications including antidepressants (AD), antipsychotics (AP), mood stabilizers (MS), benzodiazepines. There was no significant difference between the two groups regarding use of psychotropic medications in general nor in each drug class separately.

Table 3: Comparison between the two studied groups according to current use of psychotropic medication

Current psychotropic medication	STEPPS (n = 20)		TAU (n = 20)		P
	No.	%	No.	%	
Yes	**12**	**60.0**	**11**	**55.0**	□2p=0.114
AD	5	41.6	7	63.63	□2p=0.435
AP	3	25	1	9.09	FEp=0.605

MS	2	16.66	3	27.27	^{FE}p=0.423
Benzodiazepines	2	16.66	0	0.0	^{FE}p=1.000

$^{\chi 2}$p: Value for Chi square test, ^{FE}p: Value for Fisher Exact for Chi square test.

II. Comparison between the two studied groups according treatment outcomes at the end of treatment period and at 6 month follow up in comparison with base line.

A- Comparison between the two studied groups according to BEST outcome (Table 4):

STEPPS patients showed better improvement of **BEST** in comparison to TAU as shown in the statistically significant lower mean of total score of **BEST** (28.00 ± 1.71 versus 42.55 ± 12.51) that retained its statistically significant lower values at the 6 month follow up following treatment period (27.85 ± 1.56 versus 42.20 ± 12.05).

The decrease in mean of BEST scores in the Experimental group in comparison to TAU was also statistically significant for the mean value of all BEST subscales. Again, the outcomes obtained at the end of treatment period were all maintained at 6 month follow up with statistically significant differences between Experimental and TAU patients among all BEST subscales.

Table 4: Comparison between the two studied groups according to BEST outcome at the baseline, end of treatment and after six months follow up.

BEST	**STEPPS (n = 20)**	**TAU (n = 20)**	**^{t}p**
	58.60 ± 3.93	58.70 ± 3.84	0.792

^{t}p: Value for Student t–test, **: Statistically significant at p ≤ 0.01.

Table 5: Comparison between the two studied groups according to BEST outcome at end of treatment.

BEST	**STEPPS (n = 20)**	**TAU (n = 20)**	**^{t}p**
	28.00 ± 1.71	42.55 ± 12.51	<0.001*

tp: Value for Student t–test, **: Statistically significant at p ≤ 0.01.

Table 6: Comparison between the two studied groups according to BEST outcome after six months follow up.

BEST	**STEPPS (n = 20)**	**TAU (n = 20)**	**^{t}p**
	27.85 ± 1.56	42.20 ± 12.05	<0.001*

tp: Value for Student t–test, **: Statistically significant at $p \leq 0.01$

B) Comparison between the two studied groups according to DERS outcome (Table 7):
STEPPS patients showed better improvement of emotion regulation in comparison to TAU as shown in the statistically significant lower mean of total score of DERS (87.85 ± 8.50 versus 125.25 ± 3.40) that retained its statistically significant lower values at the 6 month follow up following treatment period (86.75 ± 9.03versus 124.20 ± 3.20).
The decrease in mean of DERS scores in the STEPPS group in comparison to TAU was also statistically significant for the mean value of all DERS subscales. Again, the outcomes obtained at the end of treatment period were all maintained at 6 month follow up with statistically significant differences between STEPPS and TAU patients among all DERS subscales.

Table 7: Comparison between the two studied groups according to DERS outcome at baseline

	STEPPS (n = 20)	**TAU (n = 20)**	**^{t}p**
Non accept	20.25 ± 2.31	20.55 ± 2.08	**0.669**
Goals	18.60 ± 1.72	18.80 ± 1.36	0.423
Impulse	21.60 ± 2.11	21.65 ± 1.95	0.938
Aware	21.80 ± 1.05	21.85 ± 1.08	0.875
Strategies	28.95 ± 2.76	28.20 ± 2.72	0.393
Clarity	20.85 ± 1.72	20.40 ± 1.50	0.384
Total	132.05 ± 6.65	131.65 ± 6.01	0.843

^{t}p: Value for Student t–test, **: Statistically significant at $p \leq 0.01$

Table 8: Comparison between the two studied groups according to DERS outcome at End of treatment.

	STEPPS (n = 20)	**TAU (n = 20)**	**^{t}p**
Non accept	17.60 ± 2.06	19.80 ± 1.57	<0.001*
Goals	15.60 ± 1.31	18.25 ± 1.20	<0.001*
Impulse	12..85 ± 2.10	20.30 ± 1.03	<0.001*
Aware	14.55 ± 1.73	20.65 ± 1.38	<0.001*
Strategies	17.15 ± 2.25	26.75 ± 1.91	<0.001*

Clarity	10.10 ± 2.31	19.50 ± 1.05	<0.001*
Total	87.85 ± 8.50	125.25 ± 3.40	<0.001*

[t]p: Value for Student t–test, **: Statistically significant at p ≤ 0.01

Table 9: Comparison between the two studied groups according to DERS outcome at follow up.

	STEPPS (n = 20)	**TAU (n = 20)**	**[t]p**
Non accept	17.65 ± 2.05	19.70 ± 1.52	**<0.001***
Goals	15.70 ± 1.26	18.25 ± 1.20	**<0.001***
Impulse	12.70 ± 2.10	20.05 ± 0.82	**<0.001***
Aware	14.20 ± 1.79	20.45 ± 1.31	**<0.001***
Strategies	16.55 ± 2.56	26.35 ± 1.81	**<0.001***
Clarity	9.95 ± 2.21	19.40 ± 1.09	**<0.001***
Total	86.75 ± 9.03	124.20 ± 3.20	**<0.001***

[t]p: Value for Student t–test **: Statistically significant at p ≤ 0.01

C) Comparison between the two studied groups according to quality-of-life outcome (Table 10):

STEPPS patients showed better improvement of **quality of life** in comparison to TAU as shown in the statistically significant higher mean of total score of **quality of life** (66.25 ± 4.60 versus 58.50 ± 3.42) that retained its statistically significant higher values at the 6 month follow up following treatment period (65.15 ± 4.83 versus 56.35 ± 5.02).

The increase in mean of **quality-of-life** scores in the STEPPS group in comparison to TAU was also statistically significant for the mean value of all **quality-of-life** subscales. Again, the outcomes obtained at the end of treatment period were all maintained at 6 month follow up with statistically significant differences between STEPPS and TAU patients among all **quality-of-life** subscales.

Table 10: Comparison between the two studied groups according to quality-of-life outcome at base line, end of treatment and after six months follow up.

	STEPPS (n = 20)	**TAU (n = 20)**	**[t]p**
Physical health	16.60 ± 1.98	16.65 ± 1.92	0.936

Psychological health	15.50. ± 2.30	15.60 ± 2.08	0.886
Social relation	7.20 ± 1.39	7.25± 1.40	0.911
environment	16.10 ± 1.29	16.20 ± 1.32	0.810
Total	55.40 ± 4.80	55.70 ± 4.54	0.840

[t]p: Value for Student t–test, *: Statistically significant at p ≤ 0.05

Table 11: Comparison between the two studied groups according to quality-of-life outcome at post test

	STEPPS (n = 20)	**TAU (n = 20)**	**[t]p**
Physical health	19.45 ± 2.89	17.20 ± 2.19	**<0.001***
Psychological health	18.15 ± 1.89	16.55 ± 1.70	**<0.001***
Social relation	9.75 ± 1.06	7.90 ± 1.71	**<0.001***
environment	18.90 ± 2.82	16.85 ± 1.30	**<0.001***
Total	66.25 ± 4.60	58.50 ± 3.42	**<0.001***

Table 12: Comparison between the two studied groups according to quality-of-life outcome at Follow up.

	STEPPS (n = 20)	**TAU (n = 20)**	**[t]p**
Physical health	19.60 ± 2.70	16.95 ± 2.01	**<0.001***
Psychological health	17.20 ± 1.98	15.20 ± 2.09	**<0.001***
Social relation	9.75 ± 1.01	7.80 ± 2.04	**<0.001***
environment	18.70 ± 2.67	16.40 ± 1.46	**<0.001***
Total	65.15 ± 4.83	56.35 ± 5.02	**<0.001***

III. Comparison between the Baseline test, posttest and follow up test of the STEPPS group and TAU group: s

Comparison between baseline, post-test and follow up test in STEPPS and TAU group according to BEST outcome (Table 13):

STEPPS patients showed better improvement of **BEST in post and follow up test** in comparison to the **Baseline test** of BEST.

Table 13: Comparison between the baseline, post, and follow up test in BEST scale in STEPPS group.

		BEST			***F***	***Significant post hoc comparison***
		Baseline	**End of treatment period**	**Follow up after 6 months**		
BEST	**STEPPS**	**(n = 20)**	**(n = 20)**	**(n = 20)**		
	Mean ± SD.	58.60 ± 3.93	28.00 ± 1.71	27.85 ± 1.56	899.886**	Baseline < end of treatment = follow up
	TAU	**n = 20)**	**(n = 20)**	**(n = 20)**		
	Mean ± SD.	**8.60 ± 3.93**	**42.55 ± 12.55**	**42.20 ± 12.05**	**16.839****	***Baseline < end of treatment = follow up***

[f]p: Value for Student t–test, **: Statistically significant at $p \leq 0.01$

B- Comparison between baseline, post-test and follow up test in STEPPS and TAU group according to DERS outcome (Table14):

STEPPS patients showed better improvement of emotion regulation in post and follow up test in comparison to baseline test as shown in the statistically significant differences.

Table 14: Comparison between the baseline, post, and follow up test in DERS outcome in STEPPS group:

STEPPS	**DERS**			***f***	***Significant post hoc comparison***
	Baseline	**End of treatment period**	**Follow up after 6 months**		
Non acceptance	**(n = 20)**	**(n = 20)**	**(n = 20)**	**9.955****	Baseline > end of treatment = follow up
Mean ± SD.	20.25 ± 2.31	17.60 ± 2.06	17.65 ± 2.05		
Goals	**(n = 20)**	**(n = 20)**	**(n = 20)**	**27.628****	Baseline > end of treatment = follow up
Mean ± SD.	18.60 ± 1.72	15.60 ± 1.31	15.70 ± 1.26		
Impulse	**(n = 20)**	**(n = 20)**	**(n = 20)**	**116.746****	Baseline > end of treatment = follow up
Mean ± SD.	21.60 ± 2.11	12..85 ± 2.10	12.70 ± 2.10		
Awareness	**(n = 20)**	**(n = 20)**	**(n = 20)**	**150.589***	Baseline > end of

Mean ± SD.	21.80 ± 1.05	14.55 ± 1.73	14.20 ± 1.79	*	treatment = follow up
strategies	**(n = 20)**	**(n = 20)**	**(n = 20)**	**152.104****	Baseline > end of treatment = follow up
Mean ± SD.	28.95 ± 2.76	17.15 ± 2.25	16.55 ± 2.56		
clarity	**(n = 20)**	**(n = 20)**	**(n = 20)**	**177.219****	Baseline > end of treatment = follow up
Mean ± SD.	20.85 ± 1.72	10.10 ± 2.31	9.95 ± 2.21		
total	**(n = 20)**	**(n = 20)**	**(n = 20)**	**202.089****	Baseline > end of treatment = follow up
Mean ± SD.	132.05 ± 6.65	87.85 ± 8.50	86.75 ± 9.03		

[†]p: Value for F, *: Statistically significant at $p \leq 0.05$

Table 15: Comparison between the baseline, post, and follow up test in DERS outcome in TAU group:

TAU	**DERS**			***f***	***Significant post hoc comparison***
	Baseline	**End of treatment period**	**Follow up after 6 months**		
Non acceptance	**(n = 20)**	**(n = 20)**	**(n = 20)**	**1.411**	-
Mean ± SD.	20.55 ± 2.08	19.80 ± 2.06	19.70 ± 2.05		
Goals	**(n = 20)**	**(n = 20)**	**(n = 20)**	**1.267**	-
Mean ± SD.	18.80 ± 1.36	18.25 ± 1.20	18.25 ± 1.20		
Impulse	**(n = 20)**	**(n = 20)**	**(n = 20)**	**7.990****	Baseline > end of treatment = follow up
Mean ± SD.	21.65 ± 1.95	20.30 ± 1.03	20.05 ± 0.82		
Awareness	**(n = 20)**	**(n = 20)**	**(n = 20)**	**5.119****	Baseline > end of treatment = follow up
Mean ± SD.	21.65 ± 1.08	20.65 ± 1.38	20.45 ± 1.31		
strategies	**(n = 20)**	**(n = 20)**	**(n = 20)**	**3.949***	Baseline > end of treatment = follow up
Mean ± SD.	28.20 ± 2.72	26.75 ± 1.91	26.35 ± 1.81		
clarity	**(n = 20)**	**(n = 20)**	**(n = 20)**	**3.994***	Baseline > end of treatment = follow up
Mean ± SD.	20.40 ± 1.50	19.50 ± 1.05	19.40 ± 1.09		

total	(n = 20)	(n = 20)	(n = 20)	14.849**	Baseline > end of treatment = follow up
Mean ± SD.	131.25 ± 6.05	125.25 ± 3.40	124.20 ± 3.20		

[f]p: Value for F *: Statistically significant at $p \leq 0.05$

C- Comparison between baseline, posttest and follow up test in STEPPS and TAU group according to quality-of-life outcome (Table 16):

STEPPS patients showed better improvement of quality of life in post and follow up test in comparison to baseline test as shown in the statistically significant differences.

in STEPPS group according to quality-of-life outcome

Table 16: Comparison between baseline, posttest and follow up test.

STEPPS	Quality of life			*f*	*Significant post hoc compariso*
	Baseline	**End of treatment period**	**Follow up afte 6 months**		
physical	**(n = 20)**	**(n = 20)**	**(n = 20)**	**8.744****	Baseline > end of
Mean ± SD.	16.60 ± 1.98	19.45 ± 2.89	19.60 ± 2.70		treatment = follow up
psychological	**(n = 20)**	**(n = 20)**	**(n = 20)**	**8.396****	Baseline > end of
Mean ± SD.	15.50. ± 2.30	18.15 ± 1.89	17.20 ± 1.98		treatment = follow up
social	**(n = 20)**	**(n = 20)**	**(n = 20)**	**31.397****	Baseline > end of
Mean ± SD.	7.20 ± 1.39	9.75 ± 1.06	9.75 ± 1.01		treatment = follow up
environment	**(n = 20)**	**(n = 20)**	**(n = 20)**	**8.057****	Baseline > end of
Mean ± SD.	16.10 ± 1.29	18.90 ± 2.82	18.70 ± 2.67		treatment = follow up
total	**(n = 20)**	**(n = 20)**	**(n = 20)**	**31.590****	Baseline > end of
Mean ± SD.	55.40 ± 4.80	66.25 ± 4.60	65.15 ± 4.83		treatment = follow up

[f]p: Value for F, *: Statistically significant at $p \leq 0.05$.

Table 17: Comparison between baseline, post-test and follow up test in TAU group according to quality-of-life outcome.

TAU		Quality of life		*f*	*Significant post hoc comparison*
	Baseline	**End of treatment period**	**Follow up after 6 months**		
physical	**(n = 20)**	**(n = 20)**	**(n = 20)**	**0.362**	**-**
Mean ± SD.	16.65 ± 1.92	17.20 ± 2.19	19.95 ± 2.01		
psychological	**(n = 20)**	**(n = 20)**	**(n = 20)**	**2.481**	**-**
Mean ± SD.	15.60. ± 2.08	16.55 ± 1.70	15.20 ± 2.09		
social	**(n = 20)**	**(n = 20)**	**(n = 20)**	**0.808**	**-**
Mean ± SD.	7.25 ± 1.40	7.90 ± 1.71	7.80 ± 2.04		
environment	**(n = 20)**	**(n = 20)**	**(n = 20)**	**1.186**	**-**
Mean ± SD.	16.20 ± 1.32	16.85 ± 1.30	16.40 ± 1.46		
total	**(n = 20)**	**(n = 20)**	**(n = 20)**	**2.234**	**-**
Mean ± SD.	55.70 ± 4.54	58.50 ± 3.42	56.35 ± 5.02		

[f]p: Value for F, *: Statistically significant at $p \leq 0.05$

C- Comparison between baseline (2nd session) and posttest (19th session) regarding unhelpful filters (schemas), using the Filter Questionnaire (Table 18):

Although STEPPS patients showed definitive improvement on the **Filter Questionnaire** in post-test in comparison to baseline test, the differences were not statistically significant in most of the filters.

Table 18: Comparison between STEPPS group in pre and post Filter Questionnaire

	STEPPS (n = 20) Second session	**STEPPS (n = 20) 19th session**	**[t]p**

Emotional deprivation	20.70 ± 1.86	20.05 ± 1.39	**0.025***
Abandonment	20.30 ± 1.59	20.00 ± 1.25	0.186
Mistrust	19.85 ± 1.30	19.70 ± 1.34	0.186
Defectiveness	19.60 ± 0.75	19.50 ± 0.76	0.163
Failure to achieve	19.85 ± 1.42	19.60 ± 1.14	**0.021***
Vulnerability	19.00 ± 1.12	18.95 ± 1.05	0.330
Self-sacrifice	18.85 ± 1.30	18.70 ± 1.17	0.083
Subjugation	21.50±2.03	21.35±2.03	0.083
Unrelenting standard	20.75±1.80	20.60±1.63	0.083
Entitlement	21.15±1.87	20.80±1.47	**0.031***

[t]p: Value for Student t–test ,**: Statistically significant at $p \leq 0.01$.

Discussion

In epidemiological studies of adults in the USA, the median prevalence for BPD was 1.4% of the general population. Not only are there significant health care costs associated with the disorder, but also impairment in social and occupational functioning results in unemployment and foregone earnings. Thus, the costs of this disorder are multifaceted, including the personal, familial, economic, and societal (Meehan et al, 2018).

Several psychological treatments have been developed over the last decades for persons with BPD. Dialectical behavior therapy, mentalization-based treatment, and schema-focused therapy have received the most empirical support. These new treatment programs are quite valuable, and they have improved BPD treatment in several ways. Yet, for many persons with BPD, these programs remain out of reach. The programs are rather lengthy and labor intensive, and not easy to implement in mental health care settings (Bos et al, 2010).

Blum et al (2002) developed Systems Training for Emotional Predictability and Problem Solving (STEPPS), a group treatment program that is relatively easy to implement. The program is brief and easily learned by therapists of varying backgrounds. Studies showed that it was more efficacious than treatment as usual in reducing borderline symptoms and in improving global functioning and quality of life (Blum et al, 2008; Bos et al, 2010; Bos et al, 2011).

The helplessness and hopelessness reside not only in the patient but often in the treatment providers as well. A widespread belief that continues to exist among mental health professionals is that treatment does very little for borderline personality disorder patients. Yet they are very difficult to disengage from treatment. Therapists shy away from informing the patient that she has the diagnosis because to pronounce the diagnosis not only would be equivalent to a type of ―death sentence‖ (as we used to be afraid of telling patients that they had cancer or schizophrenia), but it would also cause fear of the rage that the therapist is certain to encounter from the affectively dyscontrolled patient. Much has changed in the last two decades, but unfortunately too many therapists still feel that BPD is untreatable and is a

lifelong drain on the energy of the therapist, the psychopharmacologist, and the entire mental health system (Silk, 2008).

Recently, a number of psychological interventions for individuals with BPD have received empirical support in randomized controlled trials. One of these is Systems Training for Emotional Predictability and Problem Solving (STEPPS), which is a group psychotherapy approach, specifically designed to enable therapists to teach and patients to learn emotional regulation skills in health care areas with less access to resources or personnel. It consists of 20 weekly group sessions that include cognitive-behavioural elements and a systems component for relatives, close companions, or other professionals who interact with the patients. It can be used either as a stand-alone treatment or combined with any individual psychotherapy, even in a stepped care system where it can be the first and sometimes the only intervention for some patients. It is ideal for a public context with time limitations and patients with diverse sociocultural backgrounds (González- González et al, 2021).

We had a drop rate of 25.9% (7 out of 27 patients) in the STEPPS group and 31% (9 of 29 patients) in the TAU group despite continuous efforts to encourage patients to remain in the study. However, high dropout rates are the bane of BPD treatment trials regardless of the type of intervention. For instance, in dialectical behavioural therapy trials, the attrition rate ranged from 12% (Bateman and Fonagy, 2001 and Linehan et al, 2006) to as high as 59% in the study of Verheul et al (2003). More relevant is the recent DBT efficacy study, done in Tanta university hospital by El-Karim et al, (2021), who also had to contend with a significant drop out of 16.7% and 26.7% in the active and control groups respectively. This issue was similarly reported in most STEPPS trials.

In the randomized controlled study (RCT) performed by the creators of the program, 31% dropped out of a STEPPS program (Blum et al., 2008), whereas in the other RCT carried out by the Dutch group, 21% of patients discontinued their treatment (Bos et al, 2010), and this rate even slightly increased in their effectiveness RCT to 26% (Bos et al, 2011). Interestingly, when STEPPS effectiveness was compared to DBT in a nonrandomized study, the dropout rates were around one third of patients in both treatments (Botella et al, 2021).

The reason why patients with BPD have such a high attrition rate is obscure, but there are certain observations. Some researchers have found that the worst outcomes with BPD patients are obtained when the disorder is more chronic or severe (although not all authors agree on this; e.g., Black et al, (2009) found that higher baseline severity predicted better outcome in those who participated in STEPPS and that impulsivity is the strongest predictor of dropout); when BPD develops at a younger age; when the patient starts an intervention later; when there have been past childhood traumas or mental health or drug disorders in the family; in comorbidity with other physical problems, mental problems, or intellectual impairment; and in patients with low sociability and worse occupational or academic functioning (González-González et al, 2021).

In our study, however, the only factor that was more prevalent in the committed patients than their dropout counterparts were higher educational level, where patients with college education who continued the program was 11/20 (55%), while those who dropped out had only 2 out of seven (28.6%). This has been also observed in the study of González-González et al (2021) among other factors such as good adherence and patient collaboration in the treatment. The reason behind that is probably twofold: first is the academic content of the program, second is that educated patients tend to be more efficient in decision making, self-control, adherence to tasks and requirements of the programs. This is important because it allows better selections of patient for a particular modality of psychotherapy. It also highlights the importance of developing therapist behaviour, resulting in adaptation of the materials to the patients' educational level, promoting their academic skills, and therefore improving their continuation rate.

One observation in this study is that the dropout rate was higher in the control group (31% compared to 25% in the active group). This was also observed in the non-randomized controlled study of González- González et al (2021), which had dropout rate of 40.8% in the STEPPS group and 51.3% for TAU. This observation may point to the efficacy of the new treatment so that patient might be encouraged to continue the program because of the sensible early improvement and motivation. However, in the two randomized controlled studies in the US and the Netherlands, the drop rate was higher in the experimental groups. In Blum et al (2008), the attrition rates were 29% and 18% in the active and control group respectively. Similarly, the Dutch study of Bos et al (2010) the ratios were 21% for STEPPS and 10.8% for TAU, which was also observed, though to a smaller degree, in the effectiveness study of the same researchers (Bos et al., 2011). The reason for these differences is obscure, but it may be related to many factors such as baseline severity, impulsivity, and educational level from the subject prospect, and the quality of service, motivation and enthusiasm given by the providers. In addition, the paucity of controlled studies that have been carried out on STEPPS so far makes it rather difficult to reach a reliable conclusion about the retention of this treatment.

Another factor which may be pertinent to the attrition rate is the fact that a significant part of our study took place amid the stress and uncertainty of the COVID-19 pandemic and associated lockdown, which necessitated rapid transformation of care delivery to virtual platforms. To our knowledge, this the first study that used telemedicine techniques to convey the STEPPS program and for remote assessment of the patients. In some of our groups it was used as early as the fifth or the sixth week of treatment. We had to use online application like Zoom to carry out interviews and meetings, WhatsApp and Facebook to arrange schedules and share printed material and images. Emails were also used to deliver homework and other materials.

Obviously, psychiatry is relatively well suited to remote engagement and so is in a good position to transition to a telemedicine approach, which has been used since 1950s via videoconferencing in the US. The use of telepsychiatry has been growing since then to become the second most practiced form of telemedicine after teleradiology, reaching up to 29% in some American states between 2010 and 2017, before soaring in 2019. For example, the outpatient psychiatry division in the Massachusetts General Hospital psychiatry department switched from under 5% virtual case visits in March 2019 to over 97% in March 2020 (Chen et al, 2020).

Nevertheless, the use of telepsychiatry in our study had some positive and negative aspects. On one hand, it helped protect patients and researchers from viral transmission, minimized productivity loss due to commuting, and more importantly promoted privacy by eliminating the need to physically travel to the mental health facility, thereby reducing exposure to stigmatizing attitudes and beliefs from others. On the other hand, there was a minority of patients who could not utilize this technology and therefore unable to continue the program. Besides, there were sometimes periods of disruptions during sessions due to home-life issues and technological glitches—freezing, delays, needing to reconnect. Increased demand for online communications in COVID-19 lockdown put much burden on virtual platforms leading to failed or dropped connection, inconsistent video quality, unpredictable audio system, to meet patients' needs. Also, online communication could be particularly challenging in patients with auditory impairments as well as in reading nonverbal communications.

b-Emotional deregulation and difficulties in emotion regulation scale (DERS) outcome:

The DERS represents one of the more comprehensive measures of emotion deregulation (Gratz and Roemer, 2004). This instrument consists of six subscales measuring difficulties in the flexible multidimensional regulation of emotion, including: 1) non-acceptance of or

negative reaction to emotions (non-acceptance subscale); 2) difficulties engaging in goal-oriented behavior when experiencing negative emotions (goals subscale); 3) difficulty controlling impulsive behavior when experiencing negative emotions (impulse subscale); 4) lack of emotion awareness (awareness subscale); perceived inability to cope with negative emotions (strategies subscale); and 6) lack of clarity about one‘s emotions (clarity subscales) [Skutch et al, 2019].

In this study, an Arabic translation of the DERS which incorporates 36 self-report items endorsed on a five-point scale starting from ―almost never; 0–10%‖ to ―almost always 91–100%‖, with higher scores indicating greater difficulties in emotion regulation, was used as a measure of the extent of emotion deregulation among the study sample at baseline and later at the end of the treatment and after 6 months follow up. STEPPS patients showed better improvement of emotion regulation as compared to TAU as shown within the statistically significant lower mean of both the total score and the individual item scores that retained its statistically significant lower values at the end of the 6 month follow up period. This implies that the new intervention is effective in addressing the core issue in the psychopathology of BPD i.e. the emotional deregulation.

According to Thompson (1994), emotional regulation refers to the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions. These may include behaviours and/or cognitions that aim at changing the person‘s mood and emotions, and allowing people to return to their previous state of mind at various speed. Therefore, emotion deregulation may be defined as the inability to control and modulate one's affective state to flexibly respond to and manage emotions (Shedler and Westen, 2004).

Although the presence of emotional deregulation has been demonstrated in a host of psychiatric illnesses such as posttraumatic stress disorder (Ehring and Quack 2010), generalized anxiety disorder (Tull et al. 2009), and alcohol dependence (Fox et al. 2008), it has been considered the primary disorder in patients with BPD according to Linehan's biosocial theory, which posits that BPD is primarily a disorder of emotion deregulation and it rises from the transactions between individuals with biological vulnerabilities and an invalidating environment. Patients with BPD are emotionally sensitive from birth, and this sensitivity leads to a propensity to experience negative affect across contexts and situations, which then makes it difficult to learn appropriate emotion regulation strategies. As a result, BPD patients are characterized by high sensitivity to emotional stimuli, heightened emotional intensity, and slow return to baseline (Glenn and Klonsky, 2009).

Scarce are the studies that explored the effect of STEPPS intervention on emotional deregulation using the DERS. In a pilot study, Boccalon et al (2017) examined the effect of the treatment on 24 subjects with a personality disorder with borderline features. There was a significant decrease in the DERS total score at the end of the treatment and at 6-month follow-up. The analysis of the DERS subscales showed that ―goals‖ and ―impulse‖ were the two dimensions on which the treatment acted and the changes were stable over time, suggesting that STEPPS is associated with an improvement in emotion regulation especially the behavioral dimensions like the ability to control impulsive behaviors and to achieve goals, which was practically reflected in a reduction in the number of hospitalizations and suicide attempts.

With the objective of exploring the effectiveness of the DBT versus STEPPS, Botella and coworkers (2021) conducted a nonrandomized clinical trial on a sample of 72 patients with BPD in which both treatments were applied for six months. The results indicated that both treatment conditions (DBT and STEPPS) showed a statistically significant improvement from pretreatment to posttreatment in emotional deregulation, specifically on the emotional regulation (strategies).

Focusing on the STEPPS group, all subscales improved but the most pronounced achievement was in strategies, followed by awareness and goals while clarity subscale showed only modest improvement.
In the cohort of adolescents (14-19 years old) with symptoms of BPD and emotion dysregulation, Schuppert et al. (2009) conducted a randomized controlled pilot study on 43 participants, to test the effectiveness of Emotion Regulation Training (ERT). The ERT is an adaptation of the STEPPS program, where the treatment length and the sessions are shortened, emotion regulation skills are taught in an early stage, and the language is simplified with the examples are made agespecific. Therefore, subjects were assessed before and after random assignment to ERT plus TAU (n = 23) or to TAU alone (n = 20) using the Multidimensional Emotion Regulation Locus of Control (MERLC) scale to assess emotion regulation in conjunction with other scales to measure symptom severity. In that study, although both groups showed equal reductions in BPD symptoms over time, the group receiving ERT plus TAU (and not the TAU-only group) had a significant increase in internal locus of control: ERT participants reported more sense of control over their own mood swings, and attributed changes in mood swings not only to external factors.
In our study, however, we had more improvement in the awareness, strategies and impulse subscales similar to those studies. Furthermore, we had also the least improvement recorded in the acceptance subscale. The main difference in our study was that there was marked improvement in the clarity subscale. The reason behind this difference is unclear. Potential causes may reside in the population studied (either BPD patients or patients with personality disorder with borderline features),

baseline severity, and perhaps the version of the DERS, where we use a 36 item version, while Boccalon et al (2017) and Botella et al (2021) used a 41-item scale and a 28-item scale respectively. More importantly, we think, are the small sample sizes in all these studies making subscale analysis less reliable.
Nevertheless, it is important to discriminate between two aspects of emotion deregulation: the awareness and understanding of emotions (awareness + clarity + nonacceptance) and the ability to act in a purposeful manner and to refrain from impulsive responses (goals + impulse + strategies). The latter seems to be more affected by the STEPPS program, probably because of the behavioural nature of the intervention. Thus, STEPPS-specific therapeutic action seems to be on behavioural deregulation, improving the ability of patients to control impulsive behaviours and to achieve aims. Therefore, it could be supposed that patients do not develop an insight about own emotions, but they learn to manage them. The short length of STEPPS and the skill-training focus could represent the specific aspects of the treatment that could explain these findings (Boccalon et al, 2017).
c-The Borderline Evaluation of Severity over Time scale (BEST) outcome:
In this study, patients who attended the STEPPS program had significant improvement in the Borderline Evaluation of Severity over Time scale (BEST) scores, compared to those who received TAU as shown in the statistically significant lower mean of total score of BEST that retained its statistically significant lower values at the 6 month follow-up following the treatment period. Furthermore, the reduction in

the mean of the BEST score in the STEPPS group, in comparison to TAU, was also statistically significant for the mean values of all the BEST subscales. Again, the outcomes obtained at the end of the treatment period were all maintained at the 6-month follow-up period with statistically significant differences between the STEPPS and TAU patients among all the BEST subscales.

Although there are other instruments designed to measure acute severity and rate change during clinical trials on subjects with BPD, such as the Zanarini Rating Scale for BPD (ZAN-BPD; Zanarini et al, 2003), the BPD Severity Index (Arntz et al., 2003), and the Borderline Symptom List (Bohus et al., 2007), we opted to use the BEST score (Blum et al., 2009), which was developed together with the STEPPS program to evaluate the severity of BPD in the study subjects and monitor changes. An Arabic version of the BEST test that underwent translation and back-translation was administered to all patients at baseline, after treatment completion, and after the follow up period of 6 months.

The scale includes 15 items and three subscales. All items are rated on a Likert-like scale. The first 8 items comprise subscale A (Thoughts and Feelings), and involve assessments of mood reactivity, identity disturbance, unstable relationships, paranoia, emptiness, and suicidal thinking. The next 4 items comprise subscale B (Behaviors-Negative), which rates negative actions such as injuring oneself. Both subscales A and B are taken from the DSM-IV criteria. The final three items comprise subscale C (Behaviors- Positive), which rates actions such as following through on therapy plans.

There are several reasons for the selection of the BEST scale over the others. Being part of the STEPPS tools that developed in the 1990s, the BEST is probably the first rating tool to exist for BPD studies. In addition, it is a quick, easy to administer, self-rated, symptom-based test whose reliability, validity, and sensitivity to severity and change have been previously established (Pfohl et al., 2009). Last but not least, the scale design may reinforce the continued use of new skills, which eventually would be evident in the improvement in the total score. To understand this assumption, one has to recall that Thoughts and Feelings (A) are different from the Negative Behaviors (B) typical of the disorder. It is generally anticipated that negative behaviors (B) would respond more rapidly than thoughts and feelings (A) in a behaviour-based therapy like the STEPPS, and that the use of the newly taught behavioral skills would be reinforced when subjects noted the improvement in their subscale B score. Furthermore, section C was added to acknowledge the acquisition of positive behaviors, as well as to reinforce the use of new skills before seeing improvement in A and B, because scores in subscale C were expected to improve first (Pfohl et al, 2009). Interestingly, this positive reinforcement might explain the higher retention rate in our experimental group relative to the control, which was also found in the recent Spanish study of González-González and her colleagues (2021).

Similar to our study, the improvement in the BEST score in BPD patients who received the STEPPS program was reported in several studies.

In (2018), Black and coworkers reported data on 193 subjects from two independent sources: (1) a randomized controlled trial (RCT) at an academic medical centre, which is the same RCT of Blum et al (2008) and (2) uncontrolled data from Iowa‘s correctional system (Black et al, 2013). The BEST was administered at baseline and weeks 4, 8, 12, 16 and 20 to subjects in both the RCT and the correctional samples. Across all the BEST items, subjects in the correctional sample generally showed the greatest improvement (median D across items = 0.86), followed by those participating in the STEPPS + TAU (median D = 0.48), and TAU alone (median D = 0.28) groups. Items from the BEST scale showing the greatest improvement assessed affective instability, _taking steps to avoid/prevent problems‘, _choosing to use a positive activity‘, identity disturbance and abandonment fears. Unfortunately, in our study, we could not perform item level analysis due to the small sample size.

More recently, González-González et al (2021) reported a nonrandomized controlled study of 118 outpatients with BPD who were divided into an experimental group (EG) who participated in STEPPS, and a control group (CG) who received TAU. The BEST scale was administered at pretest, Months 3 and 6, post-test (Month 18), and 2-year follow-up (Month

42), after which a post hoc data analysis was carried out. EG subjects had significantly lower scores at posttest than CG subjects in total BEST and two subscales (Thoughts and Feelings, Positive Behaviours), which means fewer BPD symptoms for EG subjects (mean difference over 17 for total score; $p < .01$); EG subjects experienced a significant reduction on total scores and all subscales from pretest to post-test, which means an improvement in their BPD symptoms (mean difference over 20 for total score; $p < .01$). significantly, he case for CG subjects, whose scores did not change significantly; EG subjects experienced the total score reduction already at the third month after starting (mean difference over 10; $p < .01$), and again at the sixth month compared to the third month, when the group intervention was finished (mean difference over 6; $p < .01$).

In a British study, a smaller version of the STEPPS has been adapted for a primary care setting into a 13-week group treatment for emotional intensity difficulties (STEPPS EI). Severity of BPD, depression, and anxiety symptoms were measured pre and post-intervention for 148 participants. Treatment completers showed improvements in depression, anxiety, and BPD symptoms (measured by a slightly modified version of the BEST) with medium to large effect sizes (Hezelyova et al, 2021).

Even in the cohort of adolescents with BPD traits treated with the STEPPS program, there was a statistically significant improvement in the scores for the affective area and in the total score of the Diagnostic Interview for Borderline Disorder-Revised (DIB-R), a decrease in the percentage of patients who meet criteria for BPD, and an improvement (although not statistically significant) in the scores of the BEST scale throughout the treatment (Ruiz et al, 2020).

d-The Quality-of-Life scale outcome: In this study, STEPPS patients demonstrated marked improvement of quality of life in post-test and follow up in comparison to baseline test as shown in the statistically significant differences. They also showed better improvement of quality of life in comparison to TAU as shown in the statistically significant higher mean of total score of quality of life that retained its statistically significant higher values at the end of the treatment period. The increase in the mean of the quality-of-life scores in the STEPPS group in comparison to TAU was also statistically significant for the mean values of all the quality of life subscales namely physical health, psychological health, social relation, and environment. Again, the outcomes obtained at the end of the treatment period were all maintained after 6 months of follow up with statistically significant differences between STEPPS and TAU patients among all quality-of-life subscales.

It has been increasingly recognized that measures of disease alone are insufficient determinants of health status. Over the past decades, two classes of complementary health status measures have emerged to fill the information gap – objective measures of functional health status and subjective measures of health and well-being (Skevington et al, 2004).

The WHO defines the Quality Of Life (QOL) as ‗an individual‘s perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns‘ (WHOQOL Group, 1994).

Research on QOL in BPD is limited when compared to the literature on the psychopathology and treatment of BPD. Nonetheless, the main findings of the existing studies clearly indicate that QOL is seriously impaired in BPD patients. Moreover, the various studies demonstrate a lack of consensus about which tools are best utilized to measure QOL in BPD. Even with the diversity of the QOL measuring tools, the studies show that BPD treatments are helpful in improving QOL (IsHak et al, 2013).

To assess QOL, it is crucial to use assessment tools that are psychometrically sound and have cross-cultural validity. In this regard, the short version of the World Health Organization ‗s QOL Instrument, the WHOQOL-BREF (Skevington et al, 2004), is of interest for the following reasons: First, it was simultaneously developed in diverse cultures, thus having a

strong potential for easy cross-cultural applicability, since the items are framed in culture-neutral terminology. Second, the items include widely valued contextual factors of life that are not generally regarded as health related. Therefore, it is a generic instrument that assesses health related QOL (HRQOL), and social, environmental and subjective well-being issues (Ohaeri and Awadalla, 2009).

Improvement in quality of life in patients receiving the STEPPS program has also been shown in some other studies, using various tools. In the RCT of Bos et al. (2010), the Dutch researchers observed a remarkable increase in the Quality of life scores (WHOQOL-Bref) throughout the treatment and the 6-month follow up period. Overall treatment effects were found for Overall Quality of Life and General Health, Physical Health, and Psychological Health. For Social Relationships the overall treatment effect was a trend, for Environment the overall treatment effect was not significant. Immediately after the program this effect was mainly found in the psychological domain, which may have been related to the effects observed on the symptom measures. At follow-up, subjects in the STEPPS condition did better with respect to physical, social and overall quality of life. Possibly, these effects only became apparent at follow-up because changes in health behavior and improvements in interpersonal skills take time to produce an effect. They concluded that apart from symptom reduction, STEPPS was superior to TAU in improving quality of life.

One year later, the same group reported an effectiveness study on 168 patients whom their practicing clinician diagnosed with BPD. They were randomized to STEPPS plus adjunctive individual therapy (n = 84) or to TAU (n = 84). In this study they utilized only a facet derived from WHOQOL scale to measure patients 'response to treatment. This tool composed of two separate items on overall quality of life and general health. Once again, they concluded that STEPPS plus an adjunctive individual treatment is better than TAU in reducing psychological distress and improving quality of life in outpatients with features of BPD, and that STEPPS especially makes a difference in patients with higher symptom severity (Bos et al., 2011).

In a UK-based study, Hill et al. (2016) published data on 30 patients who completed the STEPPS program. The quality of life was evaluated among other outcome parameters such as symptom severity and affinity for maladaptive schemas at the start and end of the groups to allow pairwise analysis. The Quality of Life Scale (Burckhardt & Anderson 2003) was used to determine whether the patients reported a significant increase in their satisfaction across a broad range of dimensions considered to be important for one 's quality of life. They found that patients who completed the STEPPS had significant reductions in symptom severity and affinity for maladaptive schemas, as well as highly significant increases in patients 'self-reported quality of life.

In a recent Spanish study by Guillén and coworkers (2021), a sample of 202 participants diagnosed with BPD and 201 nonclinical participants filled out the Quality-of-Life Index (Ferrans and Powers, 1985) among other outcome measuring scales. The clinical participants received one of these possible treatments, DBT, STEPPS, or CBT-TAU.

The objectives of the study were: a) to examine whether people with BPD had worse QoL than the non-clinical population; b) to examine whether there were statistically significant differences between DBT, STEPPS, and TAU in the improvement of QoL; c) to examine whether participants showed clinically significant improvements in QoL after treatment, and whether the scores were within the range of the nonclinical population. Regarding the first aim, they found that participants diagnosed with BPD had lower QoL (more than one standard deviation below the non-clinical population). Their results also indicated that all three forms of psychotherapy (DBT, STEPPS, and TAU-CBT) improved QoL with no apparent differences between the different psychotherapies. Regarding the third aim, they found that, although the improvement in QoL after treatment was statistically significant, it was certainly small, and the treatments did not raise it to normal levels; thus, there was no

clinical change in QoL after the treatments. This result points out how critical it is to intervene and allocate resources to improving the QoL of BPD patients.

e-The Schema (Filter) Questionnaire Outcome: Integral to the STEPPS program is the weekly discussions of the group members about the difficulties that hinder their progress such as unhelpful filters (schemas) and maladaptive coping strategies which often characterize BPD. Patients are taught to recognize their cognitive filters, i.e., the patterns of negative and distorted thoughts and the beliefs about themselves and the world, which often trigger their intense emotions and destructive behaviours. The overall progress in reforming these negative and distorted thoughts is assessed twice (at week 2 and then at week 19) during the STEPPS program. This is carried out using a self-report measure called the _Filter Questionnaire ‘, which was devised by the program creators as a core component of the skills training (Blum et al. 2002). This questionnaire addresses 10 common unhelpful filters: Emotional deprivation, Abandonment, Defectiveness, Mistrust, Failure to achieve, Vulnerability, Self-sacrifice, Subjugation, Unrelenting standard, and Entitlement. It uses 6 questions for each individual filter. Each of these questions is scored using a Likert scale from 0 to 4, yielding a total score for each filter within the range of 0 to 24. Higher scores represent a greater prevalence of that particular filter in the patient‘s functioning.

Although STEPPS patients in our study demonstrated clear improvement on the Filter Questionnaire in post-test in comparison to baseline test, the differences were not statistically significant in most of the filters. Our results are, therefore, in agreement with Alesiani and her colleagues (2014), who studied 32 Italian patients, of whom 17 only completed the program. Although they achieved significant reduction in the number of hospitalizations related to self-harm acts, the number of suicidal attempts, and in emotional intensity scores, the scores on the Filter Questionnaire, by contrast, tended to decrease during and after the STEPPS treatment period and then they increased after treatment ends, but this was not statistically significant. They concluded that the positive effect of the treatment on the cognitive aspects (filters) is immediate but is not stable over time. The lack of changes in the scores on the Questionnaires for the Personality Assessment indicates that STEPPS does not act on the personality structure; the impact of STEPPS is evident primarily in emotion regulation and crisis management.

On the other hand, our results do not agree with those of Hill et al (2016), who carried out a longitudinal repeated-measures design study on

30 British patients with BPD. Similar to our results, they obtained significant reductions in symptom severity and increases in patients ‘quality of life. However, the affinity for maladaptive schemas was also significantly reduced in that study. They attributed this positive outcome to early identification of individual pathological schemas, which then forms an ongoing theme for discussion and teaching throughout the remainder of the program, leading to the active challenging of these filters when they present themselves. The significant reduction in scores across all 10 schemas addressed in the Filter Questionnaire suggests that STEPPS engenders not only an ability to identify the activation of these schemas in patients ‘daily functioning, but also an ability to challenge and disarm these schemas when they arise.

Limitations: First, the non-randomized study design, which may be inferior to the gold-standard randomized controlled study design in the strength of evidence. Second, the relatively small sample size, which made it difficult to detect significant effect of treatment on some outcomes, such as the individual items of the BEST score. Third, the conduction of the study during the time of the COVID19 pandemic had significant limitations that were partially compensated by the use of telepsychiatry. Fourth, since schema is rather a fixed pattern of thinking, it tended to hinder the application of the procedure.

In addition, it is notable that all participants were females, which calls for further studies that incorporate males to explore the efficacy of the intervention in that cohort.

Conclusions:

STEPPS as a sole (not add-on) intervention proved superior efficacy in comparison to TAU (cognitive behaviour therapy) for treatment of patients suffering from borderline personality disorder in Tanta University Hospital, as evidenced by the lower attrition rate of borderline patients who received STEPPS therapy in comparison to those who were managed by TAU. Patients in the STEPPS group showed better improvement of emotion regulation, borderline symptoms and quality of life in comparison to TAU as shown in the statistically significant lower mean of total score of DERS scale, BEST scale and the statistically significant higher mean of total score of WHO quality of life scale, both at the end of the treatment period after 6 months of follow up. Improvement in schema questionnaire in STEPPS group was limited as schema is rigid and need more duration to be changed.

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