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Interpersonal and Social Rhythm Therapy (IPSRT) on Depression and Emotional Instability in Patients with Bipolar Disorder Type 1 treated with Medication

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Bipolar disorder is a chronic and relapsing disorder for which various interventions have been introduced. Interpersonal and Social Rhythm Therapy (IPSRT) was developed to treat patients' stressful events, improve social and circadian rhythm disturbances, and increase treatment adherence. This quasi-experimental study, with pre-test, post-test, follow-up, and control group, aimed to investigate the effectiveness of IPSRT on depression and emotional instability in patients with bipolar disorder Type 1 treated with medication.
The statistical population included all male patients with bipolar disorder, type 1, who were referred to Azadi Rehabilitation and Treatment Center in Tehran during 2020-21. Using a convenience sampling method, participants were randomly assigned to an experimental group (n=12) and a control group (n=12). The experimental group received IPSRT in twelve 90-minute sessions, whereas the control group was on the waiting list. We used the Hamilton Depression Rating Scale (HAM-D) and the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) and analyzed data using SPSS-27 software with the Mann–Whitney U test. The findings revealed a significant difference between the experimental and control groups in terms of depression and emotional instability in the pre-test, post-test, and follow-up. IPSRT had a positive effect on reducing depression and emotional

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instability (p<.05). The results of this study showed the efficacy of IPSRT on depression
and emotional instability in patients with bipolar type 1. Thus, this method can be used as an interventional and therapeutic method to reduce depression and emotional instability in bipolar type 1 patients.

Keywords: IPSRT, depression, emotion instability, bipolar disorder type 1

Bipolar disorder is a severe mental illness that burdens patients, their families, and society (Aydın, Ozdogan, Ustundag, Ceyhun, & Esin, 2021; Nooripour et al., 2016). It is characterized by mood swings that range from acute euphoria to severe depression and causes disturbances in energy levels and performance as well as impairments in social interactions (Rantala et al., 2021). Mania is characterized by a high, open, or irritable mood (Guzman-Parra et al., 2021). Bipolar disorder (type 1) was diagnosed when patients experienced depressive and manic episodes and mania or when they experienced manic episodes only.

Bipolar disorder has been biologically associated with emotional instability, and bipolar disorder sufferers experience emotional instability characterized by irritability, agitation, aggression, changeability and impulsivity (Lee et al., 2022). Psychiatric disorders of emotion regulation contribute significantly to the pathology of bipolar disorder and can lead to poor outcomes or progression (Parker et al., 2021).

Depression is another sign of bipolar disorder. The symptoms of depression range from mild frustration to severe despair and are characterized by a change in mood. Bipolar disorder affects 20% of patients with clinical signs of depression (Mohammadyfar, Azizpour, Najafi, & Nooripour, 2018; Xiong et al., 2021).

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Even though the first line of treatment for mania and depression is often a weak medication, relapse rates are high, and full recovery is not always possible. Accordingly, psychosocial therapies are effective at strengthening treatment adherence, identifying early warning signs, improving self-management skills, and communicating with family members. The inclusion of these elements in treatment plans may be able to reduce relapse rates in patients undergoing treatment. Therefore, pharmacological and psychosocial interventions must be incorporated into routine clinical care for treating patients with bipolar disorder (Arnbjerg et al., 2022). Interpersonal and Social Rhythm Therapy (IPSRT) is an individual adjunctive therapy that can be used with pharmacological interventions in patients with bipolar disorder (Frank, Swartz, & Kupfer, 2000). This treatment relies primarily on biological mechanisms (Bouwkamp et al., 2013).

The psychological framework for social rhythm therapies (SRTs) is usually provided by combining them with other theoretical therapies (Haynes, Gengler, & Kelly, 2016). It consists of a combination of SRT and interpersonal psychotherapy (IPT) (Swartz et al., 2011). Interpersonal SRT was designed to reduce stress in patients, improve social and circadian rhythm disturbances, and increase adherence to treatment (Hlastala, Kotler, McClellan, & McCauley, 2010).

With SRT, people with fluctuating moods are encouraged to maintain a relatively active and consistent daily schedule. IPSRT is a 12-session treatment that improves lifestyle, mood, and sleep quality by reducing associated disorders (Douglas et al., 2022). IPSRT evolved from the chronological model of bipolar disorder, in which people with bipolar disorder are genetically predisposed to disturbances of sleep-wake rhythms and circadian rhythms that may contribute to their symptoms. It has been combined with

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medication as an essential component of interpersonal psychotherapy with behavioral techniques to help patients organize their daily routines, reduce interpersonal conflicts, and comply with medication regimens (Bonfils & Novick, 2021).

Several studies have investigated the effects of IPSRT on patients with bipolar disorder (Frank, 2007; Frank et al., 1997; Goldstein et al., 2014; Lam & Chung, 2021). Researchers found that IPSRT treatment improved mania symptoms in 44 bipolar disorder patients compared to those who received medication only. By helping patients maintaining a regular sleeping, waking, eating, and exercising rhythm, IPSRT can improve quality of life, mood, and interpersonal relationships, and bipolar disorder patients may benefit from it (Frank et al., 2005). In addition, studies have shown that IPSRT is effective in adults with bipolar disorder as well as patients with schizophrenia and depression (Frank et al., 2008).

Researchers have demonstrated that IPSRT can improve disease acceptance, increase treatment adherence, improve healthy coping with life events, and restore and monitor a stable circadian rhythm (Bouwkamp et al., 2013; Frank et al., 2005; Sankar et al., 2021). Given the above-mentioned conditions, that emotional disturbances and depression as symptoms of bipolar disorder cause many concerns, and that medication therapy alone is associated with the possibility of disease recurrence, IPSRT focuses on solving interpersonal problems and maintaining a regular daily rhythm of sleeping, waking, eating and exercising and may improve quality of life and reduce mood symptoms in bipolar patients. Because of the lack of research in the application of this treatment for bipolar disorders in Iran, the present study examines the hypothesis that IPSRT alleviates depression and emotional instability in bipolar disorder type 1.

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Method

A quasi-experimental design was used in this study, which included a pre-test, post-test, and follow-up with the control group. All bipolar disorder type 1 men who referred to Azadi Rehabilitation and Treatment Center in Tehran city in 2020-21 were included in the statistical population of this study. In the sample group, 24 men with bipolar disorder type 1 were randomly selected based on the inclusion criteria and randomly divided into experimental (n=12) and control groups (n=12). With the cooperation of the management of the center, the list of referrals suffering from bipolar disorder was provided to the researcher. From that list, 30 people were initially selected with consideration given the prediction of dropout due to the corona pandemic conditions and based on the criteria of the research. They were randomly divided into an experimental (15 people) and a control (15 people) group. It should be noted that out of 30 participants, 24 people remained until the end of the implementation (12 people in the experimental group and 12 people in the control group), and their information was used in the pre-test and post-test stages to generalize the findings to the statistical population.

Instrument

Inclusion criteria: Diagnosis of type 1 bipolar disorder by three methods: **A)** diagnosis by a psychiatrist, **B)** examination with the Comprehensive International Diagnostic Interview (CIDI), and **C)** assessment of DSM5 criteria by a clinical psychologist; adequate literacy (schooling and above); aged 20-50 years; relatively regular usage of medication; no history of brain or head injury; no organ dysfunction; and the willingness to take part in IPSRT.

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Exclusion Criteria: Substance abuse problems (other than nicotine and caffeine), severe psychiatric disorders (such as schizoaffective disorder), recurrence of acute symptoms of psychotic illness (including hallucinations, delusions, and psychosis), absence from more than two training sessions, and failure to complete homework assignments related to training comprised the exclusion criteria of this study.

Hamilton Depression Scale (HAM-D)

The HAM-D was developed by Hamilton in 1960 and improved in later years. This scale was one of the first developed for the assessment of depression. The original HAM-D comprised 21 items. It is essential to note that the last four (daily changes, paranoia symptoms, depersonalization and obsessive-compulsive symptoms) should not be included in the total score, because these symptoms are unusual and reflective. No indication of the severity of depression is found on these items (Richter et al., 1998). Each proposition can be scored from zero to four or zero to two, and the total score is 0 to 76 (Timmerby et al., 2017). Cut-off scores acceptable to therapists on this scale range from 0 to 6 (does not indicate depression), 7 to 17 (mild depression), 18 to 24 (moderate depression), and 25 and above (severe depression) (Hamilton, 1960). The estimate is based on a clinical interview with the patient. The patient's response to questions about guilt, suicide, sleep behavior, and other depressive symptoms is clinically significant (Bech, Allerup, Larsen, Csillag & Licht, 2014). The sensitivity in diagnosing positive cases of depression is 87%, and the highest sensitivity and specificity of the HAM-D were found in several studies to be at clinical cut-off point 17, where the sensitivity was 62.4% and specificity 92% (Timmerby

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et al., 2017). The correlation coefficient between the Beck Depression Scores and the HAM-D in an Iranian sample was 0.66 (Kheirabadi, Maracy, Akbaripour, & Masaeli, 2012). According to Cronbach's alpha, the questionnaire has a high level of reliability, which is 0.69.

Difficulties in Emotion Regulation Scale (DERS)

The Primary Emotion Regulation Difficulty Scale is a self-report instrument developed to assess clinical difficulties in emotion regulation(Gratz & Roemer, 2004). It is also a standard with 36 questions answered on a Likert scale (1 to 5). Higher scores show more difficulties in emotion regulation. This questionnaire includes six components or dimensions: the rejection of emotional responses, difficulty performing goal-directed behaviors, difficulty controlling impulses, lack of emotional awareness, limited access to emotional regulation strategies, and lack of emotional clarity. A score of six on the test scale calculates an individual's total emotional regulation difficulty score. A higher score on each of the subscales and the whole scale shows more unexpected emotional regulation problems. The results show that this scale has a high internal consistency of .93. All six emotion regulation difficulty subscales have a Cronbach's alpha greater than .80. The emotion regulation difficulty scale correlates significantly with the generalized Negative Emotion Regulation (NMR) scale and the acceptance and action questionnaire (Hayes et al., 2004). The psychometric properties of the Persian version of the Emotion Regulation Difficulty Scale were examined and confirmed in clinical (n=187) and nonclinical (n=763) samples; Cronbach's alpha coefficients ranged from .73 to .88 for the negative emotion rejection questions, from .72 to .89 for difficulty in goal-directed behaviors, and from .75 to .90 for difficulty controlling impulsive

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behaviors; Also, For the limited achievement of effective emotion regulation strategies from .76 to .85, for lack of emotional awareness from .72 to .86, for lack of emotional clarity from .77 to .90, and a total scale score from .79 to .92 was obtained (Mazaheri, 2015). Using Cronbach's alpha, the reliability of the questionnaire was .71 to .89, indicating good reliability.

Procedure

The study had two stages: preliminary and main examinations. The introductory phase aimed to gain skills in Interpersonal and Social Rhythm Therapy (IPSRT), establish treatment protocols, prepare research instruments and check their validity and reliability. In the primary research phase, the points mentioned comprise getting approval from the rehabilitation center, choosing the sample group based on research criteria, conducting a pre-test meeting to discuss the objectives, manner, and timing of the sessions, and conducting a pre-test for data collection. Next, we conducted IPSRT sessions for the experimental group and the post-test for the control group.

It is important to note that after the pre-test (completion of the research questionnaires) for the experimental and control groups, the protocol of IPSRT (Frank et al., 1997) was performed in twelve 90-minute sessions over 12 weeks during May-July 2021 at Azadi Rehabilitation and Treatment Center in Tehran. During this period, the control group received no psychological treatment. Both experimental and control groups completed questionnaires after the intervention. For data analysis, the Mann-Whitney U test was performed using SPSS-27 and Excel statistical software, depending on the study's design (pre-test, post-test, and control group). All information about the disease and the questionnaires was kept confidential. To comply with

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ethical considerations, participants provided written informed consent to participate in the study. A meeting was also held for the control group.

IPSRT sessions are summarized in the following Table.

Table 1
IPSRT Protocol

Meeting number	Content of the meeting	Objectives	Homework
1		Facilitate initial communication with participants	
2		Scientific awareness of the disease	
3		Awareness of interpersonal balance and meaningful patient relationships	
4	Discussion of problem areas in interpersonal psychotherapy, including role conflict, role transition, interpersonal deficits, grief. Presentation of the patient's role and examination of limitations because of illness	Separate writing of problem areas in interpersonal relationships	
5	Definition of IPSRT Learning to regulate body's biological rhythms and do your homework. (Adjusting sleep-wake rhythm, playing sports, professional sports activities, communicating with another person, starting daily activities, rating mood and energy from -5 to +5)	Training in IPSRT	24-hour schedule
6	Advanced training in IPSRT Cognition and self-perception of positive and negative emotions The relationship between emotions and the	Sensitization of positive and negative emotions	24-hour schedule

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	instability of the patient's mood IPSRT The direct relationship between circadian and social rhythms and patient mood and arousal		
7	Training to improve interpersonal-social relations. (Skills to resolve conflicts by identifying the dispute). Identifying expectations and feelings of parties and identifying existing solutions	Enhancing interpersonal relationships and conflict resolution	24-hour schedule Determine the nature of the dispute
8	Review and exchange of opinions among group members about task set. (Determination of nature of the disputes)	Doing the right thing	24-hour schedule
9	Identifying causes of interpersonal conflicts (IPT approach)	Awareness of causes of interpersonal conflicts	24-hour schedule
10	Investigation of solutions for interpersonal conflict resolution	Awareness of solutions for conflict resolution	24-hour schedule Resolve interpersonal conflict
11	Evaluate strategies to promote interpersonal relationships and regulate the body's circadian cycle to reduce depression and emotional instability in patients	Evaluating strategies	24-hour schedule
12	Review and summarize past meetings and solicit feedback.	Conclusions	

Results

Two types of statistical analysis are presented in this section: descriptive and inferential. Each group in the current study had 12 participants. Because of the small sample size, which was unsuitable for parametric covariance analysis, the Mann–Whitney U test was used to assess the effectiveness of the intervention.

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Using the Mann–Whitney U test, the difference between post-test and pre-test scores was calculated to determine the effectiveness of the intervention. Furthermore, the differences in scores between the follow-up and pre-test stages were calculated to assess the durability of the effect, and the obtained score was compared with the Mann-Whitney U test. The data was analyzed using SPSS 27. Depression and emotional instability are described in Table 2. Means and standard deviations were used to define the variables.

Table 2
Average and Standard Deviation of Depression and Emotional Instability Variables by Time and Group

Variables	time	IPSRT		Control group	
		M	SD	M	SD
Depression	Pretest	23.50	5.25	21.83	4.17
	Posttest	12.42	5.96	21.08	4.34
	Follow-up	12.50	5.50	21.33	3.03
emotional instability	Pretest	130.83	17.23	120.67	15.26
	Posttest	94.67	18.22	122.17	14.45
	Follow-up	95.08	17.64	122.92	12.67

The results showed that the average level of depression in the control group reached 21.83 in the pre-test, dropped to 21.08 in the post-test, and then decreased to .75. The average depression in the rhythm therapy group went from 23.50 in the pre-test to 12.42 in the post-test, demonstrating a decrease of 11.08 points, which was much higher than the changes in depression in the control group. The average emotional instability in the control group went from 120.67 to 122.17 and increased by 1.50 points, and in the experimental group, the average went from 130.83 to 94.67 and showed a decrease of 36.16 points. Table 3 presents the

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results of the Mann–Whitney U test to compare the differences between the post-test and pre-test scores in the groups.

Table 3

Results of the Mann–Whitney U Test to Compare the Difference between Post-Test and Pre-Test Scores in two Groups (Intervention Effectiveness)

Variables	Mean Difference		Mean Rank		Z	*P*
	M	SD	Control	Experimental		
depression	5.92	5.82	18.50	6.50	3.92	.001
emotional instability	17.33	20.48	19.32	5.79	4.08	.001

According to Table 3, the intervention was effective in treating depression and emotional instability (p<.05). There was a difference of 5.92 on the depression scale and one of 17.33 on the emotional instability scale. The difference between the post-test and pre-test in the experimental group is significantly more noteworthy than that in the control group, thus confirming the effectiveness of the intervention. Mann-Whitney U tests were used to determine whether the rhythm therapy intervention was durable by comparing the follow-up time score to the pre-test.

Table 4

Results of Mann–Whitney U test to Compare the Difference Between Follow-Up and Pre-Test Scores in the Two Groups (Permanence of the Effect)

Variables	Mean Difference		Mean Rank		Z	*P*
	M	SD	Control	Experimental		
Depression	5.75	6.08	18.42	6.58	3.88	.001

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Emotional instability	16.75	20.95	19.07	5.92	3.95	.001

There was a statistically significant difference between the follow-up and pre-test scores between the two groups (p<.05). Because depression and emotional instability levels differed significantly between the pre-test and follow-up, we can confirm the permanence of the effect of IPSRT intervention.

Discussion

The current study aimed to investigate the effectiveness of IPSRT on depression and emotional instability in patients with bipolar disorder type 1 under treatment with medication. The results showed that IPSRT could lead to a significant reduction in depression in patients with bipolar disorder type 1 treated with medication, which is consistent with other studies (Douglas et al., 2022; Frank et al., 2008; Lam & Chung, 2021; Sankar et al., 2021). This research was not found to have the opposite result based on the research literature.

Social rhythm therapy and interpersonal therapy are two parts of IPSRT. Interpersonal problems and social rhythms are interrelated in the IPT and SRT treatment sections. As a result of interpersonal therapy, mood problems are reduced, and interpersonal and social relationships are improved.

A variety of factors, including the close relationship between improvements in circadian rhythms and symptoms in patients with bipolar disorder, can explain the positive effects of the intervention. We consider sleep disturbances to be a trigger for depression and mania. As part of IPSRT, energy levels are monitored daily in order to improve daily schedules to deal with sleep disturbances. Studies (Lieverse, de Vries, Hoogendoorn, Smit, & Hoogendijk, 2013; Spector et al., 2006) have shown that

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regulating sleep-wake rhythms reduces depression in patients with mood disorders.

Thus, IPSRT helps to reduce depression and regulate mood by regulating daily activities and cycles and rhythms such as sleeping and waking, and reducing interpersonal disputes and inadequacies (Goldstein et al., 2014). IPSRT has the dual goal of regulating mood and improving performance in interpersonal relationships, which can reduce symptoms of depression (Goldstein et al., 2018). Another explanation is that selecting a common problem area is essential to interpersonal therapy. For example, losing a healthy self is a common problem for the entire group. Frank et al. (2000) noted that patients with bipolar disorder often grieve for someone who has had the illness or for becoming someone who would not have had bipolar disorder. This is considered grieving for the lost self in IPSRT, and grief-related interpersonal treatment techniques are used to assist the patient. In bipolar treatment, the therapist encourages the patient to express painful feelings about lost hopes, broken relationships, lost employment, and missed opportunities. This may contribute to reducing depression in patients with bipolar disorder.

It is also possible that the intervention improved patients' adherence to treatment and their intake rhythm, which may account for the improved psychiatric symptoms. For example, patients were regularly informed about the potential side effects of medications, and their concerns about medications and side effects during the treatment period were periodically addressed; it could also reduce depression by encouraging patients to continue taking medications.

Results also showed that IPSRT significantly reduced participants' emotional instability. This finding is consistent with the results of other research (Bonfils & Novick, 2021; Bonfils &

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Novick, 2021; Bouwkamp et al., 2013; Douglas et al., 2022; Frank et al., 2008; Lam & Chung, 2021; Sankar et al., 2021). In the review of the background of the research, there was no findings relating to the opposite result of the current research. Several factors can explain the positive effect of the intervention on emotional instability, including the theory of Frank et al. (2008). According to their theory (Frank, 2007), the brain's biological time is regularly regulated by specific processes such as sunrise and sunset, lunch and dinner, and coming home in the evening after work; these control our biological time. Some factors disrupt the brain's schedule, such as flying in an airplane, various daily work schedules or light deprivation. "When our brain's schedule is disrupted, we get mood swings,"(Zacks, Speer, Swallow, Braver, & Reynolds, 2007).

Therefore, in the present study, patients were educated about the body's circadian cycle and the factors that disrupt the order of this cycle, such as the disruption of times for sleep and wakefulness, lunch and dinner, work and activity, as well as how the brain cycle regulates emotions. Participants were encouraged to establish a specific time for going to bed and waking up. They were advised to set aside a particular time for lunch, dinner, and taking medications and to engage in particular activities throughout the day. Walker & van der Helm (2009) hypothesized that sleep disturbances are a biologically-related component to mood disorders and that disruptions in the sleep-wake cycle affect mood and emotion regulation.

Another focus of IPSRT is interpersonal conflict, in which people with bipolar disorder are more likely to engage. Bipolar symptoms may contribute to interpersonal differences, or interpersonal differences may overstimulate patients, which may exacerbate mood problems and emotional instability (Frank, Swartz, & Boland, 2007; Kahawage et al., 2022). This

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intervention helps reduce emotional instability by assisting patients in resolving their interpersonal issues and improving their emotional disturbance. Thus, IPSRT helps maintain mood indirectly by improving and expanding social relationships and networks and providing more social support to help improve mood and reduce mood swings (Lieverse et al., 2013).

Each day, participants in social rhythm therapy were asked to complete a round-the-clock (SRM) schedule (Frank et al., 2007). Time to wake up, meet the first person, perform a specific activity or task, eat dinner, go to bed and rate mood and energy from +1 to -1 are the headings on the chart. The homework from the previous week was discussed, behaviors and events disrupting social rhythms and moods were identified, and practical advice was given on how to complete the form and improve social rhythm stability.

In addition to medication, resolving interpersonal problems and maintaining a regular routine of sleep, waking, eating, and exercising can improve quality of life, reduce mood problems, and prevent disorder recurrence (Frank et al., 2005). This study found that improving interpersonal inadequacies and regulating disrupted circadian rhythms could explain mood stability and reduce emotional problems in bipolar individuals.

Because fluctuations in mood and in the tendency of respondents to give pessimistic and/or optimistic answers can occur, it is not possible to collect information based on self-report using a questionnaire, the effects of environmental factors, the frequent and different emotions of patients, the difficulty of changing the personality structure of patients, or the lack of control.

Homework was a limitation of the present study. In addition, the prevalence of coronary artery disease at the end of

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interventions limited the possibility of evaluating the persistence of the results in a follow-up study. This intervention method should be used and compared in future research for different types of bipolar disorders (types 1, 2, and rapid cycling). It is recommended that IPSRT be used to treat mood problems and emotional dysfunction in women as well as other mental illnesses, such as substance abuse and schizophrenia. Many disorders are related to mood disorders, such as bipolar disorder, impulsive behavior, and risky behavior.

Approval Ethical Considerations

This study was part of the first author's master's thesis. The Khatam University Research Ethics Committee approved the original study. The present study was designed based on the principles set in the Declaration of Helsinki (World Medical Association, 2001) and was accepted by the Ethics Committee of our University. After receiving information about the study's aims, all participants provided written consent to participate. The researchers first explained the purpose of the survey to the participants, and then assured them that the investigation would be kept confidential. Participants were free to withdraw from the study without giving a reason to maintain the element of voluntariness. There was no need to write a name, and participation in the research was completely voluntary.

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