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Examining the Effectiveness of Dialectical Behavior Therapy on Impulsivity, Emotion Regulation, Rumination, and Self-Criticism in Individuals with Trichotillomania

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A B S T R A C T

Trichotillomania is a mental disorder characterized by recurrent and irresistible urges to pull out hair from the body. The present study aimed to elucidate the effectiveness of dialectical behavior therapy on impulsivity, emotion regulation, rumination, and self-criticism in individuals with trichotillomania. From an objective standpoint, this study is considered applied research and, methodologically, a quasi-experimental study with a pre-test, post-test, and follow-up test design, including a control group with a 2-month follow-up period. The population of this research included all individuals with trichotillomania in districts 2 and 4 of Tehran, from whom 18 persons for each group were selected through purposive non-random sampling and were randomly assigned to either the experimental or control group. The instruments used in this research included the Massachusetts Hair Pulling Questionnaire, Williams and colleagues' (1997) Emotion Regulation Scale, Barratt and colleagues' (1990) Impulsivity Scale, Gilbert and colleagues' (2004) Self-Criticism Scale, and Nolen-Hoeksema and colleagues' (1991) Rumination Scale. The dialectical behavior therapy intervention was conducted over 8 one-hour sessions; however, the control group did not receive any intervention. The research was analyzed through mixed ANOVA (with repeated measures) and Bonferroni follow-up tests using SPSS version 22. The results of the present study indicated that dialectical behavior therapy has a significant effect on impulsivity ($P<0.01$), emotion regulation ($P<0.01$), rumination ($P<0.01$), and self-criticism ($P<0.01$), and these effects continue in the follow-up phase. It can be concluded that dialectical behavior therapy is effective in reducing impulsivity, improving emotion regulation, decreasing rumination, and reducing self-criticism, and can therefore be beneficial for individuals with trichotillomania.

Keywords: *Dialectical Behavior Therapy, Impulsivity, Emotion Regulation, Rumination, Self-Criticism, Trichotillomania*

1. Introduction

Trichotillomania is a psychological disorder characterized by recurrent and irresistible urges to pull out hair from the body (1). Evidence suggests that the prevalence of trichotillomania in various communities ranges between 5 to 12 percent (2). Individuals diagnosed with trichotillomania are those who have lost a significant portion of their hair, including scalp hair, eyebrows, eyelashes, and other body parts, due to hair-pulling and ultimately seek treatment out of distress and desperation (3). People with trichotillomania experience irresistible

cravings to pull out their hair, leading to significant functional impairments and psychiatric illness (4). Trichotillomania has been described as a type of impulse control disorder, highlighting the impulsive nature of this illness (5). Some studies suggest that trichotillomania may best be conceptualized as a disorder encompassing both impulsivity and compulsion (Starcevic, 2015). Impulsivity, as a trait, has been identified as a strong predictor of psychosocial dysfunction in trichotillomania (6).

Impulsivity involves acting, decision-making, and a tendency to perform actions impulsively rather than through thought (7). Impulsivity encompasses a spectrum of behaviors such as the inability to inhibit responses, intolerance of delayed rewards, and persistence of unrewarded responses (8). The level of impulsivity plays a significant role in health, adaptability, disordered personality, and various forms of psychopathology. Impulsivity is the core of many social harms, including substance use, pathological gambling, personality disorders, and aggressive behaviors (9). Furthermore, impulsivity is associated with lack of restraint, poor self-control, thoughtlessness, sensation-seeking, and risk-taking behaviors (10). It has been shown that individuals with trichotillomania exhibit more impulsivity and immediate behaviors compared to others (11).

Difficulties in regulating and controlling emotions have also been reported in individuals with obsessive disorders, including trichotillomania (12). Emotion regulation can be considered a process through which an individual consciously or unconsciously modifies and regulates their emotions to appropriately respond to environmental demands (13). Emotion regulation can act as a cognitive style of managing emotionally provocative information that encompasses a wide range of cognitive, behavioral, emotional, and physiological responses, aiding in the management or regulation of emotions and emotions, and leading to greater individual adaptability to the environment (14). Studies have shown that low levels of emotion regulation, resulting from an inability to effectively cope with and manage emotions, play a role in the occurrence of psychological disorders and tendencies towards risky and addictive behaviors (15).

Rumination is another factor involved in obsessive behaviors, including trichotillomania. Evidence suggests that mental disorders result from inflexible and abnormal reaction patterns to cognitive events, including persistent rumination and worry, threat control, and ineffective coping strategies related to maintaining the problem (16). Rumination, a process characterized by repetitive and intrusive thoughts, is associated with the consumption of cognitive resources (17). This excessive focus on negative thoughts can lead to the activation of metacognitive beliefs, which in turn can lead to feelings of fear, anxiety, guilt, and distress (18). Rumination is linked to a reduction in individuals' cognitive executive functioning resources and challenges their control over behaviors and emotions (19).

One of the therapeutic approaches that appears to be effective in dealing with the feelings and pains resulting from negative and distressing emotions is Dialectical Behavior Therapy (DBT) (20, 21). DBT includes four key components in group therapy: mindfulness, distress tolerance, interpersonal effectiveness, and emotion regulation (22). DBT focuses on behavior change and emotional management, integrating cognitive-behavioral therapy principles with mindfulness, acceptance, and dialectics (23). Unlike traditional cognitive-behavioral therapy, DBT places less emphasis on cognitive techniques and more on acquiring and practicing new skills (24). DBT emphasizes acceptance and change, where therapists validate patients' experiences while also encouraging personal growth and skill development (25). Research shows that DBT has proven effective in reducing symptoms of eating disorders, mood disorders, emotional disorders, and anxiety disorders (26, 27). Due to the importance of treating trichotillomania and its increasing prevalence in recent years, as well as the research gap regarding the investigation of the effectiveness of DBT on impulsivity, emotion regulation, and rumination in patients with trichotillomania, this study was conducted.

2. Methods and Materials

2.1. Study Design and Participants

The experimental research method and design were semi-experimental, including a pre-test and post-test with a control group and a 2-month follow-up period. The population included all individuals diagnosed with trichotillomania by a psychiatrist who sought treatment at a specialized dermatology center in districts 2 and 4 of Tehran. Out of this population, 36 individuals meeting the inclusion and exclusion criteria were purposively non-randomly selected as the sample and were randomly assigned to either an acceptance and commitment therapy group or a control group. The sample size was calculated based on the mean comparison formula with a 95% confidence level, an alpha error of 0.05, a test power of

Health Nexus
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80%, and a dropout probability of 0.10, estimating 18 individuals for each experimental and control group. Inclusion criteria included "having trichotillomania based on psychiatric diagnosis, individual consent to participate in the study, absence of serious medical illness, and absence of major psychiatric disorder and not receiving concurrent psychological intervention," and exclusion criteria included "missing more than two intervention sessions, unwillingness to continue participation in the research process, and failure to perform assigned tasks in intervention sessions."

Ethical considerations in this research were such that participation was entirely voluntary. Before the start, participants were familiarized with the project's details and regulations. Individuals' beliefs and opinions were respected. Members of both the experimental and control groups were allowed to withdraw from the research at any stage. Additionally, members of the control group were offered the intervention performed for the experimental group in similar therapeutic sessions upon completion of the project if interested. All documents, questionnaires, and confidential records were exclusively accessible to the researchers. Informed written consent was obtained from all volunteers.

2.2. Measures

2.2.1. Impulsiveness

Barratt Impulsiveness Scale: This impulsivity questionnaire, created by Barratt and colleagues in 1990, measures three aspects of impulsivity: cognitive, motor, and non-planning. It consists of 30 items, with responses ranging from "never=1" to "always=4," and scores ranging from a minimum of 30 to a maximum of 120. Barratt et al. confirmed the face, content, and construct validity of the impulsiveness questionnaire with a three-factor structure and reported a Cronbach's alpha coefficient of 0.89. In a study by Javid et al., exploratory factor analysis using the principal components method and varimax rotation was utilized to examine the scale's factor structure. The analysis revealed three factors: non-planning impulsiveness, motor impulsiveness, and cognitive impulsiveness. The convergent validity of this questionnaire was confirmed by calculating the correlation coefficient between its subscales, with overall reliability analyzed through Cronbach's alpha and test-retest methods, resulting in 0.81 and 0.77, respectively (28).

2.2.2. Emotion Regulation

Emotion Regulation Questionnaire: Created by Williams and Kamels in 1997, this scale measures individuals' control over their emotions. It includes 4 subscales: anger, depressed mood, anxiety, and positive affect. It is self-administered with responses rated on a 7-point scale from "strongly disagree=1" to "strongly agree=7." Items 38 and 31-30-27-22-21-18-17-16-12-9-4 are reverse scored. Test-retest reliability for the overall scale score was 0.94, and for the subscales: anger 0.72, depressed mood 0.91, anxiety 0.89, and positive affect 0.84. Convergent validity was confirmed with a correlation coefficient of 0.72 between the questionnaire items. In the research by Tahmasbian et al., the internal consistency of the questionnaire was indicated by Cronbach's alpha, showing the Emotion Regulation Scale has valid internal consistency, with significant test correlations among its subscales and items at a 0.01 confidence level (29).

2.2.3. Rumination

Rumination Scale: Developed by Nolen-Hoeksma in 1991, this scale contains 22 items rated on a 4-point scale from 1 "almost never" to 4 "almost always." Scores range from 22 to 88, with higher scores indicating greater rumination. The reliability of this scale using Cronbach's alpha ranges from 0.88 to 0.60, indicating high internal consistency. Test-retest reliability for more than three months was reported at 0.89. This scale was translated into Persian by Bagheri Nejad, Salehi Fadardi, & Tabatabai, with a Cronbach's alpha coefficient of 0.88, indicating high internal consistency in the Iranian sample. The test-retest reliability reported in the Iranian sample was 0.60, which is acceptable. Additionally, the concurrent validity of this scale with the Beck Depression Inventory was reported at 0.83, and the test-retest reliability rate of 98% is one of the validity indicators of this tool (30).

2.2.4. Self-Criticism

Self-Criticism Scale: Developed by Gilbert and colleagues in 2004, this scale has 22 items that explore individuals' thoughts and feelings about themselves when things are not going well. Responses are rated on a 5-point Likert scale from 0 "not at all true for me" to 4 "entirely true for me." Gilbert and colleagues reported the reliability of this scale using Cronbach's alpha for the self-inadequacy factor at 0.90, for the self-hating factor at 0.86, and for the

Health Nexus
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reassured factor at 0.86. Furthermore, in a study in Iran by Ghahramani Ochghaz and colleagues, the validity and reliability of this scale were examined, confirming its validity through exploratory and factorial analysis and its reliability using Cronbach's alpha for the self-inadequacy factor at 0.89, for the self-hating factor at 0.73, and for the reassured factor at 0.75 (31).

2.3. Intervention

2.3.1. DBT

DBT was conducted based on the DBT protocol by Linehan et al. (32) over 8 sessions of 60 minutes each, twice weekly in a group setting.

Session 1: Introduction to DBT and Mindfulness

The first session introduces participants to the principles of DBT and its relevance to managing trichotillomania. The concept of mindfulness, a core component of DBT, is introduced, emphasizing present-moment awareness and acceptance. Participants engage in basic mindfulness exercises aimed at enhancing their observation and description skills, focusing on non-judgmental observation of their thoughts, emotions, and the urge to pull hair.

Session 2: Mindfulness Continued and Wise Mind

Building on the mindfulness skills introduced in the first session, this session dives deeper into practicing mindfulness, with a focus on developing the "Wise Mind" concept. This concept represents a balance between emotional and reasonable minds, helping participants recognize and regulate their impulsive hair-pulling urges. Exercises aim to strengthen the ability to access Wise Mind in moments of distress or when experiencing the urge to pull hair.

Session 3: Distress Tolerance I

The third session introduces distress tolerance skills, focusing on surviving crisis situations without resorting to self-destructive behaviors like hair pulling. Techniques such as distraction, self-soothing, and improving the moment are introduced. Participants learn and practice these skills, discussing how they can be applied during moments of intense emotional distress or strong urges.

Session 4: Distress Tolerance II

Continuing with distress tolerance, this session covers the concept of radical acceptance. Participants learn to fully accept reality as it is, without trying to change it, as a strategy to cope with distress and reduce the urge to engage in hair-pulling. Exercises are designed to help participants practice acceptance in challenging situations related to their trichotillomania.

Session 5: Emotion Regulation I

This session focuses on understanding and managing emotions, a critical component for reducing hair-pulling behaviors. Participants are introduced to the model of emotions and learn strategies for identifying and labeling emotions accurately. Exercises include exploring the function of emotions and practicing strategies to decrease vulnerability to emotion mind.

Session 6: Emotion Regulation II

Building on the previous session, participants learn additional emotion regulation strategies, including how to change unwanted emotions and reduce emotional suffering. Techniques such as opposite action, problem-solving, and increasing positive experiences are introduced and practiced, with a focus on applying these strategies to manage the emotions that trigger hair-pulling.

Session 7: Interpersonal Effectiveness I

This session introduces interpersonal effectiveness skills, which help participants navigate relationships more effectively, a key aspect of maintaining emotional balance and preventing hair-pulling. Participants learn to assert their needs, set boundaries, and negotiate solutions in relationships, practicing techniques for effective communication and dealing with conflict.

Session 8: Interpersonal Effectiveness II and Review

The final session continues the focus on interpersonal effectiveness, emphasizing the balance between priorities, demands, and self-respect in interactions with others. The session concludes with a comprehensive review of all the skills learned throughout the program, discussing how participants can integrate these skills into their daily lives to manage trichotillomania more effectively. Participants are encouraged to commit to ongoing practice and identify strategies for maintaining progress.

2.4. Data Analysis

Descriptive data analysis involved calculating statistical indices for each research variable. In the inferential statistics section, repeated measures analysis of variance and SPSS-22 software were utilized.

3. Findings and Results

The demographic findings of the sample indicated that in the experimental group, there were 7 females (38.8%) and 11 males (61.1%), while in the control group, there

Health Nexus
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were 5 females (27.7%) and 13 males (72.2%). Regarding marital status, both groups comprised 2 single (11.1%) and 16 married (88.9%) participants. The age distribution in the experimental group included 4 individuals (22.2%) under 30 years, 8 individuals (44.4%) between 30 to 39 years, and 6 individuals (33.3%) between 40 to 49 years. In the control group, there were 3 individuals (16.7%) under 30 years, 10 individuals (55.5%) between 30 to 39 years, and 5 individuals (27.7%) between 40 to 49 years. In terms of education, both groups had 14 individuals (77.8%) with below diploma and 4 individuals (22.2%) with a bachelor's degree or higher in both the experimental and control groups.

Table 1

Central Tendency and Dispersion Indices of Research Variables in Experimental and Control Groups

Variable	Group	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Emotion Regulation	Dialectical Therapy	239.88 (11.37)	226.27 (11.35)	229.83 (9.80)
	Acceptance and Commitment	240.77 (13.54)	204.11 (6.24)	210.66 (5.94)
	Control	238.77 (11.30)	239.44 (11.27)	239.55 (11.37)
Impulsivity	Dialectical Therapy	60.55 (3.98)	56.11 (4.41)	53.33 (11.97)
	Acceptance and Commitment	57.00 (6.25)	48.05 (5.16)	48.94 (4.77)
	Control	60.55 (4.48)	61.11 (4.62)	60.88 (4.72)
Rumination	Dialectical Therapy	60.72 (3.83)	56.72 (3.76)	56.61 (3.71)
	Acceptance and Commitment	62.38 (4.40)	54.94 (3.91)	55.66 (3.58)
	Control	58.11 (4.66)	57.88 (4.28)	58.50 (4.30)
Self-Criticism	Dialectical Therapy	44.11 (2.98)	40.11 (3.02)	39.94 (2.75)
	Acceptance and Commitment	45.16 (2.59)	36.77 (3.28)	36.94 (3.29)
	Control	44.66 (3.12)	45.27 (3.25)	45.33 (3.36)

The Box's M test was not significant for any of the research variables, thus confirming the homogeneity of variance-covariance matrices. The results of the multivariate analysis of covariance (MANCOVA) showed that, controlling for pre-test scores, there was at least one significant difference between the two groups (experimental and control) across one of the variables ($P<0.05$). The non-significance of the Levene's test for any of the variables indicates that the condition of equal variances across groups was met, and the variance of the error of the dependent variable was equal across all groups.

Table 2

Repeated Measures ANOVA for Comparison of Pre-test, Post-test, and Follow-up across Experimental and Control Groups

Scale	Source of Effect	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance	Eta Squared
Impulsivity	Time	235.18	2	117.59	5.91	0.004	0.14
	Time*Group	286.74	2	143.37	7.21	0.001	0.17
	Group	498.37	1	498.37	6.10	0.019	0.15
Emotion Regulation	Time	801.24	1.09	730.80	23.96	0.001	0.41
	Time*Group	999.24	1.09	911.39	29.88	0.001	0.46
	Group	1422.81	1	1422.81	4.23	0.047	0.11
Rumination	Time	95.79	2	47.89	126.53	0.001	0.78
	Time*Group	105.13	2	52.56	138.86	0.001	0.80
	Group	131.61	1	131.61	34.25	0.001	0.38
Self-Criticism	Time	71.24	1.50	47.20	113.14	0.001	0.77
	Time*Group	134.01	1.50	88.80	212.85	0.001	0.86
	Group	370.37	1	370.37	13.21	0.001	0.28

Results in Table 2 indicate that the analysis of variance for within-group factors (time) and between-group, as well as the interaction between group and time for research variables, is significant. Additionally, the Bonferroni post-hoc test was used for pairwise comparison of groups.

Health Nexus
E-ISSN: 2981-2569

Table 3

Bonferroni Post Hoc Test Results

Variable	Group	Stage	Post-test	Follow-up
Impulsivity	Dialectical	Pre-test	*1.94	*3.61
		Post-test	-	1.66
	Control	Pre-test	0.59	0.67
		Post-test	-	0.84
Emotion Regulation	Dialectical Therapy	Pre-test	*6.47	*4.63
		Post-test	-	-*1.83
	Control	Pre-test	-0.68	-0.74
		Post-test	-	0.29
Rumination	Dialectical Therapy	Pre-test	*3.05	*2.38
		Post-test	-	0.66
	Control	Pre-test	0.44	0.49
		Post-test	-	0.58
Self-Criticism	Dialectical Therapy	Pre-test	*1.69	*1.75
		Post-test	-	0.05
	Control	Pre-test	0.54	0.66
		Post-test	-	0.61

*p<0.01

Results in Table 3 demonstrate that scores for research variables in the experimental group in the post-test and follow-up stages were lower than in the pre-test. In other words, DBT significantly impacted impulsivity, emotion regulation, rumination, and self-criticism. These results also show that there was no significant difference in scores for impulsivity, emotion regulation, rumination, and self-criticism between the pre-test, post-test, and follow-up stages in the control group. However, there was no significant difference between the post-test and follow-up stages regarding scores for impulsivity, emotion regulation, rumination, and self-criticism, indicating the stability of treatment effects. Moreover, these results reveal that there was no significant difference in self-criticism scores between the pre-test, post-test, and follow-up stages in the control group.

4. Discussion and Conclusion

This study aimed to investigate the effectiveness of DBT on impulsivity, emotion regulation, rumination, and self-criticism in individuals with trichotillomania. The results indicated that DBT effectively reduces impulsivity, improves emotion regulation, decreases rumination, and lessens self-criticism in individuals with trichotillomania. These findings are consistent with the previous research (20, 33-36).

This form of therapy has been successfully used in patients with borderline personality disorder and behaviors resembling self-harm. It incorporates elements from supportive, cognitive, and behavioral therapies. Some components are derived from Franz Alexander's therapeutic approach as an emotional corrective experience, aiming to improve interpersonal skills and reduce self-destructive behaviors. This method assists individuals in overcoming their feelings using counseling, metaphor, storytelling, and various other techniques (25). DBT helps patients recognize their distorted thought patterns and ineffective behaviors and employ structured discussions and behavioral assignments to facilitate desirable changes in their lives. The focus of the therapy is on providing opportunities for new adaptive learning and creating changes outside the clinical setting. Problem-solving is an integral part of treatment. All aspects of therapy are explained to the patient, and the therapist and patient work together to devise strategies for dealing with precisely defined issues (32).

The first phase of DBT focuses on controlling harmful emotional and behavioral patterns using the "here and now" approach. While the connection between current behavior and past traumatic events (childhood) will be explored, the treatment focus will primarily be on analyzing the relationship between current thoughts, feelings, and behaviors and on accepting and changing prevalent patterns. Conversely, the second phase of therapy specifically aims to process the emotional trauma of past events by re-exposing to related cues during the therapy session, thereby primarily aiming to reduce post-traumatic stress. In psychoanalytic terms, the first phase is about self-restraint and limiting oneself, and the second phase is about

Health Nexus
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exposure. This phase has four main goals: 1) remembering and accepting the truth of past traumatic events, 2) reducing self-blame and guilt often associated with some traumatic events, 3) reducing thoughts associated with doubt and fluctuation of the event and responses that breach boundaries commonly found among individuals who have suffered from severe trauma, and 4) resolving the dialectic about who should be blamed for the incident (23).

Another explanation suggests that the dialectical therapeutic approach or method, through focus on acceptance-based teaching with problem-solving techniques and social skills training, can reduce unstable patterns in interpersonal relationships, self-image, and individual emotions associated with rumination. These teachings decrease turmoil and emotional states of anxiety, anger, depression, and rumination (12), thus proving to be effective in reducing rumination. This therapeutic method can help individuals with emotional disorders achieve self-control and avoid self-criticism. It can even reduce various desperate efforts accompanied by panic to avoid actual or perceived abandonment. DBT teachings, by introducing paradoxes, playing with metaphors, developing devil's advocate positions, activating the wise mind of the client, converting negatives into positives, allowing natural changes and inconsistencies even in the therapeutic setting, and dialectically assessing and diagnosing by constantly asking what is being overlooked here, can reduce these disorders and damages in these patients and decrease self-criticism (37).

One of the limitations of this research is the inability to generalize the findings to other populations due to the purposive selection of individuals with trichotillomania in districts 2 and 4 of Tehran. Given the experimental nature of the study and the small sample size for stricter control of confounding variables, the low sample size is a primary limitation that restricts the generalizability of the results to larger groups. For more definitive and improved conclusions about the results of this study, further research in this area and other psychiatric disorders is recommended to allow for comparison and enhance the generalizability of the findings. Considering that this study was conducted on individuals with trichotillomania in districts 2 and 4 of Tehran, it is suggested that the impact of these interventions be examined in other groups and cities as well.

Authors' Contributions

Shahrbano Karimi Imam Vardikhan took the lead in conceptualizing the study, played a crucial role in the design and implementation of the research, and was primarily responsible for data collection and analysis. Additionally, Shahrbano contributed significantly to the writing and editing of the manuscript, ensuring the integrity of the research presented.

Ramezan Hassanzadeh contributed extensively to the study's methodology, ensuring rigorous statistical analysis and interpretation of the data. Ramezan also oversaw the overall execution of the research project, facilitated coordination among the research team, and contributed to the critical revision of the manuscript for important intellectual content. As the corresponding author, Ramezan served as the primary contact for editorial correspondence and managed the submission and review process.

Seyedeh Olia Emadian contributed to the literature review, providing a comprehensive background that framed the study within the context of existing research. Olia was instrumental in drafting the initial manuscript, focusing on the discussion and conclusion sections, and integrating the study's findings with the broader psychological literature. She played a chief role in revising the manuscript, incorporating feedback from peer reviews, and ensuring clarity and coherence in the presentation of the research findings.

All authors read and approved the final manuscript, agreeing to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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Health Nexus
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