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Comparison of the Effectiveness of Reality Therapy and Acceptance and Commitment Therapy on Academic Procrastination in Female Students with Symptoms of Nomophobia

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A B S T R A C T

The present study aimed to compare the effectiveness of Acceptance and Commitment Therapy (ACT) and Reality Therapy on academic procrastination in female high school students with symptoms of nomophobia. This research is classified as fundamental research and employs a quasi-experimental design with a pre-test, post-test, and follow-up, along with a control group. The statistical population consisted of all female high school students in the second cycle of secondary education in District 3 of Tehran during the 2023–2024 academic year. The sampling method was convenience sampling, and a total of 45 participants were selected. Data were collected using the Nomophobia Questionnaire by Yildirim and Correia (2015) and the Academic Procrastination Questionnaire by Solomon and Rothblum (1984). The protocol for the group therapy sessions based on ACT (Hayes et al., 1999) was adapted from Khatibi et al. (2020) and implemented over eight sessions, while the intervention protocol based on Reality Therapy was adapted from Eskandari (2017) and also conducted over eight sessions. Data analysis was performed using repeated measures analysis of variance. The results indicated a significant difference in the effectiveness of ACT and Reality Therapy on academic procrastination in female high school students with symptoms of nomophobia, with Reality Therapy leading to a greater reduction in academic procrastination compared to ACT.

Keywords: *Acceptance and Commitment Therapy, Reality Therapy, Academic Procrastination, Nomophobia.*

1. Introduction

The increasing use of mobile phones and their penetration into individuals' habits, behaviors, and daily lifestyles have brought about significant changes. However, the gradual use of smartphones can lead to excessive use and greater harm to the user (Liang, 2024). One of the psychological and behavioral issues associated with mobile phone use is the emergence of disorders such as nomophobia (no-mobile-phone phobia) (Jahrami et al., 2023; Mechraoui, 2023). Nomophobia has been recognized as a problematic use of mobile phones. As a situational fear, it falls under the category of phobias in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), contributing to various clinical symptoms such as depression, loneliness, social anxiety disorder, obsessive-compulsive disorder, and other psychological disorders (Soleymani et al., 2023).

Nomophobia affects various aspects of an individual's life, including social, occupational, and academic domains, leading to consequences such as social withdrawal, decreased interpersonal relationships and social interactions, distress, reduced concentration, poor academic performance, and sleep disorders (Gezgin et al., 2018). This condition can be a transient experience due to disruptions in social relationships, or it may become a chronic experience, leading to negative emotions and adversely affecting an individual's mental and physical health (Russell & Pang, 2020). Self-reports from students indicate a significant relationship between procrastination and nomophobia (Li et al., 2023). Academic procrastination can sometimes have irreversible consequences for students. Essentially, procrastination is associated with worry about delayed tasks, but its outcomes include anxiety, neuroticism, insufficient motivation, poor academic performance, and low self-assessment (Rebetez et al., 2018; Xu, 2021; Xu et al., 2023). These consequences arise when students fail to achieve their expected results. Additionally, academic procrastination leads to high levels of anxiety and depression, reducing students' self-esteem (Li et al., 2023).

People typically procrastinate to reduce anxiety and gain immediate gratification; however, these avoidance strategies rarely lead to positive outcomes and almost always result in increased stress, disorganization, failure, guilt, anxiety, and self-destructive behaviors (Rebetez et al., 2018). Academic procrastination affects students' mental health and academic success, with its most significant consequence being academic failure (Derakhshan et al., 2022). Given the cognitive and intellectual nature of these factors, appropriate psychological interventions may significantly prevent academic procrastination among adolescents. Various therapeutic interventions exist for addressing these issues, among which cognitive-behavioral therapies (CBT) are the most widely used and have received significant research attention (Asgharnezhadfarid et al., 2020; Davoodi et al., 2019). However, CBT interventions are primarily based on traditional therapeutic techniques such as cognitive restructuring, time management, and goal setting, which mainly stem from rational-emotive behavioral therapy or psychoeducation and are not necessarily founded on specific cognitive or emotional concepts. Overall, traditional psychological interventions have not demonstrated substantial clinical effectiveness in improving academic procrastination. Each of these treatments is based on a specific theory and, therefore, targets particular aspects of procrastination (Wang et al., 2017; Williams et al., 2016). Thus, research on the effectiveness of new psychological interventions, particularly third-wave cognitive-behavioral therapies, is of great importance.

In this regard, some studies (Akbari Zargar et al., 2021; Asgharnezhadfarid et al., 2020; Esmi et al., 2019; Ouraki et al., 2018; Sadeghi et al., 2021; Salehian, 2018; Wang et al., 2017) have examined the effectiveness of third-wave therapies. However, due to the novelty of these approaches, further research is needed to establish their clinical efficacy. Among these interventions, Acceptance and Commitment Therapy (ACT) is notable. ACT has its roots in behaviorism but is analyzed through cognitive processes (Esmi et al., 2019; Ouraki et al., 2018; Sadeghi et al., 2021). By integrating acceptance and mindfulness-based interventions with commitment and behavior change strategies, ACT helps clients achieve a more vibrant, purposeful, and meaningful life. Unlike traditional cognitive-behavioral approaches, ACT does not focus on altering or reducing the frequency of distressing thoughts and emotions but rather aims to enhance psychological flexibility. Psychological flexibility refers to the ability to remain in contact with the present moment and adapt or persist in behavior according to situational demands while aligning with personal values. This therapy consists of six closely related therapeutic processes: cognitive defusion, acceptance, contact with the present moment, self-as-context, values, and committed action (Akbari Zargar et al., 2021; Asgharnezhadfarid et al., 2020). ACT has been shown to be effective in reducing stress, anxiety, depression, and cognitive dissonance. Thus, it may be a useful intervention for reducing academic

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procrastination in adolescents (Ouraki et al., 2018; Sadeghi et al., 2021; Salehian, 2018). Evidence suggests that ACT increases psychological flexibility and, therefore, is effective in addressing many psychological issues (Esmi et al., 2019; Wang et al., 2017). A study by Wang et al. (2017) found that in the short term, both ACT and CBT reduced procrastination, but ACT had more long-term effects in reducing procrastination (Wang et al., 2017). Overall, studies indicate that ACT significantly reduces anxiety, enhances students' social adjustment (Ouraki et al., 2018; Sadeghi et al., 2021), improves emotional regulation, reduces self-focused attention, and enhances social self-efficacy beliefs (Esmi et al., 2019; Ouraki et al., 2018; Sadeghi et al., 2021; Salehian, 2018).

Various theoretical models have been proposed to explain and address the factors influencing adolescents, including forgiveness models, cognitive-behavioral therapy, and pharmacological treatments (Li et al., 2023). Each treatment has its shortcomings in terms of treatment duration and financial burden. Additionally, follow-up in these treatments has not been permanent or long-term. One widely used counseling and therapeutic approach in this area is Reality Therapy (Mahmoudian et al., 2021). Reality Therapy is a set of theoretical and practical principles introduced by William Glasser. By defining human nature, establishing behavioral principles, and outlining the therapeutic process, this approach assists individuals in need of psychological support (Khosh Akhlagh & Yousefi, 2023; Mahmoudian et al., 2021; Sarvari et al., 2023).

In recent years, due to the widespread consequences of nomophobia, there has been a particular focus on ACT and Reality Therapy as potential treatments to mitigate its adverse effects and improve adolescents' quality of life. However, findings in this area remain inconclusive, and some studies have yielded contradictory results. Given the increasing diagnosis of nomophobia (Khosh Akhlagh & Yousefi, 2023; Mahmoudian et al., 2021) and its negative impact on personal, social, and academic life, the question arises as to whether ACT and Reality Therapy are effective in reducing academic procrastination in female students with symptoms of nomophobia and whether there is a significant difference in their effectiveness.

2. Methods and Materials

2.1. Study Design and Participants

The research method was quasi-experimental, employing a pre-test, post-test, and follow-up design with a control group. The statistical population of this study comprised female high school students in the second cycle of secondary education in District 3 of Tehran, during the 2023–2024 academic year. Due to the need for a larger sample size in correlational studies to enhance the generalizability of findings, a non-random convenience sampling method was used. Accordingly, three girls' high schools from this district were selected, and after administering the Nomophobia Scale to all female students in these schools, 45 individuals who scored the highest on the Nomophobia Scale and the lowest on the Academic Procrastination Questionnaire were selected. These individuals were then randomly assigned to three groups: the first experimental group (15 participants receiving Acceptance and Commitment Therapy), the second experimental group (15 participants receiving Reality Therapy), and a control group (15 participants). In intervention groups, it is recommended that the group size should not exceed 10 to 15 participants.

Inclusion criteria included being between the ages of 15 and 18, receiving a diagnosis of nomophobia based on the Nomophobia Scale, obtaining parental consent to participate in the study, and the absence of psychiatric disorders based on a clinical interview. Exclusion criteria included simultaneous participation in other individual or group therapy programs, absence from more than two therapy sessions, and the presence of psychiatric disorders.

To conduct the research, necessary approvals were obtained from the research department and the relevant university. In the theoretical framework phase, books, articles, theses, and other studies were reviewed to examine scholars' perspectives and theories related to the research topic.

In the field study phase, after selecting the assessment tools and participants, preliminary explanations were provided to participants regarding the nature and completion of the tests. Subsequently, participants completed a demographic questionnaire and the Nomophobia Scale. Students who scored above the cutoff on the Nomophobia Scale proceeded to the second stage of the study, while those scoring below the cutoff were excluded and replaced with randomly selected students from the original participant pool. This process continued until the required sample size was achieved.

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As per the sampling method, 45 students were non-randomly selected and then randomly assigned to two experimental groups and one control group. After explaining the study objectives and establishing rapport, participants were introduced to the session structure and procedures. Both psychological interventions (Acceptance and Commitment Therapy and Reality Therapy) were explained to the experimental groups. The experimental groups underwent their respective interventions, while the control group received no intervention. All groups (experimental and control) were assessed three times: pre-test (before the intervention), post-test (after the intervention), and follow-up (two months after the intervention). During this period, the control group followed their normal routine without any intervention.

The experimental group receiving Acceptance and Commitment Therapy underwent eight fixed two-hour sessions, conducted twice a week, following the ACT protocol by Hayes et al. (1999). The Reality Therapy intervention in this study was based on William Glasser's Reality Therapy and Choice Theory, translated into Persian by Ali Sahebi. It was implemented over eight 45-minute sessions, conducted weekly.

2.2. Measures

2.2.1. Nomophobia

Nomophobia Questionnaire (NMP-Q) by Yildirim and Correia (2015): This questionnaire consists of 20 items measuring four components: inability to access information (items 1, 2, 3, and 4), loss of composure (items 5, 6, 7, 8, and 9), inability to communicate (items 10, 11, 12, 13, 14, and 15), and loss of connection (items 16, 17, 18, 19, and 20). It is scored on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater severity of nomophobia. The developers assessed its reliability, obtaining Cronbach's alpha coefficients of 0.92 for inability to access information, 0.87 for loss of composure, 0.82 for inability to communicate, 0.81 for loss of connection, and 0.94 for the total scale. Concurrent validity was also evaluated, yielding a correlation coefficient of 0.71 (Yildirim & Correia, 2015). This questionnaire has been translated and standardized in Iran, with confirmatory factor analysis indicating goodness-of-fit indices of AGFI = 0.78, NFI = 0.94, and RMSEA = 0.074. Internal consistency using Cronbach's alpha was calculated as 0.74 for inability to access information, 0.79 for loss of composure, 0.88 for inability to communicate, 0.88 for loss of connection, and 0.92 for the total scale (Davoodi et al., 2019). In another international study, the Cronbach's alpha coefficient was reported as 0.96 (Galhardo et al., 2020).

2.2.2. Academic Procrastination

Academic Procrastination Questionnaire by Solomon and Rothblum (1984): This questionnaire, developed by Solomon and Rothblum (1984), consists of 27 items measuring academic procrastination on a five-point scale with response options of rarely, sometimes, often, and always. It assesses three components: procrastination in preparing for exams (8 items), procrastination in completing assignments (11 items), and procrastination in preparing for final-term papers (8 items). Items are scored from 1 (rarely) to 4 (always), except for 11 reverse-scored items (items 2, 3, 5, 9, 11, 13, 15, 16, 21, 23, and 24). Items 7, 8, 18, 19, 26, and 27, which do not reflect academic procrastination, were excluded from the final analysis. Higher scores indicate a greater tendency toward academic procrastination. Namian and Hosseinchari (2011) reported a Cronbach's alpha reliability of 0.73 for this questionnaire, while Dowlaty (2012) obtained a reliability coefficient of 0.93. Jokar and Delavarpour (2007) assessed the validity of the questionnaire using factor analysis, confirming its satisfactory construct validity (Derakhshan et al., 2022).

2.3. Interventions

2.3.1. Acceptance and Commitment Therapy

The first session introduces group members to the therapist and each other, provides an overview of the therapy sessions, and introduces the principles of Acceptance and Commitment Therapy (ACT). Group rules are established, and members share their thoughts on anxiety and stress in daily life before completing the pre-test assessment. The second session focuses on self-perception and the spatial positioning of obsessive thoughts and actions, challenging ineffective control strategies through the concept of creative hopelessness. The third session introduces the concept of acceptance as an alternative to control and avoidance of anxiety and stress, encouraging a willingness to experience negative emotions through the "healing hands" technique. The fourth session explains the concept of cognitive defusion by distinguishing between cognitive fusion and detachment, training participants in non-judgmental observation. The fifth session introduces mindfulness

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techniques, teaching members to connect with the present moment and view themselves as a flexible psychological entity. The sixth session focuses on identifying values, distinguishing between values and goals, and recognizing obstacles that prevent individuals from living in alignment with their values. The seventh session covers committed action, guiding participants to set meaningful goals, define committed actions, and plan for value-based living. The final session reviews and summarizes the therapy sessions, reinforcing the concepts learned, practicing previously introduced techniques, and administering the post-test assessment.

2.3.2. Reality Therapy

The first session establishes rapport among group members and introduces the therapy framework, including the principles of well-being, Choice Theory, and the importance of effective interpersonal communication. The second session focuses on identifying psychological needs, explaining the impact of external control psychology, and discussing the role of basic needs in overall well-being. The third session explores the concept of the "quality world," helping participants understand how personal aspirations influence well-being. The fourth session introduces the behavioral system, encouraging participants to generate positive emotional states, consider the physiological aspects of behavior, and emphasize living in the present. The fifth session teaches the concept of total behavior, illustrating balance across the four components of behavior (acting, thinking, feeling, and physiology) using the "broken chair" technique. The sixth session revisits previous concepts while introducing the "quality world album," helping participants recognize their core needs and control mechanisms through personal imagery. The seventh session introduces problem-solving strategies, using the "backpack technique" to encourage responsible behavior selection, leading to emotional, psychological, and social well-being. The final session summarizes all sessions, reinforcing the relationship between well-being and effective relationships, integrating Choice Theory concepts with participants' insights, and providing strategies for maintaining the intervention's goals. Participants offer feedback on the intervention before concluding the program.

2.4. Data Analysis

For data analysis, repeated measures analysis of variance (ANOVA) was used, ensuring adherence to the assumptions of this statistical method. Data analysis was performed using SPSS-24 statistical software.

3. Findings and Results

Table 1 presents the mean and standard deviation of academic procrastination scores and its subscales at different measurement stages (pre-test, post-test, and follow-up) for each group. The procrastination score in the Acceptance and Commitment Therapy (ACT) group decreased from 55.3 to 32.2, with a follow-up score of 31.3. Similarly, the overall procrastination score in the Reality Therapy group dropped from 52.2 to 28.4, maintaining a score of 28.4 at follow-up. In contrast, the procrastination score in the control group remained unchanged at 51.8 from pre-test to post-test. Furthermore, the normality of variable distribution was assessed using the Shapiro-Wilk test, which was not significant, indicating that the variables followed a normal distribution ($p > 0.05$).

Table 1

Central Tendency and Dispersion Indices of Academic Procrastination and Its Subscales in Groups

Variable	Group	Pre-Test	Post-Test	Follow-Up	Shapiro-Wilk Test
Exams Procrastination	ACT Training	M (SD) = 15.17 (2.1)	M (SD) = 8.4 (1.9)	M (SD) = 8.4 (1.9)	w (p) = 0.87 (0.08)
	Reality Therapy Training	M (SD) = 14.6 (2.1)	M (SD) = 11.1 (2.3)	M (SD) = 11.1 (2.3)	w (p) = 0.92 (0.23)
	Control	M (SD) = 14.8 (2.4)	M (SD) = 14.8 (2.4)	-	w (p) = 0.96 (0.81)
Homework Procrastination	ACT Training	M (SD) = 24.3 (2.9)	M (SD) = 13.2 (2.5)	M (SD) = 13.2 (2.5)	w (p) = 0.89 (0.09)
	Reality Therapy Training	M (SD) = 25.7 (2.4)	M (SD) = 12.9 (2.9)	M (SD) = 12.9 (2.9)	w (p) = 0.82 (0.23)
	Control	M (SD) = 25.11 (2.2)	M (SD) = 25.11 (2.2)	-	w (p) = 0.90 (0.81)
Final-Term Paper Procrastination	ACT Training	M (SD) = 15.1 (3.2)	M (SD) = 10.4 (2.5)	M (SD) = 10.4 (2.5)	w (p) = 0.86 (0.39)

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	Reality Therapy Training	M (SD) = 14.8 (2.4)	M (SD) = 11.2 (2.7)	M (SD) = 11.2 (2.7)	w (p) = 0.89 (0.29)
	Control	M (SD) = 14.1 (2.4)	M (SD) = 14.1 (2.4)	-	w (p) = 0.93 (0.80)
Overall Procrastination Score	ACT Training	M (SD) = 55.3 (4.4)	M (SD) = 32.2 (4.9)	M (SD) = 31.3 (3.8)	w (p) = 0.97 (0.83)
	Reality Therapy Training	M (SD) = 52.2 (5.2)	M (SD) = 28.4 (5.3)	M (SD) = 28.4 (3.8)	w (p) = 0.88 (0.60)
	Control	M (SD) = 51.8 (12.3)	M (SD) = 51.8 (12.3)	-	w (p) = 0.92 (0.40)

As shown in Table 2, after controlling for pre-test scores, there was a significant difference between the groups in terms of academic procrastination. The results indicate that there was a significant difference in post-test scores between both experimental groups (ACT and Reality Therapy) and the control group.

Table 2

Results of ANCOVA for Academic Procrastination Scores Across Groups

Source of Variance	Dependent Variable (Post-Test)	Sum of Squares	df	Mean Squares	F	Significance Level
Group	Academic Procrastination	3201.1	2	1600.5	242.1	0.001
Error	Academic Procrastination	858.2	40	15.6	-	-
Total	Academic Procrastination	110651	45	-	-	-

To further investigate intergroup differences, a Bonferroni post-hoc test was conducted to compare post-test academic procrastination scores between the experimental and control groups. The results are reported in Table 3.

Table 3

Bonferroni Post-Hoc Test for Pairwise Comparison of Academic Procrastination Post-Test Scores Between Experimental and Control Groups

Variable	Groups	Mean Difference	Standard Error	Significance Level
Academic Procrastination	ACT vs. Reality Therapy	4.4	1.2	0.001
	ACT vs. Control	-19.1	1.3	0.001
	Reality Therapy vs. Control	-23.3	1.2	0.001

As observed in Table 3, the differences in academic procrastination scores between both experimental groups (ACT and Reality Therapy) and the control group in the post-test phase were statistically significant ($p < 0.05$). Considering the mean differences, it is evident that the reduction in academic procrastination was greater in the Reality Therapy group compared to the ACT group, thus confirming the research hypothesis.

4. Discussion and Conclusion

The present study aimed to compare the effectiveness of Reality Therapy and Acceptance and Commitment Therapy (ACT) on academic procrastination in female students with symptoms of nomophobia. The results indicated that after controlling for pre-test scores, there was a significant difference between the groups regarding the variable of academic procrastination. The findings demonstrated that there was a significant difference in post-test scores between both experimental groups (ACT and Reality Therapy) and the control group. To further examine the differences between the groups, a Bonferroni post-hoc test was conducted, comparing the post-test academic procrastination scores of the experimental groups with the control group. The results indicated that the difference between both experimental groups and the control group in academic procrastination at the post-test stage was statistically significant. Considering the mean differences, it was observed that the increase in academic procrastination was greater in the Reality Therapy intervention compared to the ACT intervention.

In a comparative analysis of the hypothesis concerning the differential effectiveness of ACT and Reality Therapy on academic procrastination in female high school students with symptoms of nomophobia, the results of the present

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study are consistent with the prior findings (Afshari et al., 2022; Almurumudhe et al., 2024; Asani, 2023; Emami Khotbesara et al., 2024; Enayati Shabkolai et al., 2023; Garaaghaji et al., 2016; Heshmati et al., 2018; Kohli et al., 2022; Nikbakht et al., 2014).

To explain these findings, it can be asserted that Reality Therapy is based on Choice Theory, emphasizing responsibility, enhancing interpersonal relationships, and effectively responding to psychological needs. One of the most critical components of academic procrastination is the ability to establish and maintain positive and constructive relationships with others. Reality Therapy focuses on improving social relationships through communication skills training, problem-solving, and fostering a sense of responsibility, enabling students to engage in more effective social interactions. Additionally, Reality Therapy emphasizes an individual's active role in behavioral change, encouraging them to make appropriate and constructive decisions, thereby gaining greater control over their behaviors. This feature can enhance students' social skills and facilitate better academic procrastination.

One of the strengths of Reality Therapy is its emphasis on problem-solving and practical responses to social challenges. Students with symptoms of nomophobia may avoid direct social interactions due to excessive dependence on mobile phones. Reality Therapy provides techniques for identifying and resolving communication problems, helping individuals overcome these barriers and improve their social interactions.

ACT is also an effective approach that, by emphasizing acceptance of unpleasant experiences and commitment to values, helps individuals better cope with psychological challenges. While ACT can be beneficial in reducing symptoms of nomophobia, its impact on enhancing academic procrastination is relatively lower due to its lesser focus on practical aspects and interpersonal skills. ACT primarily focuses on internalizing values and shifting an individual's perspective toward unpleasant experiences, whereas Reality Therapy not only changes perceptions but also provides practical skills for making positive changes in social relationships. This difference in mechanisms of action may explain the superior effectiveness of Reality Therapy in enhancing academic procrastination.

The role of culture and social environment in the effectiveness of therapeutic approaches is undeniable. In many societies, particularly in Eastern cultures such as Iran, social interactions and family relationships hold significant importance. Reality Therapy, with its emphasis on improving interpersonal relationships and fostering a sense of belonging, may align more closely with individuals' cultural and social needs, yielding better results in enhancing academic procrastination.

According to Choice Theory, humans have five fundamental needs—love and belonging, power, freedom, survival, and fun—that influence their behaviors. Reality Therapy, by focusing on fulfilling these needs, particularly the need for love and belonging, helps students develop a better sense of social interactions and establish more positive relationships. Nomophobia, the fear of being without access to a mobile phone, is often associated with social isolation and reduced face-to-face interactions. Reality Therapy encourages students to engage actively in real-life relationships and reduce dependence on technology, thereby fostering greater academic procrastination. In contrast, ACT may place more emphasis on accepting this dependency rather than altering it. The superior effectiveness of Reality Therapy in enhancing academic procrastination among students with symptoms of nomophobia may be attributed to its more practical focus on improving social relationships, problem-solving, and responsibility. While ACT is also recognized as an effective approach, due to differences in structure and objectives, it has shown weaker outcomes in the domain of academic procrastination.

The present study also faced some limitations. This research was limited to female high school students in District 3 of Tehran during the 2023–2024 academic year, and caution should be exercised when generalizing the findings to other female students. The long-term effects of these interventions were not examined, making it uncertain whether the results will be sustained over time. Factors such as family conditions, economic status, and levels of social support may have influenced the results and were not fully controlled. The study focused on symptoms of nomophobia, which may limit its applicability to other psychological disorders or behavioral problems.

Based on the findings, it is recommended that teachers and school counselors be trained in the use of Reality Therapy and ACT techniques to enhance students' mental health. These methods should also be incorporated into family counseling sessions to provide greater support for students at home. Awareness workshops should be organized for parents regarding the effects of nomophobia and strategies to address it. Given the importance and novelty of the research topic, similar studies should be conducted on other social groups. Future research should investigate the long-term effects of these interventions on

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academic procrastination. The effectiveness of these two therapeutic approaches should be compared with other psychological interventions, such as cognitive therapy or compassion-based therapy. Furthermore, educational programs based on these approaches should be developed in online formats to assess their effectiveness in virtual environments.

Authors' Contributions

Authors contributed equally to this article.

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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Ethical 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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