Research Paper
Effectiveness of Individual Psychotherapy Program for Information and Communication Technologies for Instagram Addiction

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A B S T R A C T

Background: The status of effective therapeutic interventions has been highlighted by rising concerns about adolescent addiction to information and communication technologies (ICT), especially Instagram. Accordingly, the present study was conducted to investigate the effectiveness of the individual psychotherapy program for ICT addiction, focusing on reducing the severity of Instagram addiction and Instagram usage in adolescents. This study distinguishes between 'addiction severity,' which indicates compulsive behavior and psychological dependence and 'usage duration,' which measures the actual time spent on Instagram.

Methods: This research was a pre-experimental study with AB (A [baseline] and B [intervention]) design. The statistical population includes adolescent girls from Karaj City, Iran, addicted to Instagram. Four girls were selected from 14 who were interested in participating in the research in the summer of 2021. The participants answered questionnaires on addiction to mobile-based social networks at the beginning of the treatment and during the treatment process. Each participant individually participated in 21 sessions of the psychotherapy program. Data analysis was done using statistical indicators (change in trend direction, median change, mean, reliability index, determination of overlap percentage, and improvement percentage). All calculations were done using SPSS software, version 25.

Results: Visual analysis indicated the positive effect of the individual psychotherapy program for addiction to ICT on Instagram addiction. The results also showed a decrease in the number of hours of use of this application in all four adolescents.

Conclusion: According to visual analysis, the study findings support the effectiveness of the individual psychotherapy program for ICT addiction in reducing the use of Instagram and the associated addiction levels among adolescents. However, it is crucial to consider the limitations of a single-subject design in generalizing the results and the assumptions required for inferential statistics. Therefore, these findings are preliminary and must be validated through larger-scale studies.

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Highlights

• This study investigated how addiction to Instagram and other information technologies has become common among adolescents.

• This study investigated the effectiveness of the individual psychotherapy program for information and communication technologies (ICT) addiction on adolescent girls addicted to Instagram.

• The individual psychotherapy program effectively decreased the level of Instagram addiction in adolescent girls.

• The individual psychotherapy program effectively decreased Instagram use in adolescent girls addicted to Instagram.

Plain Language Summary

Adolescents face significant challenges when trying to limit their use of technology, especially on social networking services like Instagram, which can have detrimental effects on their mental health. The primary focus of this study was to address the effectiveness of an individual psychotherapy program on Instagram addiction among adolescent girls. As participants reduced their frequency of using Instagram, we observed that the therapy provided beneficial outcomes. The findings suggest that teens who are addicted to Instagram may benefit from individual psychotherapy, which can help decrease their dependence on the application. Further research and incorporating these insights into treatment plans could enhance the impact of these results in addressing teenage technology addiction.

Introduction

Adolescents are now part of a unique generation. This age group has grown up in a society immersed in the digital world (Orben, 2020). One of the benefits of the technological age is the emergence of new multilateral communication platforms called "social networks." Due to the creation of various interactive facilities and the ability to exchange information in the fields of education, skill training, and entertainment, social networks quickly became popular among adolescents. Among these social media, Instagram offers adolescents a wide range of tools to present a picture of themselves and their thoughts in this space by posting edited photos, following other accounts and liking posts (Zillich & Riesmeyer, 2021). Instagram is widely used and the membership of more and more users is observed in this social network due to its various applications in different directions and its compatibility with smart mobile phones.

Like any other technological tool, the incorrect and unhealthy use of this medium is one of the problems in these social networks. This incorrect use can include excessive use, extreme impatience when there is no access, and excessive intellectual preoccupation with their content. Eventually, the person will be among the people with an addiction to social networks. Many users are addicted to this social network, and Instagram is gaining popularity. Examples of behavioral addiction related to virtual reality are addiction to virtual media (such as Instagram), addiction to computer games, Internet addiction and mobile phone addiction (Szczygieł & Podwalski, 2020).

Indicators of addiction to virtual networks include psychological symptoms such as defensiveness, euphoria when using social media, inability to control the time when using social networks, as well as physical symptoms such as weight gain, back pain and eye strain (Griffiths & Kuss, 2017). This addiction in the community is often characterized by a continuous need to be online, a negative impact on day-to-day functioning, and difficulties with social communication (Andreassen & Pallesen, 2014).

Social media addicts think a lot about how to spend more time surfing social networks. Over time, they spend more hours in virtual media because the time they used to spend browsing the media no longer leads to pleasure in them. This factor increases the hours of using social networks during the period of addiction. Furthermore, those who are addicted to social media frequently use these platforms as a way to escape their difficulties, as well as their emotions of guilt and sadness. When they cannot access these networks, they often experience confusion, upset, and anger (Dalvi-Esfahani et al., 2019). The

prevalence of this type of addiction in different societies is estimated between 4.5% and 47% (Szczygieł & Podwalski, 2020). Excessive and addictive use of social networks can lead to psychological and physical distress in people. For example, numerous researchers have studied the relationship between depression and addiction to social networks. There is a positive correlation between the symptoms of depression and addiction to social networks (Rutter et al., 2021). Also, a direct association exists between the duration of social network usage and the level of a person's tension, depression and anxiety (Keles et al., 2020). In addition to creating psychological problems, such as adverse effects on life satisfaction (Buda et al., 2021), excessive use of these media also leads to physical complications. Eye diseases, headaches (Solecki, 2020) and reduced sleep quality (Eroğlu & Yıldırım, 2017) are among the physical complications associated with excessive use of virtual networks.

There is a need to devise a suitable treatment for this disorder based on the mental, physical and social effects of Instagram addiction on adolescents. There is very limited research conducted in the field of treatment of addiction to virtual networks, and there are a variety of treatment approaches. Some researchers have investigated the treatment of addiction to social networks in a general way (not case by case). For example, Zohara (2021) research was conducted on the effectiveness of the psychotherapy program on Internet game addiction among 251 students. Among the undertaken studies, most of them have been related to Facebook addiction (Soron, 2015). There is a difference between "Instagram" and other social networks regarding content, function and structure of image-based message transmission. Also, this virtual medium is more popular than other virtual platforms among adolescents. Therefore, it is essential to conduct research on addiction to this type of social network. It also seems necessary to develop an effective treatment protocol for this type of addiction due to the existing research gap in the field of Instagram addiction treatment, the increasing popularity of this social network, and the upward trend of people addicted to social networks.

In this research, the protocol of the individual psychotherapy program for information and communication technologies (ICT) addiction was used to modify Instagram addiction. This treatment protocol was previously used for Internet game addiction (Torres-Rodríguez et al., 2018). The editor of the protocol states that it can be used for ICT addiction (and internet-based addictions) (Torres-Rodríguez et al., 2018). Research has indicated that using this therapy paradigm to treat Internet game addiction has resulted in a moderate increase in

self-control and a lower relapse rate compared to alternative therapies. Furthermore, it was noted that following treatment, social abilities increased significantly for all participants (Torres-Rodríguez et al., 2018). Cognitive behavioral therapy has been used to develop this approach (programa individualizado psicoterapéutico para la adicción a las tecnologías de la información y la comunicación [PIPATIC], which was presented in a new style along with the training of other techniques and cross-sectional psychological strategies) (Torres & Carbonell, 2017). In addition, the solution-oriented approach can be mentioned as the second approach used in developing this psychotherapy program (Torres-Rodríguez et al., 2018).

Because the combination of psychological strategies is more effective than one approach (Dong & Potenza, 2014; Orzack et al., 2006; Shek et al., 2009), the strategies of other methods have been used in PIPATIC protocol to achieve the best results by equipping adolescents with various skills and multilateral psychological training (Torres-Rodríguez et al., 2018).

Instagram addiction affects major dimensions of adolescents' lives (physical, psychological, interpersonal relationships, academics). It is necessary to conduct this research because there has been no research in Iran regarding the treatment of Instagram addiction so far. In addition, the protocol used in this research is comprehensive, including different aspects of an adolescent's life. This research was conducted to investigate the effectiveness of individual psychotherapy programs for information and communication technology addiction on the severity of Instagram addiction and its use in adolescent girls addicted to this application.

Materials and Methods

Design, setting and sample

In this study, we employed an AB, pre-experimental design, revealing correlations between independent and dependent variables. However, it does not necessarily establish causal relationships. It can be said that the AB design is an essential building block for real experimental designs. This design consists of two phases: Phase A (baseline) and phase B (intervention) (Byiers et al., 2012).

The statistical population comprised all adolescent girls of Karaj City, Iran, who used virtual social networks. Sampling was done on a voluntary and purposeful basis. First, a call was placed in the virtual space in the Karaj Teenage Girl Photography Association group.

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This association consisted of 14 to 17-year-old girls who had previously met in a photography class. Based on this call, 14 girls aged 14-17 were referred to the researcher. Eleven students got a relatively high score after completing the mobile-based virtual network addiction questionnaire. Then, four people were selected during two stages of interviews with them and one of their family members. The inclusion criteria were an age range of 14-17 years, scoring >80 in the mobile-based social network addiction questionnaire, not being involved in any emotional relationship with the opposite sex (this criterion was chosen because a romantic relationship is one of the most important reasons for excessive use of social networks (Chukwuere & Chukwuere, 2017) and lacking any psychological disorders. The exclusion criteria were receiving psychotherapy interventions or therapeutic-educational programs while conducting research and consuming any addictive substances.

Study measurements

The study data were collected by the mobile-based social networking addiction questionnaire (Khajeahmadi et al., 2017). This questionnaire includes 23 questions with 4 parts: Individual performance, time management, self-control and social relations. It is scored on a 5-point Likert scale, from 1 (complete disagreement) to 5 (complete agreement). The total score ranges from 23 to 115; higher scores indicate greater addiction severity. The questionnaire's content, face and criterion validity were found acceptable. The Cronbach α coefficient for each part of the questionnaire was calculated as follows: Individual performance=0.709, time management=0.68, self-control=0.72 and social relations=0.681. The Cronbach α of the total scale was 0.92 (Khajeahmadi et al., 2017). To accurately measure the time spent by adolescents on Instagram in this study, we employed a self-reporting approach, wherein participants reported their daily Instagram usage over a definite period. This measurement consisted of two phases: The participants completed questionnaires three weeks before and seven times throughout the intervention. The reporting of Instagram usage time was done in minutes per day. To enhance the accuracy of the reports, participants were asked to utilize the time-tracking features available within the Instagram application itself, which allowed for more precise monitoring and recording of daily activity time. A random sample of participants was chosen to provide screenshots of their application's time-tracking feature to validate their self-reported data's accuracy.

Study procedure

After choosing the eligible samples, a briefing group meeting was held with the participation of all subjects to introduce the research and the procedure and to assure the confidentiality of the subjects' data. Two weeks before the start of the individual psychotherapy program, all four participants in the baseline phase filled out the mobile-based social networking addiction questionnaires three times each (once every 5 days). The therapeutic intervention took place during 21 sessions and 5 stages.

The main treatment protocol is a combined one developed by Torres-Rodriguez et al. (2018) to treat video game addiction and has five major stages. In developing this protocol, the strategies of Carroll and Nuro (2002) were also used to set up treatment plans (Carroll & Nuro, 2002; Torres-Rodríguez et al., 2018). The treatment protocol is shown in Table 1. The core principles and strategies of the intervention aligned closely with the original protocol. However, minor adjustments were made to accommodate each session's unique needs, the participants' personalities, and the researcher's innovative approaches. Goal setting training, self-strengthening and self-affirmation strategies, use of confrontational thoughts, and emotion management are among the psychological training of this program. Treatment sessions are designed according to the adolescent's needs, and the necessary training is taught by using new and various tools that are popular with this age group, such as film analysis, narration reading, role-playing, incomplete sentence games, and PowerPoint presentations. The research was conducted by a master's student who specialized in clinical psychology and was guided by a psychology professor. A cyberspace expert also supervised the implementation of this program. An introductory meeting was held before the therapy sessions to familiarize teenagers and their parents with the intervention program. The therapy sessions were conducted for seven weeks, three meetings per week. These sessions were conducted online through Skype, enabling interactive video communication. The intervention focused mainly on teenagers, but the fourth session specifically included the participation of their mothers, aiming to integrate familial support into the therapeutic process. The obtained data were analyzed using statistical indicators (change in trend direction, median change, mean, reliability index, determination of overlap percentage and improvement percentage). All analyses were done using SPSS software, version 25.
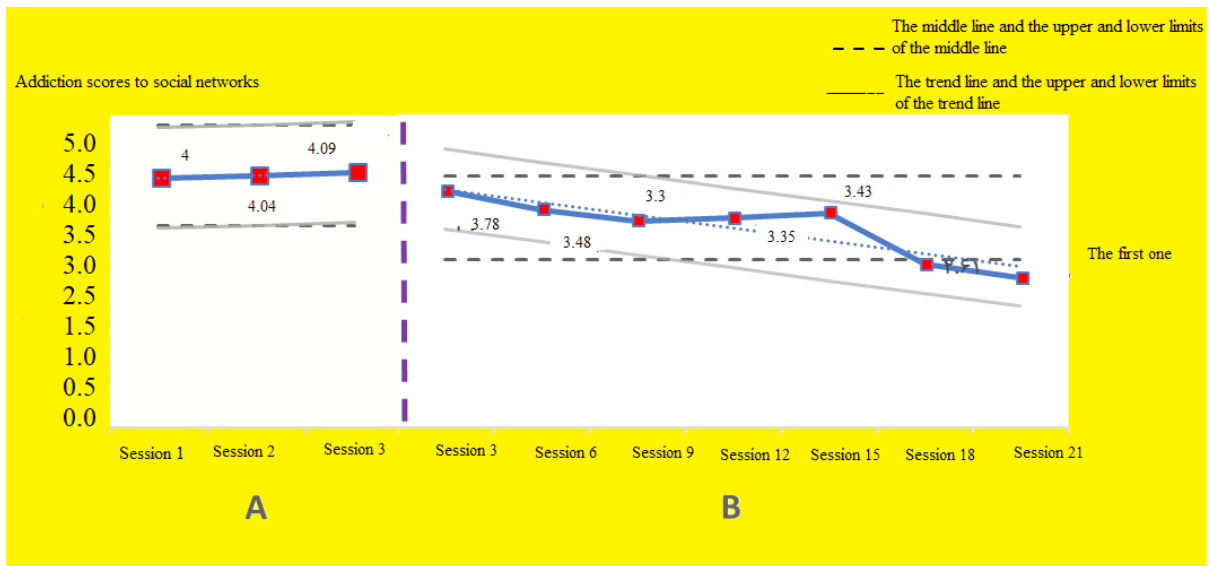
Results

Over the course of seven weeks, the assessment was conducted online. The participants' weekly completion of the questionnaire allowed continuous and dynamic evaluation of the intervention's impact on their addictive behaviors and patterns.

The Figures 1, 2, 3 and 4 show the data results for each participant's baseline and treatment period. In the figures, 'A' shows participants' baseline scores before the intervention, and 'B' the scores during the intervention. The blue line shows the change in scores between baseline and treatment, emphasizing the impact of the intervention on Instagram addiction levels.

Table 1. Summary of individual psychotherapy program sessions for information and communication technology addiction

Session	Content	Objectives of the Meeting
1	Greetings, explanations of the treatment process, introduction of objectives and rules, empathy with the subject, and exploring moral values	Acquaintance and motivation
2	Discussing responsibility and the characteristics of responsible persons and educating on goal-setting	Goal development
3	Information about Instagram history, statistics on addiction, and optimal use training by a media expert	Teaching how to use virtual reality correctly
4	An overview of the effects of Instagram addiction and the necessity of family cooperation	Teaching the mothers of teenagers
5	Exploring the causes of Instagram usage and the connection between emotions, cognition, and performance, sharing self-control strategies, and teaching thought-stopping techniques, using the marshmallow experiment video of Walter Mischel to illustrate self-control concepts This seminal experiment, conducted in the 1960s at Stanford University, offered children a choice between an immediate reward and a larger reward if they could wait 20 minutes. The selection process and wait times were used to evaluate the children's self-control capabilities (Mischel et al., 1976).	Providing effective strategies for controlling addictive stimuli
6	Reviewing self-control strategies and practicing coping responses for virtual network temptations	Practicing coping responses
7	Addressing cognitive distortions and using metaphors to reinforce self-control	Cognitive restructuring
8	Redefining the problems leading to Instagram use, teaching problem-solving and coping strategies	Teaching problem-solving strategies
9	Analyzing behaviors and reactions, with a focus on self-improvement	Description and interpretation
10	Talking about the relationship between identity and emotional expression.	Strengthening introspection
11	Improving self-image through various activities, including self-esteem movie analysis	Strengthening self-esteem
12	Emotional awareness and management, including identifying emotions and strategies for controlling them	Recognizing emotions in various situations
13	Classifying and managing negative emotions while exploring different reactions	Emotional coping skills
14	Promoting creative solutions for interpersonal challenges	Interpersonal problem-solving skills
15	Teaching effective communication and analyzing communication styles	Examining communication styles
16	Correcting communication errors with assertive expressions	Correcting communication styles that are not correct
17	Addressing adolescent and family communication issues while promoting creative problem-solving	Addressing interpersonal communication challenges.
18	Discussing family roles and responsibilities, as well as teaching constructive criticism	Examining family responsibilities
19	Highlighting lifestyle changes and encouraging beneficial activity replacement	Creating a new way of life
20	Targeting engagement in personal and social activities and modeling recovery stories	Modeling and developing alternative communication
21	Ending with a treatment summary and strategies for preventing relapse.	A concise summary of the treatment and prevention of recurrence

Figure 1. Effectiveness of individual psychotherapy intervention on improving Instagram addiction of the 1st participant

The intervention effectively reduced Instagram addiction, except for participant number 1, who exhibited a minimal change in scores before and after the intervention, suggesting a specific response to the intervention.

The Figures 5, 6, 7 and 8 show the effectiveness of psychotherapy intervention for the hours of using Instagram. In these figures, 'area A' represents participants' scores in the weeks preceding the intervention, which illustrates initial levels of addiction. Area B scores show changes caused by the therapeutic measures during the intervention. The blue lines trace the trajectory of these scores, indicating whether the post-intervention trend is ascending or descending, thus assessing the intervention's impact on addiction behaviors. As observed, the results show that the intervention effectively reduces the number of hours spent using Instagram by all participants.

Discussion

The results of the research indicated the effectiveness of individual psychotherapy program for ICT addiction in reducing Instagram addiction. So far, there has been no research on the efficacy of this program on Instagram
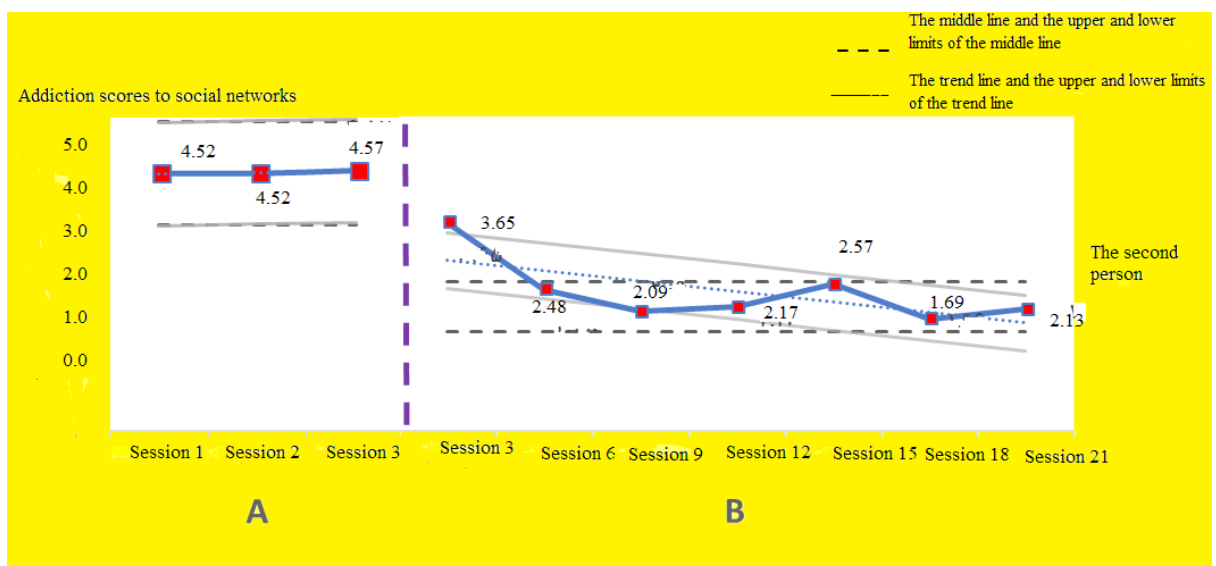
Figure 2. Effectiveness of individual psychotherapy intervention on improving Instagram addiction of the 2nd participant

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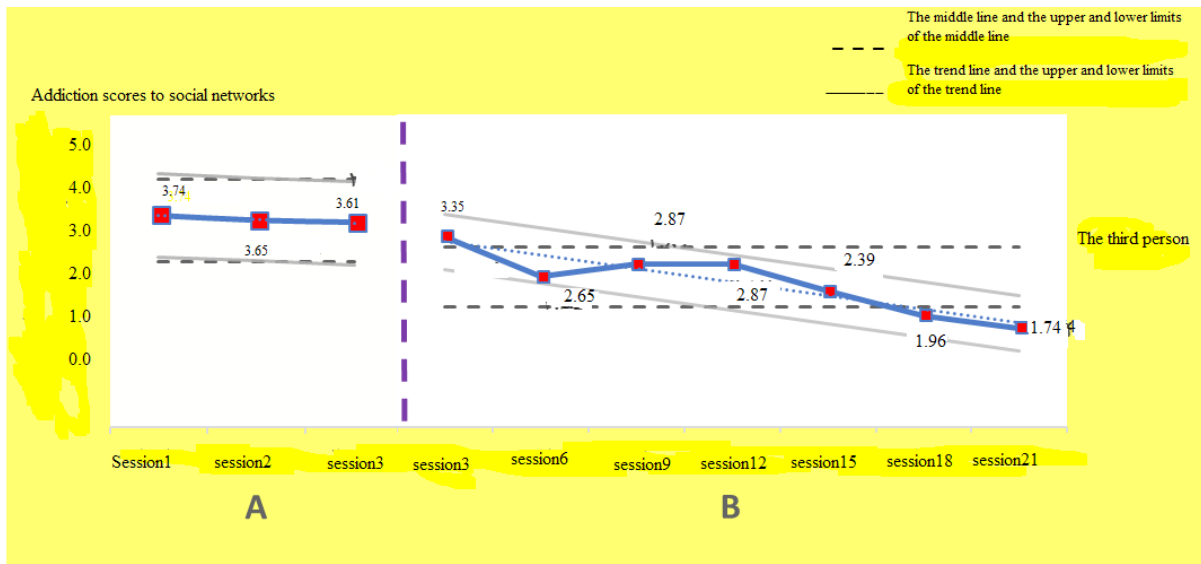
Figure 3. Effectiveness of individual psychotherapy intervention on improving Instagram addiction of the 3rd participant

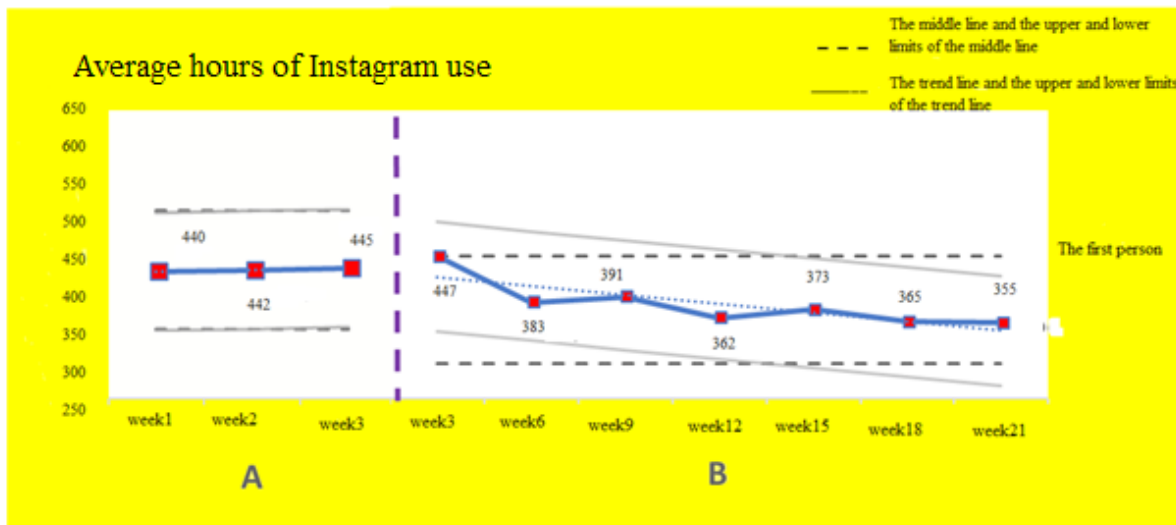addiction. Still, some researchers have examined the effectiveness of this treatment program on Internet game addiction. Addiction to Instagram and internet games are in the same group as addiction to ICT. Therefore, this research can be considered similar and consistent with other research studies (Torres-Rodríguez et al., 2018; Zohara, 2021). This treatment program uses two cognitive-behavioral and solution-oriented approaches to explain its effectiveness on Instagram addiction. It is possible to understand why this treatment protocol is effective on Instagram addiction because it is a subset of Internet addiction and the positive effects of cognitive-

behavioral therapy on Internet addiction (Ögel et al., 2012; Şenormanci et al., 2010; Van Rooij et al., 2012), and social network addiction (Soron, 2015; Zhou et al., 2021) and the positive effect of solution-oriented treatment on Internet addiction have already been demonstrated (Zhang et al., 2020). In addition, using different psychological approaches and techniques (Dong & Potenza, 2014; Orzack et al., 2006; Shek et al., 2009) is important in interpreting the results of this treatment because the use of different psychological approaches and strategies increases the effectiveness of that treatment program compared to just one approach. Further-
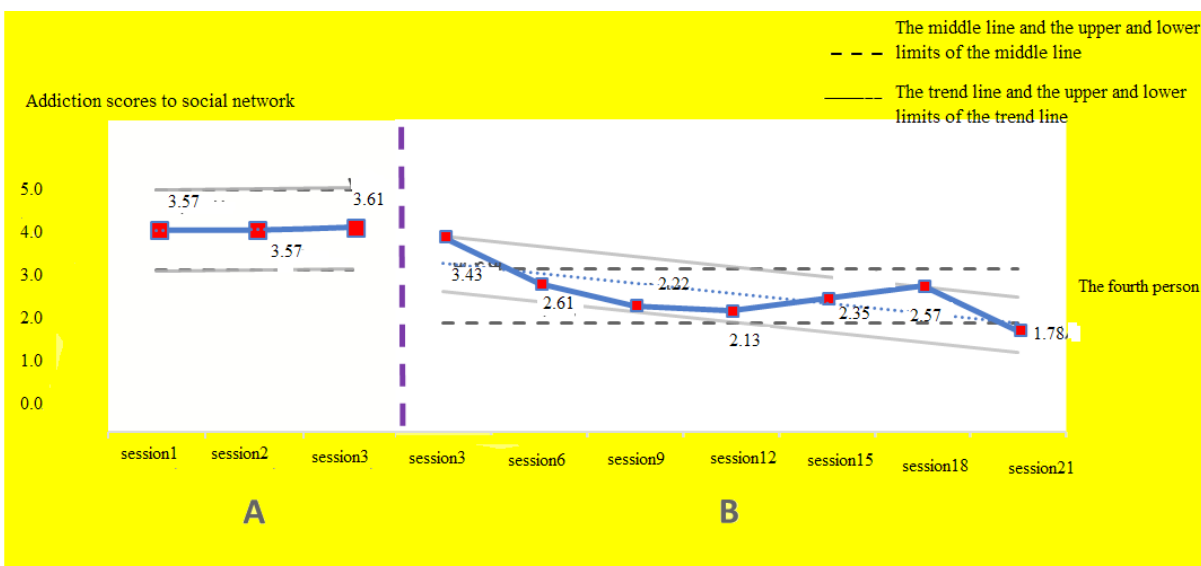
Figure 4. Effectiveness of individual psychotherapy intervention on improving Instagram addiction of the 4th participant

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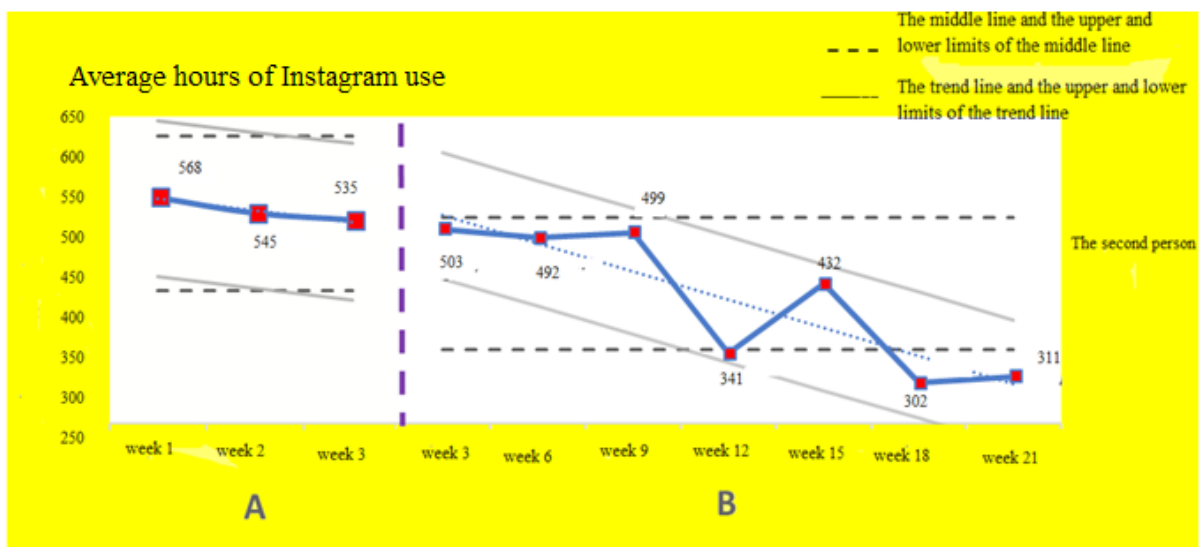
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Figure 5. Effectiveness of individual psychotherapy intervention in reducing the hours of using Instagram by the 1st participant

more, the incorporation of diverse psychological approaches and techniques, as highlighted in research by Dong and Potenza (2014), Orzack et al. (2006) and Shek et al. (2009), play a crucial role in interpreting the outcomes of this treatment. These studies show that using various psychological strategies enhances the treatment program's effectiveness compared to relying on a single approach.

Using appropriate psychological techniques and strategies is essential in investigating this treatment protocol's effectiveness. For example, teaching self-control skills is one

of the important goals of this treatment program. The main criterion of addiction is the lack of self-control (Tang et al., 2015) and self-control training is effective in reducing susceptibility to addiction (Shekarchi et al., 2021). The participants in our study received self-control skills through new tools and various exercises throughout the treatment course, particularly during the 5th session. Furthermore, these exercises were reviewed in the 21st session to prevent recurrence.
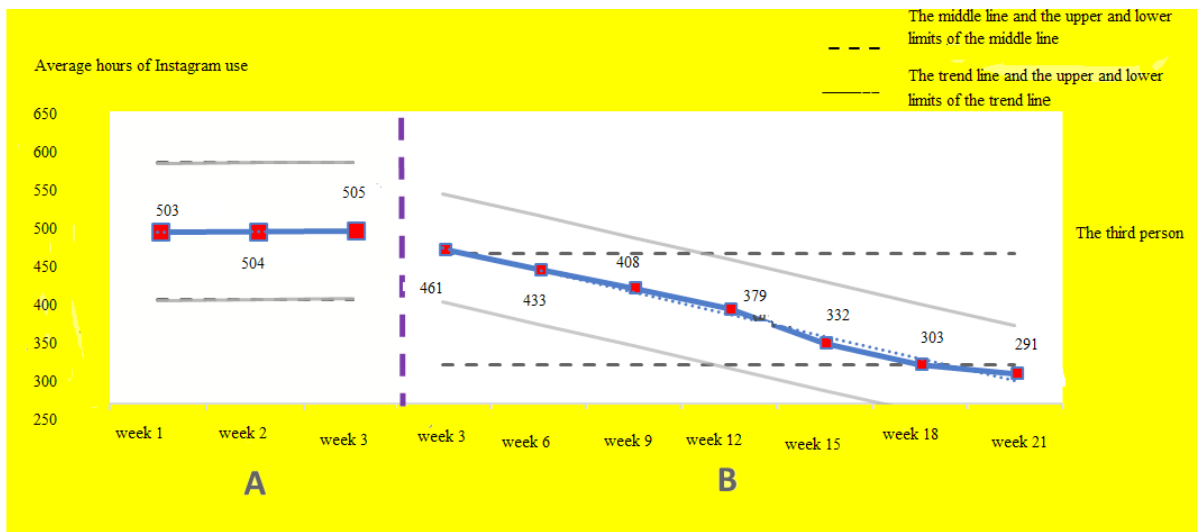
Teaching coping skills is another significant technique of this treatment program. Teaching coping skills has a positive effect on reducing addiction (Ahmadpanah et al., 2013).

Figure 6. Effectiveness of individual psychotherapy intervention in reducing the hours of using Instagram of the 2nd participant
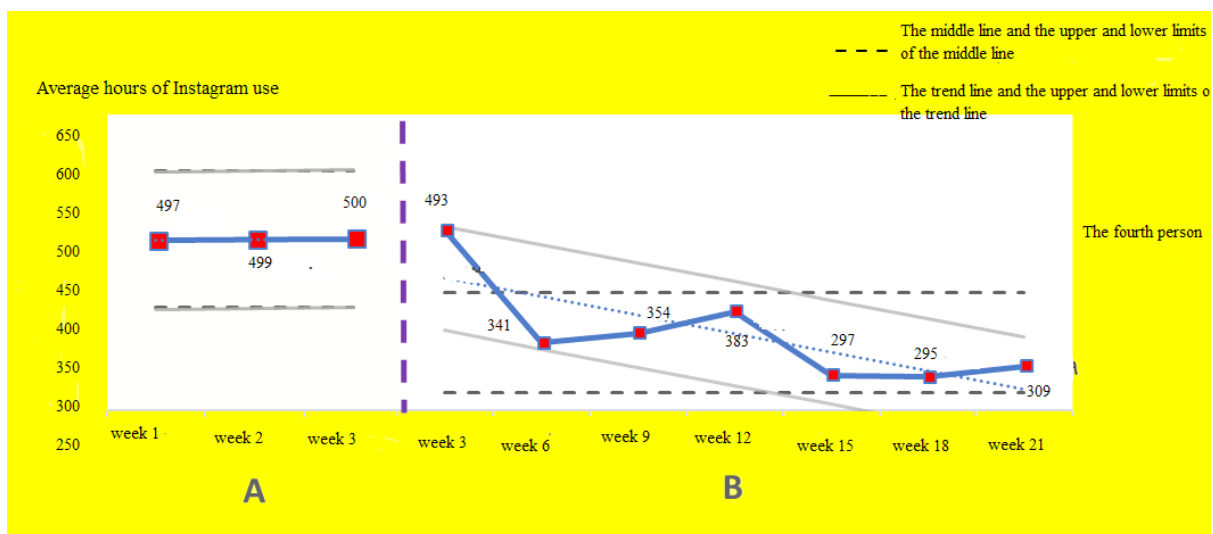
Figure 7. Effectiveness of individual psychotherapy intervention in reducing the hours of using Instagram of the 3rd participant

Another crucial aspect of our treatment protocol is the goal-setting training. Our program is built on encouraging a life filled with purpose and decisiveness. This principle was consistently emphasized throughout all sessions and exercises to enhance self-regulation and personal growth.

Goal-based interventions use real examples to strengthen people's willpower and this process leads to a person's impulse control. Researchers have mentioned the positive effect of goal setting on changing addictive behaviors. Therefore, training in setting appropriate goals can be mentioned as one of the strengths of this treat-

ment protocol in reducing Instagram addiction (Locke & Latham, 2004; Verdejo-Garcia, 2020).

Important exercises were also performed in the 5th, 7th, 12th and 13th sessions in emotion recognition, recognition of harmful emotions, emotion regulation and control. These activities can be useful in equipping a person with the ability to regulate emotions. Given the established inverse relationship between emotion regulation and social network addiction (Barbar et al., 2021; Hormes et al., 2014), this treatment program's focus on emotion regulation activities constitutes a significant strength. These

Figure 8. Effectiveness of individual psychotherapy intervention in reducing the hours of using Instagram of the 4th participant

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activities may contribute to the observed recovery from Instagram addiction among the participants.

Using diverse and entertaining tools specific to the adolescent age in this treatment program, such as games, film analysis, role-playing, and arrangement of the content of the 19th and 20th sessions, based on finding fun activities and entertainment, increased adolescents' vitality and cheerfulness level. There is an inverse relationship between the sense of vitality and addiction to virtual media (Baltaci, 2019). Therefore, injecting a sense of vitality and vivacity throughout the sessions of this treatment program can be considered one of the important factors in the modification of addiction to Instagram in adolescence.

Throughout the treatment, and especially in the 7th and 14th sessions, there was a process of discovering and correcting cognitive distortions and incompatible psyches. Creative methods were also used in homework, such as analyzing incompatible psychological structures and cognitive distortions in the characters of the stories or through adolescent self-reporting. There is a direct and significant relationship between cognitive distortions and maladjusted psychological schemas with addiction to social networks (Bour et al., 2020). Therefore, paying attention to these schemas and cognitive errors and correcting them in the Instagram addiction treatment program cannot be ignored. The results demonstrate that the initiation of the psychotherapy program was associated with a decrease in Instagram usage among the participants, indicating a downward trend in the hours spent on the platform. A significant decrease in daily Instagram usage was observed among the participants during the seven-week treatment program. The decrease in Instagram usage at the end of the treatment compared to the beginning of the treatment ranged from 85 to 257 minutes. The treatment's efficacy in reducing Instagram usage is highlighted by this variance, with the extent of the decrease varying across individuals. The observed data revealed a mean reduction in Instagram usage time exceeding 180 minutes (three hours) per day across participants, except for the first participant.

It is necessary to pay attention to the content of the individual psychotherapy program in explaining the effect of this program on reducing the hours spent using Instagram. For example, teaching and practicing self-regulation strategies throughout the sessions is one of the notable points of this treatment protocol. Self-regulation strategies refer to a person's motivation level and efforts to achieve their goals. There is a significant and direct relationship between self-regulation strategies and time management (Kuhl & Fuhrmann, 1998; Aflaki Fard &

Akbari, 2019). Therefore, it is possible to mention the role of these strategies in reducing the number of hours adolescents spend using Instagram. Goal setting is also one of the important topics in this treatment program. Proper goal setting has a positive effect both in the treatment of addictive behaviors (Verdejo-Garcia, 2020) and in time management (Fitsimmons, 2008). Therefore, reducing the hours spent using Instagram can be considered an effective factor in this psychotherapy program. Using new strategies in time control, such as preparing a planning notebook, weekly self-reinforcement in case of success in reducing the hours of using Instagram, and the percentage of daily wasted time on a general scale effectively reduced the hours of using Instagram.

Due to the limitations of the AB design, if the dependent variable changes after the introduction of a treatment, it is not always clear whether the treatment is responsible for the change. In addition, the generalizability of the results in this type of study is limited. Therefore, the findings should be used with caution.

Conclusion

The individual treatment program for ICT addiction was effective in reducing the level of addiction and the hours spent on Instagram. Therefore, considering the sensitive period of adolescence, it is suggested to perform this treatment for adolescents addicted to Instagram or cyberspace. Future research on this treatment protocol's effectiveness should use experimental methods to produce more generalizable results. It is also suggested to conduct a study to compare this treatment program and another treatment approach in the field of reducing addiction to Instagram in teenagers.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Shahid Beheshti University (Code: IR.SBU. REC.1401.029). Informed written consent was obtained from the adolescent participants and their mothers after thoroughly explaining the details of the therapeutic training course.

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Authors' contributions

Data collection, analysis and interpretation: Niloofar Mohasseb; Review and editing: Marzie Hashemi; Conceptualization, study design, drafting the original paper and final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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