

Psychological rehabilitation of individuals with alcohol use disorder, drug addiction, gambling disorder, and codependency

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ABSTRACT

The objective of this study was to assess the impact of a 12-month course of cognitive behavioral therapy (CBT) on individuals diagnosed with alcohol use disorder, drug addiction, gambling disorder, and codependency, with a focus on improving quality of life and reducing symptom severity. A quantitative design was employed, involving both control and experimental groups, each initially comprising 100 participants. By the end of the study, the final sample sizes in the experimental groups were 72 (alcohol use disorder), 70 (drug addiction), 74 (gambling disorder), and 73 (codependent behavior) individuals. An equal number of participants in the corresponding control groups were reassessed. Quality of life was measured using the World Health Organization Quality of Life BREF instrument, which measures physical health, psychological health, social relationships, and environmental conditions. The results indicated a significant improvement in quality-of-life scores in the experimental groups compared to the control groups. The Wilcoxon signed-rank test confirmed statistically significant improvements ($p < 0.001$) across all addiction categories, while the Mann-Whitney U test demonstrated substantial post-intervention differences between control and experimental groups ($p < 0.001$). Participants in the experimental group showed marked reductions in addiction severity, as indicated by AUDIT, DAST, G-SAS, and Spann-Fisher Codependency Scale assessments. Effect sizes (Cohen's d) ranged from 2.83 to 3.47, confirming the strong impact of psychotherapy. These findings underscore the effectiveness of CBT in reducing addiction severity and enhancing quality of life, supporting its broader integration into addiction treatment programs. The study provides valuable evidence for addiction rehabilitation efforts in Kazakhstan. From a practical perspective, these findings highlight the importance of structured psychotherapeutic interventions in addressing addiction-related issues. The study underscores the need to expand access to CBT in rehabilitation centers, particularly in regions with high addiction rates. Future policy initiatives should prioritize the development of therapist training programs and the implementation of evidence-based treatment methods. Moreover, the results emphasize the necessity for continuous post-treatment support to maintain long-term recovery and prevent relapse. By incorporating CBT into standardized rehabilitation protocols, policymakers and healthcare providers can enhance the overall effectiveness of addiction treatment services.

1. Introduction

In Kazakhstan, the issue of addiction has reached alarming levels, making psychological rehabilitation a critical public health priority. According to the Ministry of Health, >50,000 individuals are officially diagnosed with drug addiction. However, the actual prevalence is likely higher due to underreporting linked to social stigma and the latent

nature of these conditions (Fetkulov et al., 2019). Alcohol dependence is also widespread. Estimates indicate that approximately 3.5 % of the adult population experiences alcohol use disorders, with rising rates among youth (Adilbayeva, 2023). Similarly, gambling addiction has become increasingly prevalent. A study by Zhatkanbaeva et al. (2021) reports that approximately 5 % of the population exhibits signs of pathological gambling behavior, contributing to a substantial

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socioeconomic burden.

Furthermore, codependency—a psychological issue affecting family members and close acquaintances of individuals with addictions—remains underestimated despite its significant impact on mental health (Aimaganbetova et al., 2020). This study focused on alcohol, drug, and gambling addiction due to their high prevalence and significant public health impact, which necessitate targeted intervention strategies. By examining these common addictions, the study aimed to provide a comprehensive evaluation of CBT's effectiveness in addressing widely recognized addiction patterns and their impact on quality of life.

Rehabilitation is a comprehensive set of measures necessary to address functional limitations in daily activities resulting from health issues, including addiction as a psychiatric diagnosis (Pomerleau et al., 2008). In the context of both chemical and non-chemical dependencies, which significantly impact an individual's mental health and overall life, rehabilitation aims to establish new behavioral patterns and provide adequate social support. This support may involve psychiatrists, social workers, psychotherapists, or entire institutions such as rehabilitation centers (Mambetalina et al., 2023; Nyamathi et al., 2010). Addictions of varying etiology have long been a serious concern in many societies, and Kazakhstan is no exception (Bufford & Lappan, 2024; Zhatkanbaeva et al., 2021). The prevalence of alcohol, drug, and gambling addictions, along with associated codependency, has necessitated comprehensive approaches to rehabilitation (Aimaganbetova et al., 2020; Fetkulov et al., 2019; Pomerleau et al., 2008). Psychological rehabilitation through psychotherapy has emerged as a promising solution for treating addictive behaviors (Angres & Bettinardi-Angres, 2008; Feingold & Tzur Bitan, 2022). Group and individual psychotherapy have gained widespread recognition as effective methods for managing various forms of addiction (Emmelkamp et al., 2014; Krentzman, 2023; Miller et al., 2019). These approaches encompass a range of therapeutic techniques designed to help individuals understand and control their addictive behaviors, while also addressing the underlying psychological issues that contribute to the onset and progression of addictions (Angres & Bettinardi-Angres, 2008; Glasner-Edwards & Rawson, 2010). It is also crucial to note that psychological rehabilitation aims to enhance the patient's adaptive capabilities at physiological, psychological, and social levels without reliance on psychoactive substances (Magill et al., 2013). In Kazakhstan, where the level of addictive behavior shows concerning trends, the need for effective psychological rehabilitation programs has become increasingly pressing (Hook & Bogdanov, 2021).

The Transtheoretical Model of Behavior Change (TTM), developed by Prochaska and DiClemente, represents a fundamental theoretical framework for understanding the process of overcoming addiction. TTM delineates five stages of behavioral change: precontemplation, contemplation, preparation, action, and maintenance (Hofmann et al., 2012). These stages describe the gradual transition from addiction to recovery, with cognitive behavioral therapy (CBT) demonstrating a strong alignment with this process.

During the precontemplation stage, individuals may deny the existence of a problem or fail to recognize the severity of their dependence. In this study, participants who did not receive CBT (the control groups) exhibited similar behaviors, including resistance to acknowledging their addiction. The contemplation stage is characterized by an awareness of the problem and ambivalence regarding the necessity of change. At this stage, CBT facilitates the development of motivation and the restructuring of cognitive patterns (Ray et al., 2020). The preparation stage involves the decision to initiate change and the first steps toward modifying behavior. Throughout therapy, participants are trained in addiction management strategies, trigger awareness, and alternative behavioral models. This is followed by the action stage, in which individuals actively implement behavioral modifications and apply newly acquired coping skills. Researchers have documented a significant reduction in dependency levels among individuals who received CBT-based therapy, as confirmed by statistical analysis (Magill et al., 2013). Finally, the maintenance stage is crucial for relapse prevention.

Existing studies underscore the necessity of continued support, including participation in self-help groups and regular psychotherapeutic sessions, to reinforce sustained behavioral changes (O'Sullivan et al., 2019). The collective evidence highlights the high efficacy of CBT across all stages of the recovery process—from problem recognition to the establishment of long-term behavioral modifications (McHugh et al., 2010).

Quality-of-life assessments are widely utilized in addiction research as they reflect the multifaceted impact of addiction and its treatment on individuals' lives (Manning et al., 2019; O'Sullivan et al., 2019). In this study, participants were asked to evaluate their quality of life and the extent of their addiction before and after the intervention period. This approach enabled a direct comparison of changes in perceived well-being and addiction severity. The study is expected to contribute to the existing body of knowledge on the rehabilitation of individuals with addictions. First, the experiment aimed to confirm the effectiveness of psychotherapy in the context of Kazakhstan, where it is a relatively new practice. Second, by focusing on various groups of individuals with addictions, the study sought to evaluate treatment outcomes across different forms of addiction, tracking changes in addiction severity. Finally, a quantitative design with control and experimental groups ensured reliability, supporting the validity of the results. By demonstrating the potential benefits of this approach, the study aims to promote the broader integration of psychotherapy into addiction treatment programs nationwide.

1.1. Literature review

Psychological rehabilitation of individuals with addiction has been extensively studied across various countries (Crookes, 2018). Psychotherapy is central to addiction treatment, given its potential to address underlying psychological issues that contribute to addictive behaviors (Morgenstern & McKay, 2007). Another advantage is its applicability to various forms of addictive behavior, rendering this approach versatile (Burke & Carruth, 2012). On the other hand, psychological rehabilitation can extend beyond psychotherapy by integrating other methods of assistance and support (Rowe, 2012). These include psychoeducation, anonymous groups, psychological counseling, and comprehensive support during the resocialization of individuals with addictions (Krentzman, 2023). These methods have been shown to contribute to social and professional self-definition, self-esteem, self-worth, the formation of constructive value systems, and self-awareness. They also enhance competitiveness, stress management, and the ability to develop short-term and long-term life plans (Crookes, 2018). Additionally, psychocorrective activities in sensory rooms, art therapy, body practices, music therapy, existential therapy, and others are employed to support rehabilitation (Magill et al., 2013; Stitzer & Petry, 2006). However, the scientific literature often evaluates these interventions (including CBT) in isolation, limiting the understanding of their effectiveness (Hofmann et al., 2012; McHugh et al., 2010).

In the realm of alcohol addiction, psychotherapy is widely used as a primary treatment method (Magill et al., 2013). CBT has emerged as one of the most effective approaches aimed at altering dysfunctional thoughts and behaviors related to alcohol consumption (Ray et al., 2020). Meta-analyses have demonstrated that CBT assists individuals in developing coping strategies, reducing alcohol consumption, and preventing relapse (Hofmann et al., 2012; Magill et al., 2013). Motivational interviewing, another extensively utilized method, enhances individuals' motivation to change their lives through a non-confrontational and empathetic approach (Nyamathi et al., 2010; Rubak et al., 2005).

Addiction to drugs represents a more complex issue due to the variety of substances and their differing effects on the brain and behavior (Carroll & Onken, 2005). Psychotherapy for drug addiction often includes a combination of CBT, contingency management, and family therapy (McHugh et al., 2010). Contingency management, which

provides tangible rewards for positive behaviors such as abstinence, is particularly effective in short-term treatment for drug addiction (Ainscough et al., 2017; Stitzer & Petry, 2006). Family therapy, which involves the family of an individual with an addiction in the treatment process, targets relationship dynamics that normalize drug use (Rowe, 2012). These approaches have been found beneficial for reducing drug use, improving family relationships, and enhancing overall treatment outcomes (Carroll & Onken, 2005).

Gambling disorder—a relatively new field of research—draws parallels with substance addiction in terms of the compulsive behaviors exhibited by individuals (Yau & Potenza, 2015). Psychotherapy for gambling disorder often incorporates treatment methods from drug addiction therapy, including CBT and motivational interviewing (Wynn et al., 2014). Internet-based interventions have also gained popularity, offering accessible and flexible treatment options for individuals with gambling addiction (Fong, 2005). These interventions have shown promising results in reducing gambling time, improving mental health, and enhancing quality of life (Rosenthal, 2008).

Codependency, defined as excessive emotional or psychological dependence on a partner, often develops in relationships associated with addiction (Ahmad-Abadi et al., 2015). Although codependency is not formally recognized as a diagnostic category in either ICD-11 or DSM-5-TR, within the context of Kazakhstan, it is typically conceptualized as a clinically significant phenomenon observed in the families of individuals with addictions. This concept is actively employed in rehabilitation practices to identify and address dysfunctional relationship patterns that contribute to the perpetuation of addiction. Psychotherapy for individuals with codependency is designed to assist them in recognizing and altering their supportive behaviors. Commonly employed approaches include cognitive behavioral therapy, individual therapy, and support groups. These interventions enhance self-esteem, promote independence, and foster healthier relationship dynamics (Bacon et al., 2020). Research has demonstrated that eliminating codependency is critical to the overall success of addiction rehabilitation, as it prevents the continuation of addictive behaviors within relationships (Ahmad-Abadi et al., 2017; Scaturro et al., 2020).

In Kazakhstan, the application of these psychotherapeutic approaches must account for cultural and social factors unique to the region (Adilbayeva, 2023). Cultural perceptions of addiction, stigma, and the availability of treatment resources influence the effectiveness of psychotherapy (Braun-Koch et al., 2022). Studies in similar cultural contexts emphasize the importance of culturally adapted measures and interventions tailored to local values and norms (Hook & Bogdanov, 2021). The integration of traditional treatment methods with contemporary psychotherapy has been proposed as a potential strategy to enhance the acceptability and outcomes of treatment (Zhatkanbaeva et al., 2021).

Quality of life (QoL) has become a significant indicator in addiction research, reflecting the multifaceted impact of treatment quality and overall rehabilitation (Bratu et al., 2023). QoL assessments encompass various domains, including physical health, psychological well-being, social relationships, and environmental factors (Colpaert, 2022). Research has shown that improvements in quality of life are associated with successful addiction treatment outcomes (Inanlou et al., 2020; Scaturro et al., 2020). The literature discusses the need for comprehensive treatment programs that target abstinence from addictive behavior while enhancing the overall well-being of patients with a history of addiction (Stitzer & Petry, 2006; Yau & Potenza, 2015).

The quantitative design employed in addiction research—involving control and experimental groups—has provided compelling evidence of the effectiveness of psychotherapeutic interventions (Dragioti et al., 2017). Randomized controlled trials (RCTs) are considered the gold standard, offering a high level of internal validity (Gerber et al., 2011). Studies often compare the outcomes of individuals receiving psychotherapy with those receiving standard care or no treatment, thereby isolating the effects of the intervention. Meta-analyses and systematic

reviews of RCTs further strengthen the evidence base, demonstrating consistent positive results for psychotherapy across various forms of addiction (Abdallah et al., 2023; Hofmann et al., 2012; Magill et al., 2013; Ray et al., 2020; Shean, 2014).

Despite extensive research supporting psychotherapy, challenges remain in ensuring its accessibility and acceptance among individuals with addiction in Kazakhstan (Akhand, 2019). Barriers include limited trained therapists, social stigma, and financial constraints (Adilbayeva, 2023). Addressing these barriers is crucial for the successful implementation of psychotherapeutic interventions. Recommended initiatives entail increasing funding for addiction treatment, enhancing therapist training programs, and reducing stigma through public awareness campaigns (Akhand, 2019).

The Kazakhstani context introduces distinct moderating factors that shape both the manifestation of addictive behaviors and the effectiveness of psychotherapy. Unlike in Western countries, where psychotherapy is widespread and well-established, access to qualified specialists in Kazakhstan remains limited, particularly in regions outside major urban centers (Hook & Bogdanov, 2021). According to reports from the Ministry of Health, the number of practicing cognitive behavioral therapists remains low, restricting the dissemination of evidence-based methods for addiction treatment (Adilbayeva, 2023). The social stigma surrounding addictive disorders in Kazakhstan impedes help-seeking behavior, as addiction is often perceived not as an illness but as a personal weakness (Braun-Koch et al., 2022). This perception reduces patient adherence to treatment and increases the likelihood of relapse (Inanlou et al., 2020). Additionally, the availability of alternative rehabilitation approaches, such as religious programs or pharmacological treatment without concurrent psychological support, limits the prevalence of psychotherapeutic interventions in addiction treatment (Akhand, 2019). Given these factors, the relevance of this study extends beyond the application of psychotherapy in a new regional setting to an assessment of how barriers to accessing qualified care and societal attitudes influence treatment effectiveness.

1.2. Problem statement

The detrimental impact of alcohol, drug, and gambling addiction extends beyond the individual, affecting their families and society at large (Crookes, 2018). Despite the availability of various rehabilitation programs, the effectiveness of these interventions, particularly psychotherapy, has not been extensively studied within Kazakhstan (Zhatkanbaeva et al., 2021). To address this gap, the current research focused on evaluating the efficacy of CBT within the framework of psychological rehabilitation. Furthermore, unlike isolated assessments (Hofmann et al., 2012; McHugh et al., 2010), the present study was conducted in real rehabilitation centers in Kazakhstan, where CBT was implemented within a broader therapeutic framework. This approach enhanced the ecological validity of the results by reflecting the actual conditions of psychological rehabilitation, including therapist variability, patient diversity, and contextual factors (e.g., social support and institutional infrastructure). By evaluating CBT effectiveness under real-world conditions, the study aimed to generate statistically reliable and clinically translatable findings to directly inform real-world treatment strategies and policy decisions in addiction rehabilitation. The primary objective of this study was to assess the impact of CBT on reducing the severity of addiction and improving the quality of life for individuals diagnosed with alcohol, drug, or gambling addiction, as well as for those experiencing codependency. This objective was driven by the need to provide scientifically grounded data for the development of rehabilitative psychology in Kazakhstan.

To achieve this goal, the study addressed the following specific objectives:

1. To establish control and experimental groups comprising individuals with different types of addiction.

2. To measure baseline levels of quality of life and severity of addiction before the experimental period and after one year of psychotherapy in the experimental groups.
3. To evaluate the effectiveness of CBT in enhancing the quality of life for individuals with addiction and reducing addiction severity.

The study sample included individuals diagnosed with addiction or codependency by a psychiatrist. This criterion ensured that participants had a clinically established need for intervention, thereby increasing the relevance and applicability of the results. The inclusion of a control group for each experimental group receiving CBT provided a basis for assessing the therapy's effectiveness under comparative conditions.

2. Research methods

This study utilized the World Health Organization Quality of Life BREF (WHOQOL-BREF) assessment. The WHOQOL-BREF is a shortened version of the WHOQOL-100 questionnaire, consisting of 26 items. Scores in the four domains are scaled positively, ranging from 0 to 100, with higher scores indicating a better quality of life (Skevington et al., 2004). The instrument provides a comprehensive evaluation across four areas: physical health, psychological health, social relationships, and environmental conditions. The WHOQOL-BREF is particularly suited for this study as it allows a detailed assessment of various life aspects, reflecting the multidimensional impact of psychotherapy.

The "Physical Health" domain includes questions related to pain and discomfort, energy and fatigue, sleep and rest, and mobility. These indicators measure addiction's impact on physical well-being and subsequent improvements through psychotherapy. The "Psychological Health" domain assesses positive feelings, thinking, learning, memory and concentration, self-esteem, and body image. This area is crucial for evaluating mental and emotional improvements resulting from therapeutic interventions. Regarding "Social Relationships," the domain examines personal relationships, social support, and sexual activity. These aspects shed light on how addictions impact social interactions and relationships and how these areas can be improved through effective psychotherapy. The "Environment" domain includes questions about financial resources, freedom, physical safety, health care and social protection, home environment, and opportunities for acquiring new information and skills (Skevington et al., 2004).

This study used the Russian-language version of this methodology (Yermakhanov et al., 2021). All participants were fluent in Russian. Respondents completed the WHOQOL-BREF at the beginning of the study (baseline) and at the end of the 12-month experimental period. All administrations occurred in a controlled environment to enhance the reliability of the results. Several management strategies were employed to ensure standardized conditions, minimize the influence of external factors, and uphold ethical principles. Participant selection was conducted using a random number generation method, which ensured objective allocation to the control and experimental groups. Individuals with comorbid addictions were excluded, as their inclusion could lead to confounding effects and complicate result interpretation.

To monitor adherence to the therapeutic program, participants in the experimental group were required to attend CBT sessions regularly, with their attendance systematically recorded. In cases of missed sessions, individual interviews were conducted to determine the reasons for absence and to provide additional motivation for continued participation. All diagnostic assessments were carried out under strictly standardized conditions to minimize the influence of random factors and subjective biases.

Ethical considerations were also carefully addressed. To mitigate potential ethical risks, the control group participants who did not receive CBT were provided with access to psychoeducational materials and consultations, thereby ensuring that all participants received baseline support. In cases of psychological deterioration or crisis situations, participants had the option to seek assistance from professionals who

were not directly involved in the experiment. Participants were asked to respond to each question based on their experiences and perceptions over the past two weeks. Research assistants were present to maintain the accuracy of the assessment.

The study also employed a range of standardized psychometric tests designed to assess addiction severity. These include the Alcohol Use Disorders Identification Test (AUDIT), the Drug Abuse Screening Test (DAST), the Gambling Severity Assessment Scale (G-SAS), and the Spann-Fisher Codependency Scale. These instruments have been translated and adapted for Russian-speaking populations, making them suitable for the current study (Berdichevsky et al., 2021; Nazari et al., 2023; WHO, 2021).

The Alcohol Use Disorders Identification Test (AUDIT) is an international screening tool developed by the World Health Organization to assess alcohol consumption and related behaviors, as well as alcohol-related problems. The test consists of 10 questions, each scored on a scale from 0 to 4, with a total score ranging from 0 to 40. Scores from 0 to 7 indicate low-risk alcohol use, scores from 8 to 15 indicate hazardous alcohol use, scores from 16 to 19 indicate harmful alcohol use, and scores of 20 or above indicate alcohol use disorder (Reinert & Allen, 2007).

The Drug Abuse Screening Test (DAST) is a self-report questionnaire designed to assess the frequency of drug use and related issues. It consists of 10 items, each requiring a "yes" or "no" response. Each "yes" response receives 1 point, with the total score ranging from 0 to 10. A score of 0 indicates no drug-related problems, while 1–2 points suggest low-level issues, 3–5 points indicate moderate problems, and 6 or above signifies significant issues that may require treatment. The DAST effectively determines the severity of drug use and its impact on individuals (Villalobos-Gallegos et al., 2015).

The Gambling Severity Assessment Scale (G-SAS) is designed to evaluate the severity of gambling urges and behavior over the past week. It consists of 12 items, each rated on a scale from 0 to 4, with a total score ranging from 0 to 48. The items measure the frequency, intensity, and control of gambling urges, as well as the emotional and social consequences of gambling. Higher scores indicate greater clinical severity (Nazari et al., 2023). The G-SAS assesses both the degree of gambling-related problems and changes over time.

The Spann-Fisher Codependency Scale measures the extent of codependent behavior. The survey includes 16 items, each rated on a scale from 1 (strongly disagree) to 6 (strongly agree). The scores are summed, with a range from 16 to 96. Scores below 35 indicate a low level of codependency, while higher scores reflect a more severe degree of codependency (Berdichevsky et al., 2021). This scale measures the level of codependent behavior and monitors treatment progress, which is crucial for evaluating targeted therapeutic interventions.

2.1. Study design

The study employed a quantitative design with both control and experimental groups to evaluate the effectiveness of CBT in the psychological rehabilitation of individuals with alcohol use disorder, drug addiction, gambling disorder, and codependency. The experimental period spanned one year, enabling a comprehensive assessment of the intervention's short-term and long-term effects. Several measures were implemented to minimize participant attrition. Regular contact with participants was maintained throughout the study to provide continuous support and address any issues that arose. Participants received access to additional resources and support services, highlighting the importance of their involvement and its impact on the study's outcomes. The CBT sessions were conducted by therapists specializing in addiction treatment, all possessing a minimum of three years of experience. Each therapist was assigned to work exclusively with one specific addiction population under investigation in this study.

As part of the study, cognitive behavioral therapy (CBT) was implemented in an individual format, facilitating treatment adaptation

to each participant's specific needs and intensive focus on participant-specific concerns. The program lasted for 12 months, during which each participant in the experimental group attended weekly sessions. Throughout the therapy, each patient completed a total of 52 individual sessions, with each session lasting 60 min.

The therapeutic process was structured and consisted of three key stages. The first stage focused on psychoeducation and cognitive restructuring, during which patients were introduced to the principles of CBT, examined addiction as a combination of cognitive and behavioral factors, and analyzed triggers and automatic responses. Therapists assisted participants in identifying and challenging dysfunctional beliefs related to addiction, as well as in developing more adaptive cognitive strategies.

During the main stage of therapy, participants acquired and reinforced self-regulation skills, developed coping strategies for managing triggers and impulsive reactions, and engaged in behavioral experiments. Special attention was given to stress management and emotional instability, as these factors frequently contribute to the development and maintenance of addictive behaviors. Depending on the type of addiction, additional techniques were employed; for instance, exposure and response prevention was used for individuals with gambling addiction.

The goal of the final stage of therapy was to consolidate the changes and prevent relapse. Patients assessed their progress, formulated sustainable strategies for maintaining abstinence, and developed individualized relapse prevention plans. Particular emphasis was placed on independently applying acquired skills in daily life.

Participants were selected based on predefined criteria, with eligibility primarily based on a psychiatric diagnosis indicating a single type of addiction (individuals with co-occurring addictions were excluded from the study). Eligible participants were then randomly assigned to either an experimental group (receiving CBT) or to a control group, which did not receive psychotherapy during the study period. Randomization was achieved using a random number method.

Participation in the study required attending regular psychotherapy sessions. For the experimental group, CBT sessions occurred weekly, with each session lasting 1 h. Therapists followed a structured CBT protocol designed specifically for addiction treatment. The therapy focused on assisting participants in identifying and modifying unproductive attitudes, thoughts, and behaviors; developing coping strategies; and enhancing problem-solving skills.

2.2. Participants

Participants in the study were individuals diagnosed with addiction or codependency by a psychiatrist. These participants were recruited from various rehabilitation centers in Almaty. Inclusion criteria required a confirmed diagnosis of alcohol, drug, or gambling addiction or codependency, as well as fluency in Russian. Eligible participants were between 18 and 65 years of age and were required to provide informed consent to participate in the 12-month study.

An effect size calculation was performed to determine the appropriate sample size. Based on previous research on the efficacy of CBT for addiction treatment, an effect size of 0.5 (moderate effect) was adopted. Based on a power analysis with a significance level (α) of 0.05 and a power (1-beta) of 0.80, it was determined that approximately 64 participants per group (experimental and control) were needed to detect a

significant difference. To account for potential attrition and ensure sufficient statistical power, it was decided to recruit 100 participants per group. The attrition rate was relatively low. The data are presented in Table 1.

Final retention rates in the experimental groups were as follows: 72 participants in the alcohol use disorder group; 70 participants in the drug addiction group; 74 participants in the gambling disorder group; 73 participants in the codependency group. A random sample of participants was selected and tested in the control groups for paired sample tests. Demographically, the post-attrition sample consisted of individuals aged 18 to 65, with a mean age of 35. The remaining sample comprised a slightly higher proportion of men (54 %) than women (46 %). The majority of participants had higher education (69 %), with the remaining 31 % having completed secondary education.

2.3. Ethical issues

The study strictly adhered to the ethical principles outlined in the Helsinki Declaration. Informed consent was obtained from all participants before their inclusion in the study. Participants were informed about the study's objectives, procedures, and duration, as well as their right to withdraw from the study at any time without any penalties. Confidentiality was rigorously maintained; personal information was anonymized and accessible only to the research team. Publications and reports ensured that no participant could be identified. The study protocol included measures to ensure that the control groups had access to support, such as psychoeducation and psychological counseling. Ethical approval from the rehabilitation centers was obtained before the commencement of the experimental period, and the study design was approved in compliance with fundamental ethical standards. Regular inspections and monitoring by the administrators of the rehabilitation centers ensured compliance with ethical standards throughout the study.

2.4. Limitations

Despite the use of randomized controlled trials (RCTs), this experiment had several limitations. Firstly, it relied on self-reported measures of quality of life and addiction severity, which may lead to data distortion. Participants could have overestimated or underestimated their quality of life and the progression of their addiction due to subjective perceptions or social desirability bias. Secondly, despite a sufficient sample size, participant attrition may have influenced the results. Individuals who discontinued their participation might have had negative experiences with the therapy, potentially introducing systematic bias. Thirdly, while the study lasted for one year and provided verified data on the long-term effects of CBT, further observation is needed to understand the sustainability of the changes. Future research should continue to monitor delayed effects or relapses in order to gain a deeper examination of CBT's impact on individuals with addictions in Kazakhstan. Additionally, while codependency is conceptualized as a clinically significant condition in Kazakhstan's rehabilitation practice, it is not classified as an official diagnostic category in either ICD-11 or DSM-5-TR. This discrepancy may limit the international generalizability of the results. Although this study employed within-group (Wilcoxon test) and between-group (Mann-Whitney test) comparisons, future

Table 1
Socio-demographic characteristics of participants by group.

Social categories	Alcohol (EG, $n = 72$)	Drug addiction (EG, $n = 70$)	Gambling (EG, $n = 74$)	Codependency (EG, $n = 73$)	Control ($n = 75$)
Men	39	38	40	39	41
Women	33	32	34	34	34
Average age	34.86	35.02	35.04	34.98	35.10
Education: higher	50	48	51	50	52
Education: secondary	22	22	23	23	23

research could benefit from calculating and directly comparing individual change scores (pre- and post-intervention) across different groups. This approach would enable a more precise assessment of treatment effects through methods such as mixed-model analysis of variance (ANOVA).

2.5. Data analysis

Data analysis was conducted using IBM SPSS 25. Given the naturalistic design of the study and the heterogeneity of participant groups (alcohol use disorder, drug addiction, gambling disorder, and codependency), a conservative statistical approach was applied. Specifically, the Wilcoxon signed-rank test was used to assess pre- and post-intervention differences within each group, and the Mann-Whitney *U* test was employed to compare post-intervention scores between experimental and control groups. The non-normal distribution of several variables and unequal sample sizes across subgroups could violate the assumptions of parametric methods such as repeated measures analysis of variance or mixed-effects models. Therefore, the study relied on non-parametric tests. Using change scores and comparing them across groups might provide a more direct assessment of treatment effects. Nevertheless, the current approach was deemed more appropriate for the existing data structure and sample characteristics.

3. Results

Data from the pre-test and post-test assessments of WHOQOL for each type of addiction were analyzed to determine mean scores and standard deviations. The results indicate that the experimental groups exhibited significant improvements in quality of life across all domains following CBT, whereas the control groups did not show substantial changes (see Fig. 1).

Regarding participants with alcohol use disorder, the control group had a pre-test mean score of 42.31 with a standard deviation (SD) of 4.82. The post-test scores in this group did not exhibit marked changes, maintaining similar mean and SD values. In contrast, the experimental group had a pre-test mean score of 42.31 (SD = 4.82), but the post-test score increased to 74.47 (SD = 5.50). This substantial improvement underscores the effectiveness of CBT in enhancing the quality of life for individuals with alcohol use disorder.

Similarly, in the drug addiction group, the control group had a pre-test mean score of 43.12 (SD = 5.29), with post-test scores remaining stable and showing no considerable changes. However, the experimental

group exhibited a significant increase in post-test scores—from a pre-test mean of 43.12 (SD = 5.29) to a post-test mean of 74.21 (SD = 4.57). This notable improvement highlights the positive impact of CBT on individuals with a history of drug dependence.

The gambling disorder group demonstrated similar patterns. The control group had a pre-test mean score of 40.94 (SD = 4.48), with no profound changes in post-test scores. On the other hand, the experimental group, which started with a similar pre-test mean score of 40.94 (SD = 4.48), saw a significant increase in post-test scores to 74.92 (SD = 4.79). These results indicate that CBT effectively improves the quality of life for individuals with gambling addiction.

In the codependency group, the control group had a pre-test mean score of 42.12 (SD = 4.89), with post-test scores remaining unchanged and showing no significant alterations. In contrast, the experimental group demonstrated a substantial increase in post-test scores, rising from a pre-test mean of 42.12 (SD = 4.89) to a post-test mean of 74.33 (SD = 5.58). This improvement indicates that CBT is highly effective in enhancing the quality of life for individuals with codependency.

When comparing different types of addictions, it is evident that all experimental groups experienced positive changes in quality-of-life scores following CBT intervention. This consistency suggests that CBT is a reliable and versatile therapeutic approach. Conversely, the control groups failed to achieve substantial improvements in quality-of-life scores from the pre-test to the post-test, indicating the stability of baseline measurements.

The results indicate that individuals with alcohol use disorder, drug addiction, gambling disorder, and codependency can derive considerable benefit from CBT. The improvements observed in the experimental groups highlight the potential of CBT to facilitate meaningful changes in various aspects of life for individuals with these conditions. This therapeutic approach has proven effective across different forms of addiction, demonstrating its broad applicability and efficacy.

The significant increase in post-test results within the experimental groups, in contrast to the stable scores in the control groups, validates the observed improvements. These findings underscore the importance of CBT as a treatment method capable of leading to substantial enhancements in the quality of life for individuals with various forms of dependency.

The Wilcoxon signed-rank test was employed to compare pre-test and post-test scores within each group. This non-parametric test is suitable for paired samples with data that may not follow a normal distribution. Table 2 presents the results for the control and experimental groups across the different types of dependencies.

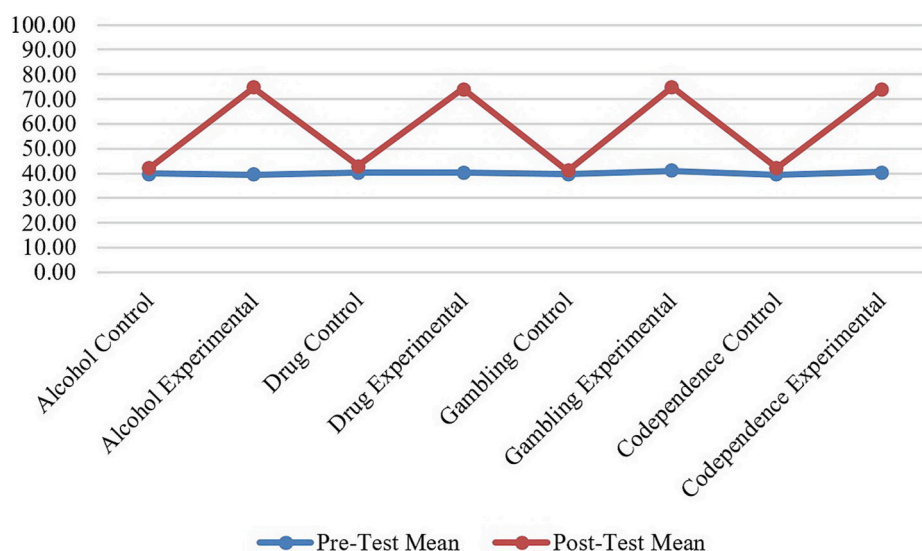


Fig. 1. Distribution of mean scores on the WHOQOL Scale by type of addiction and group.

Table 2
Results of the Wilcoxon signed-rank test for quality of life assessment.

Type of addiction	Comparison	Z-value	Asymptotic significance (2-tailed)	Based on
Alcohol Use Disorder	Post-test Control - Pre-test Control	-3.395	0.001	Negative Ranks
Alcohol Use Disorder	Post-test Experimental - Pre-test Experimental	-7.376	0.0	Negative Ranks
Drug Addiction	Post-test Control - Pre-test Control	-3.401	0.001	Negative Ranks
Drug Addiction	Post-test Experimental - Pre-test Experimental	-7.274	0.0	Negative Ranks
Gambling Disorder	Post-test Control - Pre-test Control	-1.053	0.292	Negative Ranks
Gambling Disorder	Post-test Experimental - Pre-test Experimental	-7.477	0.0	Negative Ranks
Codependency	Post-test Control - Pre-test Control	-3.516	0.0	Negative Ranks
Codependency	Post-test Experimental - Pre-test Experimental	-7.427	0.0	Negative Ranks

For individuals with alcohol use disorder, the Wilcoxon signed-rank test revealed a profound difference between pre-test and post-test scores in both the control and experimental groups. Specifically, the control group exhibited a Z-value of -3.395 with an asymptotic significance (two-tailed) of 0.001, indicating a major change. In contrast, the experimental group demonstrated a Z-value of -7.376 with an asymptotic significance of 0.000, reflecting a substantial improvement in quality-of-life scores following the intervention.

For individuals with drug addiction, the control group showed a Z-value of -3.401 with an asymptotic significance of 0.001, indicating a significant difference between pre-test and post-test scores. The experimental group, however, had a Z-value of -7.274 with an asymptotic significance of 0.000, signifying a considerable improvement in quality of life following the therapeutic intervention.

In the gambling disorder group, the control group did not show a significant difference between pre-test and post-test scores, with a Z-value of -1.053 and an asymptotic significance of 0.292. However, the experimental group demonstrated substantial improvement with a Z-value of -7.477 and an asymptotic significance of 0.000, indicating the effectiveness of the intervention for this group.

The Wilcoxon signed-rank test results in the codependency group indicated a statistically significant difference in the control group with a Z-value of -3.516 and an asymptotic significance of 0.000. The experimental group also showed a substantial improvement, with a Z-value of -7.427 and an asymptotic significance of 0.000. In summary, the Wilcoxon signed-rank test results demonstrate substantial improvement in quality-of-life indicators in the experimental groups across all types of addictions following the psychotherapeutic intervention. All control groups, with the exception of the gambling disorder group, also showed notable changes in scores. These results underscore the effectiveness of the intervention for patients in the experimental groups, highlighting its potential benefits for individuals with various types of dependencies.

The Mann-Whitney U test was employed to compare the distribution of scores between the control and experimental groups across different types of dependence. This non-parametric test is suitable for independent samples in cases where data do not meet the assumptions required for parametric tests. The results for the control and experimental groups across various types of dependence are summarized below (Table 3).

For individuals with alcohol use disorder, the Mann-Whitney U test for pre-intervention scores yielded a U value of 3588.000, a Wilcoxon W value of 6216.000, a Z value of -0.037, and an asymptotic significance (two-tailed) of 0.970. This indicates no pronounced difference between

Table 3
Results of the Mann-Whitney U test for quality of life assessment.

Type of addiction	Comparison	U-value	Z-value	Asymptotic significance (2-tailed)
Alcohol Use Disorder	Pre-test Control	3588.0	-0.037	0.97
Alcohol Use Disorder	Post-test Control	0.0	-11.182	0.0
Drug Addiction	Pre-test Control	3481.0	-0.06	0.952
Drug Addiction	Post-test Control	0.0	-11.09	0.0
Gambling Disorder	Pre-test Control	3290.5	-1.249	0.212
Gambling Disorder	Post-test Control	0.0	-11.277	0.0
Codependency	Pre-test Control	3052.0	-1.842	0.065
Codependency	Post-test Control	0.0	-11.225	0.0

the control and experimental groups prior to the intervention. However, for post-intervention scores, the U value was 0.000, the Wilcoxon W value was 5050.000, the Z value was -11.182, and the asymptotic significance was 0.000, indicating a notable post-intervention difference between the groups.

For individuals with drug addiction, the pre-intervention results showed a U value of 3481.000, a Wilcoxon W value of 5966.000, a Z value of -0.060, and an asymptotic significance (two-tailed) of 0.952, indicating no significant difference between the groups before the intervention. Conversely, the post-intervention results exhibited a U value of 0.000, a Wilcoxon W value of 5050.000, a Z value of -11.090, and an asymptotic significance of 0.000. These findings reveal a notable divergence between the groups after the intervention.

In the gambling disorder group, the pre-intervention scores showed a U value of 3290.500, a Wilcoxon W value of 8340.500, a Z value of -1.249, and an asymptotic significance (two-tailed) of 0.212, indicating no significant difference between the control and experimental groups prior to the intervention. However, the post-intervention scores revealed a U value of 0.000, a Wilcoxon W value of 5050.000, a Z value of -11.277, and an asymptotic significance of 0.000, signifying a statistically meaningful difference between the groups following the intervention.

Finally, for individuals with codependency, the Mann-Whitney U test for pre-intervention results yielded a U value of 3052.000, a Wilcoxon W value of 8102.000, a Z value of -1.842, and an asymptotic significance (two-tailed) of 0.065, indicating no significant difference between the groups before the intervention. Post-intervention scores, however, revealed a U value of 0.000, a Wilcoxon W value of 5050.000, a Z value of -11.225, and an asymptotic significance of 0.000. These post-intervention scores reflect a highly significant difference between the groups.

Thus, the Mann-Whitney U test results indicate no notable differences between the control and experimental groups before the intervention across all types of dependencies. However, the post-intervention results revealed marked distinctions between the groups, with the experimental groups exhibiting greater improvement in quality-of-life measures following the psychotherapeutic intervention. These results confirm the effectiveness of psychotherapy for individuals with various types of dependencies. To further validate the results, Cohen's d was calculated to assess the magnitude of improvement in quality of life across each type of addiction. This measure of effect size provides valuable insight into the practical relevance of the treatment outcomes, offering a deeper understanding beyond statistical significance alone.

For individuals with alcohol use disorder, Cohen's d for the control group was 0.49, indicating a minor improvement in quality of life. The experimental group achieved a d value of 6.94, reflecting substantial

improvement due to psychotherapy. For individuals with drug addiction, the control group demonstrated a Cohen's *d* of 0.55, signifying a medium effect, whereas the experimental group had a *d* value of 6.56, confirming the high efficacy of psychotherapy. In the context of gambling disorder, the control group had a Cohen's *d* of 0.22, indicating minimal improvement. In contrast, the experimental group showed a *d* value of 6.34, illustrating a positive impact of psychotherapy. For individuals with codependency, the control group had a Cohen's *d* of 0.55, representing a medium effect. In contrast, the experimental group exhibited a *d* value of 6.46. The large effect sizes calculated for the experimental groups across all diagnostic categories demonstrate psychotherapy's substantial impact on quality-of-life measures across all experimental groups.

These large effect sizes provide compelling evidence for the findings' practical value, reinforcing the statistical significance observed in the Wilcoxon signed-rank test. The results suggest that the improvements in quality of life are statistically significant and relevant in a practical context. This underscores the effectiveness of psychotherapeutic interventions for individuals with alcohol use disorder, drug addiction, gambling disorder, and codependency. A further analysis of the interventions' impact on the severity of these dependencies is detailed in Table 4.

For alcohol use disorder, the mean score for the control group before testing was 29.11 (SD = 6.33), with a range from 20 to 40. The mean score after testing was 29.03 (SD = 6.32), with scores ranging from 19 to 41. The score range remained largely unchanged, indicating no significant difference between pre-test and post-test scores. According to AUDIT test norms, scores in this range suggest potentially hazardous alcohol-related behavior, though they do not necessarily indicate dependence. Conversely, the mean score for the experimental group before testing was 29.60 (SD = 6.80), with a range from 20 to 40. However, the mean score after testing decreased to 7.68 (SD = 4.47), with a score range from 0 to 15. This reduction indicates a shift from hazardous alcohol consumption to low-risk or even non-risk behavior, demonstrating a substantial decline in alcohol use disorder following the intervention.

For drug addiction, the mean score for the control group before testing was 8.14 (SD = 1.49), with a range from 6 to 10. The mean score after testing was 8.13 (SD = 1.72), with scores ranging from 5 to 11, showing no significant changes from pre-test to post-test. According to DAST norms, scores within this range indicate harmful drug use that requires further intervention. The mean score for the experimental group before testing was 7.96 (SD = 1.49), with a range from 6 to 10. The mean score after testing decreased to 3.14 (SD = 1.50), ranging from 1 to 5. This substantial reduction indicates a transition from harmful to low-risk or minimal drug use, confirming the effectiveness of the intervention in reducing drug dependence.

For gambling disorder, the mean score for the control group before testing was 38.11 (SD = 5.12), with a range from 30 to 48. The mean score after testing was 38.09 (SD = 5.18), with a score range from 29 to 50, indicating no substantial changes. G-SAS scores within this range suggest a severe degree of problem gambling. The mean score for the experimental group before testing was 39.55 (SD = 6.17), with the same range as the control group. However, the mean score after testing

significantly decreased to 14.36 (SD = 6.83), with scores ranging from 4 to 25. This decrease indicates a progression from severe problem gambling to mild or moderate issues, demonstrating the intervention's effectiveness in alleviating gambling dependence.

For codependency, the mean score for the control group before testing was 70.26 (SD = 10.28), with a range from 51 to 90. The mean score after testing was 70.42 (SD = 10.19), with scores ranging from 52 to 91, showing no significant changes. According to the Spanier-Fisher codependency scale, scores in this range suggest a high level of codependency. The mean score for the experimental group before testing was 69.12 (SD = 12.09), ranging from 50 to 90. The mean score after testing decreased to 31.44 (SD = 7.26), with a range from 20 to 45. This considerable reduction indicates a shift from a high to a moderate or low level of codependency, illustrating the effectiveness of the intervention in addressing codependency.

To evaluate changes in pre-test and post-test scores between the control and experimental groups across the four types of dependencies—alcohol, drugs, gambling, and codependency—the Wilcoxon signed-rank test was employed. The results are presented in Table 5.

For alcohol use disorder, there was no statistically significant difference between pre-test and post-test scores in the control group, as indicated by a *Z*-value of -0.517 and a *p*-value of 0.605. This suggests that the control group did not experience noticeable changes in alcohol use disorder levels. Conversely, the experimental group exhibited a substantial reduction in alcohol use disorder, with a *Z*-value of -7.376 and a *p*-value of 0.000, indicating the effectiveness of the intervention. In the case of drug addiction, the control group showed no significant changes, with a *Z*-value of -0.146 and a *p*-value of 0.884, indicating stability in the severity of drug dependence. However, the experimental group demonstrated a significant reduction, with a *Z*-value of -7.288 and a *p*-value of 0.000. These results highlight the positive impact of the intervention. In the gambling disorder group, the control group also showed no significant change, as evidenced by a *Z*-value of -0.048 and a *p*-value of 0.962. This result suggests that gambling dependence levels remained unchanged. In contrast, the experimental group experienced a substantial decrease in dependence, with a *Z*-value of -7.477 and a *p*-value of 0.000, indicating the effectiveness of the intervention. For codependency, the control group did not show significant changes, with a *Z*-value of -1.234 and a *p*-value of 0.217, indicating stable levels of codependency. On the other hand, the experimental group exhibited a

Table 5
Results of the Wilcoxon signed-rank test for assessing dependency severity by group type.

Dependency	Group	Z-value	Asymptotic significance (2-sided)
Alcohol	Control	-0.517	0.605
Alcohol	Experiment	-7.376	0.0
Drugs	Control	-0.146	0.884
Drugs	Experiment	-7.288	0.0
Gambling	Control	-0.048	0.962
Gambling	Experiment	-7.477	0.0
Codependency	Control	-1.234	0.217
Codependency	Experiment	-7.425	0.0

Table 4
Distribution of mean values by type of dependency and group type.

Dependency	Group	Pre-test Mean	Pre-test Min	Pre-test Max	Post-test Mean	Post-test Min	Post-test Max
Alcohol	Control	29.11	20	40	29.03	19	41
Alcohol	Experiment	29.6	20	40	7.68	0	15
Drugs	Control	8.14	6	10	8.13	5	11
Drugs	Experiment	7.96	6	10	3.14	1	5
Gambling	Control	38.11	30	48	38.09	29	50
Gambling	Experiment	39.55	30	48	14.36	4	25
Codependency	Control	70.26	51	90	70.42	52	91
Codependency	Experiment	69.12	50	90	31.44	20	45

notable reduction, with a Z-value of -7.425 and a p-value of 0.000 , pointing to the intervention's success.

In summary, the results of the Wilcoxon signed-rank test demonstrate that the interventions led to statistically significant reductions in dependency levels in the experimental groups for all four types of conditions. The Mann-Whitney *U* test compared differences between control and experimental groups. Table 6 presents the results for each form of dependency, including the testing phase, Mann-Whitney *U* values, Wilcoxon *W* values, Z-values, and asymptotic significance (two-tailed).

For alcohol use disorder, the preliminary scores for the control group showed no statistically significant difference, with a Mann-Whitney *U* value of 2524.0 , a Wilcoxon *W* value of 5152.0 , a Z value of -0.272 , and a p-value of 0.785 . This indicates that the groups were comparable prior to the intervention. However, post-test results for the experimental group demonstrated a marked difference, with a Mann-Whitney *U* value of 0.0 , a Wilcoxon *W* value of 2628.0 , a Z value of -10.362 , and a p-value of 0.000 . These changes indicate the effectiveness of the intervention in reducing alcohol use disorder.

For drug addiction, the pre-test results for the control group showed no significant differences, with a Mann-Whitney *U* value of 2272.5 , a Wilcoxon *W* value of 4757.5 , a Z value of -0.756 , and a p-value of 0.450 . This suggests that the groups were similar before the intervention. In contrast, the post-test results for the experimental group revealed a substantial reduction in drug dependence, with a Mann-Whitney *U* value of 42.5 , a Wilcoxon *W* value of 2527.5 , a Z value of -10.093 , and a p-value of 0.000 .

Regarding gambling disorder, the control group's pre-test results showed no significant differences, with a Mann-Whitney *U* value of 2363.0 , a Wilcoxon *W* value of 5138.0 , a Z value of -1.441 , and a p-value of 0.150 . These values emphasize group comparability before the intervention. The post-test results for the experimental group showed a significant difference, with a Mann-Whitney *U* value of 0.0 , a Wilcoxon *W* value of 2775.0 , a Z value of -10.505 , and a p-value of 0.000 . The results highlight the intervention's impact on reducing gambling dependence.

For codependency, the pre-test results for the control group were similar to those of the experimental group, with a Mann-Whitney *U* value of 2494.0 , a Wilcoxon *W* value of 5195.0 , a Z value of -0.668 , and a p-value of 0.504 . Conversely, the post-test results for the experimental group showed a significant reduction in codependency levels, with a Mann-Whitney *U* value of 0.0 , a Wilcoxon *W* value of 2701.0 , a Z value of -10.432 , and a p-value of 0.000 .

In summary, the results of the Mann-Whitney *U* test indicate that the interventions effectively reduced dependence levels across all categories of addictions. The lack of significant changes in the control groups further underscores the efficacy of the interventions. The reliability of these findings is supported by effect sizes calculated using Cohen's *d*. For alcohol use disorder, the effect size was 2.83 , indicating a marked decrease in dependence. Drug dependence displayed an effect size of 3.12 , reflecting a substantial reduction. Gambling dependence yielded an even larger effect size of 3.47 . Codependency in the experimental group also decreased, showing a high effect size of 3.22 . These results validate the hypothesis that targeted CBT-based interventions are effective in addressing addiction in Kazakhstan.

4. Discussion

The results of this study provide substantial evidence for the effectiveness of psychotherapy in improving the quality of life for individuals with various types of addictions. The use of non-parametric tests, specifically the Wilcoxon signed-rank test and the Mann-Whitney *U* test, facilitated a reliable analysis by accounting for non-normal data distribution. The significant improvements observed in the experimental groups across all types of addictions underscore the potential benefits of psychotherapeutic interventions.

In the context of alcohol dependence, the results demonstrated that individuals in the experimental group experienced considerable enhancements in quality of life, surpassing those observed in the control group. This result is consistent with previous research highlighting the effectiveness of psychotherapy in the treatment of substance use disorders (Angres & Bettinardi-Angres, 2008; Feingold & Tzur Bitan, 2022; Miller et al., 2019; Pomerleau et al., 2008). The findings confirm that structured therapeutic interventions can lead to meaningful improvements in life satisfaction and overall well-being for individuals coping with alcohol use disorder (Magill et al., 2013; Nyamathi et al., 2010; Ray et al., 2020).

In the case of drug dependence, the substantial improvements observed in the experimental group post-intervention corroborate existing literature supporting the efficacy of psychotherapy in drug addiction treatment (Emmelkamp et al., 2014; Feingold & Tzur Bitan, 2022; Fetkulin et al., 2019; Glasner-Edwards & Rawson, 2010; Heidari & Ghodusi, 2016). These results indicate that psychotherapy not only alleviates substance dependence but also enhances quality of life by addressing the underlying psychological and emotional issues associated with addiction (Babaie & Razeghi, 2013; Heidari & Ghodusi, 2016; Manning et al., 2019; O'Sullivan et al., 2019). Therefore, psychotherapy is crucial for sustainable recovery and long-term improvement (Bratu et al., 2023; Colpaert, 2022; Darharaj et al., 2024).

The study also revealed marked improvements in the experimental group with gambling addiction, whereas no substantial changes were detected in the control group. This finding is pertinent given the growing recognition of gambling addiction as a serious mental health concern (Yau & Potenza, 2015; Zhatkanbaeva et al., 2021). Psychotherapeutic interventions targeting cognitive behavioral strategies have been shown to assist individuals in managing their gambling behavior. The present findings offer additional empirical support for these approaches (Wynn et al., 2014). A crucial element of this success lies in psychotherapy's capacity to address the cognitive distortions and emotional triggers that underlie gambling addiction (Fong, 2005; Rosenthal, 2008).

In the case of codependency, the experimental group demonstrated a notable improvement in quality of life through a reduction in dependent behaviors—an outcome consistent with previous research (Ahmad-Abadi et al., 2015; Aimaganbetova et al., 2020; Bacon et al., 2020). Codependency often involves deeply ingrained emotional and psychological patterns that can be challenging to alter. This study suggests that psychotherapy can provide individuals with the tools and strategies necessary to develop healthier relationships and enhance their overall well-being, reinforcing the conclusions discussed earlier (Ahmad-Abadi et al., 2017; Scaturro et al., 2020).

Table 6

Results of the Mann-Whitney *U* test for assessing dependency severity by group type.

Dependency	Group	Test phase	Mann-Whitney <i>U</i>	Wilcoxon <i>W</i>	Z-value	Asymptotic significance (2-sided)
Alcohol	Control	Pre-test	2524.0	5152.0	-0.272	0.785
Alcohol	Experiment	Post-test	0.0	2628.0	-10.362	0.0
Drugs	Control	Pre-test	2272.5	4757.5	-0.756	0.45
Drugs	Experiment	Post-test	42.5	2527.5	-10.093	0.0
Gambling	Control	Pre-test	2363.0	5138.0	-1.441	0.15
Gambling	Experiment	Post-test	0.0	2775.0	-10.505	0.0
Codependency	Control	Pre-test	2494.0	5195.0	-0.668	0.504
Codependency	Experiment	Post-test	0.0	2701.0	-10.432	0.0

These results can be understood and explained through several theoretical frameworks. Cognitive behavioral theory provides a foundation for comprehending how psychotherapy can assist individuals in recognizing and altering maladaptive thinking and behavior patterns that contribute to their addictions (Hupp et al., 2008). By restructuring these cognitive distortions, individuals can develop more adaptive coping strategies and improve their quality of life (Abramowitz, 2013).

Self-determination theory also offers valuable insights into the mechanisms through which psychotherapy can enhance well-being. This theory posits that fulfilling basic psychological needs for autonomy, competence, and relatedness is crucial for achieving optimal psychological well-being and quality of life (Deci & Ryan, 2012). Psychotherapeutic interventions that support the development of these needs can help individuals gain control over their addictions, bolster their sense of self-efficacy, and attain greater life satisfaction (Ryan & Deci, 2024).

The novelty of this study lies in its comprehensive examination of the effectiveness of psychotherapy across various types of addictions using rigorous non-parametric statistical methods. By employing the Wilcoxon signed-rank and Mann-Whitney *U* tests, this study effectively addressed the limitations associated with parametric tests, such as the assumption of normality. It provided compelling evidence of the benefits of psychotherapy. The findings complement existing literature, demonstrating that psychotherapy can significantly improve the quality of life of individuals with alcohol use disorder, drug addiction, gambling disorder, and codependency issues. Furthermore, this research contributes to the growing body of evidence supporting the use of psychotherapy as a valuable intervention for various types of addictions.

The participant attrition rate in this study was carefully monitored to assess its impact on the validity and generalizability of the findings. The initial sample consisted of 100 participants per group, with four experimental groups representing alcohol use disorder, drug addiction, gambling disorder, and codependency. By the end of the study, retention rates varied across groups. The final sample sizes in the experimental groups were 72 (alcohol use disorder), 70 (drug addiction), 74 (gambling disorder), and 73 (codependent behavior) individuals. The overall attrition rate across all groups averaged 27.75 %, which is consistent with typical rates observed in long-term psychotherapy research.

The primary reasons for attrition varied across addiction types. A significant portion of participants, particularly those in the alcohol and drug addiction groups, found it challenging to maintain motivation for therapy. Amotivation is a well-documented barrier in addiction rehabilitation, which likely contributes to the discontinuation of therapy for some individuals. Another major factor was relapse, which affected individuals with substance use disorders more frequently, often leading them to withdraw from therapy or enter inpatient rehabilitation instead. Some participants left the study due to life circumstances such as work obligations, relocation, or financial constraints, even though therapy was provided free of charge. Psychological barriers, including discomfort with therapy, denial of addiction severity, or stigma associated with mental health treatment, were also relevant factors, especially for individuals in the gambling disorder and codependency groups. A small percentage of participants, approximately 3–5 % across all groups, discontinued therapy due to health complications or co-occurring psychiatric conditions that hindered their ability to engage in the sessions.

While the attrition rate was moderate, it remained within an acceptable range for psychotherapy research and did not indicate any systematic bias favoring a specific group. The final sample size was sufficient for statistical analyses, ensuring adequate power to detect significant effects. However, it is important to note that participants who completed the therapy may represent a more motivated subset of participants, which could affect the generalizability of the findings. Nevertheless, by reporting the attrition rates and their underlying causes, the study provides a transparent assessment of its strengths and limitations, reinforcing its validity while recognizing the challenges encountered in real-world psychotherapy applications.

Research involving human participants and/or animals

The authors declare that the work is written with due consideration of ethical standards. The study was conducted in accordance with the ethical principles approved by the Ethics Committee of L.N. Gumilyov Eurasian National University (Protocol No hwo6532 of October 2023).

CRediT authorship contribution statement

Aidos Ibragim: Writing – review & editing, Funding acquisition, Formal analysis. **Bakytgul Issatayeva:** Writing – review & editing, Methodology, Investigation. **Kundyz Kuanzhanova:** Writing – review & editing, Resources, Project administration. **Almagul Mandykayeva:** Visualization, Validation, Supervision. **Aliya Mambetalina:** Writing – original draft, Data curation, Conceptualization.

Informed consent

All research participants gave their written informed consent before the commencement of the research.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

All data generated or analyzed during this study are included in this published article.

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