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COGNITIVE-BEHAVIORAL INTERVENTION FOR ALCOHOL DEPENDENCE: EVIDENCE OF EFFECTIVENESS IN A HEALTH CENTER IN THE PERUVIAN ANDES

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Abstract
This study evaluated the effectiveness of a cognitive-behavioral therapy (CBT) intervention in adults with alcohol dependence treated at a health center in the Peruvian Andes. Using a pre-experimental design, 45 diagnosed participants were assessed with the AUDIT test in pre- and post-intervention measurements. The therapy consisted of weekly 50-minute sessions aimed at modifying maladaptive cognitive and behavioral patterns. Results showed a significant reduction in alcohol dependence, with mean scores decreasing from 29.73 to 20.22 ($p < 0.001$), and improvements across risk consumption, dependence symptoms, and harmful drinking dimensions. The intervention demonstrated high psychometric reliability of the instrument ($\alpha = 0.884$; $\omega = 0.903$) and findings consistent with international studies supporting CBT as an effective strategy to reduce relapse, promote abstinence, and improve psychological well-being. It is concluded that CBT represents a robust and adaptable therapeutic tool with potential for implementation in public health services for recovery and relapse prevention in adults with alcohol dependence.
Keywords: cognitive-behavioral intervention, alcohol dependence, mental health, therapeutic effectiveness

INTRODUCTION

Globally, alcohol consumption involves over 2.3 billion individuals, though prevalence varies across countries—from societies with a tradition of moderate drinking to others where alcohol is less accepted. Europe reports the highest levels, while South America shows lower rates, and the Middle East remains substantially reduced due to cultural and religious norms (World Health Organization [WHO], 2024). Excessive intake, conceptualized as pathological, is linked to mental disorders, chronic diseases, and accidents, highlighting the need for a comprehensive public health response. The Global Burden of Disease further confirms that alcohol dependence is embedded within scientific efforts to quantify disease impact and risk factors, enabling longitudinal and cross-population evaluations (Murray, 2022).

Alcohol dependence is characterized by compulsive use and inability to control intake despite awareness of harm. The ICD-10 classifies it within mental and behavioral disorders due to psychoactive substances. Its consequences span hepatic, cardiovascular, gastrointestinal, and neurological damage, while also precipitating mental health and cognitive impairments. Beyond individual health, dependence generates profound social, legal, and economic costs (Piñeiro, 2019). According to WHO (2024), alcohol consumption causes 2.6 million deaths annually (4.7% of global mortality) and psychoactive substances account for an additional 0.6 million, with men disproportionately affected. The report urges global actions toward the Sustainable Development Goals (SDGs) by 2030, focusing on reducing consumption and expanding access to interventions.

In Peru, harmful alcohol use affects an estimated 35% of the population, with 8–10% showing dependence. Many do not recognize it as a disease and thus avoid treatment (INSM “HD-HN,” 2024). MINSA (2024) warns that

dependence often extends to the family sphere, reinforcing compulsive dynamics and requiring individual and family-based therapies. Addictions rank among the most diagnosed mental health pathologies, with alcoholism as the leading cause. During the COVID-19 pandemic, reported cases rose from 46,090 in 2020 to 70,972 in 2022, an increase of nearly 65%. Regionally, in Apurímac, 90.4% of individuals aged 15+ have consumed alcohol, with prevalence higher in urban than rural areas, and more common among those with higher education (INEI, 2019). Cognitive-behavioral therapy (CBT), focused on present problems, targets dysfunctional emotions and behaviors while incorporating elements such as temporality, learning processes, and reflective capacity. Its techniques are theoretically robust and empirically validated, with strong evidence for effectiveness in psychiatric disorders and clinical conditions related to mental health (Vernon & Doyle, 2017).

In summary, alcohol dependence constitutes a pressing public health concern at global, national, regional, and local levels, generating severe medical, psychological, social, and familial repercussions. The available evidence demonstrates a sustained increase in cases alongside insufficient coverage of effective interventions, in turn underscoring the urgent need to design and implement therapeutic strategies capable of mitigating the magnitude of this phenomenon. Within this context, psychology—particularly through the cognitive-behavioral approach—provides a robust and empirically validated framework to address risk consumption patterns, dependence-related symptoms, and harmful use. Hence, this study seeks to respond to the central research question: What is the effectiveness of a cognitive-behavioral program in reducing alcohol dependence among adults in a health center in the Peruvian Andes? By doing so, it aims to generate both theoretical and practical, as well as methodological contributions, ultimately strengthening clinical and community responses to an expanding pathology.

Considering the arguments outlined above, this research is theoretically justified insofar as it seeks to generate a critical reflection on how to intervene in a growing public health problem, while simultaneously reinforcing the existing body of knowledge on the efficacy of this model. At a practical level, its implementation will contribute to the development of interventions and strategies capable of addressing this pathology in a more effective and sustainable manner. From a methodological standpoint, the use of a quasi-experimental design provides a significant contribution to the scientific field, as the data generated may serve as a valuable foundation for future investigations. In line with the problem identified, the present study is oriented toward determining the significant effectiveness of a cognitive-behavioral intervention program in addressing alcohol dependence among adults attending a health center in the Peruvian Andes. To achieve this overarching objective, three specific goals were established: first, to assess the program's effectiveness in reducing risk consumption; second, to evaluate its impact on dependence-related symptoms; and third, to determine its influence on harmful alcohol use. In this way, the study seeks to provide robust scientific evidence supporting the application of CBT as a comprehensive therapeutic strategy, one capable of mitigating both the initial patterns of risky behavior and the more severe manifestations of alcohol dependence within Peruvian community settings.

In the same vein of therapeutic integration, Hu et al. (2022), in a multicenter clinical trial with 263 adults diagnosed with alcohol dependence, evaluated the combined use of repetitive transcranial magnetic stimulation and CBT. Patients receiving both interventions experienced significantly fewer relapses and notable improvements in depressive symptoms, anxiety, and sleep quality, suggesting that neuromodulatory techniques can optimize treatment outcomes. Similarly, Hallihan et al. (2024), in a systematic review of 11 randomized trials with 1,543 participants, confirmed that integrating CBT with other behavioral interventions reduced heavy drinking, increased abstinence days, and enhanced overall functioning compared to standard treatments. Collectively, these studies show that CBT, when combined with complementary approaches, amplifies its effectiveness and supports more sustained recovery in adults with alcohol dependence. With regard to digital modalities, Johansson et al. (2021), in a randomized trial with 1,169 Swedish adults, compared online CBT—with or without therapeutic support—to informational material alone. At three months, therapist-guided CBT significantly reduced weekly consumption, although effects diminished by six months, underscoring the importance of professional support for long-term outcomes. Likewise, Stapinski et al. (2021), in a randomized trial with 123 young adults, found that a digital CBT program combined with psychological support reduced alcohol use, binge episodes, and anxiety symptoms at six months. Together, these findings highlight digital CBT, whether guided or supported, as an effective and accessible alternative for reducing problematic alcohol use and preventing progression to dependence.

Although the results were less consistent regarding direct consumption outcomes, these improvements may indirectly contribute to reducing relapse. Complementarily, Kiluk et al. (2024), in a randomized clinical trial with 99 outpatients, demonstrated that a digital CBT program (CBT4CBT) more rapidly increased the percentage of abstinent days compared to both face-to-face CBT and treatment-as-usual, with effects persisting through six-month follow-up. Taken together, these studies confirm that CBT, across its diverse modalities, constitutes a flexible and effective intervention with significant potential for technological innovation to optimize recovery processes in adults with alcohol dependence.

THEORETICAL FRAMEWORK

Romanowska and Dobroczyński (2021) explain that the Cognitive Theory proposed by Aaron Beck in the 1960s highlighted the central role of thoughts in shaping emotions and behavior. Beck argued that cognitive distortions

lie at the core of emotional disorders, as negative schemas perpetuate hopelessness and anxiety (Thase, 2022). His proposal soon consolidated as a structured, empirically grounded alternative to the dominant psychodynamic approaches (Beck & Fleming, 2021). According to Thase (2022), this theory emphasizes that automatic thoughts directly influence emotions and behaviors, creating a vicious cycle of psychological symptoms. To counter this, Beck developed cognitive restructuring techniques to identify and modify such distortions (Romanowska & Dobroczyński, 2021), thus laying the foundation for CBT, one of the most empirically supported therapies today (Beck & Fleming, 2021).

In parallel, Ajodo et al. (2024) highlight the Relapse Prevention Model by Marlatt and Gordon in the 1980s, which reframed relapse as a predictable process driven by situational, emotional, and cognitive factors (Hajisahneh et al., 2025). This model recognized the vulnerability to high-risk situations and proposed strategies for managing them effectively (Ludgate, 2021). It also introduced the "abstinence violation effect," explaining how minor lapses can escalate into full relapse if interpreted with guilt and hopelessness (Hajisahneh et al., 2025). Consequently, it emphasizes coping skills and self-efficacy (Ajodo et al., 2024), becoming essential for both clinical practice and public health programs (Ludgate, 2021). Beck and Ellis established that beliefs and cognitive components are deeply embedded in emotional problems. CBT incorporates techniques to help patients identify distressing thoughts, assess their validity, and replace them with more realistic interpretations, thereby reducing symptoms (Beck et al., 2010). Overall, addressing distorted thought patterns is crucial to resolve underlying problems and foster meaningful behavioral change.

According to Beck, the most effective way to interrupt the cycle of addiction is through techniques addressing both cognitive and behavioral domains: the former target convictions related to substance use, while behavioral strategies emphasize concrete actions that prevent consumption (Medrado et al., 2010). In this context, "addictive beliefs" and "control beliefs" are in constant conflict, making self-monitoring essential. Beck (2013) highlights two forms: systematic recording of thoughts to describe and modify them, and weighing advantages versus disadvantages to recognize harms of use and benefits of abstinence.

The WHO (2016), consistent with ICD-10, defines alcohol dependence as an addictive disorder involving behavioral, physiological, and cognitive impairments, where consumption becomes a pervasive necessity with severe consequences. Evidence-based psychological interventions such as Rational Emotive Therapy (RET), Cognitive-Behavioral Therapy (CBT), and Client-Centered Therapy (CCT) are therefore imperative. Alcohol dependence reflects the inability to cease consumption, reinforced by family, occupational, and social difficulties, and is marked by behavioral and physiological symptoms indicating loss of control despite harmful outcomes (Gómez & Gómez, 2016). Svärdman et al. (2022) describe CBT as a therapeutic approach to modify maladaptive thought patterns that undermine psychological well-being. Based on the premise that cognitions directly influence emotions and behaviors, restructuring distorted schemas fosters change (Pinto et al., 2024). In clinical practice, this involves identifying automatic thoughts, testing their validity, and replacing them with more realistic interpretations to promote a balanced perception of daily experiences (Lawler et al., 2021).

Pinto et al. (2024) emphasize that CBT is characterized by structured techniques such as social skills training, gradual exposure, and problem-solving, all implemented systematically with clear objectives and active patient involvement (Svärdman et al., 2022). Experiential learning turns each session into a practice space where adults rehearse new behaviors, while between-session assignments foster transfer of skills to daily life (Lawler et al., 2021; Pinto et al., 2024). Lawler et al. (2021) add that CBT stands out for its brevity and results-oriented focus, integrating cognitive and behavioral methods that generate sustainable changes (Svärdman et al., 2022). This approach promotes emotional self-regulation, self-esteem, and adaptive coping, thereby enhancing quality of life in adults (Pinto et al., 2024).

Killgore et al. (2021) define alcohol dependence as a chronic disorder marked by compulsive intake driven by reward mechanisms involving dopamine (Nakashima et al., 2024). Repeated exposure produces tolerance, requiring greater quantities to achieve effects and perpetuating consumption (Popova et al., 2021). Beyond occasional use, dependence involves loss of control, cravings, and persistence despite negative consequences (Killgore et al., 2021), often accompanied by withdrawal symptoms such as tremors, anxiety, and irritability (Popova et al., 2021). Taken together, these features reflect its compulsive nature (Nakashima et al., 2024). Consequently, alcohol dependence must be understood as a multidimensional phenomenon where biological, cognitive, and behavioral factors converge (Popova et al., 2021; Killgore et al., 2021), requiring structured interventions aimed at modifying thought patterns, strengthening motivation, and developing self-regulation strategies (Nakashima et al., 2024).

METHODOLOGY

The present research is classified as applied, since it seeks to generate knowledge with practical utility in the treatment of alcohol dependence (Hernández-Sampieri & Mendoza, 2018). The approach was quantitative, aiming for objective and replicable measurements through statistical procedures that would allow the hypotheses to be tested and the phenomenon under study to be rigorously described (Ñaupas et al., 2014). The design followed a pre-experimental scheme with a single group and pre- and post-intervention measurements, which, although limiting internal validity due to the absence of a control group, is nonetheless pertinent in clinical contexts where

it would be unethical to withhold treatment from patients with a confirmed diagnosis. The study adopted a longitudinal perspective, enabling the observation of change over different moments in time, and an explanatory scope, oriented toward establishing causal relationships between the intervention and the reduction of alcohol dependence (Hernández-Sampieri & Mendoza, 2018).

The operationalization of variables was structured around two principal dimensions. The independent variable corresponded to the Cognitive-Behavioral Intervention Program, conceptually defined by Beck et al. (2010) as a psychotherapeutic process that addresses the interrelationship between cognitions, emotions, and behaviors. At the operational level, it was implemented through weekly 50-minute sessions delivered at the Health Center. The dependent variable was alcohol dependence, understood as the compulsion to sustain a harmful and persistent pattern of alcohol consumption.

For measurement purposes, the Alcohol Use Disorders Identification Test (AUDIT) was employed in its version officially adapted and validated by the Ministry of Health of Peru. This instrument has demonstrated robust psychometric properties and constitutes the national reference tool for early detection and screening of problematic alcohol use. The standardized version developed by MINSA ensures both cultural validity and clinical relevance within the Peruvian population, accordingly overcoming the limitations that may arise from direct adaptations of international versions.

The study population consisted of 50 patients diagnosed with alcohol dependence who were receiving care at the Health Center, from which a sample of 45 adults of both sexes, aged between 18 and 70 years, was selected. The sample size was calculated using the formula for finite populations, with a 95% confidence level and a 5% margin of error (Ventura, 2017). Patients with a confirmed diagnosis and a commitment to regular attendance were included, whereas those who did not meet these criteria were excluded. The selection was carried out through simple random probabilistic sampling, In doing so ensuring the representativeness of the sample (Otzen & Manterola, 2017).

Data processing was conducted in several phases. Initially, a database was constructed in Microsoft Excel with the pretest records, to which the posttest data were subsequently added, generating preliminary descriptive statistics. Thereafter, the information was analyzed using JAMOVI 2.3 software through inferential procedures. Since the Shapiro–Wilk test indicated a non-normal distribution ($p < 0.05$), the Wilcoxon signed-rank test for paired samples was employed, which as a result ensuring statistical appropriateness in hypothesis testing.

The study was conducted in full compliance with the ethical principles of the Declaration of Helsinki. Informed consent was obtained from all participants, which collectively ensuring confidentiality and voluntariness. Furthermore, the protocol was approved by the corresponding institutional committee, thus guaranteeing adherence to established ethical standards in clinical research.

To evaluate alcohol dependence, the Alcohol Use Disorders Identification Test (AUDIT) was employed in its version adapted and validated by the Ministry of Health of Peru through Ministerial Resolution No. 247-2020-MINSA. This official version constitutes the national reference instrument for screening and early diagnosis of problematic alcohol use in both public and private health services. Its validation ensures cultural relevance and psychometric robustness within the Peruvian population, in doing so guaranteeing that the results obtained in the present study are supported by an institutionally recognized standard.

RESULTS

Table 1 Reliability of the instrument in the original sample

	Cronbach's Alpha		**McDonald's ω**	
Scale	0.711		0.808	
Note: Item 4 shows a negative correlation with the total scale and should probably be reverse-scored.				

Table 1 presents the reliability indices of the AUDIT instrument applied to the original sample. The results indicate a Cronbach's alpha of 0.711 and a McDonald's omega of 0.808, reflecting an acceptable level of internal consistency in psychometric terms. Nevertheless, Item 4 was found to exhibit a negative relationship with the total scale, suggesting a mismatch in its wording and the need for reverse scoring to ensure measurement coherence. This finding is particularly relevant, as it highlights the importance of subjecting instruments to contextual validation processes, even when they hold international recognition. Hence, the review and adjustment of this item are essential to optimize the reliability of the test in the studied population, as a result ensuring a more accurate assessment of alcohol dependence among adults receiving care at the health center.

Table 2 Reliability of the instrument in the original sample with Item 4 reversed

	Cronbach's Alpha	McDonald's ω
Scale	0.884	0.903

Note: Reliability values increase substantially after reversing Item 4.

Table 2 shows the reliability of the instrument after reversing Item 4, which produced a notable increase in internal consistency coefficients. Cronbach's alpha rose from 0.711 to 0.884, and McDonald's omega from 0.808 to 0.903, thus surpassing the thresholds commonly accepted in the psychometric literature for considering an instrument highly reliable. These results confirm that the adjustment not only corrected the previously detected negative relationship but also reinforced the robustness of the scale as a whole. Consequently, the AUDIT demonstrates a stronger and more coherent internal structure for assessing alcohol dependence in the studied sample, as a consequence ensuring greater precision and validity in measuring this disorder within the local clinical context.

Table 3 Fit indices of the AUDIT instrument in the sample

						IC 90% del RMSEA	
X2 /df	p	CFI	TLI	SRMR	RMSEA	Lower	Upper
2.423	<.0001	0.829	0.759	0.0933	0.177	0.127	0.228

Note: The fit indices of the AUDIT instrument show an adequate value for X2 /df< 3

Table 3 presents the fit indices of the AUDIT instrument in the analyzed sample. The χ^2/df ratio was 2.423 with statistical significance at $p < 0.0001$, indicating an acceptable model fit, as it falls within the recommended threshold (< 3) for confirmatory factor models. Likewise, the Comparative Fit Index (CFI = 0.829) and the Tucker–Lewis Index (TLI = 0.759) are slightly below the 0.90 benchmark suggested in the literature, although they reflect a structure with a moderate level of fit. By contrast, the Root Mean Square Error of Approximation (RMSEA = 0.177; 90% CI: 0.127–0.228) and the Standardized Root Mean Square Residual (SRMR = 0.0933) reveal certain limitations, as they exceed the optimal cut-off values (< 0.08). These results suggest that, while the instrument demonstrates an overall acceptable fit, further refinement of specific items is required to achieve more robust levels of factorial validity. Nevertheless, the AUDIT retains adequate performance in identifying alcohol dependence within the evaluated population, in turn constituting a clinically useful tool in the context of this study.

Table 4 Descriptive measures and normality of the difference

Descriptive Statistics		
		D
N		45
Mean		9.51
Media		10.0
Mode		10.0
Standard Deviation		1.82
Skewness		-0.721
Std. Error of Skewness		0.354
Shapiro –Wilk W		0.864
Shapiro-Wilk p-value		< .0001

Note: Descriptive measures of ther mean difference (D)

Table 4 presents the descriptive statistics and the normality test for the difference between pretest and posttest AUDIT scores. The results indicate a mean of 9.51, accompanied by a median and mode both equal to 10, reflecting a relatively stable central tendency. The standard deviation was 1.82, suggesting low dispersion around the mean, while the skewness coefficient (–0.721) points to a slight negative skew in the data distribution. Nevertheless, the Shapiro–Wilk test yielded a statistic of W = 0.864 with a p-value < 0.0001, which as a whole confirming the absence of normality in the distribution. This finding justifies the use of non-parametric procedures, specifically the Wilcoxon signed-rank test, to test the study hypotheses and ensure statistical analyses that are appropriately aligned with the characteristics of the sample.

Table 5 Effectiveness of the cognitive-behavioral intervention program on alcohol dependence in adults

	N	Mean	Median	Mean Difference	Median Difference	P-value
TOTALPREAUDIT	45	29.73	30.00			
TOTALPOSTAUDIT	45	20.22	20.00	9.51	10.00	0.001

Note: The sample corresponds to a total of 45 adults.

Table 5 provides evidence of the effectiveness of the cognitive-behavioral intervention program in reducing alcohol dependence among adults. The results show that the mean AUDIT score decreased from 29.73 at pretest to 20.22 at posttest, while the median declined from 30.00 to 20.00. These differences translate into an average reduction of 9.51 points and a median difference of 10 points. The obtained p-value (0.001) confirms that these variations are statistically significant, in turn supporting the hypothesis that the applied intervention effectively reduced alcohol dependence levels in the studied population. These findings not only reaffirm the relevance of the cognitive-behavioral approach in clinical contexts but also demonstrate its potential to generate quantifiable and sustained improvements in patients' mental health.

Primary Pre–Post Analysis (AUDIT Total)

Table 6 Decision rule to corroborate the general hypothesis.

Wilcoxon Signed-Rank Test						
				Statistic		**p**
TOTALPREAUDIT	TOTALPOSTAUDIT	Wilcoxon	W	1035		< .0001

Note. $H_a\ \mu_{Measure\ 1\ -\ Measure\ 2} \neq 0$

Table 6 presents the results of the Wilcoxon signed-rank test applied to contrast the general hypothesis. The obtained statistic was W = 1035 with a p-value < 0.0001, which allows the rejection of the null hypothesis and the acceptance of the alternative hypothesis at a 5% significance level. This indicates that there are statistically significant differences between pretest and posttest scores, in this regard confirming the effectiveness of the cognitive-behavioral intervention program in reducing alcohol dependence among adults. These results strengthen the empirical evidence regarding the relevance of cognitive-behavioral therapy as an effective therapeutic strategy and validate its application in primary healthcare settings.

The cognitive-behavioral intervention produced a significant reduction in the severity of alcohol use as measured by the AUDIT. The mean score decreased from 29.73 (pretest) to 20.22 (posttest), while the median dropped from 30 to 20, yielding an average difference of 9.51 points and a median difference of 10 points. Since the distribution of differences was non-normal (Shapiro–Wilk $p < 0.001$), the Wilcoxon signed-rank test for paired samples was applied, producing a significant result ($p < 0.001$). The direction of the effect was consistent across all three dimensions—risky consumption, dependence symptoms, and harmful use—which as a result reinforcing the robustness of the main finding.

Secondary Analysis (Specific Dimensions)

Table 7 Decision rule to corroborate the first specific hypothesis.

Wilcoxon Signed-Rank Test				
			Statistic	**p**
1ST DIMENSION CR	1ST DIM. POST CR	Wilcoxon W	1035	< .0001

Note. $H_a\ \mu_{Measure\ 1 - Measure\ 2} \neq 0$

Table 7 presents the results of the Wilcoxon signed-rank test applied to the first specific hypothesis, corresponding to the dimension of risky alcohol consumption. The obtained statistic was W = 1035 with a p-value < 0.0001, which allows the rejection of the null hypothesis and confirms that the cognitive-behavioral intervention program produced a significant reduction in risky consumption levels among participating adults. These results demonstrate that the intervention not only impacts overall dependence but also effectively addresses early stages of problematic use, in turn strengthening the preventive capacity of the cognitive-behavioral approach against progression toward more severe conditions.

Table 8 Decision rule to corroborate the second specific hypothesis

Wilcoxon Signed- Rank Test				
			Statistic	**p**
2ND DIMENSION SD	2ND DIM. POST SD	Wilcoxon W	535[a]	< .0001

Note. $H_a\ \mu_{Measure\ 1 - Measure\ 2} \neq 0^a$ *11 pairs of values tied.*

Table 8 presents the results of the Wilcoxon signed-rank test applied to the second specific hypothesis, corresponding to the dimension of dependence symptoms. The obtained statistic was W = 535[a] with a p-value < 0.0001, which allows the rejection of the null hypothesis and the acceptance of the alternative hypothesis. This result confirms that the cognitive-behavioral intervention program significantly reduced dependence symptoms among the evaluated adults, including manifestations such as craving, loss of control, and compulsive use. The evidence therefore demonstrates that the intervention not only mitigates risky consumption patterns but also modifies the core symptomatic features of addiction, thereby contributing to more stable and sustained recovery processes.

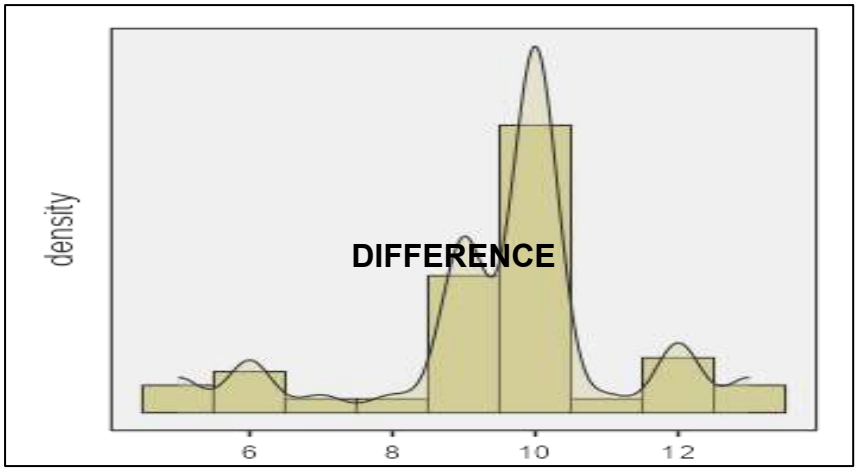
Table 9 Decision rule to corroborate the third specific hypothesis

Wilcoxon Signed-Rank Test				
			Statistic	**p**
3RD DIMENSIÓN CP	3RD DIM.POST CP	Wilcoxon W	1035	< .0001

Note. $H_a\ \mu_{Measure\ 1 - Measure\ 2} \neq 0$

Table 9 presents the results of the Wilcoxon signed-rank test applied to the third specific hypothesis, corresponding to the dimension of harmful consumption. The analysis yielded a statistic of W = 1035 with a p-value < 0.0001, which allows the rejection of the null hypothesis and the acceptance of the alternative hypothesis. These results indicate that the cognitive-behavioral intervention program achieved a significant reduction in harmful consumption patterns, that is, in behaviors generating the most severe physical, psychological, and social consequences among participating adults. In this way, the findings confirm that the therapy not only addresses early risk stages and dependence symptoms but also mitigates the most detrimental effects of alcoholism, which by extension consolidating its effectiveness as a comprehensive treatment strategy.

Figure 1. Scores Before and After

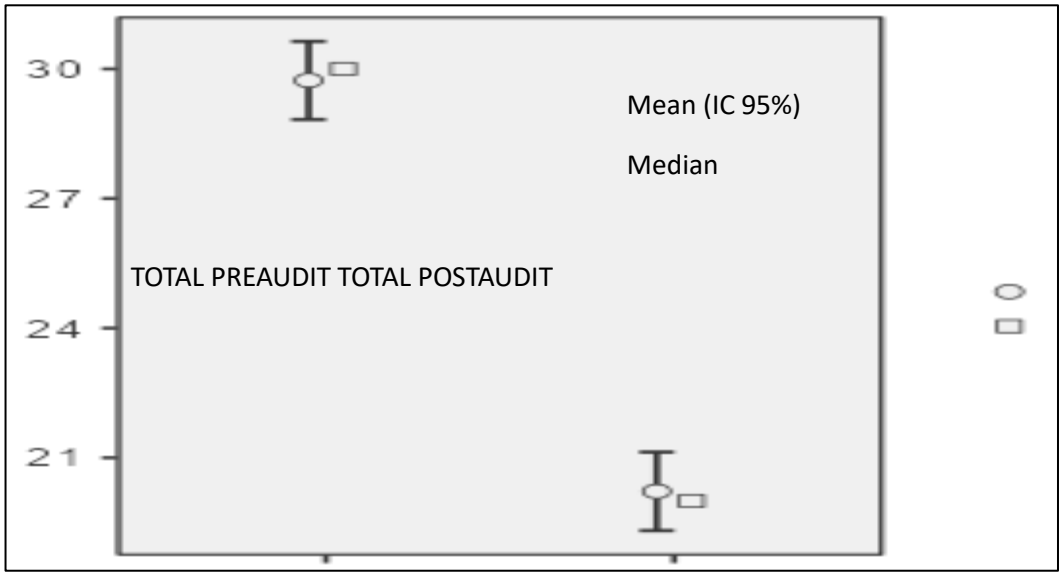


Note. The data correspond to patients diagnosed with alcohol dependence disorder who were receiving care at the Health Center.

The figure displays the distribution of the differences obtained between pretest and posttest AUDIT scores among patients with alcohol dependence attending a health center. The histogram, accompanied by the density curve, reveals a clear concentration around the mean (≈ 9.5) and the median (10), reflecting a consistent reduction in disorder severity following the cognitive-behavioral intervention. The unimodal shape with slight negative skewness indicates that the majority of participants achieved significant improvements, while extreme cases were exceptional and did not alter the central tendency.

Methodologically, the absence of normality detected through the Shapiro–Wilk test justified the use of the non-parametric Wilcoxon signed-rank test, which confirmed a statistically significant difference ($p < 0.001$). Clinically, this graphical representation corroborates that the impact of the program was not only quantitative but also homogeneous and replicable across the majority of participants, thereby validating the effectiveness of cognitive-behavioral therapy as a robust and applicable strategy in public health contexts for reducing problematic alcohol use.

Figure 2. Scores Before and After



Note. The data correspond to the mean and median of the scores obtained in the pretest and posttest.

The figure presents the graphical comparison between the mean and median values obtained in the pretest and posttest AUDIT scores among patients with alcohol dependence. It can be observed that, in the pretest, both the mean and the median clustered around 30 points, reflecting a severe level of dependence at the beginning of the study. In contrast, in the posttest, both measures markedly declined to approximately 20 points, confirming a substantial reduction in consumption severity following the cognitive-behavioral intervention. The consistency

between the mean and median, together with the narrow 95% confidence intervals, demonstrates that the program's effect was both uniform and consistent across the evaluated sample.

From a methodological perspective, the visualization corroborates that the difference between pretest and posttest scores is not only statistically significant but also clinically meaningful, as it reflects a shift of patients from a range of severe dependence toward more moderate or controlled levels. This convergence of statistical indicators reinforces the robustness of the intervention, providing empirical evidence that cognitive-behavioral therapy constitutes an effective strategy for reducing problematic consumption patterns and fostering recovery within public health contexts.

DISCUSSION

In line with the general objective—namely, to determine the significant effectiveness of the cognitive-behavioral intervention program in reducing alcohol dependence among adults at a health center in Andahuaylas in 2024—the results revealed a significant reduction between pretest and posttest measurements. The total AUDIT mean decreased from 29.73 to 20.22 and the median from 30 to 20, with mean and median differences of 9.51 and 10 points, respectively. The Wilcoxon signed-rank test confirmed these findings by yielding a p-value < 0.001, indicating that the intervention was effective in reducing alcohol dependence. These results align with the findings reported by Martínez et al. (2018), who, in Spain, evaluated 130 individuals with alcohol addiction treated through group-based cognitive-behavioral therapy. Their study revealed that more than half successfully completed the treatment, and a substantial proportion maintained abstinence when follow-up sessions were incorporated after discharge. This experience converges with the present study in highlighting CBT's capacity to reduce relapses and enhance adherence among patients with alcohol dependence.

Although some factorial fit indices (CFI, TLI, RMSEA) showed moderate values, this outcome may be attributable to the small sample size and specific clinical characteristics of the population. Nevertheless, this does not compromise the validity of the instrument, as the version of the AUDIT officially validated by the Ministry of Health of Peru was employed, thereby supporting its applicability in the national context. The high reliability achieved in this study ($\alpha = 0.884$; $\omega = 0.903$) confirms the internal consistency of the test, further reinforcing the relevance of the findings regarding the effectiveness of the cognitive-behavioral intervention. Similarly, consistency is observed with the study by Pérez et al. (2020), conducted in Lima with 100 adults diagnosed with alcohol dependence. The authors reported that after twelve weeks of cognitive-behavioral intervention, alcohol consumption was reduced by 40%, with statistically significant differences. This precedent reinforces the effectiveness observed in the Andahuaylas sample, demonstrating that in Latin American contexts, CBT achieves concrete and consistent impacts in reducing problematic alcohol use.

As a whole, the concordance between the empirical results and both international and national precedents demonstrate that cognitive-behavioral intervention constitutes a robust clinical resource against alcohol dependence. Beyond evidencing significant improvements in AUDIT scores, the findings confirm that the program can be adapted to diverse settings while maintaining its effectiveness. These results underscore the importance of systematically incorporating such interventions into healthcare services to consolidate sustained recovery processes and prevent relapse among adults. The findings obtained have important implications for clinical practice and public health management. The effectiveness of the cognitive-behavioral program in reducing risky consumption, dependence symptoms, and harmful use suggests that such interventions can be systematically implemented in health centers across Peruvian provinces. Its structured, brief, and adaptable nature facilitates its application by psychology and psychiatry professionals in resource-limited contexts, contributing not only to patient recovery but also to the strengthening of community strategies for relapse prevention and reduction.

In line with Specific Objective 1—to determine the significant effectiveness of the cognitive-behavioral intervention program in the dimension of risky alcohol consumption among adults at a health center in Andahuaylas in 2024—the results revealed a notable reduction. Both the mean and the median declined significantly in the posttest measurements, and the Wilcoxon signed-rank test yielded $p < 0.001$, thereby allowing the rejection of the null hypothesis. These findings demonstrate that CBT effectively reduced risky consumption levels among the adult patients evaluated. Furthermore, consistency is observed with the study by Srivastava et al. (2022), who assessed 226 adults in an experimental trial comparing CBT with standard treatment. Their results showed that participants receiving CBT exhibited lower relapse risk and higher abstinence rates at both six- and twelve-month follow-ups. This investigation confirms that the cognitive-behavioral approach positively influences the control of risky drinking and provides greater stability in recovery outcomes.

On the other hand, Hu et al. (2022) conducted a multicenter clinical trial with 263 adult patients, evaluating the combination of repetitive transcranial magnetic stimulation and CBT. The findings demonstrated a significant reduction in relapses and improvements in associated comorbidities, such as depression and anxiety. The dimension of risky consumption was particularly benefited in the groups receiving integrated CBT, which supports the results of the Andahuaylas study regarding the capacity of this intervention to reduce initial and risky drinking patterns in alcohol-dependent adults. As a whole, the evidence obtained in the present study, along with that from the selected precedents, reinforces the value of CBT as an effective intervention for reducing risky

alcohol consumption. The convergence of findings across diverse cultural and methodological contexts strengthens the argument that this therapeutic approach constitutes a reliable clinical strategy. These results underscore the relevance of employing CBT within healthcare services, enabling not only the reduction of dependence but also the mitigation of early behaviors that heighten vulnerability to abuse and relapse.

In line with Specific Objective 2—to determine the significant effectiveness of the cognitive-behavioral intervention program in the dimension of dependence symptoms among adults at a health center in Andahuaylas in 2024—the results confirmed notable improvements. The Wilcoxon signed-rank test yielded a p-value < 0.001, indicating a statistically significant reduction in dependence symptoms following the intervention. This finding validates the proposed hypothesis, demonstrating that the program effectively modified behaviors and perceptions associated with compulsive use, craving, and loss of control that characterize alcohol dependence. Consistently, Hallihan et al. (2024) conducted a systematic review of 11 randomized clinical trials involving 1,543 participants. Their results showed that integrated behavioral interventions, including CBT, reduced excessive consumption and increased days of abstinence, while also enhancing overall functioning. These findings reinforce the notion that CBT, as applied in Andahuaylas, not only decreases dependence symptoms but also contributes to a broader and more sustainable recovery in the quality of life of treated patients.

Similarly, Johansson et al. (2021) evaluated the effectiveness of digital CBT in Sweden with a sample of 1,169 adults presenting harmful use or alcohol dependence. The results showed that therapist-guided CBT substantially reduced weekly consumption and dependence-related symptoms, particularly in the short term. This precedent confirms that CBT, in its diverse modalities, can directly impact the symptomatic manifestations of dependence, which is consistent with the results obtained in the present study. In summary, the reduction of dependence symptoms observed in the Andahuaylas population is supported by international evidence underscoring the effectiveness of CBT across diverse modalities. Both in traditional clinical settings and digital formats, results consistently demonstrate that this therapy mitigates the core components of dependence, consolidating progress toward comprehensive recovery. The combined evidence suggests that CBT is an adaptable tool with strong capacity to address the central symptoms of alcoholism across heterogeneous populations.

In line with Specific Objective 3—to determine the significant effectiveness of the cognitive-behavioral intervention program in the dimension of harmful alcohol consumption among adults at a health center in Andahuaylas in 2024—the results revealed significant improvements. The Wilcoxon signed-rank test yielded $p < 0.001$, leading to the rejection of the null hypothesis and confirming that the intervention was effective in reducing levels of harmful consumption. These findings indicate that CBT successfully modified behaviors associated with problematic use, thereby mitigating the most severe effects of alcohol dependence in the adult population studied.

Moreover, consistency is observed with the study by Stapinski et al. (2021), who evaluated an online CBT program among young adults aged 17 to 24 with risky alcohol use. The findings revealed significant reductions in episodes of abuse and anxiety symptoms associated with consumption, particularly among those who received psychological support. This evidence aligns with the present study by demonstrating that CBT is effective in controlling harmful consumption patterns, even across populations of different ages and intervention modalities.

Moreover, Magill et al. (2023) conducted a narrative review on the effectiveness of CBT in the treatment of alcohol and other substance use disorders in adults. The results confirmed that CBT demonstrates consistent efficacy compared with standard treatments, yielding moderate effects on abstinence and on the reduction of harmful behaviors associated with consumption. This precedent reinforces the findings from the Andahuaylas sample, as both studies underscore CBT's capacity to mitigate excessive drinking and the harms linked to alcohol abuse. Taken together, the results of this specific objective confirm the importance of CBT as a therapeutic resource for reducing harmful consumption patterns. Evidence from both local and international contexts demonstrates that this approach effectively mitigates the severity of behaviors associated with abuse, offering an efficacious alternative for addressing the most complex cases of dependence. These findings reaffirm the need to implement structured CBT programs within healthcare services to promote recovery and prevent more severe consequences in the adult population.

CONCLUSION

The results obtained allow us to conclude that cognitive-behavioral therapy constitutes an effective and consistent intervention for reducing alcohol dependence in adults, as evidenced in the Andahuaylas sample. The significant decrease in AUDIT scores between the pretest and posttest, confirmed through the Wilcoxon signed-rank test, demonstrates that the systematic application of this program generates quantifiable changes in the severity of dependence. The intervention showed sustained effectiveness across all evaluated dimensions—risky consumption, dependence symptoms, and harmful use—accordingly validating both the general and the specific hypotheses proposed.

When compared with the international literature, these findings confirm the robustness of cognitive-behavioral therapy as a strategy to reduce problematic alcohol consumption, prevent relapses, and improve associated symptoms such as anxiety and depression. Nevertheless, the present study adds value to the Peruvian scientific context by providing empirical evidence within a local clinical population characterized by particular sociocultural

features. In this regard, the research contributes to narrowing the existing gap in the regional literature, where studies on the effectiveness of CBT applied to public health challenges in the country remain scarce.

In this way, it is reaffirmed that cognitive-behavioral therapy should be consolidated as a treatment strategy of choice within public health programs in Peru, given its methodological flexibility and applicability in provincial health centers. Beyond confirming its clinical effectiveness, this study supports the relevance of implementing the AUDIT in its version validated by the Ministry of Health of Peru as a screening tool and as an instrument for evaluating change. Overall, these results reinforce the utility of CBT for alcohol dependence management and offer valuable input for policy development and future research in Peruvian clinical psychology and public health.

A relevant methodological limitation of the study was the absence of a control group, which restricts the ability to establish stronger causal inferences. Likewise, the small sample size (n = 45) constrains the generalizability of the results to broader populations. Finally, external validity is limited to the specific context of a health center in Andahuaylas. Nevertheless, the use of the AUDIT in its version adapted and validated by the Ministry of Health of Peru (R.M. No. 247-2020-MINSA) constitutes a methodological strength that ensures the cultural and clinical validity of the measurement, as a consequence reinforcing the relevance of the results obtained.

This study lacks a control group, which limits causal inference, and relies on a sample of 45 participants from a single center, as a consequence restricting generalizability. However, the use of the AUDIT in its version validated for the Peruvian context and the high internal consistency observed (after reversing Item 4) strengthen the validity of the measurement. Future research should incorporate quasi-experimental or randomized designs, larger samples, and longitudinal follow-up to estimate the sustainability of the effect. While the Wilcoxon signed-rank test was appropriate given the non-normality of the data, it is recommended that subsequent studies include measures of effect size (Rosenthal's r or Cohen's d for paired data) and 95% confidence intervals. These indicators complement the p-value and provide a clearer estimation of the clinical magnitude of the observed change, in doing so facilitating comparison with international research and enabling a more precise evaluation of the intervention's real impact.

In the factorial validity analysis of the AUDIT, the CFI (0.829) and TLI (0.759) indices fell slightly below the recommended thresholds (≥ 0.90). This outcome may be attributed to the small sample size (n = 45) and the heterogeneous characteristics of the Andean clinical population, factors that tend to reduce the stability of structural equation models. Nevertheless, the instrument demonstrated high internal consistency after reversing Item 4 ($\alpha = 0.884$; $\omega = 0.903$). To improve these indices in future applications, it is suggested to increase the sample size, revise the wording of items with low loadings, and explore confirmatory analyses with two-factor models that have been reported in other Latin American validations.

Building on these results, future research should be directed toward the development of studies with more rigorous experimental designs, including control groups and larger, more diverse samples. Likewise, it would be pertinent to conduct longitudinal follow-ups to assess the sustainability of the intervention's effects over the medium and long term. Finally, it is recommended to explore digital modalities of cognitive-behavioral therapy in the Peruvian context, as such approaches could expand coverage, reduce geographical barriers, and enhance accessibility in rural areas.

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ANNEX

Alcohol Use Disorders Identification Test (AUDIT) – Adaptation by the Ministry of Health of Peru

Age: _____ Sex: _____ Area of residence: _____
Study cycle: _____

INSTRUCTIONS

The following questions refer to your alcohol consumption. Please answer all of them honestly; there are no right, good, wrong, or bad responses. Mark with an **X** in the space that best reflects what you feel, think, or do:

1. **How often do you consume any alcoholic beverage?**

(0) Never (skip to Questions 9 and 10)
(1) Once a month or less
(2) 2 to 4 times a month
(3) 2 to 3 times a week
(4) 4 or more times a week

2. **How many alcoholic drinks do you usually have on a typical day when you are drinking?**

(0) 1 or 2
(1) 3 or 4
(2) 5 or 6
(3) 7 to 9
(4) 10 or more

3. **How often do you have six or more drinks on a single occasion?**

(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

4. **During the past year, how often have you found yourself unable to stop drinking once you had started?**

(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

5. **During the past year, how often have you failed to do what was normally expected of you because of drinking?**

(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

6. **During the past year, how often have you needed a first drink in the morning to recover after a heavy drinking session the night before?**
(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

7. **During the past year, how often have you had feelings of guilt or remorse after drinking?**
(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

8. **During the past year, how often have you been unable to remember what happened the night before because you had been drinking?**
(0) Never
(1) Less than once a month
(2) Monthly
(3) Weekly
(4) Daily or almost daily

9. **Have you or someone else ever been injured as a result of your drinking?**
(0) No
(2) Yes, but not in the past year
(4) Yes, during the past year

10. **Has a relative, friend, doctor, or other health professional ever been concerned about your drinking or suggested that you cut down?**
(0) No
(2) Yes, but not in the past year
(4) Yes, during the past year