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Changes in Mindfulness and Distress Tolerance before and after an Acceptance and Commitment Therapy Intervention among Latine Adults Who Smoke: Results from a Pilot Study

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ABSTRACT

Background. Smoking cessation presents unique challenges for Latine adults who face specific cultural and socio-economic barriers to quitting. Acceptance and Commitment Therapy (ACT) is a promising intervention to address these challenges because it targets underlying mechanisms implicated in smoking cessation, including mindfulness and distress tolerance. The primary objective of this study was to assess the changes in mindfulness and distress tolerance before and after an ACT-based treatment. Method. Participants were 23 English-speaking Latine adults who participated in a culturally relevant ACT-based intervention. Mindfulness was measured with the Five Facet Mindfulness Questionnaire and distress tolerance was measured via the Distress Tolerance Scale. Descriptive analyses were conducted to assess changes in mindfulness and distress tolerance scores at three different timepoints: baseline, one week post end of treatment (EOT), and two-months post EOT. Results. Results showed changes in mindfulness and distress tolerance in the expected direction, whereas both scores increased after the intervention. The facets of mindfulness and subdimensions of distress tolerance revealed different patterns. Conclusion. Findings suggest the potential for ACT-based interventions to influence mindfulness and distress tolerance constructs among Latine people who smoke and have psychological distress and may guide hypotheses testing for larger scale studies focused on treatment effects stratified by smoking status.

Keywords
Acceptance and Commitment Therapy, mindfulness, distress tolerance, Latine adults, smoking cessation

RESUMEN

La cesación tabáquica presenta retos para personas adultas de origen latino quienes enfrentan barreras socioeconómicas y culturales para dejar de consumir tabaco. La Terapia de Aceptación y Compromiso (TAC) es una intervención prometedora para abordar estos desafíos ya que se enfoca en mecanismos subyacentes involucrados en la cesación tabáquica. El objetivo principal de esta investigación fue evaluar los cambios en atención plena y tolerancia del malestar antes y después de una intervención basada en TAC. Los participantes fueron 23 adultos de origen latino, que hablaban inglés, y participaron en una intervención culturalmente relevante basada en TAC. La atención plena se midió por medio del Cuestionario de Mindfulness de Cinco Facetas y la tolerancia del malestar fue medido por la Escala de Tolerancia del Malestar. Se realizaron análisis descriptivos para evaluar los cambios de puntuaciones en atención plena y la tolerancia del malestar en tres momentos del curso de la investigación: línea base, una semana después del tratamiento y dos meses después del tratamiento. Los resultados demostraron cambios en atención plena y la tolerancia del malestar en la dirección prevista, ya que las dos puntuaciones aumentaron después de la intervención. Los patrones de las subescalas variaron. Los hallazgos sugieren el potencial de las intervenciones basadas en TAC para influenciar los constructos de atención plena y tolerancia del malestar en personas latinas que fuman y tienen distrés psicológico, y pueden guiar pruebas de hipótesis en estudios a mayor escala enfocados en efectividad de tratamientos y estratificados por estado de uso de tabaco.

Palabras clave
Terapia de Aceptación y Compromiso, atención plena, tolerancia del malestar, personas latinas, cesación de tabaco

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Cambios en atención plena y tolerancia del malestar antes y después de la Terapia de Aceptación y Compromiso entre adultos de origen latino que fuman: Resultados de un estudio piloto

Introduction

Tobacco use disparities present significant challenges for the Latine community, both in Latin America and the United States (U.S.). Despite lower overall smoking rates among Latine compared to the U.S. national average (Martell et al., 2016), the prevalence varies greatly across countries and national subgroups (Kaplan et al., 2014; OECD/The World Bank (2020). Further, Latine adults constitute nearly a fifth of the U.S. population (Colby & Ortman, 2015); thus, attention to the health behaviors of this group is of utmost importance. For instance, research has shown that acculturation toward the U.S. mainstream culture is related to higher smoking prevalence among Latina women, although unrelated for Latino men (Abraido-Lanza et al., 2005; Bethel & Schenker, 2005). Critical factors contributing to tobacco-related disparities include the underutilization of cessation resources (Trinidad et al., 2011) and the lack of cessation support from healthcare providers, with Latine groups receiving less guidance compared to the general population of smokers in the U.S. (Lee et al., 2023).

Evidence-based interventions have demonstrated effectiveness in helping people quit smoking (Hartmann-Boyce et al., 2021; Lu et al., 2024); however, their impact has been less examined among Latine populations (Correa-Fernández et al., 2024; Simmons et al., 2022; Zvolensky et al., 2014). This gap is particularly pronounced when considering the role of psychological distress, which is prevalent among smokers and linked to increased smoking behavior (Correa-Fernández et al., 2021; Casas, 2023). Acceptance and Commitment Therapy (ACT) is a theoretical framework and evidence-based intervention useful to address a variety of psychological issues but is underexplored within Latine populations, especially in culturally tailored formats (Arch et al., 2012; Gregg et al., 2007; Kwon et al., 2022). Unlike other psychological treatments that aim to deliberately decrease symptoms of distress, ACT-based interventions aim to help individuals increase their "psychological flexibility", which refers to a person's ability to notice and face unpleasant experiences and still behave according to their values and goals. According to this model, individuals develop psychological flexibility as a result of six inter-related processes (Twohig, 2012): (1) *present moment* (i.e., focusing on what

is happening now rather than on the past or future; also known as "mindfulness"); (2) *acceptance* (i.e., allowing the presence of painful thoughts and feelings without trying to change them; (3) *cognitive defusion* (i.e., seeing thoughts as words or images instead of literal truths); (4) *self-as-context* (i.e., noticing our own experiences; also known as "observing self"); (5) *values* (i.e., clarifying what truly matters in a person's life); (6) *committed action* (i.e., performing behaviors that are consistent with the values). For instance, in an ACT-based smoking cessation treatment, individuals are encouraged to notice their smoking behavior as a way to control or avoid their uncomfortable internal experiences (e.g., stress, anxiety, sadness, anger) and to learn more adaptive responses in pursuit of their quitting goal (Gifford et.al., 2004). Despite ACT proven efficacy and utility for diverse populations and health conditions (Beygi et al., 2023; Masuda, 2014; Gloster et al., 2020), only a handful studies have reported on the effects of ACT-based treatment among Latine individuals who smoke in the U.S. (Kwon et al., 2022; Santiago-Torres et al., 2022; Correa-Fernández et al., 2024). Fortunately, these studies have demonstrated promising results.

Besides treatment effectiveness, it is important to measure and evaluate change processes in order to understand how and why treatments work. This recommendation has been highlighted in a recent review (Gloster 2020), as the mechanisms via which ACT-based interventions affect health-related outcomes are not well understood, particularly in culturally diverse settings (Gonzales, 2017; Cañón et al., 2023). Two core constructs integral to ACT that can inform change processes are mindfulness and distress tolerance. Mindfulness is the practice of present-focused, non-judgmental attention (Kabat-Zinn, 1994) and distress tolerance is the ability to endure difficult emotional experiences without being overwhelmed or resorting to maladaptive coping behaviors (Linehan, 2014). These two transdiagnostic constructs are central to ACT treatment and may contribute to improvements in smoking abstinence.

Mindfulness is a core process within psychological flexibility, represented as *present moment awareness*. Within the ACT framework, mindfulness contributes to build psychological flexibility via enhancing the observation of internal experiences in a non-judgmental way and encouraging individuals to reduce the automatic or rigid reactions to challenging situations and, instead, choose actions consistent with their values. Research

has shown that people who smoke have lower levels of mindfulness compared to those who don't smoke (Barros et al., 2015). Mindfulness has shown promise in smoking cessation by reducing cravings and the habitual nature of smoking (Brewer et al., 2011). Also, in a sample including Latine adults, Spears and colleagues (2019) found that dispositional mindfulness was linked to better emotional regulation and increased abstinence. Further, there is emerging research linking the various facets of mindfulness (i.e., Observing, Describing, Acting with Awareness, Non-judging, and Non-reactivity) with smoking behaviors. For instance, a study conducted in Brazil found that non-smokers scored higher than people who smoke in the facets of Observing and Non-reactivity, suggesting that people who smoke have lower levels of mindfulness in these areas (Barros et al., 2015). Additionally, among Spanish-speaking participants of Mexican heritage who reported smoking, the Nonjudging facet of mindfulness was a significant predictor of cessation (Spears et al., 2015). Taken together, these studies highlight the importance of focusing on specific aspects of mindfulness in the study of smoking cessation interventions among Latine groups.

Distress tolerance, the capacity to endure emotional discomfort in healthy ways, is also relevant to psychological flexibility, particularly the *acceptance* process. In essence, increasing distress tolerance is a step toward developing psychological flexibility as it entails embracing a variety of thoughts or emotions instead of avoiding or suppressing them. In the context of smoking cessation, studies have suggested that lower distress tolerance is associated with higher nicotine dependence and difficulty in quitting smoking (Cosci et al., 2011). Yet, the literature lacks an examination of distress tolerance enhancement strategies within cessation programs tailored for Latine smokers. Further, the examination of the various components of distress tolerance (i.e., tolerance, absorption, appraisal, and regulation) in the context of smoking cessation is lacking. Trujillo and collaborators (2017) found that while overall distress tolerance was significantly linked to smoking-related outcomes (i.e., craving, nicotine dependence), the individual subscales were not. However, this study did not specifically focus on a Latine population, indicating a need for further research in this group inside and outside the U.S.

Taken together, theoretical underpinnings and empirical research underscore the relevance of mindfulness and distress tolerance as transdiagnostic constructs addressed via ACT-based interventions with benefits for smoking cessation efforts. Nonetheless, there is limited research examining these constructs among Latine populations inside and outside the U.S. Given the relevance of understanding mechanisms of change in ACT-based treatment for Latine smokers with psychological distress, this study examined changes on mindfulness and distress tolerance scores among Latine adults who smoked and participated in a culturally adapted ACT intervention (Correa-Fernández et al., 2023; Correa-Fernández et al., 2024). Importantly, we aimed to also explore changes in the particular components of mindfulness and distress tolerance, beyond a total score. By doing so, we examined the mechanisms that could explain improvements in smoking abstinence, thereby contributing to the broader discourse on effective culturally responsive behavioral health care for Latine populations. Given the pilot nature of the data, authors did not conduct formal hypothesis testing. However, the anticipated outcomes were that participants would improve mindfulness and distress tolerance levels compared to their baseline scores.

Method

Ethical Statement

This project was approved by the University of Houston Institutional Review Board. Authors followed the ethical standards agreed upon in their institution. Also, authors followed the Universal Declaration of Ethical Principles for Psychologists, the International Ethical Guidelines for Biomedical Research Involving Human Subjects and the declarations of the ISP regarding ethical behavior at the time of submission.

Participants

Data for this study was drawn from Project PRESENT, a pilot study developed to test the feasibility and acceptability of an ACT-based smoking cessation intervention among English-speaking Latine adults who smoked and had psychological distress (Correa-Fernández et al., 2024). The study sample comprised 23 adults aged 22 to 61 years old (M = 39.52, SD = 11.46) and the majority of whom were partnered (n = 13,

56.5%). Education levels among participants varied, whereas 39% (*n*= 9) indicated having completed college or a post-bachelor's degree. In terms of gender, seven persons identified as men (30.4%) and 16 self-identified as women (69.6%). Most participants had a full-time job (*n* = 12, 52.2%), followed by part-time work (*n* = 5, 21.7%), unemployment with current job-seeking (*n* = 4, 17.4%), unemployment without job-seeking (*n* = 1, 4.3%), and being unable to work or disabled (*n* = 1, 4.3%). Regarding income, the participants were distributed across different income brackets, with 30.4% (*n*=7) earning $24,000 or less, 34.8% (*n*=8) earning between $24,001 and $42,000, and 30.4% (*n*=7) earning between $42,001 and $54,000. Regarding nativity, 56.5% (*n*=13) were born in the U.S., while 43.5% (*n*=10) were born in other Latin American countries (i.e., Mexico, Venezuela, Brazil) or Puerto Rico. Out of the 10 foreign born individuals, three were residing in Puerto Rico. The range of the time living in the U.S. for the other seven participants fluctuated between 8 and 35 years; M=24.29 (SD=9.03). In addition, 39% of participants (*n*=9) reported any use of nicotine replacement therapy, while only 9% of those reported using the medication as recommended.

Parent Project Procedures

Eligible participants for project PRESENT attended an in-person or online baseline visit where they were provided detailed information about the study, gave informed consent, and completed initial assessments. Of note, the parent project was intended to take place partially in-person in a metropolitan area in Texas, U.S.; however, due to the COVID-19 pandemic and resulting quarantine conditions, the project was successfully transitioned to remote implementation (Correa-Fernández et al., 2024).

During the baseline visit, participants (N=23) also completed the first counseling session. Out of 23 participants, four completed the baseline visit in person while the other 19 completed it via a videoconference call (i.e., encrypted Zoom account). Thereafter, participants were invited to complete seven more sessions delivered via phone**.** Culturally relevant aspects of the intervention entailed: (a) the acknowledgment of light smoking and intermittent smoking as typical smoking patterns among Latine people; and (b) the inclusion of Latine values through the program, including content (i.e., family role in smoking or quitting), delivery (e.g., *respeto* y *personalismo* in counselor communication style), and context (e.g., consideration of acculturation as a source of stress), among other factors (Correa-Fernández et al., 2024). In addition to the ACT-based treatment,

interested participants received nicotine patches provided at the first visit and mailed biweekly thereafter to support smoking cessation efforts. Follow-up assessments were conducted one week post end of treatment (EOT) and two months after EOT to evaluate changes in participants' intra and interpersonal factors. Of note, interventionists were trained in the study protocol and were different people than the study personnel assisting with assessments. Participants received $30 gift cards for completion of assessments during the baseline and first follow-up visit, and $40 for completion of the second follow-up visit. Additionally, they received $10 gift cards for attendance to sessions 2-8. In total, participants were eligible to receive a maximum of $170 for their participation in this study. Additional details of the intervention protocol and feasibility outcomes are published elsewhere (Correa-Fernández et al., 2023; Correa-Fernández et al., 2024).

Measures

Mindfulness

To gauge participants' mindfulness skills at different stages of the study, the Five Facet Mindfulness Questionnaire - Short Form (FFMQ-SF) was administered at the three distinct timepoints. The FFMQ-SF, developed from a factor analysis of five independently created mindfulness questionnaires (Baer et al., 2006, 2008), comprises 15 items across five facets of mindfulness: Observing, Describing, Acting with Awareness, Non-judging, of inner experience, and Non-reactivity to inner experience. All items are rated on a five-point Likert scale from 1 (never or very rarely true) to 5 (very often or always true). Some items are reverse coded. Subscale scores and total scores are calculated by the sum of the items. Higher scores indicate higher mindfulness. A sample item from the scale is, "I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted." The FFMQ-SF is internally consistent, with Cronbach's alpha values reported above .70 for each facet in the original study, demonstrating significant internal consistency (Baer et al., 2008).

Distress Tolerance

To evaluate participants' capacity to tolerate emotional distress, the Distress Tolerance Scale (DTS; Simons & Gaher, 2005) was administered at three separate timepoints. The DTS is a 15-item self-report instrument in which respondents indicate

their level of agreement with statements concerning their emotional responses to distress. Responses are measured on a five-point Likert scale, from 1 (strongly agree) to 5 (strongly disagree). Only one item is reverse coded. The DTS is comprised of four subscales: Tolerance, Absorption, Appraisal, and Regulation. Subscale scores are the mean of the relevant items, and the total score is calculated using the mean of the subscale scores. Higher scores indicate higher distress tolerance. A sample item includes, "Feeling distressed or upset is unbearable to me." In the original validation study, Simons and Gaher (2005) reported a Cronbach's alpha of .89, indicating good internal consistency, and scores were positively associated with adaptive emotional regulation and coping strategies in the face of stress.

Analytic Strategy

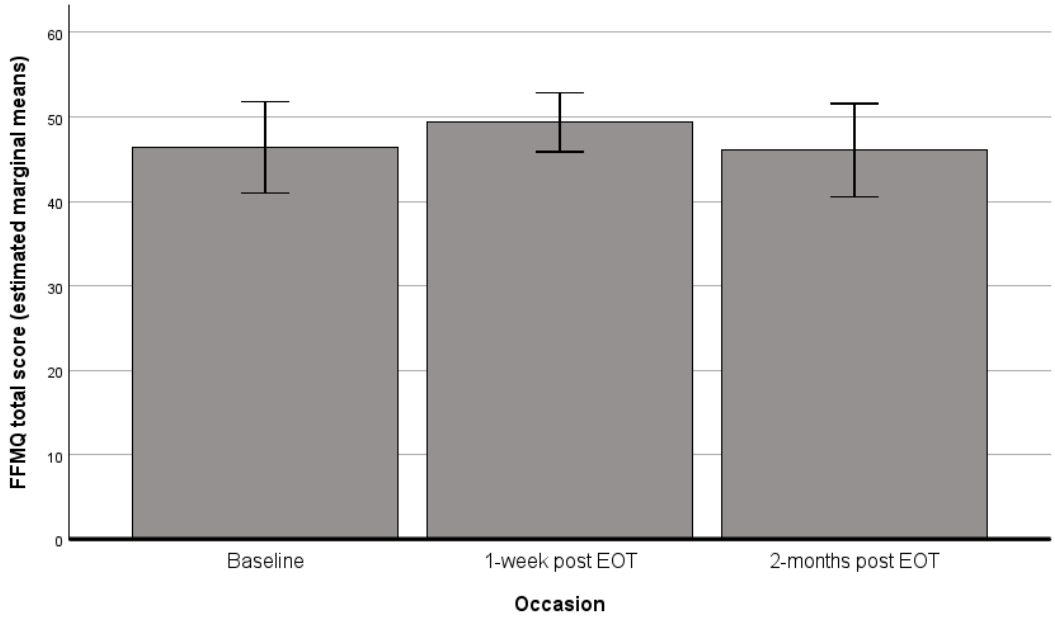
The Statistical Package for the Social Sciences (SPSS, v28) was used to examine this study's data. Given our small sample size and the pilot study nature of the collected data, we limited our analyses to descriptive statistics (frequencies, range, mean, and standard deviations) and visual representations of the data via bar graphs. Specifically, we reported estimated marginal means given that these estimates account for the data dependency caused by repeated measures within a person.

Results

Regarding mindfulness, estimated marginal means of FFMQ-SF total scores indicated an increase in mindfulness scores 1-week post EOT compared to baseline (Cohen's d = 0.68). At 2 months post-EOT, mindfulness scores decreased slightly compared to 1-week EOT (Cohen's d = -0.45) but remained similar to baseline (Cohen's d = 0.11). See Figure 1. When examining the individual FFMQ-SF subscales scores, data showed various patterns regarding the mindfulness facets (See Table 1). The describing and non-judging facets showed an increase in scores from baseline to the 1-week post EOT follow-up and a decrease at 2-months post EOT, although scores remained higher than baseline. The awareness facet showed an increase in scores from baseline to the 1-week post EOT follow-up but a decrease in scores at 2-months post EOT that were lower than baseline. Finally, the observing and non-reactivity scores showed a continuous decrease in scores from baseline to 1-week post EOT and then 2 months post EOT.

Figure 1

Estimated marginal means of FFMQ-SF total score by measurement occasion



Note. Estimated marginal means were obtained from fitting a repeated measures ANOVA model. FFMQ-SF = Five Facet Mindfulness Questionnaire-Short Form; EOT = End of Treatment. *Source.* Authors' own work.

Regarding distress tolerance, estimated marginal means of the DTS total scores indicated an increase in distress tolerance scores 1-week post EOT compared to baseline (Cohen's $d = 0.69$). At 2 months post-EOT, distress tolerance scores decreased marginally compared to 1-week EOT (Cohen's $d = -0.18$) but remained higher than baseline (Cohen's $d = 0.63$). See Figure 2. When examining the individual DTS subscales scores, data showed various patterns regarding the distress tolerance subscales (See Table 1). For instance, the scores for the tolerance and absorption components showed an upward trajectory whereas there was an increase in scores from baseline to the 1-week post EOT follow-up and a continued increase at 2-months post EOT. Both the appraisal and regulation subscale scores showed an increase in scores from baseline to the 1-week post EOT follow-up. At 2-months post EOT, appraisal scores decreased compared to 1-week post EOT but remained higher than baseline, while regulation scores decreased compared to 1-week post EOT but remained similar to baseline scores.

Table 1

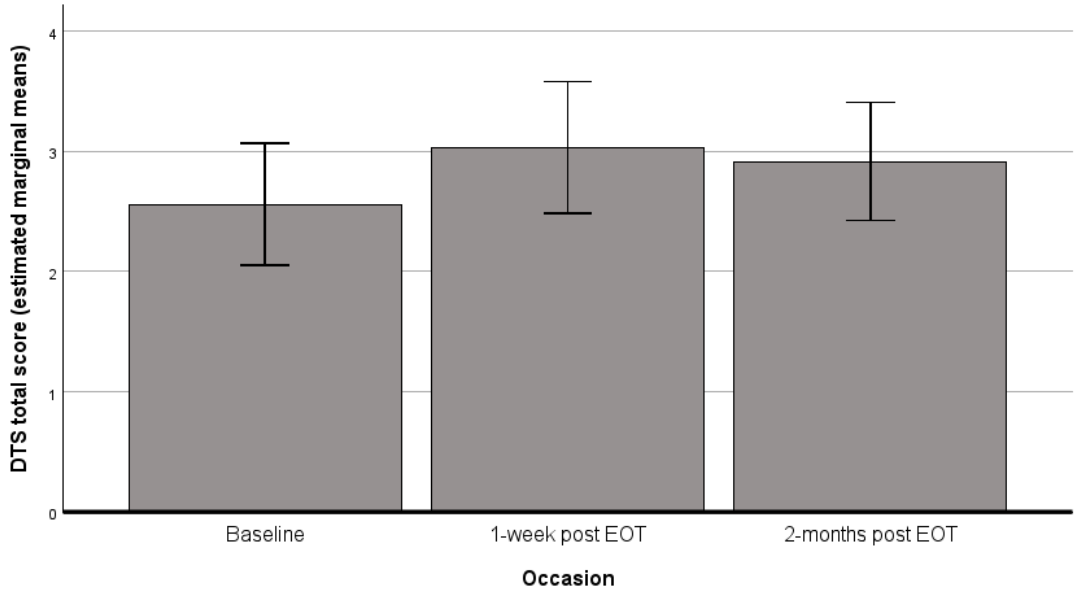
Estimated Marginal Means of FFMQ-SF and DTS scores across time

	Estimated Marginal Means (Standard Error) 95% Confidence Interval		
Variables	**Baseline**	**1-week post EOT**	**2-months post EOT**
FFMQ-SF-Observing	10.92 (0.83) (9.12, 12.73)	10.62 (1.03) (8.37, 12.86)	9.46 (0.70) (7.93, 11.00)
FFMQ-SF-Describing	9.31 (0.58) (8.04, 10.58)	9.85 (0.69) (8.35, 11.34)	9.54 (0.79) (7.82, 11.26)
FFMQ-SF-Awareness	9.23 (0.91) (7.24, 11.22)	9.69 (0.86) (7.8, 11.56)	8.77 (0.63) (7.39, 11.15)
FFMQ-SF-Nonjudging	7.39 (0.80) (5.65, 9.12)	9.85 (0.93) (7.83, 11.86)	9.31 (0.76) (7.65, 10.97)
FFMQ-SF-Nonreactivity	9.54 (0.88) (7.62, 11.46)	9.39 (0.63) (8.02, 10.75)	9.00 (0.74) (7.38, 10.62)
FFMQ-Total	46.39 (2.47) (40.99, 51.78)	49.39 (1.61) (45.88, 52.89)	46.08 (2.52) (40.58, 51.57)
DTS-Tolerance	2.67 (0.25) (2.16, 3.21)	2.83 (0.29) (2.19, 3.48)	3.03 (0.25) (2.47, 3.59)
DTS-Absorption	2.50 (0.28) (1.88, 3.12)	2.97 (0.27) (2.38, 3.56)	3.08 (0.27) (2.48, 3.68)
DTS-Appraisal	2.38 (0.21) (1.92, 2.83)	3.18 (0.25) (2.63, 3.73)	2.88 (0.15) (2.55, 3.20)
DTS-Regulation	2.69 (0.33) (1.98, 3.41)	3.14 (0.33) (2.41, 3.86)	2.67 (0.34) (1.92, 3.41)
DTS-Total	2.56 (0.23) (2.05, 3.07)	3.03 (0.25) (2.48, 3.58)	2.91 (0.22) (2.42, 3.41)

FFMQ-SF= Five Facet Mindfulness Questionnaire-Short Form; DTS= Distress Tolerance Scale

Figure 2

Estimated marginal means of DTS total score by measurement occasion



Note. Estimated marginal means were obtained from fitting a repeated measures ANOVA model. DTS = Distress Tolerance Scale; EOT = End of Treatment. *Source.* Authors' own work.

Discussion

Findings from this study revealed an increase in mindfulness and distress tolerance overall levels after a culturally relevant ACT-based intervention delivered in a hybrid mode (videoconference and phone) among Latine adults who smoke cigarettes and experienced psychological distress. Of note, except for the Observing and Non-reactivity facets of the FFMQ-SF, the other FFMQ-SF subscales as well as all DTS subscale scores revealed an expected increase at 1-week post EOT. Interestingly, FFMQ-SF and DTS subscale scores exhibited different trends when comparing baseline and 2-month EOT assessments.

As expected, mindfulness overall scores increased after the intervention and slightly decreased for the second follow-up but remained consistent with baseline. This suggests that the intervention could have contributed to an increase in participants' dispositional mindfulness, which is consistent with an ACT-based treatment. Contrary to expectations, the Observing and Non-reactivity subscales showed a decreasing trajectory after treatment, suggesting a reduced capacity to observe one's emotions and thoughts and to pause before automatically responding. Of note, some research has recommended

exerting precaution with the Observing subscale (inclusive excluding from analyses) because the items may not fit into the mindfulness construct as well as other subscales, particularly among non-meditators (Baer et al., 2006; Rudkin, Medvedev, & Siegert, 2018). Also, given that this facet reflects heightened awareness of internal experiences, it is possible that what the "observing behavior" facet entails may be overwhelming for individuals with psychological distress. In addition, although we did not compare smoking status of participants relative to their mindfulness scores for this study, low non-reactivity scores among smokers versus non-smokers have been reported previously (Barros et al., 2015). Hence, future research should expand analyses related to these subscales among Latine populations with various levels of mindfulness training and smoking status.

Related to the second follow-up after treatment, the Describing and Non-judging subscales continued to show an improvement compared to baseline, suggesting that the increase in participants capacity to describe and not judge their internal experience was sustained beyond the end of the intervention. This finding is in line with Spears and colleagues' research indicating that Nonjudging facet of mindfulness was significantly related to cessation among individuals of Mexican heritage who smoke (Spears et al., 2015). Conversely, individuals' capacity to Act with Awareness seemed to improve immediately after treatment but worsen compared to pre-treatment. It is important to consider that participants in this study were individuals attempting to quit smoking, a process which likely challenged their ability to be mindful. Future research examining change in mindfulness scores pre-post ACT-based treatment among people who smoke should consider differences by smoking status as well as previous exposure to mindfulness. On the other hand, we acknowledge that the small sample size (particularly at follow-up periods) prohibits drawing definite conclusions about the reasons for the observed patterns; instead, the reported findings can be considered hypotheses generators to be formally tested in future work.

Taken together, mindfulness-related findings from this pilot study highlight the complex and interrelated nature of mindfulness components and their connection to psychological flexibility, a key concept of ACT-based treatment. Rather than promoting present-moment awareness in isolation, ACT emphasizes its role as a means for values-based action. Among individuals attempting to quit smoking while simultaneously managing mood-related challenges, the decreases in observation and non-reactivity may reflect a transitional phase in which individuals are beginning to engage more openly with

thoughts and emotions. This shift can temporarily heighten emotional reactivity, particularly during the emotionally demanding stage of making a quit attempt. In contrast, increases in the ability to label experiences and a non-judging stance align with ACT's emphasis on acceptance and cognitive defusion (Twohig, 2012) and may signal a more flexible and adaptive relationship with internal experiences. Future research would benefit from long term follow-up assessments to evaluate the maintenance of therapeutic gains and determine whether more intensive or sustained interventions are warranted.

Distress tolerance has been identified as a transdiagnostic process key to understanding how individuals cope with aversive states, with lower tolerance linked to avoidance behavior and poorer health outcomes (Mohsenabadi et al, 2025). However, there is a notable gap in the literature regarding the examination of distress tolerance dimensions among Latine individuals who smoke. Most existing research addresses overall distress tolerance and in other demographic groups (Cosci et al., 2011; Trujillo et al., 2017), with limited specific research focusing on Latine people who smoke. Our study contributes to addressing this gap. As expected, participants' capacity to withstand distress appeared to increase following the ACT-based intervention, and this improvement was sustained after two-months post treatment. Notably, participants demonstrated an upward trajectory in their ability to endure discomfort and remain engaged in goal-oriented behavior despite experiencing distress. These findings suggest a potentially positive impact of ACT-based treatment on the development of distress tolerance skills, which is consistent with ACT emphasis on psychological flexibility.

From an ACT perspective, the observed changes in distress tolerance may reflect increases in psychological flexibility (Zou, et al., 2025). On the one hand, the sustained gains in the Tolerance and Absorption subscales suggest that participants became more willing to experience unpleasant affective states and less likely to be dominated by distress. These shifts are consistent with central ACT processes, including acceptance, present-moment awareness, and self-as-context (Twohig, 2012). Specifically, increased tolerance may indicate a growing capacity for experiential acceptance while reduced absorption may reflect enhanced cognitive defusion and perspective-taking. This allows individuals to observe distressing thoughts and emotions without becoming entangled in them. On the other hand, the temporary rise in Appraisal scores suggests that ACT may initially reduce catastrophic evaluations of distress through cognitive defusion, but this effect weakened overtime. Similarly, improvements in Regulation, or less urgent attempts to escape distress, were seen immediately post-treatment but returned to baseline at

follow-up, suggesting that this domain may be more vulnerable to real-world stressors once formal therapeutic support ends. Taken together, these subscales patterns illustrate how ACT can help individuals reframe discomfort as manageable, even if some skills require reinforcement and continued practice to be sustained over time. Nonetheless, as stated above, findings from this pilot study should be interpreted with caution and used to generate hypotheses rather than to draw definite conclusions about the effects of an ACT-based treatment.

The study has several limitations. The small sample size limits the representativeness of the sample and generalizability of results. This is, the findings may not represent mindfulness or distress tolerance scores of other Latine adults who smoke. In particular, not all Latine heritage groups were represented in the study. As such, Cohen *d* values provided should be interpreted with caution. Given the data was derived from a one-arm study, without a control group, it is not possible to argue that changes in scale scores are due to the ACT-intervention or external factors. Finally, there is a possibility of a placebo effect, whereas participants' responses may be influenced by their expectations, leading to inflated improvements. Nonetheless, the different patterns of results (versus a uniform increase in scores) may indicate accurate responses. To address these limitations, future research should include a larger sample size with additional representation of Latine national groups, and a randomized control trial study design where participants are randomly assigned to the intervention or a control group. In addition, it would be relevant to examine whether distress tolerance levels vary based on nicotine replacement usage. In this study, the low rate of nicotine replacement endorsement prevents us from conducting such comparisons.

Despite the above-mentioned limitations, the study has various strengths. Data comes from the only culturally relevant ACT-based intervention for Latine smokers who have comorbid psychological distress (Correa-Fernández et al., 2023; Correa-Fernández et al., 2024). Thus, findings related to decreases in mindfulness and distress tolerance levels in this underrepresented population are a contribution to the gaps in knowledge. Importantly, reporting subscales scores for both mindfulness and distress tolerance is a contribution to the field as just a handful studies have reported how the specific components of these transdiagnostic constructs may change pre-post psychotherapeutic interventions.

Conclusion

Overall mindfulness and distress tolerance levels improve after a culturally relevant ACT-based smoking cessation intervention among Latine adults who smoke cigarettes and experienced psychological distress. The facets of mindfulness and subdimensions of distress tolerance reveal different patterns. Results suggest the potential for ACT-based interventions to influence mindfulness and distress tolerance constructs among the Latine community and may guide hypotheses testing for larger scale studies focused on treatment effects stratified by smoking status.

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