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Moderated mediation of motivation and self-efficacy in a brief motivational interviewing intervention to reduce youth alcohol use

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ABSTRACT

Background: Adolescent alcohol use is a significant public health concern, particularly in Latin America where rates are high. Despite the increasing use of evidence-based interventions in this region, there is a need for further research to understand how and for whom the programs work best.

Objectives: This study examines at how motivation and self-efficacy affected an alcohol prevention intervention among students in Zacatecas, Mexico. We tested whether motivation mediated the relationship between alcohol use risk and the success of the intervention, and whether self-efficacy moderated this relationship.

Methods: We analyzed data from 5,955 middle school students using correlation and mediation analysis to assess the indirect effects of motivation. We then conducted a moderated mediation analysis to see if the indirect effect differed between students with low and high self-efficacy.

Results: Students with higher motivation had lower risk for alcohol use and were more successful in achieving the intervention outcome. Motivation was a stronger mediator in the high self-efficacy group compared to the low self-efficacy group.

Conclusions: This study deepened our understanding of the mechanisms of change for the program and emphasized the importance of personal self-efficacy in targeting motivation. It also highlights the need for testing mechanisms in Latin America.

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Prevention; motivational interviewing; brief intervention; alcohol; moderated mediation; motivation; self-efficacy; Latin America; mechanisms; theory; adolescents; IBEM

Data from school surveys of youth indicate that alcohol is the most used drug in adolescents (World Health Organization, 2018). At this stage of development, heavy alcohol use has neurological (Medina et al., 2007) and social repercussions (Brown et al., 2008), and is linked to a predisposition for future risk behaviors such as the use of other substances, unsafe sexual behaviors, and aggression (Poudel & Gautam, 2017). Given this evidence, prevention of youth alcohol use becomes crucial, especially in Latin American countries where alcohol use begins typically around 12 to 13 years of age (Comisión Interamericana para el Control del Abuso de Drogas, 2019), a period when adolescents are most vulnerable to the adverse effects of using alcohol.

Several studies of adapted evidence-based prevention programs have been conducted in Latin America (Anderson et al., 2017; Gaete et al., 2022; Mejía-Trujillo et al., 2015; Orpinas et al., 2014). As a result, multiple trials have shown promising results in diminishing risk behaviors and increasing protection towards healthy adolescent development. However, theories underlying programs have been tested predominantly through studies from high-income countries (i.e., Catalano et al., 2021) without emphasis on their generalizability. Additionally, evaluations from lower- and middle-income countries have concentrated on program outcomes without regard for a program's theoretical components,

resulting in an insufficient understanding of how and for whom a program works. This is a fundamental problem in prevention science and has been framed as a lack of *scientific equity* for populations that are often underrepresented in studies of preventive interventions (Perrino et al., 2015).

In line with the need to examine the theoretical components of interventions in Latin America, this study aimed to evaluate (a) the role of *motivation* as a mediator and (b) the role *self-efficacy* as a moderator of the indirect effect through motivation. We used data from a large implementation of a school-based preventive intervention based on motivational interviewing adapted to Mexican youth.

Brief intervention motivational interviewing

The Brief Intervention Motivational Interviewing program (*Intervención Breve basada en Entrevista Motivacional* in Spanish; i.e., IBEM, which we will use through this article to refer to the program) was developed in Colombia (Pinto & Toro, 2016) to delay the age of onset of alcohol use among Latinx students who have not started consumption, decrease frequency and quantity of alcohol use among those who already have started using alcohol, and prevent progression to other illicit drug use at later ages. IBEM consists of two sessions: a first session of approximately 15 minutes where

the students are screened for alcohol use risk level, and goals are developed to address the student's level of risk; and a second follow-up session (at least 3 months later) where the student's goal achievement is assessed and adjusted, if needed. The first session comprised three parts: First, screening of alcohol risk level used both a quantitative screening instrument and qualitative assessment by trained facilitators. Second, delivery of adaptive educational and motivational intervention components was used by trained facilitators. That is, intervention component dosage was titrated based on the student's risk classification. Students at higher risk were referred to receive specialized intervention. In contrast, students at low risk received educational information about alcohol. The risk level was communicated to students and used in the follow-up to compare students' results after the evaluation done in the first session. Third, the facilitator encouraged the students to set up a specific goal related to their current alcohol use risk level. Additional sessions may be included, usually at 3-month intervals, to reinforce a student's goals and motivation. During these additional sessions, facilitators evaluate the students' progress toward their goals, explore barriers to accomplish their purpose, and renew commitment to diminish alcohol intake or maintaining without using alcohol.

IBEM has been used in three Latin American countries: Colombia, since 2013, with more than 10,000 students; Mexico, since 2019, with a similar number of students; and Brazil, since 2019, with approximately 1,000 students. One quasi-experimental trial and one experimental trial of IBEM efficacy have been conducted, both in Colombia. The first trial showed the need to decrease the time between sessions (no more than 3 months between each one). Results of the trial indicated a 12% decrease in past-30-day alcohol use measured after three to seven months after the intervention (Reyes-Rodríguez et al., 2018). The second study (Reyes-Rodríguez et al., 2019), which randomly assigned classes of students to control and experimental groups, showed that IBEM was efficacious in reducing quantity and frequency of alcohol consumption in adolescents under 16 years of age (11% decrease) three months after the intervention. This study also demonstrated reductions in levels of risk for alcohol use among the participants between the first and second sessions.

As part of a larger body of motivational interviewing-based interventions, IBEM relies on two theoretical foundations: *motivation* (Miller & Rollnick, 2012) and *self-efficacy* (Bandura, 1977). In IBEM, motivation is considered a fundamental mechanism for change being related usually (but not exclusively) to the perception of discomfort associated with basic needs. Motivation for change occurs when people know that something is not suitable or is dangerous for them. In this regard, self-regulation theory (Miller & Brown, 1991) suggests that a homeostatic regulatory mechanism allows for identifying discrepancies between a person's current situation and achieving a personal goal. Motivation for change is represented in three constructs: *readiness*, *willingness*, and *ableness*. Readiness refers to preparation for change, willingness refers to the extent to which the person wants to change, and ableness indicates a person's perceived capacity to make the change happen (Miller & Rollnick, 2012).

Another critical concept in IBEM is self-efficacy (Bandura, 1977), which focuses on an individual's perceptions regarding their ability to act; it refers to personal judgments and beliefs regarding the ability to control certain situations. This perception influences the motivation to provoke a change; likewise, expectations of self-efficacy largely determine the choice of activities, effort, persistence, and thought patterns and emotional responses derived (López-Torrecillas, Del, et al., 2002). In fact, Bandura (1977) stated that high perceived self-efficacy and a repertoire of coping skills lead to successful coping with difficult situations; that is, a person with low expectation of self-efficacy is more susceptible to abandoning attempts at initiating or maintaining the behavior in the event of a failure in its execution. Indeed, when perceived self-efficacy is low in the face of adverse situations, it can trigger anxiety and depression (López-Torrecillas, Salvador, et al., 2002).

IBEM combines motivation and self-efficacy to help students change their behaviors regarding their alcohol use. During program implementation, facilitators work with students' personal beliefs regarding alcohol use to shift their behavior toward healthy habits. In addition, facilitators determine predictors of change and focus the intervention on these predictors (Prochaska et al., 1992). For example, facilitators stimulate cognitive processes like consciousness-raising, environmental reevaluation, self-revaluation; and behavioral processes like helping relationships. As a result, both motivation and self-efficacy are assessed and enhanced by IBEM.

In line with the theoretical foundation of the IBEM program, this study hypothesized that students' motivation for behavioral change mediates the relation between alcohol risk and students' goal achievement regarding alcohol use. Also, we expected that self-efficacy moderated the effect of motivation for change. We hypothesized that high self-efficacy would enhance the impact of motivation to achieve students' alcohol use goals.

Methods

Participants

Participants consisted of 5,955 seventh-, eighth-, and ninth-grade students from 29 schools in Zacatecas, Mexico, who completed the IBEM program from September 2019 through March 2020. The number of students who received the first session of IBEM was 9,824. However, because of COVID-19, only 6,174 (62.8%) students completed the program's two sessions. Of these, 5,955 (60.6%) students had matching identification numbers for both the first and second sessions of the program. Students' ages were between 11 and 16 years ($M = 12.8$ years, $SD = 0.94$); 45.27% of students were male and 54.73% were female.

Measures

Alcohol risk assessment

In the first session of IBEM, students were classified in an alcohol-related level of risk based on their alcohol use drinking patterns. Risk-level classification depended on students'

responses to the Colombian Spanish-validated version of the CRAFFT instrument (Pérez-Gómez & Díaz-Granados, 2011) and their use of alcohol. The CRAFFT instrument consists of a set of six questions about risky adolescent behavior in the last year: (a) *Have you ridden a car driven by someone (including yourself) who was under the influence of alcohol or drugs?* (b) *Have you used alcohol or drugs to relax?* (c) *Have you used alcohol/drugs alone?* (d) *Have you forgotten things you did while you were under the influence of alcohol or drugs?* (e) *Have your family or friends told you that you should drink less or use less drugs?* (f) *Have you had trouble under the influence of alcohol or other drugs?* (CRAFFT, 2022; Knight et al., 2003). In IBEM, students who respond affirmatively to five or more of these questions are classified at *severe risk*; students who respond affirmatively to three to four are classified at *high risk*; students with zero to three items but have used alcohol more than once in the last 3 months are considered at *moderate risk*; finally, *low risk* is assigned when students have marked zero to one item, and their alcohol use is only on one occasion.

Motivation during the intervention session

In the first IBEM session, after the students had received the educational information based on their risk level, facilitators asked *How important it is for you to change your alcohol use?* Students responded using a 1 to 10 visual analog scale (0 = *Not at all*, 10 = *Fully motivated*). This question was presented to students on a separate form designed to be used during the intervention.

Self-efficacy

In the first IBEM session, students were asked about their self-efficacy in achieving the proposed goals. Facilitators asked the students *How confident are you that you can achieve the change you propose?* Students responded using visual analog scale (0 = *not at all*, 10 = *100% sure*). This question also was presented to the student in a separate sheet designed to be used during the intervention.

Goal achievement post-intervention (dependent variable)

Intervention goals for students were related to abstaining or diminishing alcohol consumption, diminishing the frequency of alcohol use, and avoiding social circumstances related to alcohol consumption. Considering that this sample consisted of adolescents from lower- to middle-economic background in Mexico and that it is not common for these students to be driving while unattended, driving under the influence (DUI) of alcohol was not considered a goal of the intervention.

Student goal achievement was measured during the second session of IBEM when facilitators asked the students about their efforts to achieve the goals stated in the first intervention session. Facilitators ask the question *How close were you in meeting your goals?* Following the intervention protocol, students responded to this question using a visual analog scale in which students selected a number from 0 to 10 (0 = *Goal not at all achieved*, 10 = *Goal fully achieved*).

Procedure

IBEM was delivered in Zacatecas as part of a larger place-based intervention that sought to reduce harms related to alcohol use and misuse (Brown et al., 2022). As part of this initiative, 29 schools in the geographic areas of the cities of Zacatecas and Guadalupe were contacted through the local Department of Education and invited to participate in the implementation of IBEM. To reach the students, school staff, in conjunction with the IBEM implementation team, contacted parents and asked them to participate in the program. All the parents of the students from Grades 6 to 9 were invited to participate. After parental approval, the student had the opportunity to accept or decline their participation in the study. The implementation of IBEM and the use of data were approved by the Institutional Review Board of the Zacatecas "Luz Gonzales Cosío" General Hospital (Reg: CONBIOETICA-32-CEI-001.20180807). Signed informed consent and assent were obtained from both parents and students in the study. The timeline and implementation process of IBEM in Zacatecas is presented in Figure 1.

Missing data

We examined differences in alcohol risk, self-efficacy, gender, and age between students who received a follow-up wave of the intervention and those who did not receive the follow-up due to COVID-19 lockdown (see Table 1). Significant chi-square differences between the two groups were found for alcohol risk, self-efficacy, gender, and age. Effect sizes associated with each test were small (Chen, Cohen, & Chen, 2010), except for severe alcohol risk which was medium (Odds Ratio = 1.79).

Statistical analysis

Descriptive analysis of the data showed motivation and goal achievement to be highly skewed, with 79.38% and 55.01% of students in the highest categories (i.e., *Fully motivated* and *Fully achieved*, respectively). Therefore, we categorized

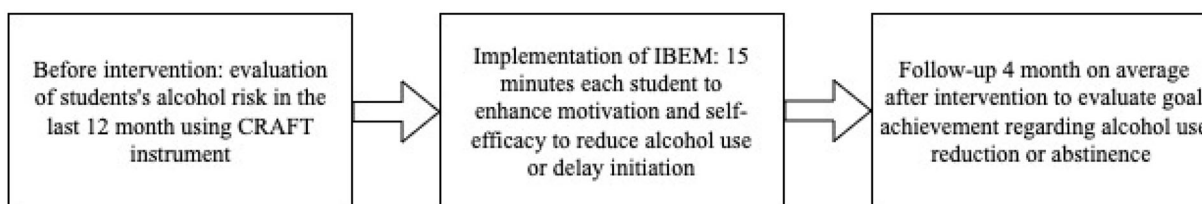


Figure 1. Indicates the timeline and implementation process of IBEM in Zacatecas.

Table 1. Missing data.

Characteristic	Covid-19 N = 3,650 ^a	Analysis N = 5,955 ^a	Effect size ^b	p Value ^c
Alcohol risk				<.001
Low	2,516 (69%)	4,474 (75%)	OR = 0.73 (0.67–0.8)	
Medium	433 (12%)	643 (11%)	OR= 1.11 (0.98–1.26)	
High	423 (12%)	571 (9.6%)	OR = 1.24 (1.08–1.41)	
Severe	276 (7.6%)	260 (4.4%)	OR= 1.79	
Self-efficacy				<.01
Low	257 (7.0%)	350 (5.9%)	OR= 1.21 (1.03–1.43)	
Medium	1,007 (28%)	1,541 (26%)	OR= 1.09 (0.99–1.20)	
High	2,386 (65%)	4,060 (68%)	OR= 0.88 (0.81–0.96)	
Motivation				>.05
Low	239 (6.5%)	363 (6.1%)	OR = 1.08 (0.91–1.28)	
Medium	551 (15%)	862 (14%)	OR = 1.05 (0.94–1.18)	
High	2,859 (78%)	4,727 (79%)	OR = 0.94 (0.85–1.04)	
Gender (Male)	1,805 (50%)	2,686 (45%)	OR = 1.10 (1.02–1.18)	<.001
Age	13.1 (0.935)	12.8 (0.937)	.320 ^d	<.001 ^e

^aN Frequency and (Percentage of students in each category).

^bOdds Ratio. 95% CI between parentheses.

^cPearson's Chi-squared tests.

^dCohen's d.

^eT-test.

Table 2. Descriptive statistics for IBEM measures.

	Alcohol risk		Motivation		Goal achievement		Self-efficacy	
	n	%	n	%	n	%	n	%
Low	4,474	75.13	363	6.10	1,023	17.18	1,891	31.75
Moderate	643	10.80	862	14.48	1,656	27.81		
High	571	9.59	4,727	79.38	3,276	55.01	4,060	68.18
Severe	260	4.37	na	na	na	na	na	na
Missing	7	0.12	3	0.05			4	0.07

na: not applicable (Motivation, Goal achievement, and Self-efficacy do not have a *severe* category in their scoring algorithm).

motivation and goal achievement into low, medium, and high levels following the categories used on IBEM materials: 10 = *high*, 8 to 9 = *medium*, and 0 to 7 = *low* (Pinto & Toro, 2016). Additionally, to facilitate the interpretation of self-efficacy's role as a moderator, we categorized the students' self-efficacy responses into two groups: students with *high* self-efficacy (scoring a 10 on the self-efficacy scale) versus students with *low* self-efficacy (scoring 9 or below on the scale). Table 2 shows the levels of the measures included in the statistical analysis.

Data analysis proceeded in three steps. First, we examined zero-order polychoric correlations among Motivation, Goal Achievement, and Alcohol Risk for statistical significance using $\alpha = .05$ Type I error rate. Second, following Baron & Kenny (1986), we tested Motivation as a mediator in the relationship between Alcohol Risk and Goal Achievement, with bootstrapped standard errors as estimated using weighted least squares means and variances (WLSMV) estimations via *Mplus* v8.0 (Muthén & Muthén, 2009). Third, we examined moderated-mediation as a multigroup (low vs. high self-efficacy) path

analysis (Wang & Wang, 2019) of the mediator model where a model with path coefficients constrained to equality between low and high self-efficacy groups was tested against a model with coefficients estimated freely between the two groups using the DIFFTEST option.

Results

Polychoric correlations

We observed significant positive associations between goal achievement and motivation ($r = .225$ $SE = 0.020$) and goal achievement and self-efficacy ($r = .262$ $SE = 0.019$). Also, we observed a significant negative association between alcohol risk and goal achievement ($r = -.222$, $SE = 0.014$), a significant negative association between alcohol risk and motivation ($r = -.195$, $SE = 0.016$), and a significant negative association between alcohol risk and self-efficacy ($r = -.175$, $SE = 0.016$). All these correlations were small, using Cohen's

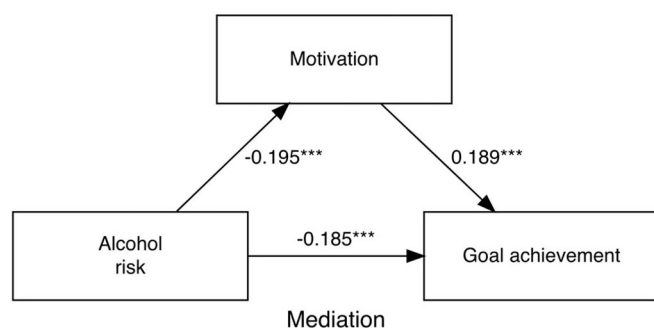


Figure 2. Mediation analysis. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

(1988) benchmarks. The highest correlation was between motivation and self-efficacy ($r = .410$, $SE = 0.020$).

Mediation analysis

Results of the mediation analysis, shown in Figure 2, indicated that the negative relationship between alcohol risk level and student goal achievement remained statistically significant after including motivation as a mediator between the two variables ($\beta = -0.185$, $SE = 0.014$). This result suggested that students at higher levels of risk tended to present lower alcohol use reduction. Regarding the mediating effect of motivation, alcohol risk was associated significantly and negatively with motivation ($\beta = -0.195$, $SE = 0.016$), and motivation was associated significantly and positively with goal achievement ($\beta = 0.189$, $SE = 0.020$), with a corresponding significant indirect effect ($\beta = -0.037$, $SE = 0.005$). Results indicated that the inclusion of motivation as a mediator accounted for a 16.7% of the effect of alcohol risk on goal achievement (indirect effect divided by the total effect).

Moderated-mediation analysis

Examination of the indirect effect of motivation as a mediator of the relationship between alcohol risk and goal achievement indicated differential mediation between low- and high-efficacy groups, $\Delta\chi^2(3) = 12.605$, $p < .01$, with the effect of motivation as a mediator being greater in the high self-efficacy than the low self-efficacy group (*low self-efficacy group*: $\beta = -0.011$, $p = .051$, *high self-efficacy group*: $\beta = -0.035$, $p < .001$). As shown in Figures 3(A,B), the difference between the two groups was stronger in the path between motivation and goal achievement (*low self-efficacy group*: $\beta = 0.065$; $p = .041$, *high self-efficacy group*: $\beta = 0.202$; $p < .001$).

Discussion

The scientific evaluation of prevention programs has shown that individually tailored risk and protective factors effectively diminish problematic behaviors (Sloboda et al., 2012). However, many programs still require research to show *how* they work, especially in lower- and middle-income Latin American countries where program theories are used extensively but not tested widely. In this study, we evaluated the

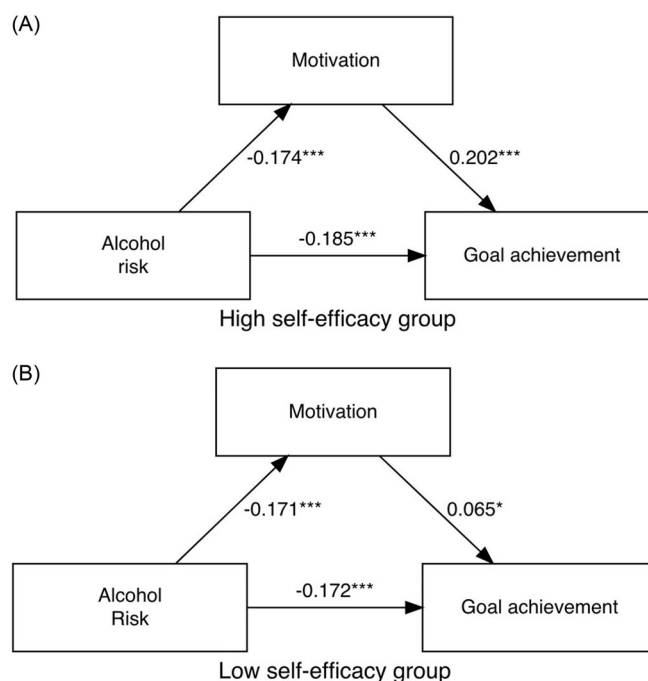


Figure 3. (A) Moderated mediation high self-efficacy group. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (B) Moderated mediation low self-efficacy group. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

role of motivation and self-efficacy, core components of the IBEM program theory, in students' success in reducing their alcohol use during its implementation in Zacatecas, Mexico.

Our findings support the theory that student motivation for behavioral change in IBEM is an important mechanism in the pathway to achieve program effects. The bridge between alcohol risk and intervention goal achievement was stronger in students with high self-efficacy than in students with low levels of self-efficacy, supporting our hypothesized role of self-efficacy as another important element of youth alcohol prevention. This infers that if IBEM could successfully increase self-efficacy, then the expected reduction in alcohol use accounted for by the motivation mechanism would be greater.

These findings illustrate the complexity of interrelationships in adolescents' drinking behavior; specifically, the role of motivation and self-efficacy as links in the causal process between risk for alcohol use and consequent achievement of behavioral goals of alcohol reduction in youth (i.e., Bandura, 1977; Miller & Rollnick, 2012; Ryan & Deci, 2000). This evidence supports a programmatic decision to intervene in these psychological constructs to guide changes in adolescent drinking behaviors. Therefore, our findings are informative for adjusting IBEM program components.

Additionally, results from this study support the need to explicate the theory of change of adaptive components in other preventive interventions. Adaptive components of preventive interventions (Collins, 2018) have been gaining popularity given the possibilities of incorporating technology and rapid data analysis in intervention delivery. However, adaptive elements are centered commonly on program implementation (i.e., dosage) but not on delivering different program components based on real-time risk assessment.

Finally, understanding how adolescents react to different intervention components is a fundamental step in the development of flexible interventions and for understanding why some programs are more beneficial for specific populations. Unpacking the psychological mechanisms of preventive intervention provides evidence for the functioning of the programs and the understanding of adolescent decisions about alcohol use. Consequently, understanding psychological processes addresses the scientific inequity that limits the advancement of new theories and approaches to develop preventive interventions in Latin American countries.

Limitations

Limitations of this study exist in the substantial rate of missing data in the follow-up IBEM session, which was caused by COVID-19 restrictions in Mexico. Because of a national lockdown that occurred between the first and second sessions of the program, we were able to analyze data from only 61% of the total students who received the IBEM intervention. However, our examination of missingness, as related to key variables used in the study, demonstrated that the magnitude of the differences between the two groups was generally small. Moreover, we note that the source of missingness (i.e., the COVID-19 pandemic) was exogenous to the study and considered to not pose a significant threat to the validity of the findings. Another limitation is related to the measures of motivation and self-efficacy we used, which were self-reported and only two items to evaluate motivation and self-efficacy. As such, the reported data may have been subject to social desirability bias and the construct reliability of the measures may have been limited. As part of this brief intervention, the study was designed to not take more than 15 minutes with each student, which curtailed our ability to include additional measures in study assessments. Finally, this study did not consider the role of other components of Motivational Interviewing as developing discrepancies of evoking change talk. Most research is needed to evaluate the role of multiple components interacting during the implementation of the intervention.

Conclusions

The current study shows that motivation without self-efficacy is insufficient for student goal achievement. According to our findings, motivation is a significant predictor of a student's success in achieving the goal they set for themselves in the intervention. However, the effect of motivation weakens as self-efficacy diminishes, and, consequently, raises a question about the best approach to direct students' goals when self-efficacy is low. The implication of these findings is that to increase intervention efficacy, program deliverers should incorporate efforts to identify and address self-efficacy in the motivational interview process, especially while working with students at higher levels of risk. Together, self-efficacy and motivation explain a significant amount of the change in goal achievement of the intervention.

Although the use of evidence-based intervention in Latin America has been rising, there still is a lack of studies linking efficacy evaluations and program theory testing in a region with high diversity, cultures, and contexts that challenge program success. A lack of understating of program theory increases the likelihood of misconceptions about how interventions achieve results in target populations; therefore, programs are recommended or implemented for wrong reasons, which decreases the probability of success. Also, poor articulation of program theory reduces the ability to have a greater public health impact, maintaining operation of programs that are low or partially effective for some populations. These two problems derive from scientific inequity and have substantial implications for how good programs are sustained after demonstrating that they work.

Disclosure statement

The first author, Francisco Cardozo, declares not to have been influenced or advised to interfere in the study's validity by any source. All his contributions are covered by a scholarship stipend (approx. 75% Colombian government, 25% the University of Miami) and 100% tuition from the University of Miami. The second author, Dr. Eric C. Brown, is a former member of the AB InBev Foundation Scientific Partners Task Force and was a consultant for the Foundation on underage drinking prevention in 2018. The third and fourth authors, Juliana Mejía-Trujillo and Dr. Augusto Pérez-Gómez, declare that IBEM was applied in the City Pilot Project, which involves cities in six countries: China, South Africa, Belgium, the United States, Mexico, and Brazil, with funding from the ABINBEV Foundation. Nuevos Rumbos was completely autonomous in the application of IBEM as well as in the administration of its data. No member of the ABINBEV Foundation were involved with any of the project's implementation phases, neither in its planning nor in the collection or analysis of data or the writing of the manuscript.

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References

- Anderson, P., O'Donnell, A., Kaner, E., Gual, A., Schulte, B., Pérez Gómez, A., ... Rehm, J. (2017). Scaling-up primary health care-based prevention and management of alcohol use disorder at the municipal level in middle-income countries in Latin America: Background and pre-protocol for a three-country quasi-experimental study. *F1000Research*, 6, 311. <https://doi.org/10.12688/f1000research.11173.2>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215. <https://doi.org/10.1037/0033-295x.84.2.191>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>

- Brown, S. A., McGue, M., Maggs, J., Schulenberg, J., Hingson, R., Swartzwelder, S., ... Murphy, S. (2008). A developmental perspective on alcohol and youths 16 to 20 years of age. *Pediatrics*, 121(Suppl 4), S290–S310. <https://doi.org/10.1542/peds.2007-2243D>
- Brown, E. C., Montero-Zamora, P. A., Garcia, J. O., Aviles, K., Beaulieu, D., & Haggerty, K. P. (2022). Development and Implementation of Businesses That Care in Zacatecas, Mexico. *Prevention Science: The Official Journal of the Society for Prevention Research*, 23(4), 663–673. <https://doi.org/10.1007/s11121-021-01312-w>
- Catalano, R. F., Hawkins, J. D., Kosterman, R., Bailey, J. A., Oesterle, S., Cambron, C., & Farrington, D. P. (2021). Applying the social development model in middle childhood to promote healthy development: Effects from primary school through the 30s and across generations. *Journal of Developmental and Life-Course Criminology*, 7(1), 66–86. <https://doi.org/10.1007/s40865-020-00152-6>
- Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics—Simulation and Computation*, 39(4), 860–864. <https://doi.org/10.1080/03610911003650383>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.). Lawrence Erlbaum.
- Collins, L. M. (2018). Introduction to adaptive interventions. In L. M. Collins (Ed.), *Optimization of behavioral, biobehavioral, and biomedical interventions: The multiphase optimization strategy (MOST)*. (pp. 267–287). Springer.
- Comisión Interamericana para el Control del Abuso de Drogas (2019). *Informe sobre el consumo de drogas en las américas 2019*. (pp. 0–315) Comisión Interamericana para el Control del Abuso de Drogas.
- CRAFT (2022). Retrieved from <https://craft.org/>
- Gaete, J., Ramirez, S., Gana, S., Valenzuela, D., & Araya, R. (2022). The Unplugged program in Chile ("Yo Se Lo Que Quiero") for substance use prevention among early adolescents: Study protocol for a randomized controlled trial. *Trials*, 23(1), 76. <https://doi.org/10.1186/s13063-021-05904-3>
- Knight, J. R., Sherritt, L., Harris, S. K., Gates, E. C., & Chang, G. (2003). Validity of brief alcohol screening tests among adolescents: A comparison of the AUDIT, POSIT, CAGE, and CRAFT. *Alcoholism, Clinical and Experimental Research*, 27(1), 67–73. <https://doi.org/10.1111/j.1530-0277.2003.tb02723.x>
- López-Torrecillas, F., Del, M., Salvador, M., Ramírez-Uclés, I., & Verdejo, A. (2002). El papel de la autoeficacia en el tratamiento de las drogodependencias. *Psicopatología Clínica Legal y Forense*, 2, 21–31.
- López-Torrecillas, F., Salvador, M. d M., & Cobo, A. V. y P. (2002). Autoeficacia Y Consumo De Drogas: Una Revisión. *Psicopatología Clínica, Legal y Forense*, 2, 33–51.
- Medina, K. L., Schweinsburg, A. D., Cohen-Zion, M., Nagel, B. J., & Tapert, S. F. (2007). Effects of alcohol and combined marijuana and alcohol use during adolescence on hippocampal volume and asymmetry. *Neurotoxicology and Teratology*, 29(1), 141–152. <https://doi.org/10.1016/j.ntt.2006.10.010>
- Mejía-Trujillo, J., Pérez-Gómez, A., & Reyes-Rodríguez, M. F. (2015). Implementation and adaptation in Colombia of the Communities That Care. *Adicciones*, 27(4), 253–264. <https://doi.org/10.20882/adicciones.750>
- Miller, W. R., & Brown, J. (1991). Self-regulation as a conceptual basis for the prevention and treatment of addictive behaviors. In N. Heather, W. R. Miller & J. Greeley (Eds.), *Self-control and the addictive behaviours*. (pp. 3–79): Maxwell Macmillan.
- Miller, W. R., & Rollnick, S. (2012). *Motivational Interviewing: Helping people change*. (3rd ed.). Guilford Press.
- Muthén, B., & Muthén, L. K. (2009). *Statistical analysis with latent variables*. (4th ed.). Wiley.
- Orpinas, P., Ambrose, A., Maddaleno, M., Vulcanovic, L., Mejia, M., Butrón, B., Gutierrez, G. S., & Soriano, I. (2014). Lessons learned in evaluating the Familias Fuertes program in three countries in Latin America. *Revista Panamericana de Salud Publica—Pan American Journal of Public Health*, 36(6), 383–390.
- Pérez-Gómez, A., & Díaz-Granados, O. S. (2011). The CRAFT/CARLOS as an instrument for the early detection of alcohol and other psychoactive substances use: An adaptation to Spanish. *Revista Colombiana de Psicología*, 20, 265–274. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0121-54692011000200009&lng=pt&nrm=iso&tlng=es http://www.scielo.org.co/scielo.php?script=sci_abstract&pid=S0121-54692011000200009&lng=pt&nrm=iso&tlng=es
- Perrino, T., Beardslee, W., Bernal, G., Brincks, A., Cruden, G., Howe, G., Murry, V., Pantin, H., Prado, G., Sandler, I., & Brown, C. H. (2015). Toward scientific equity for the prevention of depression and depressive symptoms in vulnerable youth. *Prevention Science : The Official Journal of the Society for Prevention Research*, 16(5), 642–651. <https://doi.org/10.1007/s11121-014-0518-7>
- Pinto, C., & Toro, J. (2016). *Manual de Intervención Breve Basada en Entrevista Motivacional IBEM*. : Corporación Nuevos Rumbos.
- Poudel, A., & Gautam, S. (2017). Age of onset of substance use and psychosocial problems among individuals with substance use disorders. *BMC Psychiatry*, 17(1), 10. <https://doi.org/10.1186/s12888-016-1191-0>
- Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *The American Psychologist*, 47(9), 1102–1114. <https://doi.org/10.1037/0003-066x.47.9.1102>
- Reyes-Rodríguez, M. F., Mejía-Trujillo, J., Pérez-Gómez, A., Cardozo, F., & Pinto, C. (2018). Effectiveness of a brief intervention based on motivational interviewing in Colombian adolescents. *Psicología: Teoría e Pesquisa*, 33, 1–7. <https://doi.org/10.1590/0102.3772e33421>
- Reyes-Rodríguez, M. F., Pinto-Gómez, J. C., Cardozo-Macías, F., Pérez-Gómez, A., Mejía-Trujillo, J., & Toro-Bermúdez, J. (2019). Evaluation of the prevention program "Brief Intervention Based on Motivational Interviewing" in Colombian adolescents. *International Journal of Mental Health and Addiction*, 18, 471–481. <https://doi.org/10.1007/s11469-019-0057-3>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Sloboda, Z., Glantz, M. D., & Tarter, R. E. (2012). Revisiting the concepts of risk and protective factors for understanding the etiology and development of substance use and substance use disorders: Implications for prevention. *Substance Use & Misuse*, 47(8-9), 944–962. <https://doi.org/10.3109/10826084.2012.663280>
- Wang, J., & Wang, X. (2019). *Structural equation modeling: Applications using Mplus*. : John Wiley & Sons.
- World Health Organization (2018). *Global status report on alcohol and health 2018*. (p. 478). <https://apps.who.int/iris/handle/10665/274603>