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Moderators of Brief Motivation-Enhancing Treatments for Alcohol-Positive Adolescents Presenting to the Emergency Department

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Abstract

A 2011 randomized controlled trial compared the effectiveness of two brief motivation-enhancing therapy (MET) models among alcohol-positive adolescents in an urban emergency department: adolescent MET-only versus MET + Family Check-Up (FCU), a parent MET model. Results indicated that among the 97 adolescents completing the 3-month assessment, both conditions were associated with reduced drinking and MET+FCU was associated with lower rates of high volume drinking than adolescent MET-only. The goal of this study was to identify predictors and moderators of high volume drinking in the original trial. Seven candidate variables were evaluated as moderators across three domains: demographic characteristics, psychological factors, and socio-contextual factors. Analyses of covariance models identified one significant predictor and one significant moderator of outcome. Older adolescents had significantly worse drinking outcomes than younger adolescents regardless of MET condition. Adolescents whose parents screened positive for problematic alcohol use at baseline had significantly worse drinking outcomes in the MET+FCU condition than the MET-only condition. Results indicate that alcohol-positive adolescents presenting to the emergency department may respond better to MET models if they are under the age of 16. Involving parents who have problematic alcohol use in a parent-focused MET may have negative effects on adolescent high volume drinking.

Keywords

adolescent; motivation-enhancement therapy; moderator; emergency department

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1. Introduction

Integrating alcohol and other drug use interventions for adolescents into traditional medical settings has been recognized as an area of public health importance (Addiction Technology Transfer Center Workgroup, 2015). The emergency department (ED) visit offers a unique opportunity to screen adolescents for alcohol problems and offer brief intervention, due to extremely high rates of alcohol-related problems in this setting (D'Onofrio et al., 2012; McDonald, Wang & Camargo, 2004).

Two recent systematic reviews by Tanner-Smith and Lipsey (2015) and Mitchell and colleagues (2013) identified a total of seven randomized controlled trials that have evaluated brief interventions incorporating motivational enhancement therapy (MET) principles among adolescents under the age of 18 in the ED (Bernstein et al., 2009; Bernstein et al., 2010; Cunningham et al., 2012; Johnston et al., 2002; Spirito et al., 2004; Spirito et al., 2011; Walton et al., 2010). Since these reviews were published, another randomized controlled trial by Cunningham and colleagues (2015) tested three conditions among adolescents age 14 to 20 presenting to the ED: MET delivered by a therapist, MET delivered by computer, and brief assessment.

Of the eight randomized clinical trials that included participants under the age of 18, seven focused specifically on alcohol use outcomes, five compared MET to brief assessment, and three compared MET to active comparison conditions. The pattern of results across these studies generally indicated that all of the conditions – MET, brief assessment, and active control - were associated with significant reductions in drinking frequency and drinking-related consequences. Only one of the five studies comparing MET and brief assessment (Spirito et al., 2004) found any evidence indicating that the MET condition was associated with superior drinking outcomes; over the 12 month follow-up period, MET was associated with lower rates of overall drinking days and high volume drinking days (i.e., days of 4 drinks for females and 5 drinks for males) than brief assessment, but only among the subgroup of adolescents who screened positive for problematic alcohol use at baseline.

In an attempt to enhance the performance of MET in the ED setting, Spirito and colleagues conducted a subsequent 2011 trial examining whether MET delivery could be improved by the addition of the Family Check-Up (FCU; Dishion & Kavanagh, 2003). The FCU is an assessment and feedback intervention, consistent with an MET approach, designed to enhance parental recognition of youth risk behaviors and increase parental motivation to reduce these behaviors and associated risk factors (Dishion et al., 2002). It consists of a family assessment task followed by a feedback session with the parent. The FCU was developed to target specific parent risk and protective factors linked to adolescent alcohol and drug use such as parental substance use, parental monitoring of peer substance involvement, and the nature of the parent-teen relationship (Dishion et al., 2002; Dishion, Nelson, & Kavanagh, 2003).

Using a two-group design with three follow-up points (3-, 6-, and 12-months), the Spirito et al. (2011) trial randomly assigned 125 adolescents aged 13 to 17 who presented to the ED for an alcohol-related event to either adolescent MET only or MET+FCU. Consistent with

other trials testing two active conditions, results indicated that both conditions were associated with reductions in drinking across all three follow up points, with the strongest effects at the 3-month follow-up. At 3 months, there was a main effect favoring MET+FCU in the proportion of adolescents reporting any high-volume drinking days over the past 90 days, with rates of 14.6% in MET+FCU versus 32.1% in MET only ($p < .05$). At both 6 and 12 months, rates of adolescents reporting high volume drinking over the past 90 days were significantly lower than at baseline but there was no significant difference between the two conditions (6 months: 27.0% MET+FCU vs. 43.6% MET; 12-months: 48.6% MET+FCU vs. 58% MET). These findings provided preliminary indication of the acute benefits of adding a parent FCU to adolescent MET.

Detecting treatment differences at the group level represents only the first step in understanding the effects of the two MET models among adolescents presenting to the ED. A critically important remaining question is which treatment approach (adolescent MET only or MET+FCU) is optimal for which adolescent presenting to the ED. Addressing this question requires the identification of moderator variables, defined as variables that are present before treatment, are independent of treatment assignment, and have an interactive effect with treatment condition (see Kraemer et al, 2002; Wallace, Frank, & Kraemer, 2013). In contrast to predictor variables, which indicate which teens are most likely to respond to any treatment, moderator variables indicate which adolescents are most likely to benefit from a specific treatment approach and have prescriptive value (see Baron & Kenny, 1986). Identifying which ED patients are most likely to benefit from a specific intervention can support empirically informed triaging decisions, which in turn promotes more judicious allocation of services in this resource constrained environment.

1.1. Selection of Candidate Variables

The purpose of this article was to conduct analyses of predictors and moderators of 3-month treatment outcome among the 97 alcohol-abusing adolescents in the Spirito et al. (2011) study who received one of the two MET models and were included in the acute outcome analysis. We focus on predictors and moderators of outcome at the 3-month assessment because: a) both MET conditions had their maximum effects at 3-months; b) the 3-month outcome was the only timepoint at which treatment differences were found; and c) other randomized clinical trials in the ED have similarly found that brief MET interventions have their maximum effects at 3-months.

Identifying moderators of treatment outcome requires at least two treatment conditions and larger sample sizes than are often recruited for efficacy studies (see Kraemer et al., 2002). Consequently, prior research on moderators of adolescent substance use treatment outcome is relatively scant (see Strada, Donohue, Lefforge, 2006). A 2011 review by Becker, Curry, and Yang identified 14 variables that had been shown to significantly predict or moderate adolescent substance use post-treatment. These variables were organized into four broad categories: adolescent biological / demographic status, adolescent psychological factors, family factors, and social network factors. A more recent review by Hernandez and colleagues (2015) grouped potential moderators into three domains based on developmental theory: biological / demographic factors, psychological factors, and socio-contextual factors.

The biological / demographic and psychological domains were identical to those discussed by Becker and colleagues (2011), whereas the socio-contextual domain encompassed both family and social network factors. We used the three domains identified in the more recent integrative review by Hernandez et al. (2015) to guide the current analysis of predictors and moderators.

To avoid spurious results that capitalize on chance, we limited our testing to one candidate variable per 10–15 subjects for a total of seven putative moderators (see Curry et al., 2006). We selected at least two candidate variables from each of the three categories, based on those measures that were available in the initial dataset. For the demographic category, we selected three variables: sex, age, and Hispanic ethnicity. Sex and age were selected because they have been found to differentially influence adolescents' response to treatment in more than one trial (e.g., Henggeler, Pickrel, & Brondino, 1999; Kaminer, Bursleson, & Goldberger, 2002). Hispanic ethnicity was also included because it is a frequently examined moderator that has mixed support. For instance, Clair and colleagues (2013) found that Hispanic adolescents responded better to an MET model than relaxation therapy, while other studies and literature reviews (e.g., Becker et al., 2012; Strada et al., 2006) have failed to find evidence that race/ethnicity moderated adolescent treatment outcome. For psychological factors, we focused on severity of alcohol use and depressed mood. Baseline alcohol use severity has consistently been found to be a significant predictor of treatment outcome (Coatsworth et al., 2001; Tamm et al., 2013), and was found to moderate treatment outcome in the Spirito et al. (2004) trial. Meanwhile, depressed mood is common among adolescent substance users (Grant et al., 2006; Kandel et al., 1999) and has demonstrated a mixed relationship with treatment outcome depending on the characteristics of the sample and the intervention (see Hersh, Curry, & Kaminer, 2014). Finally, for the socio-contextual domain, we included one measure of family factors and one measure of peer factors, as both have been independently associated with adolescent substance use outcomes (Kiesner, Poulin, & Dishion, 2010; Van Ryzin, Fosco, & Dishion, 2012). We selected problematic parent alcohol use as our indicator of family factors and peer substance involvement as our indicator of peer factors.

Although these analyses were designed to be exploratory, a few specific hypotheses were postulated. For predictors, we expected baseline alcohol use and depressed mood to be associated with poorer treatment response across both conditions. For moderators, we expected adolescents with higher levels of parental alcohol use and peer substance involvement to have better outcomes in the MET+FCU condition, due to the FCU's emphasis on promoting parental awareness and monitoring (Dishion et al., 2002). We did not have specific hypotheses about the three demographic variables.

2. Method

The study participants, procedures, and treatment conditions have been described in detail previously (Spirito et al., 2011) and are briefly summarized below.

2.1 Participants

Adolescents were recruited in an urban level I trauma center in the Northeast United States. To be eligible, adolescents needed to self-report drinking of alcohol in the six hours before the ED visit or exhibit a positive blood alcohol concentration as tested using blood, breath, or saliva. Forty-two alcohol-positive adolescents were not approached to participate due to experiencing severe traumatic injury ($n = 21$), being actively suicidal ($n = 17$), or not speaking English or Spanish as the primary language ($n = 4$). Of 264 adolescents who were approached, 125 (47%) agreed to participate. Intoxication was the primary reason for admission in the majority (74%) of participants, with the remaining participants admitted for intoxication with injury or medical concern. The most common reason for non-participation was discharge from the ED prior to completion of recruitment. One hundred and thirteen adolescents (90% of randomized) received the allocated intervention and 97 (78% of randomized, 86% of treated) completed the 3 month assessment and were analyzed in the original trial.

2.2 Procedure

Study procedures were approved by the university and hospital institutional review boards. In both treatment conditions, master's level clinicians with degrees in counseling or psychology were responsible for enrolling families in the study and conducting the consent, assessment, and MET protocols. Adolescents were not approached until their blood alcohol levels were below 0.1% and they were able to pass a mental status exam. The clinician then described the study and obtained written informed consent from parents and written assent from adolescents. The assessment battery was administered immediately prior to randomization, which was conducted using treatment assignments in sealed envelopes. Because participants in both conditions were often admitted very late in the night with high blood alcohol concentrations, most participants were scheduled to return to the ED to receive their intervention. Follow up interviews were conducted by research assistants blind to treatment assignment at 3, 6, and 12 months.

2.3 Intervention Conditions

MET—All adolescents received the MET, which was a 45-minute session that consisted of an empathetic and non-confrontational therapeutic style, paired with exploration of the teen's motivation for drinking, review of potential negative consequences, personalized normative assessment feedback, development of goals regarding drinking, and anticipation of barriers to accomplishing goals. Independent raters evaluated each session for fidelity to the protocol and competency in treatment delivery. Fidelity ratings averaged 83% and competency ratings ranged from 83.0% to 97.0% (see Spirito et al., 2011).

MET+FCU—Families in the MET+FCU condition returned for a 1-hour videotaped family assessment task (FAsTask; Dishion & Kavanagh, 2003) that consisted of the parent(s) and teen discussing family beliefs regarding alcohol, marijuana and other drug use, as well as parent involvement in the teen's life including parental monitoring and supervision of teens whereabouts, activities, and peers. Videos were coded by two independent raters in order to provide information about the parent and teen's interaction patterns. A week after

completion of the assessment task, parents received feedback derived from the FAsTask and from other self-report measures about family stress, parental substance use, parental supervision and monitoring, and parental beliefs about substance use. Parents were first guided through a self-assessment, then were given targeted feedback, and then were helped to develop of a plan for change. Fidelity ratings of the MET+FCU condition ranged from 79% to 100% and competence ratings ranged from 75% to 100% (see Spirito et al., 2011).

2.4 Potential Predictor and Moderator variables

Demographic Factors: Sex, Age, and Ethnicity—The adolescent’s sex, age in years, and ethnicity (i.e., Hispanic vs. non-Hispanic) were measured on a standard self-report demographic questionnaire.

Psychological Factors: Depressed Mood and Substance Use Severity—The Center for Epidemiologic Studies-Depression Scale (Radloff, 1977) was administered to the adolescent to assess self-reported depressed mood. It contains 20 depressive symptoms that are each rated on a four-point scale from 0 (rarely or none of the time) to 3 (most or all of the time) and summed for a total score. The CES-D has demonstrated high test-retest reliability and internal consistency with both adults and adolescents (Radloff, 1977; 1991). Cronbach’s alpha in this sample was .91. The measure has a well-established cutoff score (e.g., 16 or greater) to aid in identifying individuals with depressed mood, which has demonstrated good sensitivity and specificity (Cuijpers, Boluijt, & Van Straten, 2008; Field, Miguel, & Sanders, 2001). We used this cutoff score to dichotomize the variable in the analysis.

Severity of alcohol use was evaluated using the Adolescent Drinking Index (Harrell & Wirtz, 1989), a 24 item scale that assesses four dimensions of drinking problem symptoms (i.e., loss of control of drinking, social indicators, psychological indicators, and physical indicators). The ADI has demonstrated strong internal consistency, test-retest reliability, and discriminant validity in predicting diagnoses of substance use disorders (Harrell & Wirtz, 1989). The alpha value was .91. The ADI also has a well-established cutoff score of 16, which was used to make the variable categorical in the analysis.

Socio-Contextual Factors: Parent and Peer Substance Use—Problematic parent alcohol use was a categorical variable created from a series of questions about the parent’s drinking behaviors. The variable was intended to capture problematic alcohol use that did not rise to the level of an alcohol use disorder. Parents were classified (yes/no) as having problematic alcohol use if they reported: a) having stopped using alcohol because of problems with it in the past, b) occasionally becoming argumentative or irritable when drinking; or c) reporting having 3 or more drinks per drinking occasion “more than half the time,” i.e., indicating potential misuse that did not meet the criteria for binge drinking (National Institute of Alcohol Abuse and Alcoholism, 2004).

Peer substance involvement was measured using seven items about peer substance use and seven items about peer tolerance of adolescent substance use, adapted by Chassin and colleagues (1993) from the Monitoring the Future study (Johnston, O’Malley, & Bachman, 1988). On a 6-point scale, adolescents reported how many of their friends (1 = none to 6 =

all) engaged in both occasional and regular use of alcohol, marijuana, and other drugs. Adolescents also rated on a 5-point scale whether their close friends would *strongly disapprove* (1) to *strongly approve* (6) of their engaging in these same forms of substance use. Alpha values of the peer substance use and peer tolerance of substance use items were .87 and .91, respectively. Consistent with initial report by Chassin et al. (1993), the two sets of items were highly correlated in this sample ($r = .60, p < .001$), and were therefore standardized and averaged to form an overall peer substance involvement score.

2.5 Dependent Variable

In the original trial, three outcome variables were collected using the Adolescent Drinking Questionnaire (ADQ; Jessor, Donovan, & Costa, 1989). The ADQ is scored on an 8-point scale and separately assesses: drinking frequency (days per month), quantity (drinks per occasion), and frequency of high-volume drinking (> 4 or 5 drinks per occasion for females and males, respectively) over the prior 3 months. We focused on frequency of high-volume drinking, since the original trial found a significant effect favoring MET+FCU over MET only on this variable.

2.6 Statistical Analyses

Prior to hypothesis testing, we conducted two preliminary analyses. First, we tested for pre-randomization differences across treatment conditions on the candidate variables. No group differences were found on any of these variables. We also conducted analyses of missing data across groups and did not find any patterns. We considered this as evidence to support the assumption that data that were missing were missing at random.

The primary outcome for all predictor/moderator analyses was frequency of high volume drinking at 3 months, which was measured on an 8-point ordinal scale. We used an analysis of covariance (ANCOVA) approach (i.e., follow-up variable regressed on baseline and other predictors) with an ordinal logistic model to accommodate the ordinal scale of the dependent variable. Separate ANCOVA models regressed high volume drinking at 3 months on baseline values of high volume drinking, treatment condition, each candidate variable, and the interactive effects of these variables. A candidate variable was considered a moderator if it demonstrated a significant (candidate \times treatment) interaction on the 3-month outcome. Candidate variables that demonstrated a significant main effect on outcome without a significant (candidate \times treatment) interaction were considered predictors. All variables were centered (Kraemer & Blasey, 2004) and continuous predictors were standardized to two standard deviations (Gelman, 2008) to put coefficients on the same scale as the dichotomous variables. Significant interactions between potential moderators and treatment condition were probed using simple intercepts and simple slopes (Preacher et al, 2006), estimated for treatment and control groups and sub-groups with and without the given moderator.

Given the sample size and associated power, our analyses were exploratory in nature and did not adjust for multiple comparisons. We use a standard statistical significance criterion of $p < .05$ and note p -values between .05 and .10 as statistical trends. Effect sizes are reported using Cohen's (1988) f^2 statistic, a measure of the proportion of unexplained variability in

the outcome that is attributable to the moderator by treatment assignment interaction effect; values of .02 are considered small, .15 are considered medium, and .35 are considered large.

3. Results

3.1 Sample Characteristics

The final sample of 97 adolescents was almost evenly split between male (46%) and female (54%) and was predominantly Non-Hispanic White (67%). Hispanics comprised 26% of the sample. Sixty percent of the sample were older adolescents aged 16–17 years and 40% were younger adolescents aged 13–15 years. At baseline, 40% of the adolescents screened positive for an alcohol use problem on the ADI and 30% were in the clinical range for depressed mood on the CES-D. Adolescent self-reported rates of high volume drinking over the prior 90 days covered the full range: 14% reported never engaging in high volume drinking, 60% reported engaging in high volume drinking less than once a month, and 26% reported engaging in high volume drinking at least monthly. Based on parent self-report, 23% of the parents had problematic alcohol use.

3.2 Replication of Original Trial Results

Before testing predictors and moderators of outcome, we attempted to replicate the primary outcome analyses from the original comparative trial (Spirito et al., 2011), which used the generalized estimating equation (GEE) procedure. ANCOVA modeling found that those in the MET+FCU condition had significantly lower levels of high volume drinking than those in the MET only condition at the 3 month assessment, but not at the 6 or 12 month assessment. This pattern of results was identical to those reported in the original trial.

3.3 Predictors

Table 1 presents the *p*-value results of the omnibus tests of each of the seven candidate variables. Of the seven variables, there was one significant predictor, one significant moderator, and one statistical trend for moderation.

The only significant predictor of outcome was the adolescent's age. Across both treatment conditions, older adolescents had higher levels of high volume drinking at 3 months than younger adolescents, even when controlling for baseline status, $b = 1.48$, $z = 2.03$, $p < .05$, 95% CI [.05 to 2.91]. This effect was small to medium in size. These data suggest that older adolescents had worse acute treatment outcomes, regardless of treatment condition.

3.4 Moderators

As shown in Table 1, problematic parent alcohol use significantly moderated the effect of treatment condition at 3 months, $b = 2.97$, $z = 2.03$, $p < .05$, 95% CI [.10, 5.83]. The moderation effect was small in size ($f^2 = 0.03$).

Figure 1 depicts the problematic parent alcohol use \times treatment interaction by plotting the level of high volume drinking at each timepoint. To facilitate visual depiction of the interaction, we converted the 8-point high volume drinking scale into a weighted estimate of raw drinking days over the past 90 days. Counter to hypotheses, among those parents with

problematic alcohol use, MET+FCU had a *negative* effect on outcome relative to MET only. These results suggest that the superiority of MET+FCU over MET found in the original trial was driven by those whose parents did not have problematic alcohol use at baseline.

There was also a statistical trend with a small effect size for peer substance involvement to moderate the effect of treatment condition at 3 months, $b = 2.51$, $z = 1.76$, $p = .08$, 95% CI $[-.29, 5.31]$. Examination of this interaction indicated that adolescents with higher levels of peer substance involvement at baseline appeared to respond better to MET+FCU than the MET only intervention.

4. Discussion

This study explored possible predictors and moderators of outcome across two brief, MET models in the ED setting: adolescent MET-only and MET+FCU. Older adolescents had worse treatment outcomes regardless of treatment assignment. Parent problematic alcohol use was associated with significantly less favorable response to MET+FCU than MET only, and there was also a trend for higher levels of peer substance use to be associated with better response to MET+FCU.

The identification of age as a significant predictor was consistent with prior literature indicating that younger and older adolescents respond better to different types of treatment. Kaminer and colleagues (2002) found that older adolescents did not respond as well as younger adolescents to cognitive behavioral therapy, while Henggeler and colleagues (1999) found that younger adolescents responded better than older adolescents to multisystemic therapy (a family-focused approach). Some researchers have argued that brief interventions are appropriate for adolescents with less entrenched substance use behaviors, whereas longer interventions are needed for adolescents with more serious problems (see Goti et al., 2010). Of note, in this sample, baseline severity of alcohol use was not a predictor of outcome. Thus, one possible interpretation of our finding that younger adolescents were more susceptible to the two brief MET models is that they had less entrenched patterns of alcohol use, but that these patterns were not detectable on a simple measure of alcohol-related problems.

Our finding that parent alcohol use was associated with less favorable response to FCU plus MET was unexpected and counter to our hypotheses. By providing individualized feedback within a motivational interviewing style, the FCU aims to enhance parental recognition of specific risk behaviors (including parents' own substance use) and engender motivation for reducing these problem behaviors. The current results indicate that adolescents of parents who demonstrated problematic alcohol use at baseline, one of the specific risk factors that the FCU is designed to address, had the poorest response to the intervention. A possible interpretation of these findings is that the FCU's attempt to increase parents' awareness of how their drinking affected their teen's alcohol use was either insufficient or actually sparked resistance among those parents with problematic alcohol use. While the adolescent MET was designed to accommodate adolescents across all levels of readiness to change, the FCU did not take into account the parent's readiness for change. Future work should explore if the outcomes of the FCU can be improved by taking into account the family's readiness to

support all aspects of the planned intervention. Another consideration is that the joint family assessment task discussing beliefs about alcohol use may have had deleterious effects if the parent had problematic use. A second interesting direction for future research would be to examine if the FCU's effectiveness could be enhanced by having parents and adolescents conduct parts of the assessment task separately before coming together.

The small effect size statistical trend for peer substance involvement to moderate treatment outcome also bears mention. Consistent with our hypotheses, adolescents with higher levels of peer substance involvement appeared to respond better to MET+FCU than adolescent MET only. It appears that the FCU's focus on parental monitoring and supervision may have conferred incremental benefit over the MET's generic focus on peer alcohol use norms and on change planning in terms of countering the effects of peer substance involvement. These results are consistent with previous literature demonstrating that interventions are most efficacious for adolescents who demonstrate the specific risk factors interventions were designed to target (Tien, Sandler, MacKinnon, & Wolchik, 2004; Prado et al., 2013). Replication of these findings in a larger sample is needed to bolster confidence.

4.1 Limitations

Results must be interpreted in the context of several limitations. First, the study was adequately powered to compare the two treatment conditions, but was not powered to test multiple moderators across the two conditions. As noted by Garcia and colleagues (2010), the "absence of findings should not be interpreted as findings of absence". This work should be viewed as exploratory and hypothesis generating. Second, results should not be generalized beyond the current sample, which was predominantly comprised of relatively infrequent high volume drinkers (i.e., 76% reported engaging in high volume drinking less than monthly) that sought care in an ED. Future research is needed to determine the extent to which the current results extend to adolescents with different demographic and clinical characteristics. Third, most of the significant effects in this study were small in size, which may reflect the relatively low levels of high volume drinking at baseline. These results suggest that replication among more frequent high volume drinkers is warranted. Finally, we only examined the effects of Hispanic ethnicity on treatment outcomes and did not test treatment differences between racial groups. Given that race and ethnicity do not capture the within group heterogeneity that exists among racial and ethnic groups, future studies should consider examining variables that capture this within- group variability as well as help explain the inconsistent findings previous studies have demonstrated (Clair et al., 2013; Liddle, Rowe, Dakof, Henderson & Greenbaum, 2009; Robbins et al., 2008; Waldron & Turner, 2008). Relevant variables may include levels of acculturation, language, perceived discrimination, and racial/ethnic identity salience and pride.

4.2 Clinical Implications

The current findings extend the conclusion of the primary trial that adolescents presenting to the ED due to an alcohol-related event who receive the MET+FCU have better acute outcomes than adolescents who receive MET only. The previous study's findings are extended by specifically asking and answering a significant question: "which intervention approach has the best acute outcomes for whom?" Overall, the results indicate that MET

interventions at both the adolescent and parent level may be less effective and require adaptation for older adolescents. Our results also suggest that adolescents whose parents have problematic alcohol use are less likely to benefit from the addition of the FCU, while adolescents with high levels of peer substance involvement may be more likely to benefit from the FCU. These results provide mixed evidence for the notion that adolescents may be more amenable to interventions that are tailored to or that address their specific risks. Taken together, these results provide information for tailoring MET interventions according to the adolescents' demographic, psychological, and socio-contextual risk factors, including the parent's level of alcohol use. Such information can be of value to researchers and key stakeholders responsible for implementing evidence based interventions by identifying subpopulations that may benefit most from specific intervention strategies.

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Highlights

- A 2011 trial of alcohol-positive adolescents presenting to the emergency department (ED) found that adolescent + parent motivational enhancement therapy (MET) reduced high volume drinking better than adolescent MET only.
- Seven variables were tested as potential predictors or moderators of high volume drinking at 3 months post-treatment.
- Older adolescents (age 16–18) had worse drinking outcomes than younger adolescents (age 13–15) in both MET conditions.
- Adolescents whose parents screened positive for problematic alcohol use had worse drinking outcomes with adolescent + parent MET than adolescent MET only.
- Alcohol-positive adolescents presenting to the ED may respond better to MET if they are under the age of 16 and involving parents with problematic alcohol use in MET may have negative effects on adolescent high volume drinking.

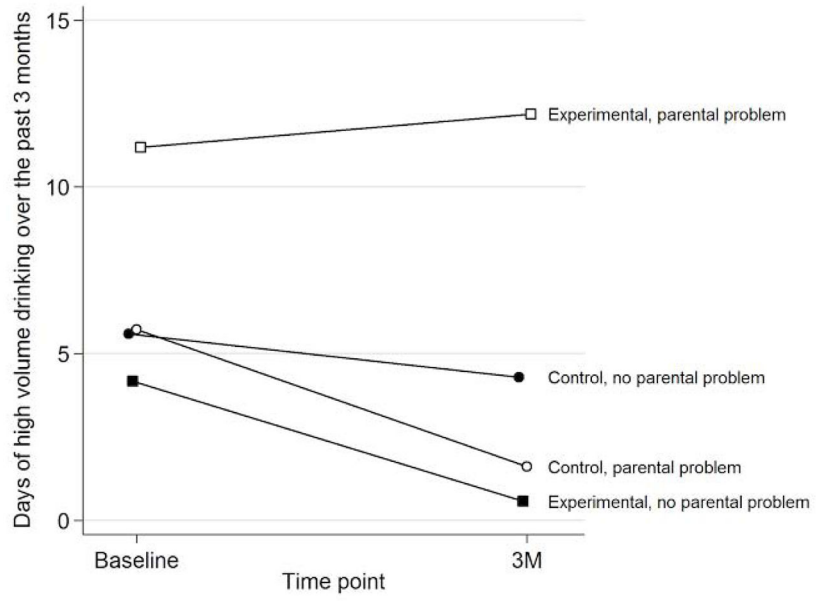


Figure 1.

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Table 1
Variables Examined as Potential Predictors and Moderators of Acute High Volume Drinking

Potential Moderator	Main Effect P-Value	Main Effect ES	Interaction P-Value	Interaction ES	Status
Demographics					
Gender	.48	.05	.99	.03	
Age	.04*	.07	.99	.01	Predictor
Hispanic ethnicity	.28	.03	.99	.01	
Psychological Factors					
Baseline alcohol use	.17	.08	.40	.01	
Depression	.37	.02	.38	<.01	
Social/Contextual					
Parent problematic use	.37	.01	.04*	.03	Moderator
Peer substance involvement	.44	.03	.07 ⁺	.02	Moderator (trend)

Note. ES = effect size. Effect sizes are computed using Cohen's f^2 statistic, which summarizes differences in model R^2 , and where values of .02, .15, and .35 indicate small, medium, and large effects, respectively.

* $p < .05$,

⁺ $p = 0.07$.