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## Teen Options for Change (TOC): An Intervention for Adolescent Emergency Patients who Screen Positive for Suicide Risk

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### Abstract

**Objective**—Previous research has documented the feasibility of adolescent suicide risk screening in emergency departments. This randomized trial examined the effectiveness of Teen Options for Change (TOC), an intervention for adolescents seeking medical emergency services who screen positive for suicide risk.

**Method**—Participants were 49 adolescents, ages 14 to 19, seeking services for non-psychiatric chief complaints who screened positive for suicide risk due to recent suicidal ideation/attempt and/or depression plus alcohol abuse. They were randomly assigned to TOC or enhanced treatment-as-usual. Depression, hopelessness, and suicidal ideation were assessed at baseline and two-month follow-up.

**Results**—Adolescents assigned to TOC showed greater reductions in depression than adolescents assigned to the comparison group (Cohen's  $d = 1.07$ ; large effect size). Hopelessness, suicidal ideation and alcohol outcomes trended positively (nonsignificantly) with small to moderate effect sizes.

**Conclusions**—TOC is a promising, brief intervention for adolescents seeking emergency services who are at risk for suicide.

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An undisputed tragedy, suicide is the 3<sup>rd</sup> leading cause of death among adolescents between the ages of 14-19 in the United States.<sup>1</sup> Moreover, nationally representative data reveal that, in the past year, 16% of high school students had serious thoughts of attempting suicide and 8% made a suicide attempt.<sup>2</sup>

Fortunately, previous research has documented the feasibility and potential utility of youth suicide risk screening in the medical emergency department.<sup>3</sup> Although few studies have empirically examined emergency department interventions for adolescents at elevated risk for suicide, these studies supports the feasibility and potential benefit of brief interventions in this setting (See online appendix for a brief review.).

This pilot randomized controlled trial examined the feasibility and short-term efficacy of Teen Options for Change (TOC), an intervention designed for adolescents who present to the emergency department and screen positive for suicide risk, but who are not at acute high risk and in need of psychiatric hospitalization. We focused on adolescents with non-psychiatric chief complaints because those with psychiatric chief complaints received a suicide risk evaluation and mental health intervention or referral as routine care at the participating hospital. Our goal was to reach adolescents for whom this did not routinely occur. We defined a positive screen for suicide risk as a recent suicide attempt or suicidal ideation, or as co-occurring depression and alcohol or drug misuse. Consistent with other interventions that incorporate motivational interviewing,<sup>4</sup> TOC is based on the self-determination theory of self-regulation and change,<sup>5</sup> with a focus on adolescents' values, goals, and options for behavioral change.

We compared TOC with enhanced treatment-as-usual to obtain information about the feasibility of the TOC study trial (recruitment, randomization, retention), and to examine TOC's short-term effectiveness. We hypothesized that adolescents randomized to TOC would report lower rates of depression, hopelessness, and suicidal ideation when assessed two months after their emergency department visit.

## Method

Participants were 49 adolescents who met study inclusion criteria, which included: being 14 to 19 years of age; having a positive suicide risk screen, defined as suicidal ideation, a recent suicide attempt *or* positive screens for both depression and alcohol or drug abuse (measures described below); presenting with a non-psychiatric chief complaint; and exclusion criteria of a level one trauma (critically ill, medically unstable), significant cognitive impairment (unable to complete self-report screen), or disposition of psychiatric hospitalization. Descriptive information on the full sample of adolescents screened and a CONSORT diagram are included in the online appendix.

Suicidal ideation and recent suicide attempt history were assessed with two questions adapted from the Columbia-Suicide Severity Rating Scale (C-SSRS):<sup>6</sup> recent suicidal ideation (past two weeks), or a recent suicide attempt (past month). The 15-item Suicidal Ideation Questionnaire – Junior (SIQ-JR)<sup>7</sup> was used to measure the nature and frequency of suicidal thoughts over the past month. Sample items and psychometric properties for the SIQ-JR and all study measures are included in the online appendix.

Depression was assessed with the Reynolds Adolescent Depression Scale, Short Form (RADS-2:SF)<sup>8</sup>, a 10-item self-report scale that measures severity and frequency of depression symptoms. Hopelessness was assessed with the Beck Hopelessness Scale (BHS).<sup>9</sup> Alcohol consumption and at-risk drinking were assessed with the Alcohol Use Disorders Identification Test (AUDIT).<sup>10</sup> The first three items (AUDIT-C) were used for the suicide risk screen and all 10 items were used in baseline and follow-up measures. Drug use and drug use consequences were assessed with the 6-item CRAFFT,<sup>11</sup> which has demonstrated strong sensitivity and specificity for identifying drug-related problems among adolescent medical patients.<sup>11</sup> A positive screen was defined as a score of 26 or higher on

the RADS-2:SF with comorbid drug (CRAFFT score of 2 or higher) or alcohol use (AUDIT-C score of 3 or higher).

All recruitment took place during afternoon and evening shifts. Adolescents who screened positive were required to provide at least two telephone numbers, verified by project staff, before randomization to TOC or enhanced treatment-as-usual. To ensure the integrity of randomization, we used envelopes with randomly ordered group assignments, organized into four packets (stratified by gender and suicide attempt history).

Adolescents randomized to enhanced treatment-as-usual were given a crisis card with suicide emergency phone numbers in addition to written information about depression, suicide risk, firearm safety and local mental health services. Adolescents randomized to TOC received these same resources and personalized feedback regarding their screening responses. They also participated in an adapted motivational interview (approximately 35-45 minutes) with a mental health professional. Study therapists completed a minimum of 40 hours of training conducted by a member of the Motivational Interviewing Trainers' Network. They were certified when their taped pilot sessions met preset criteria for adherence with motivational interviewing elements (e.g., use of open-ended questions and affirmations). Data on the adherence of TOC therapists with motivational interviewing principles is provided in the online appendix.

The TOC therapist reviewed the personalized feedback with each adolescent assigned to the TOC condition. This feedback included normative data for depression and suicidal ideation, risk level for alcohol use, and functional impairment. TOC therapists used a culturally tailored goals and values clarification guide (designed with input from adolescent focus groups) to facilitate identification of behavioral goals. Using motivational interviewing techniques such as building a discrepancy between the adolescent's values, goals, and actual fulfillment of these goals, they facilitated the adolescent's development of a personalized action plan. This consisted of an objective (e.g., finish high school with GED) and a list of up to three steps to take toward this objective. Adolescents in TOC also received a handwritten follow-up note and a telephone check-in from their therapist two to five days after their emergency department visit to support and facilitate action plan implementation.

Adolescents and their parents/guardians were offered dollar gift items as a token of appreciation for completing the screen. Adolescents were remunerated \$20 for completion of the baseline assessment. At the two-month follow-up assessment, participants were remunerated \$30, with an additional \$20 incentive if they returned to the hospital for the assessment. Community-based assessments were also conducted. The clinicians conducting follow-up assessments were blind to intervention condition.

We obtained Institutional Review Board approvals from our university and the participating hospital. Parent/guardian written informed consent was obtained when a parent was present (IRB waived requirement if not present) and adolescent assent was obtained. The study team followed a detailed risk-management protocol with action steps for adolescents in either group who met criteria for "high risk" (e.g., active suicidal intent, past-week attempt) at baseline and follow-up.

We used chi-square and independent t-tests to compare the baseline demographic and clinical characteristics of adolescents randomly assigned to TOC and enhanced treatment-as-usual. Our analysis of intervention effects followed the *intent to treat* strategy, which included all 46 adolescents who completed the follow-up assessment. Repeated measures analyses of variance were used for the continuous outcome measures.

## Results

The ages of adolescent participants (80% female) ranged from 14 to 19 years, ( $M=17.7\pm 1.7$ ). The racial distribution was: 57% ( $n = 28$ ) African American, 39% ( $n = 19$ ) Caucasian, 4% ( $n = 2$ ) American Indian or Alaska Native, 2% ( $n = 1$ ) Native Hawaiian/Pacific Islander, 2% ( $n = 1$ ) Hispanic, and 2% ( $n = 1$ ) Other. These percentages do not sum to 100% because some adolescents self-identified as bi-racial.

Of the 49 adolescents who screened positive for elevated suicide risk, 35% ( $n = 17$ ) were due to recent suicidal ideation or a recent suicide attempt, and 53% ( $n = 26$ ) reported current depressive symptoms with comorbid alcohol and/or drug abuse. A total of six participants (12%) screened positive for both criteria. Seven of the participants (14%) made a suicide attempt within the past month.

Of the 27 adolescents who were randomized to TOC, 23 adolescents participated in the full intervention (personalized feedback + adapted motivational interview); four participants did not participate in the interview because they were discharged and chose to leave the hospital before the interview could be completed. Adolescents' behavior change goals primarily related to personal growth and improvement (70%), academic achievement or school attendance (15%), and increased independence (15%). Goals related to personal growth and improvement ranged from improving the use of natural supports (20%; e.g., friends, family) to engaging more in favored or new hobbies/ activities (17%) to getting professional help (25%). Specific examples include "getting up at set time [8 a.m.] in the morning" and "[increase] physical activity."

Forty-six of 49 participants (94%) completed the 2-month follow-up measures. Retention analyses were not conducted because only three adolescents were lost to follow-up. These three adolescents (two African American, one Caucasian) had a mean age of  $17.92\pm 1.66$ . Mental health service utilization following emergency department visits did not differ between groups. Seven adolescents in the TOC group (29%) and eight adolescents in the treatment as usual group (36%) received some type of mental health service during the two-months following their visit.

The mean baseline and 2-month follow-up scores for TOC and control groups are displayed in Table 1. For depression (RADS-2:SF), we found a significant main effect for treatment group,  $F=10.84$ ,  $df=1,44$ ;  $p < .01$  and a significant time  $\times$  treatment group interaction,  $F=9.89$ ,  $df=1,44$ ;  $p < .01$ , indicating a positive effect for TOC. We did not find any significant treatment or group effects for hopelessness (BHS), suicidal ideation (SIQ-JR), or alcohol misuse (AUDIT). There was a significant effect for time for suicidal ideation,

$F=7.41$ ,  $df=1,44$ ;  $p < .01$ . Adolescents showed a decrease in suicidal ideation over the study period.

Because this preliminary randomized controlled trial was not powered to identify modest effects as statistically significant, we also examined actual effect sizes for each outcome variable. The TOC intervention had large positive effects for depression, moderate positive effects for hopelessness, and small positive effects for suicidal ideation and alcohol use (See Table 1).

## Discussion

In this pilot randomized clinical trial, adolescents in the Teen Options for Change (TOC) intervention reported significantly greater reductions in depressive symptoms than adolescents in the enhanced treatment-as-usual group. This finding suggests that a brief emergency department-based intervention, incorporating personalized feedback and an adaptive motivational interview, may be beneficial to adolescents who screen positive for suicide risk. Although further research is needed, particularly due to the limited sample size in this study, such a reduction in depression, in addition to the medium effect size for reducing hopelessness, suggests that a focus on positive behavioral activation and change has a beneficial impact on adolescents at risk, even within a short period of time.

TOC is a brief intervention that takes advantage of the adolescents' presence in an emergency setting where parents are often present and wait times provide an opportunity for assessment and intervention.<sup>13</sup> Its feasibility of implementation was evidenced in this study by the high levels of patient participation and retention, and by the IRB waiver of required parental consent for adolescents' participation in the emergency setting. Moreover, adolescents who use emergency services as their usual source of health care often have fewer financial resources and report higher rates of substance use, physical health problems, and mental health problems.<sup>14</sup> Therefore, utilizing the emergency department may allow for a greater number of at-risk adolescents to be reached.

It is important to note that TOC had a minimal differential impact on suicidal ideation, with a significant reduction evident for both groups across the two months. Furthermore, TOC was not associated with increased treatment seeking. Evidence regarding effective interventions aimed at reducing suicidal thoughts and behaviors is very limited. In a meta-analysis by Corcoran and colleagues,<sup>12</sup> evidence points towards slight decreases in suicidal and self-harm events at posttest for intervention participants when compared to a control group; however, this positive trend is not evident at later follow-ups. This suggests that the minimal impact on suicidal ideation found in this study may not be maintained over time. For adolescents at elevated suicide risk who report high levels of suicidal ideation, it may be important to expand TOC to include therapeutic approaches that specifically target the suicidal ideation.

The promising findings for TOC in this preliminary study warrant further study with a larger sample and longer follow-up period to determine the extent to which findings replicate, to examine the mediators of any positive effects (e.g., behavioral change? self-efficacy?

hopefulness? increase in reasons for living?), and to determine if positive changes translate into reduced suicidal behavior over time.

There are several limitations to this study. The sample was recruited from one hospital's emergency department in a relatively underserved, low-income community, and it is unclear whether these findings would apply to a larger, more representative population of adolescents. Similarly, all recruitment occurred during afternoon and evening shifts, and adolescents who seek emergency services at other times may differ in some important way that impacts intervention effectiveness. Another limitation is the preliminary nature of this study, its relatively small sample size of 49 adolescents, and the absence of patient satisfaction data. Finally, although the consent rate was very high for follow-up assessments (n = 46; 94%), two months is a relatively short follow-up period and the sustained or delayed effects of TOC are unknown. We also did not have information to disaggregate the effective components of TOC, which included personalized feedback, an adapted motivational interview and a follow-up note.

In summary, findings suggest that Teen Options for Change (TOC) may be a promising brief intervention for adolescents who screen positive for suicide risk in medical emergency departments but are not at high acute risk and in need of psychiatric hospitalization. As suicide risk screening becomes increasingly prevalent, triage options warrant further research and consideration, and TOC may be a useful triage option. This is particularly important given recent findings of an absence of improved outcomes even when adolescents follow-through with outpatient recommendations following discharge from the emergency department.<sup>15</sup>

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1**Baseline to Follow-up Comparisons of Clinical Descriptive Data<sup>a</sup>

| Clinical Variables | M     | SD   | M     | SD   | p     | Cohen's d |
|--------------------|-------|------|-------|------|-------|-----------|
| Depression         |       |      |       |      |       |           |
| Baseline           | 28.32 | 3.4  | 27.25 | 4.2  | .354  | 1.07      |
| Follow-Up          | 30.87 | 4.0  | 25.38 | 4.7* | <.001 |           |
| Hopelessness       |       |      |       |      |       |           |
| Baseline           | 8.79  | 5.7  | 7.94  | 4.6  | .580  | 0.40      |
| Follow-Up          | 8.64  | 5.7  | 5.66  | 5.2  | .070  |           |
| Suicidal Ideation  |       |      |       |      |       |           |
| Baseline           | 29.40 | 24.6 | 31.02 | 19.6 | .805  | 0.22      |
| Follow-Up          | 24.28 | 17.3 | 21.46 | 17.4 | .584  |           |
| Alcohol Use        |       |      |       |      |       |           |
| Baseline           | 5.05  | 7.5  | 5.17  | 6.3  | .953  | 0.19      |
| Follow-Up          | 5.95  | 7.7  | 4.71  | 3.9  | .526  |           |

Note. Depression is measured by the RADS-2-SF; possible scores range from 10 to 40, with higher scores indicating more severe depressive symptoms. Hopelessness is measured by the BHS; possible scores range from 0 to 20, with higher scores indicating greater hopelessness; Suicidal Ideation is measured by the SIQ-JR; possible scores range from 0 to 90, with higher scores indicating more suicidal ideation; Alcohol use is measured by the AUDIT; possible scores range from 0 to 40, with higher scores indicating greater alcohol use.

<sup>a</sup>Means were compared by independent sample t-tests.