### *Pilot Study Testing the Reduction of Mental Health Stigma by a Universal Contact-Based Intervention*

While educational interventions alone appear to have a positive impact on reducing mental illness stigma in youth [1-5], mixed results have been found for "contact-based" anti-stigma interventions, or programs in which a mental health advocate shares his/her personal experience. Some research indicates that combining contact-based and educational approaches may be most impactful [2, 4, 6-9]. As a next step in this line of investigation, the Center for Mental Health Research and Recovery (CMHRR) at Montana State University seeks to identify a more effective contact-based intervention for youth that can be combined with educational approaches.

In November and December of 2016, the CMHRR evaluated a contact-based mental health stigma reduction intervention that incorporates the singing and story-telling of country artist Jason DeShaw, whose performance has received national awards for mental health advocacy. Anecdotal feedback on Mr. DeShaw's performance suggests that the combination of music and his personal account of living with mental illness is tremendously engaging and inspiring to youth, especially to those struggling with mental health challenges. In the current study, the level of stigma related to mental health in youth, along with other resiliency outcomes, was assessed before and immediately after Mr. DeShaw's live performances using short, written, anonymous surveys. The study measures included the Reported and Intended Behavior Scale (RIBS) (Stigma) [10], the Children's Hope Scale (Hopefulness) [11], one item measuring help-seeking behavior on a 7-point scale (Help-seeking) [4], and a single item measuring youth interest in pursuing work in a mental health field developed by Mercedes Becker of the CMHRR. The study took place in four Montana high schools, with a total student body of 1,272 students, of which, 48% (612 students) participated in the study.

### Data analysis

Because there were many missing post-test scores for each of the four study measures, the sample size in the results tables represents the number of youth that completed both the pre-test and post-test measures; those that did not complete both a pre-test and a post-test were not included in the analysis.

A within-subjects linear mixed model (LMM) analysis of repeated measures (pre- to post-test), with robust estimates of standard errors (to account for any heterogeneity of error terms) was used to examine the effect of the intervention on each outcome. The LMM analysis included between site (school-to-school) variability as well as the clustering of students nested in schools. For the separate sub-group analysis, a Group (cutpoint) by Time (pre- to post-test) interaction effect was included and then interaction effects were interpreted for the difference of the least square means (LSM) estimates within each group. Cohen's *d* was calculated to estimate effect sizes for the within-subjects difference of LSM estimates.

### Primary outcome

The study evaluated mental illness stigma as a primary indicator of the efficacy of the intervention. The results are shown in **Table 1**. For mental health stigma, the higher the score, the greater the stigma endorsed by the student. When results of all students (n=612) were considered, the intervention had a statistically significant effect on mental health stigma (Cohen's $d$ = 0.268, p=0.0001). Additionally, if students were stratified into quartiles, based on their pre-test results, then the effect size was associated with the pre-test stigma levels: the

upper 75th quartile showed the greatest reduction (Cohen's $d$=0.735, p=0.0001), the middle quartile had a medium effect size (Cohen's $d$=0.493, p=0.0001), while the lower quartile had no significant effect. Together, these results indicate that the one hour contact-based intervention was effective in reducing mental health stigma in this population.

**Secondary outcomes**

The study also aimed to evaluate three measures related to mental health: help-seeking behaviors, hopefulness, and willingness to work in the mental health field. The study determined whether the intervention affected a barrier to mental healthcare, which is help-seeking behavior in youth, using a single survey question. A significant increase in help-seeking attitudes was observed post-intervention (Cohen's $d$=0.069, p=0.045, Table 1). The Children's Hope Scale tests a child's belief in his/her ability to achieve a goal, with higher belief in achieving a goal associated with better self-image, and vice-versa [11]. No significant changes were found pre- to post-test for the Children's Hope Scale, indicating that the general feeling of hopefulness was unchanged by the intervention. Lastly, students were asked a single question about their willingness to work in a mental health field before and after the intervention. A significant increase was found for this outcome post-intervention (Cohen's $d$=0.16, p=0.0001, Table 1), suggesting that the intervention may also increase interest in building a much-needed workforce.

While this study provides promising results and strongly supports a next-step trial, some limitations should be mentioned. The two main limitations of this study are that it did not have a control group and the post-intervention surveys were collected only one hour after the pre-test surveys. However, the effect size observed for the primary outcome of stigma suggests that the contact-based intervention has promise as a new intervention to reduce mental health stigma and should be tested further in a larger, randomized, controlled trial, perhaps in combination with an educational component to potentially increase the effect size. Longitudinal surveys can be collected in the next-step trial to begin to determine duration of efficacy of the intervention. To extend the potential scope of impact of Mr. DeShaw's performance/presentation, the CMHRR also is eager to evaluate the effectiveness of a video documentary of his work that could be combined with educational approaches and made available to youth nationally. The results summarized are an exciting first step toward a potentially new, effective intervention for reducing mental health stigma in youth.

**Table 1. Outcome measures before (pre-test) and after (post-test) a contact-based stigma reduction intervention**

| Outcome Measures | N | Pretest to Posttest | | | |
| | | LSM Difference (SE)[a] | 95% CI[b] | p value[c] | Cohen's $d$[d] |
|---|---|---|---|---|---|
| Mental Health Stigma | 611 | -0.218 (0.025) | -0.268 to -0.168 | 0.0001 | 0.268 |
| Children's Hope Scale | 596 | -0.003 (0.028) | -0.059 to 0.052 | 0.9026 | 0.003 |
| Help-Seeking Attitude | 326 | 0.144 (0.071) | 0.003 to 0.285 | 0.0454 | 0.069 |
| Interest in Mental Health Field | 568 | 0.190 (0.032) | 0.125 to 0.254 | 0.0001 | 0.164 |

[a] LSM Difference = Difference of LSM estimates (posttest minus pretest).
[b] 95% CI = 95% Confidence Interval for the difference of LSM estimate.
[c] p value = associated with the test ($t$-statistic) for the difference of the LSM estimate.
[d] Cohen's $d$, which was adjusted for the correlated LS means from pre- to post-test, was calculated to estimate effect sizes for the within-subjects difference of LSM estimates.

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