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# Who benefits most? A preliminary secondary analysis of stages of change among street-involved youth☆

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## Introduction

Street-involved youth are subject to greater health inequalities, such as mental health challenges, increased risk for suicide and substance abuse, as well as a wide variety of health concerns, compared to housed youth (Kelly & Caputo, 2007; Kidd, Gaetz, Frederick, Karabanow, & Slesnick, 2017; Kirst, Frederick, & Erickson, 2011; Lynk, McCay, Carter, Aiello, & Donald, 2015; McCay et al., 2010). Further, street-involved youth frequently experience a sense of mistrust when accessing healthcare and social services, as a result of stigma, discrimination, and previous negative experiences (Hughes et al., 2010; McCay & Aiello, 2013; Slesnick, Meade, & Tonigan, 2001). As a result, health inequalities and a sense of mistrust contribute to the difficulties experienced by street-involved youth when accessing needed services to support healthy behaviour change (Slesnick, Meyers, Meade, & Segelken, 2000). Therefore, innovative and effective strengths-based interventions are needed to engage youth who are street-involved to build capacity for healthy behaviour change and to identify self-set goals necessary for successful exiting from street-life (McCay & Aiello, 2013). One intervention that may be effective for street-involved youth who face numerous challenges and barriers to making healthy behaviour changes is Motivational Interviewing (MI) (French, Reardon, & Smith, 2003; Helfrich, Chan, Simpson, & Sabol, 2012; Hettema, Steele, & Miller, 2005; McCay & Aiello, 2013). Overall, MI is an evidence-based, client-centered approach which aims to promote self-efficacy and healthy behaviour change (Hettema et al., 2005; Miller & Rollnick, 2002). As such, MI enables healthcare providers to more effectively strengthen individuals' efforts to change, as well as to better understand the processes involved in making changes (DiClemente, Schlundt, & Gemmell, 2004; Hughes et al., 2010).

MI has been derived from the Transtheoretical Stages of Change Model (DiClemente et al., 2004) which provides a framework for recognizing when individuals are ready to change their behaviour to achieve health-related goals. According to the Transtheoretical Stages of Change Model, behavioural change can be conceptualized according to five stages: (1) precontemplation – an individual may acknowledge a problem but may not desire change; (2) contemplation – an individual is beginning to be aware of the problem; (3) preparation – an individual is planning for change and small steps may be taken; (4) action - the individual is beginning to change and modify his/her behaviour or environment; and (5) maintenance – the person has already changed and is working to maintain that change (DiClemente et al., 2004; DiClemente et al., 2010). Since MI aims to strengthen personal motivation specifically tailored to an individual's Stage of Change, it appears to be an intervention that is well suited to working with street-involved youth who find it challenging to makes changes in their lives (Peterson et al., 2006). In particular, the identification of an individual's stage of change may be useful at the beginning of a specific treatment or intervention, to identify who may likely benefit from the intervention (DiClemente et al., 2004; Miller & Rollnick, 2002). A number of studies have, in fact, demonstrated benefits to identifying the stages of change with youth, such as understanding smoking behaviour, and strengthening motivation to change (Callaghan et al., 2005; Dino, Kamal, Horn, Kalsekar, & Fernandes, 2004; Stephens, Cellucci, & Gregory, 2004; Taylor, Zaitsoff, & Paterson, 2014). Despite the demonstrated benefits of adopting the Stages of Change Model with youth, limited research has focused on implementing the model with youth who are street-involved; particularly with a focus on understanding how best to engage youth in healthcare and social services to achieve positive behaviour change in order to ultimately support these youth to exit the street.

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In an effort to address the lack of engagement with healthcare services, as well as existing challenges surrounding positive behaviour change for street-involved youth, the primary research team implemented and evaluated a resilience-based MI intervention at three community agencies serving street-involved youth. Although it was anticipated that those youth who received the resilience-based MI intervention (i.e., the intervention group) would demonstrate significant improvement on particular indicators (resilience, self-esteem, and social connectedness, as well as indicators of mental health symptoms and overall functioning) compared to those youth who did not receive the intervention (i.e., the comparison group), the question of which youth would likely benefit from the intervention was relatively unknown. As such, the purpose of this secondary analysis was to determine whether or not the degree of change/improvement on the intended outcomes (i.e., indicators of resilience, self-esteem, social connectedness, mental health, and overall functioning) differed according to: the youth's stage of change at baseline; and whether or not youth participants had received the resilience-based MI intervention. Specifically, it was expected that participants who were at the contemplation or preparation/action stages of change at baseline, and who had received the intervention would demonstrate greater improvement on the intended outcomes than those in the pre-contemplation stage.

## Methods

A mixed method, quasi-experimental non-equivalent comparison group design was adopted in the primary study to assess the effectiveness of a 6-week Resilience-based MI intervention for youth participants. Following all required institutional ethics review board approvals, participants were recruited from three community-based agencies providing shelter to street-involved youth; two shelter sites in Canada (Toronto & Calgary), as well as one shelter site in the United States (Philadelphia). In the primary study sample size estimation took into account the preliminary nature of the study and issues of feasibility with regard to implementing and evaluating the 6-week Resilience-based MI intervention for youth participants.

To be eligible, youth must have: been between16 to 24 years of age; recently entered one of the study site shelters (within the past 1–2 weeks); previously lived on the street or in short-term residential programs for at least one month; been able to speak and understand English; and been able to provide informed consent. Due to challenges with recruitment at one of the study sites, a collaborative decision was made to extend recruitment to include street-involved youth who were accessing services from one study site's drop-in program and who were not necessarily living in the shelter at that study site. Youth who met the eligibility criteria were invited to participate in the study. In keeping with agency practice, all youth participants were assigned to a case manager upon entering the shelter. To enable a non-equivalent comparison group design, designated case managers across all three sites (n = 11) received training in the intervention; while the remaining case managers did not receive any intervention training. In turn, there were two groups of youth participants in the study: the *intervention group* who received the intervention from their case managers, and the *comparison group* who received treatment as usual from their case managers. In the primary study, data were obtained from participants in the intervention and comparison groups at the same three time points: baseline (T1), immediate post-intervention (T2) and 4-weeks post-intervention (T3). A total of 87 youth were recruited to participate in the primary study: 53 were in the intervention group and 34 were in the comparison group. Of the 53 intervention group participants, 27 completed the intervention, 18 dropped out of the intervention (i.e., they attended only one or two of the six sessions), and eight did not engage in the intervention (i.e., they completed the T1 questionnaires but did not attend any sessions). Of the 34 comparison group participants, 19 completed the T1 and T2 questionnaires, while 15 dropped out (i.e., they completed only the T1 questionnaires).

The current secondary analysis was conducted with only those participants in the intervention and comparison groups who completed both the baseline (T1) and immediate post-intervention (T2) questionnaires. As such, the current sample includes a total of 45 youth participants: 26 from the intervention group (one participant was eliminated who only completed the T1 and T3 questionnaires) and 19 from the comparison group.

### *Resilience-based motivational interviewing intervention*

The 6-week Resilience-based Motivational Interviewing (MI) intervention provides a targeted, manualized approach adopted in practice by case managers to engage street-involved youth who are accessing shelter services. This manualized intervention focuses on: developing trusting relationships with youth; engaging youth in participatory processes to reduce risk-oriented behaviours, such as self-harm; and promoting the acquisition of skills and healthy behaviours while helping the youth to develop and initiate an attainable plan to support their transition to independent living. The theoretical underpinnings of the intervention include strengths-based and resilience-based approaches with a focus on positive youth development, (Ginsburg & Jablow, 2006) and Motivational Interviewing (MI) (Miller & Rollnick, 2002).

This manualized intervention consisted of six weekly individual one-hour meetings between the youth and their case manager. The outline for the 6-week intervention is as follows: Week 1: Laying the foundation for a trusting therapeutic relationship, Week 2: Strengths-based interviewing, Week 3: Introduction to readiness, importance, and confidence rulers, Week 4: Exploring the value and importance of working toward specific goals and making specific changes, Week 5: Exploring the skills and strategies required to work toward specific goals and make specific changes, and Week 6: Future goals. Although this is a manualized approach, the intervention allows for flexibility in meeting the youth where they are at with regards to their readiness to make changes-.

### *Measurements*

Outcome measures used to collect data from the intervention and comparison group participants at baseline (T1) and immediate post-intervention (T2) from the primary study were selected for the secondary analysis. Specifically, the following standardized measures with sound psychometric properties that have been utilized previously with street-involved youth were employed. *Beck's Depression Inventory* (*BDI*) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), is a 21-item, four or five-point Likert self-report tool for depression and psychological distress. Scores range from 0 to 63, with a higher score indicating severity of depression ($\alpha = 0.86$) (Beck et al., 1961). *Beck's Hopelessness Scale* (*BHS*) (Beck, Weissman, Lester, & Trexler, 1974), is a 20- item, true/false self-report tool to assess hopelessness and attitudes in the past and the future ($\alpha = 0.93$) with higher scores indicating greater levels of hopelessness. *Depressive Symptom Inventory Suicidality Subscale* (*DSI-SS*) (Joiner, Pfaff, & Acres, 2002), is a four-item, self-report questionnaire to measure suicidality ideation within the past two weeks ($\alpha = 0.90$). Scores range from 0 to 12 and scores higher than one indicate suicidal ideation (Joiner et al., 2002). *Adolescent Version of Michigan Alcoholism Screening* (*MAST*) (Snow, Thurber, & Hodgins, 2002), is a 19-yes/no self-report tool, that was adapted from the adult screening tool to reflect experiences of adolescents with alcoholism ($\alpha = 0.73$), with higher scores indicating higher levels of substance use. *Social Connectedness Scale* (*SCS*) (Lee, Draper, & Lee, 2001), is a 20-item, six-point Likert self-report tool to measure social connectedness and belongingness. Scores range from 20 to 120 ($\alpha = 0.92$) and increased scores indicate greater levels of connectedness. *Rosenberg Self-Esteem Scale* (*RSES*) (Rosenberg, 1979) is a 10-item, four-point Likert self-report tool to measure global self-worth ($\alpha = 0.92$). Scores range from 10 to 40,

with higher scores indicating higher self-esteem (Rosenberg, 1979). *Resilience Scale* (*RS*) (Wagnild & Young, 1993), is a 25-item, seven-point Likert self-report scale. Scores range from 25 to 175 with greater scores exhibiting a high degree of resiliency (α = 0.93). *Global Assessment of Functioning Scale* (*GAF*) (Endicott, Spitzer, Fleiss, & Cohen, 1976), is a single score, ranging from 0 to 100, that integrates three different dimensions of social, occupational, and psychological functioning (α = 0.79). *University of Rhode Island Change Assessment Scale* (*URICA*) (DiClemente et al., 2004), has been developed to provide a quantitative measure of an individual's stage of change based on the Transtheoretical Stages of Change Model. The URICA is a 32-item, five-point Likert scale that represents four subscales: precontemplation, contemplation, action, and maintenance (α = 0.88). Further, URICA subscales can be calculated to produce a readiness score to assign participants a specific stage status (DiClemente et al., 2004). These scores were used to categorize participants into stages of change for the purpose of this secondary analysis. In addition, *socio-demographic data* concerning age, gender, sexual orientation, relationship status, length of time on the street (in weeks), length of time in Canada/USA (in years), length of education (in years), study site, current living situation, mental health service use, employment, and school attendance were collected.

## Data analysis

### *URICA stage assignment*

To assign all participants (intervention and comparison) in the secondary analysis, a stage of change readiness score was calculated using the URICA algorithm, which consists of summing the averages from the Contemplation, Action, and Maintenance subscales and subtracting the Precontemplation average (DiClemente et al., 2004). Possible readiness scores range from −2 to +14, with a higher score reflecting a greater readiness to change (DiClemente et al., 2004). Specific readiness cut-off scores were used to assign participants in the intervention and comparison groups to a stage of change and included: those with scores lower than 8 were assigned to *precontemplation*, those with scores ranging from 8 to 12 were assigned to *contemplation*, and those with scores ranging from 12.1–14 were assigned to *preparation/action* (Callaghan et al., 2005; DiClemente et al., 2004). Four groups emerged from this analysis: *intervention-precontemplation* (N = 13), *intervention-contemplation* (N = 14), *comparison-precontemplation* (N = 13), and *comparison-contemplation* (N = 6). There were no participants in the preparation/action stage of change.

### *Statistical analysis*

All data were analyzed using Statistical Package for the Social Science (SPSS). Statistical significance was set at $p \leq .01$ to account for multiple *t*-tests. The study variables were normally distributed, thus supporting the use of parametric statistical tests. The frequencies, means, and standard deviations were calculated for all study variables. According to the level of measurement for each variable, independent *t*-tests, ANOVA, Pearson Correlations, and chi-square analyses were used to assess for significant associations between demographic data and baseline study outcome measures for all participants in the secondary analysis. To compare characteristics of the sample, independent *t*-tests, ANOVA, and chi-square were used to assess for significant differences between the intervention group and the comparison group, as well as across study sites and across stages of change at baseline. A series of paired-samples *t*-tests were conducted to assess for change in study outcome measures between baseline (T1) and immediate post-intervention (T2) on all study measures for the intervention and comparison participants according to the assigned stage of change (i.e., *intervention-precontemplation*; *intervention-contemplation*; *comparison-precontemplation*, and *comparison-contemplation*). Cohen's *d* statistic was computed to estimate the effect size of change.

**Table 1**
Overall socio-demographic data of subsample (N = 45).

| | Mean | SD |
|---|---|---|
| 1. Age | 20.44 | 2.2 |
| 2. Length of time on street (weeks) | 115.31 | 114.78 |
| 3. Length of time in Canada/USA (years) | 17.64 | 5.70 |
| 4. Length of education (years) | 10.89 | 1.27 |
| | **N** | **%** |
| 5. Study site | | |
| Toronto | 20 | 44 |
| Philadelphia | 15 | 33 |
| Calgary | 10 | 22 |
| 6. Gender | | |
| Male | 26 | 58 |
| Female | 19 | 42 |
| 7. Current living situation | | |
| Shelter | 38 | 84 |
| Other | 7 | 16 |
| 8. Sexual orientation | | |
| Straight | 33 | 73 |
| Other | 12 | 27 |
| 9. Employment | | |
| Yes | 7 | 16 |
| No | 38 | 84 |
| 10. Relationship status | | |
| Single | 42 | 93 |
| Other | 3 | 7 |
| 11. Attending school | | |
| Yes | 11 | 24 |
| No | 34 | 76 |
| 12. Mental health service use at least once in the last month | | |
| Psychiatrist | 12 | 27 |
| Therapist | 11 | 24 |
| Substance abuse treatment | 5 | 11 |

## Results

Two significant site differences were identified at baseline with regards to the study outcomes measures. An ANOVA conducted to assess for differences in study outcome variables across study sites found that participants from one study site had significantly higher levels of substance use [F (2, 42), 21.07, $p = .000$] and a significantly lower level of functioning [F (2, 42), 26.98, $p = .000$] compared to the other two study sites. Given that no other differences were found in outcome variables across the three sites, and that the focus of this secondary analysis on stages of change, data from all three sites were combined for the current analysis.

Socio-demographic characteristics of all study participants are provided in Table 1. The sample was comprised of 26 males (58%) and 19 females (42%), with a mean age of 20.44 years (SD = 2.2); most were single (n = 42) (93%), and the majority identified as heterosexual (n = 33) (73%). In addition, the majority of the youth were living in a shelter (n = 38) (84%) and were not attending school (n = 34) (76%).

Several significant associations were identified at baseline with regards to the socio-demographic data and study measures. One gender difference was found, specifically males reported significantly higher levels of self-esteem than females ($t = 3.15$, df = 43, $p = .003$). The second significant association was between job status and substance use. Participants who were unemployed reported significantly higher substance use ($t = -3.13$, df = 43, $p = .004$) than those who were employed. No other associations were found between demographic and study outcome measures.

A series of *t*-tests was conducted to assess for change between Time 1 and Time 2 for the study *intervention-precontemplation*; *intervention-contemplation*; *comparison-precontemplation*; and *comparison-contemplation* groups with the significance level set at $p = .01$ to account for multiple comparisons. Within the *intervention-contemplation group*,

**Table 2**
Paired-samples *t*-tests for study measures at baseline and immediate post-intervention for intervention group based on their stage of change.

| Study variables | T1 (n = 12) | | T2 (n = 12)* | | Significance | | Effect size |
|---|---|---|---|---|---|---|---|
| Intervention - pre-contemplation | Mean | SD | Mean | SD | *t*(*df*) | *p* | Cohen's *d* |
| BDS | 18.67 | 10.65 | 15.00 | 14.00 | 155(11) | 0.150 | 0.30 |
| BHS | 5.33 | 2.53 | 4.17 | 3.61 | 1.08(11) | 0.303 | 0.37 |
| DSI-SS | 1.67 | 2.57 | 0.83 | 1.59 | 1.45(11) | 0.175 | 0.39 |
| MAST | 4.50 | 5.37 | 3.50 | 3.09 | 0.83(11) | 0.425 | 0.23 |
| SCS | 80.33 | 14.59 | 88.75 | 17.16 | −3.43(11) | 0.006 | 0.53 |
| RSES | 28.08 | 5.90 | 30.42 | 6.65 | −1.35(11) | 0.203 | 0.37 |
| RS | 127.25 | 21.63 | 136.42 | 22.94 | −1.47(11) | 0.169 | 0.41 |
| GAF | 53.75 | 21.00 | 58.33 | 18.33 | −1.36(11) | 0.200 | 0.23 |

*missing 1 participant's T2 data

| Study variables | T1 (n = 14) | | T2 (n = 14) | | Significance | | Effect size |
|---|---|---|---|---|---|---|---|
| Intervention -contemplation | Mean | SD | Mean | SD | *t*(*df*) | *p* | Cohen's *d* |
| BDS | 26.64 | 12.23 | 20.00 | 9.61 | 2.23(13) | 0.040 | 0.60 |
| BHS | 7.85 | 6.64 | 3.86 | 3.84 | 3.08(13) | 0.009 | 0.74 |
| DSI-SS | 1.93 | 2.67 | 1.00 | 2.04 | 1.41(13) | 0.182 | 0.39 |
| MAST | 4.36 | 3.97 | 5.43 | 5.42 | −1.03(13) | 0.324 | 0.23 |
| SCS | 71.93 | 19.80 | 70.21 | 17.22 | 0.31(13) | 0.766 | 0.09 |
| RSES | 27.36 | 6.95 | 28.93 | 6.28 | −1.02(13) | 0.328 | 0.24 |
| RS | 128.57 | 23.42 | 139.64 | 19.46 | −2.78(13) | 0.016 | 0.51 |
| GAF | 54.21 | 18.17 | 58.43 | 18.48 | −2.26(13) | 0.041 | 0.23 |

**Table 3**
Paired-samples *t*-tests for study measures at baseline and immediate post-intervention for comparison group based on their stage of change.

| Study variables | T1 (n = 13) | | T2 (n = 13) | | Significance | | Effect size |
|---|---|---|---|---|---|---|---|
| Comparison-pre-contemplation | Mean | SD | Mean | SD | *t*(*df*) | *p* | Cohen's *d* |
| BDS | 21.54 | 14.96 | 18.54 | 17.31 | 1.39(12) | 0.190 | 0.19 |
| BHS | 4.00 | 6.04 | 6.31 | 6.01 | −2.11(12) | 0.057 | 0.38 |
| DSI-SS | 0.38 | 0.65 | 0.31 | 0.75 | 0.37(12) | 0.721 | 0.10 |
| MAST | 4.23 | 4.44 | 3.39 | 4.57 | 1.09(12) | 0.296 | 0.19 |
| SCS | 71.00 | 19.65 | 73.92 | 18.15 | −0.83(12) | 0.422 | 0.15 |
| RSES | 27.31 | 7.91 | 28.15 | 7.38 | −0.52(12) | 0.615 | 0.11 |
| RS* | 122.17 | 38.40 | 124.50 | 37.04 | −0.40(11) | 0.698 | 0.06 |
| GAF | 56.38 | 18.02 | 60.46 | 16.11 | −1.73(12) | 0.110 | 0.24 |

*1 missing value

| Study variables | T1 (n = 6) | | T2 (n = 6) | | Significance | | Effect size |
|---|---|---|---|---|---|---|---|
| Comparison-contemplation | Mean | SD | Mean | SD | *t*(*df*) | *p* | Cohen's *d* |
| BDS | 17.83 | 8.95 | 22.33 | 9.91 | −2.00(5) | 0.102 | 0.48 |
| BHS | 4.50 | 4.28 | 6.50 | 3.62 | −1.62(5) | 0.167 | 0.50 |
| DSI-SS | 0.83 | 1.60 | 0.83 | 2.04 | 0.00(5) | 1.00 | 0.00 |
| MAST | 6.67 | 6.19 | 7.33 | 7.81 | −0.32(5) | 0.759 | 0.09 |
| SCS | 71.17 | 18.24 | 64.83 | 16.02 | 1.80(5) | 0.133 | 0.37 |
| RSES | 29.67 | 6.41 | 26.50 | 7.31 | 1.28(5) | 0.258 | 0.46 |
| RS | 140.67 | 23.59 | 131.00 | 14.55 | 2.00(5) | 0.102 | 0.49 |
| GAF | 61.00 | 11.42 | 59.50 | 13.62 | 0.74(5) | 0.493 | 0.12 |

participants demonstrated a statistically significant improvement in scores on the BHS ($t = 3.08$, df = 13, $p = .009$), indicating decreased levels of hopelessness. There were no other statistically significant results at $p = .01$ within the intervention-contemplation group. Cohen's *d* statistic was computed for all of the study variables (see Table 2) and yielded a medium effect size on the BHS (0.74), the BDS (0.60), and the RS (0.51) for participants in the intervention-contemplation group. Furthermore, for participants in *intervention-precontemplation group*, a statistically significant difference was observed on the social connectedness measure (SCS) from T1 to T2 ($t = -3.43$, df = 11, $p = .006$), as well as a medium effect size (0.53), indicating higher levels of social connectedness following completion of the intervention. There were no significant differences in the comparison group, regardless of the stage of change (see Table 3). Furthermore, a medium effect size was obtained for the BHS (0.50) in the comparison-contemplation group, with participants demonstrating increased hopelessness from T1 to T2.

## Discussion

The purpose of this secondary analysis was to determine whether the degree of change/improvement on the study outcome measures -specifically resilience, self-esteem, social connectedness, mental health indicators, and overall functioning - differed according to the youth's stage of change at baseline, and whether the youth participated in the intervention or comparison group. The socio-demographic

characteristics of the youth participants in the secondary analysis are consistent with attributes of street-involved youth reported in the literature; specifically more males than females accessed the shelters, and a majority of the youth participants reported being unemployed and not enrolled in school (Busen & Engebretson, 2008; McCay et al., 2010). The mean length of education, Grade 1 and up, for this sample was 10.89 years, which is a consistent among street-involved youth (Busen & Engebretson, 2008). The lack of a high school diploma can impact a youth's potential to be employed and can result in substance use (Thompson, Bender, Windsor, Cook, & Williams, 2010). Participants in this study who were unemployed reported significantly higher substance use compared to those who were employed. It is also noteworthy that males had significantly higher levels of self-esteem compared to the females in the secondary analysis, and the mean scores for the males in this secondary analysis are comparable to self-esteem levels of youth at a similar age in the general population (Wershler & Ronis, 2015).

Results from the secondary analysis indicated that those participants who completed the Resilience-based Motivational Interviewing intervention and who were also at the contemplation stage at baseline demonstrated the most improvement, following completion of the intervention. Specifically, those youth who completed the intervention and were at the contemplation stage demonstrated a significant improvement in hopelessness, as well as decreased depression and increased resilience. These findings are consistent with other research studies examining the differential effect of stages of change. Specifically, youth who participated in smoking cessation (Dino et al., 2004; Stephens et al., 2004) or substance abuse treatment programs (Callaghan et al., 2005; Wei, Heckman, Gay, & Weeks, 2011) in the contemplation stage demonstrated a greater improvement, such as motivation for change, compared to youth in the precontemplation stage. Taken together, these studies demonstrated that youth at the contemplation stage who participated in programs for smoking cessation or substance use were able to recognize problematic behaviours, determine whether the change would be worthwhile, and discuss the benefits of making change. It is striking that these behavioural strategies - namely recognizing, discussing and deliberating change - are integral to Motivational Interviewing. Benefits (such as decreased hopelessness and increased resilience) observed for the current study participants in the *intervention-contemplation group* may be, in part, attributed to their capacity to discuss their problematic behaviour, address or adopt a goal in collaboration with their case manager, and gain the necessary confidence and skills to make effective change.

In contrast, no differences were found on study outcomes for youth in the comparison group, regardless of their stage of change. Youth who were in the *comparison-contemplation group* did not demonstrate change despite their readiness, highlighting that readiness to change alone may not be sufficient to achieve a positive outcome. The youth who were in the comparison group and at the contemplation stage did not have the benefit of participating in the Resilience-based MI intervention. Accordingly, these youth did not achieve improvements in mental health and overall functioning as noted in the *intervention-contemplation group*; suggesting that these youth may have been unable to progress toward making effective healthy behaviour change. The comparison group findings suggest that street-involved youth who are at the contemplation stage of change may require additional support to adopt healthy behaviour change. Furthermore, youth who were in the comparison group, but at the precontemplation stage of change, also did not demonstrate any improvements in the outcome variables. Studies suggest that youth at the precontemplation stage of change may not readily acknowledge that they have a problem and typically have lower motivation for change (Dino et al., 2004; Stephens et al., 2004). The current study findings regarding the precontemplation group align with literature that suggests that in order for youth in the precontemplation stage to move toward contemplation and healthy behaviour change, they need to be able to recognize their risk-orientated behaviour, and to discuss attitudes and beliefs regarding their problematic health behaviour to create individualized and achievable goals (Dino et al., 2004; Stephens et al., 2004).

An unexpected finding was the fact that youth in the *intervention-precontemplation group* demonstrated a significant improvement in social connectedness (a measure of belonging to a larger social group), despite not demonstrating any other significant improvements on study outcomes. It is noteworthy that these youth had social connectedness scores comparable to a group of street-involved youth who participated in a pilot study, focused on strengthening social relationships (McCay et al., 2011). It may be that for youth in the intervention-precontemplation phase (defined as not desiring change) street-life provided a feeling of community or family, in which they felt cared about and thus did not want to disrupt these relationships by making changes in their lifestyles. Ultimately, it may be necessary for youth to disengage from street culture, which may well create a barrier to developing healthy behaviour change, in order to achieve positive change (Karabanow, 2008; Lynch, McCay, Aiello, & Donald, 2017). For street-involved youth to make effective healthy behaviour change, a shift of focus from street-culture to focusing on self-set goals may be necessary and could be representative of the lower social connectedness for participants in the *intervention-contemplation group*.

## Limitations

It is important to note several study limitations. Foremost, this is a secondary analysis with a relatively small sample size which may have resulted in a lack of power to detect significant differences between pre-test and post-test results for some variables. As previously mentioned, there were challenges with recruitment at one of the study sites and, as such, some youth included in the sample were not living in the shelter. Regardless, the only site differences that were identified included increased substance use and lower functional level at one site and, therefore, the analysis combined data from all three sites, which may ultimately affect the generalizability of the study.

## Conclusion

In summary, these findings demonstrate the potential for engaging youth in the contemplation stage in a short-term 6-week Resilience-based Motivational Interviewing intervention, offered by frontline case managers to accelerate positive change, as evidenced by improved mental health and overall functioning. This secondary analysis is a step toward demonstrating the usefulness of stages of change among street-involved youth to understand who is likely to benefit from an intervention that focuses on positive engagement; ultimately with the aim of reducing risk-orientated behaviour and forming self-set goals to support successful exiting from street-life. However, it should not be assumed that street-involved youth who are at the initial stages of change, such as pre-contemplation, are unable to make effective healthy behaviour change. Counselling strategies tailored to the youths' stage of change, and the ability to explore and reduce ambivalence and resistance to change, as well as encouraging self-motivation, are needed to reduce risk-orientated behaviours and support street-involved youth in healthy behaviour change.

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