

**Safer-Drinking Strategies Used by Individuals Experiencing Homelessness
and Alcohol Use Disorder**

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Abstract

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We analyzed interview data collected from 86 adults experiencing homelessness and alcohol use disorder, (AUD) describing their endorsement and implementation of safer-drinking strategies over a one-month time frame. At week 2 and month 1, strategies geared towards reducing alcohol consumption were most highly implemented by participants, followed by strategies related to buffering the effects of alcohol, and finally changing the manner in which one drinks. The mean number of endorsed strategies increased significantly from 2.8 at Week 0 to 3.4 at Week 2 ($p=0.01$, paired t-test), as did the number of implemented strategies, from 2.1 at Week 2 to 2.8 at Month 1 ($p=0.01$). These findings indicate that people experiencing homelessness and AUD can and will adopt strategies that minimize alcohol-related harm.

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LIST OF ABBREVIATIONS

AUD	Alcohol Use Disorder
BMI	Body Mass Index
DESC	Downtown Emergency Service Center
DSM	Diagnostic and Statistical Manual of Mental Disorders
GED	General Education Development
HaRT-A	Harm Reduction Treatment for Alcohol
PBS	Protective Behavioral Strategies
SDS	Safer Drinking Strategies
SHaRE	Safer-drinking and Harm Reduction Form
SPSS	Statistical Package for the Social Sciences

1. Introduction

Worldwide, three million deaths result annually from alcohol use, and it is a causal factor in more than 200 disease and injury conditions (World Health Organization, 2018).

Alcohol use is considered one of the four key risk factors contributing to the rates of noncommunicable diseases such as cardiovascular disease, cancer, chronic lung disease, and diabetes (Parry, Patra, & Rehm, 2011). Alcohol use impairs cognitive functions including memory and complex motor control associated with the risk of injury. Globally in 2016, an estimated 0.9 million injury-related deaths and 53.4 million injury-related disability affected life years were attributable to alcohol (World Health Organization, 2018). Alcohol use is highly correlated with transmission of, and mortality from, sexually transmitted diseases in that it increases the likelihood of unprotected sex and decreases adherence to drug regimens (Schneider, Chersich, Neuman, & Parry, 2012). Additionally, epidemiological studies demonstrate a consistent association between alcohol use and the occurrence of mental illnesses, including major depressive disorders (Rehm et al., 2017).

When comparing nations, alcohol use parallels socioeconomic status and marginalization. Dependence and harmful use are most prevalent in high-income countries, mostly in the Northern Hemisphere (World Health Organization, 2018). In the United States, alcohol is the third leading cause of mortality, responsible for an estimated 88,000 deaths annually (National Institute on Alcohol Abuse and Alcoholism (NIAAA), 2018). The consequences of alcohol use manifest in medical, psychological, and social harms relative to individuals' economic and social vulnerability (Collins, 2016). While marginalized populations in the United States may consume

similar to lower levels compared to those with greater financial means, they experience a disproportionate burden of alcohol-related harm (Collins, 2016). After adjustment for consumption patterns, body mass index (BMI), and smoking, low socioeconomic status is consistently associated with increased likelihood of alcohol-related harm (Katikireddi, Whitley, Lewsey, Gray, & Leyland, 2017).

Due to interlocking systems of oppression within marginalized populations, people experiencing homelessness, as defined by the U.S. Federal McKinney-Vento Act (Moore, 2019) as being unhoused for at least 6 of the last 12 months, are at greater risk of both alcohol use and attributable harm (Fazel, Khosla, Doll, & Geddes, 2008). Health conditions and mortality rates experienced by this population mirror those found in developing countries and lead to similarly premature life expectancies of between 42 and 52 years (Fazel, Geddes, & Kushel, 2014). Among the many issues affecting this population globally, we find disproportionately higher rates of mental illness and substance use (Fazel et al., 2008). Estimates vary widely due to sampling and operational variation, but it is estimated that between one-quarter to a half of single homeless adults have reported a problem with alcohol use (Dietz, 2009; Spinelli et al., 2017), a worrisome trend when use of the substance can worsen symptoms of mental illness among a population with little to no access to care (People, 1988).

Research indicates that for this population, alcohol use may be considered an adaptive means of building community, and staving off psychiatric and withdrawal symptoms (Collins et al., 2012). Therefore, it is critical that models of care consider and accommodate affected individuals' and communities' specific needs (Collins et al., 2011).

The field of harm reduction has emerged as an effective means reducing adverse health, social, and economic harms associated with the use of licit and illicit substances. The defining feature of the harm reduction model is the focus of policies, programs, and practices on the reduction of harm, rather than on reducing the amount of drug and alcohol use itself (Collins et al., 2011). Within the larger framework of harm reduction, methods of reducing alcohol-related harm, or safer-use strategies, have been noted as actions one can enact prior to, during, or after alcohol consumption to reduce related harm (Collins et al., 2015; Martens, Martin, Littlefield, Murphy, & Cimini, 2011). This includes but is not limited to use of designated drivers, consuming food and water while drinking, and setting consumption limits.

Despite extensive literature on safer-drinking strategies among college students (Araas & Adams, 2008; LaBrie, Lac, Kenney, & Mirza, 2011; Sugarman & Carey, 2007), limited research has examined the use of safer-drinking strategies in marginalized populations (Araas & Adams, 2008; LaBrie et al., 2011; Sugarman & Carey, 2007), and fewer still have focused on those experiencing homelessness (Collins et al., 2015). Because those experiencing homelessness experience more alcohol-related harm than the general population, it is critical that we focus attention on safer-drinking strategies in marginalized populations.

“Harm Reduction Treatment for Alcohol (HaRT-A) for People Experiencing Homelessness and Alcohol Use Disorder,” a randomized control trial (RCT) (N=168), addressed this gap by testing the three-month efficacy of harm reduction treatment in Seattle, Washington (Collins et al., in press). The harm reduction arm of this study involved tracking of participant-led harm reduction

metrics concerning endorsement and implementation of harm-reduction goals and safer-drinking strategies. Compared to the control group, participants who received harm reduction, reported significantly greater increases in confidence to engage in harm reduction and decreases in peak alcohol use, alcohol-related harm, alcohol use disorder (AUD) symptoms, and positive urinary ethyl glucuronide tests (all, $p < .05$) (Collins et al., 2019). The present study will build from the HaRT-A study, focusing on the first month of intervention and further exploring participants' responses to one component of this intervention, safer-drinking strategies.

2. Materials and Methods

This study used a prospective cohort study design, with secondary analysis of data previously collected during the parent RCT (N=168). Data were entered into REDCap, a secure, online research database during the primary research study. After obtaining written, informed consent, research staff conducted 45-minute baseline (week 0) interviews using the measures described below. Participants were then individually randomized using permuted, stratified block randomization (Hedden, Woolson, & Malcolm, 2006) to either the HaRT-A or services-as-usual conditions. Only HaRT-A participants (n= 86) were included for our secondary analysis; although 2 were excluded because their record lacked some data needed for this analysis. No participants from the services-as-usual group were included.

HaRT-A Participants were administered demographic and alcohol measures at baseline (week 0). They were next provided with harm-reduction counseling, during which study interventionists provided personalized alcohol feedback, tracked relevant alcohol metrics, elicited participants' own goals (i.e., goals determined by the participant and not necessarily related to alcohol use)

and introduced a list of safer-drinking strategies. This study focuses on the third component, safer-drinking strategies.

Interventionists introduced a list of strategies developed together with community members, physicians and psychologists that have the potential to help people stay healthier while drinking, alter the way that they drink, or change the amount that they drink (Collins et al., 2019). If the participant was physically dependent, and reduction or abstinence was the stated goal, interventionists reviewed information on the risks of alcohol withdrawal, tapering schedules, and medically supervised withdrawal options. Endorsement of safer-drinking strategies was assessed at week 0 (baseline) and week 2 (follow-up) and implementation was assessed at week 2 and month 1 (post-test), respectively, were used in the current analysis.

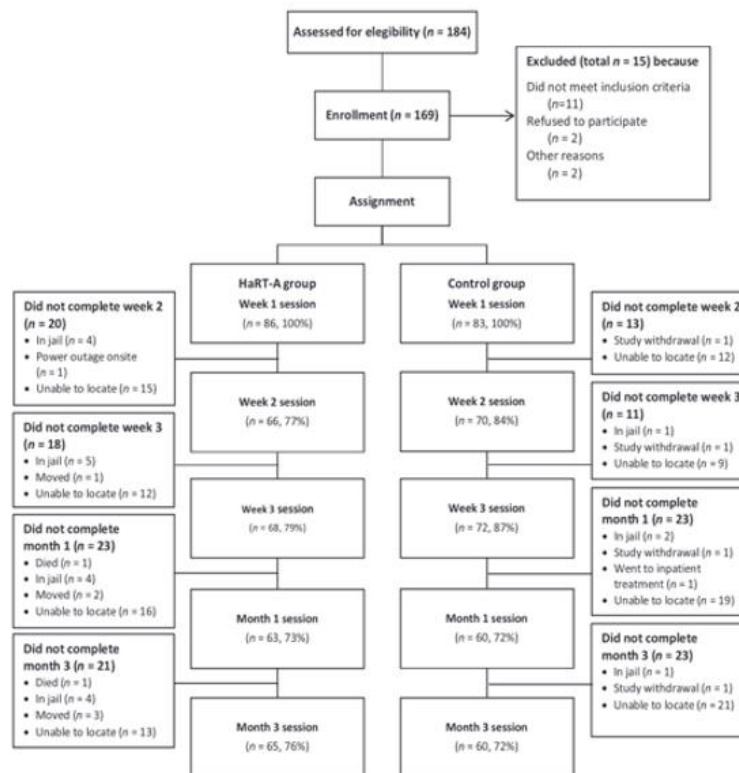
Procedures were approved by the Institutional Review Board at the University of Washington and followed principles outlined in the Declaration of Helsinki.

2.1 Participants

A total of 84 participants experiencing homelessness and AUD within the HaRT-A arm of the primary study were included in this secondary analysis (86 eligible; 2 excluded because missing some necessary data). Participants were recruited from three clinics and agencies in Seattle: Pioneer Square Clinics, Downtown Emergency Service Center (DESC), and the REACH program at Evergreen Treatment Services. The participants were identified as being homeless as defined by the McKinney-Vento Act (Moore, 2019) for a minimum of 6 months within the last year and met the DSM-5 criteria for AUD. Some attrition occurred over time. About 75% (n=63)

of the 86 total participants remained active in the study at Month 1. See Figure 1 for documentation of loss to follow-up in the primary study.

Figure 1: Subject Participation at Enrollment and Intervention Sessions



2.2 Measures

2.2.1 Demographic Variables

The *Personal Information Form*

was used to assess age, gender,

race, ethnicity, education level

and employment status (Collins

et al., 2014). Demographic

variables were used to describe

the sample at baseline (Table 1).

Most of the participants were

men (80%), and most (70%) had

completed high school (or GED) or additional education. Age ranged from 21 to 63 years and

was 48 years on average. Slightly more than half (55%) were Black or African American. White

was the next more frequent race (23%). About 88% were experiencing homeless during the 30

days before baseline.

Table 1

Baseline descriptive Statistics for the study sample (N = 85)

Variable	M(SD) / %
Age	48.34 (9.09)
Ethnicity	7.1% Hispanic/Latino/a
Race	
American Indian/Alaska Native/First Nations	13.1%
Asian	0%
Black/African American	54.8%
Native Hawaiian/Pacific Island	1.2%
White/European American	22.6%
More than one Race	3.6%
Other	4.8%
Highest Education Level	
No HS School Degree	29.8%
HS graduate/GED	38.1%
Vocational School	1.2%
Some College	23.8%
College graduate	6.0%
Some graduate school/ advanced degree	1.2%
Sex Assigned at Birth	
Female	20%
Male	80%

Notes. Percentages may not total 100% due to rounding.

2.2.2 Safer-Drinking Strategies

The Safer-drinking and Harm Reduction Form (SHaRE) is an open-ended questionnaire used to

record a participant's endorsement and implementation of safer-drinking strategies. After a 12-

item list of strategies was presented during the intervention, participants' open-ended responses

regarding strategies they wanted to commit to ("endorsed") were recorded. Participants were

informed that study interventionists would check in with them during subsequent weeks to assess

whether they had successfully implemented safer-use strategies in the prior week. In addition to

the baseline appointment (Week 0), endorsement and implementation of safer-drinking strategies was assessed at similar counseling appointments at Week 2 and Month 1.

2.3 Procedures

2.3.1 Qualitative Data Analysis

Responses describing safer-drinking strategies were transcribed from SHaRE into a spreadsheet. Content analysis, a systematic process of coding and classification (Charmaz, 2014), was employed to categorize participants' individual use of safer-drinking strategies. Participants' responses were reviewed by a team of raters, including bachelor's and master's level students and a clinical psychologist, to identify recurring categories of safer-drinking strategies. Initial coding was conducted independently, in-vivo, utilizing a pre-described codebook from a similar study (Grazioli, Hicks, Kaese, Lenert, & Collins, 2015). Independent coding was discussed, and discrepancies resolved until inter-rater agreement reached acceptable standards in literature (i.e., 80% or better) (Shek, Tang, & Han, 2005). This process identified the individual strategies that a participant endorsed at Week 0 and Week 2, as well as the total number of endorsed strategies. However, the implementation assessment at Week 2 and Month 1 only yielded the total number of implemented strategies and not information on which individual strategies were implemented. Frequency analysis was conducted in SPSS to describe the total number and percentage of safer-drinking strategy categories endorsed by the participants at beginning and end of study, as well as overall strategy retention by participants.

2.3.2 Quantitative Data Analysis

Sociodemographic characteristics of participants were analyzed to determine if statistically significant differences were present between race, sex assigned at birth, age, and ethnicity in regard to strategies endorsed and achieved. Preliminary descriptive analyses were conducted in SPSS to describe the sample, document data distribution, and identify potential outliers.

Nineteen safer drinking strategies served as major dependent variables. The frequencies of all variables were unimodal and approximately normally distributed, although there was some truncation at lower values and some skewing at higher values. A paired t-test and Wilcoxon signed rank test were employed to examine differences between baseline and follow-up appointments. Isolated or internally inconsistent findings were interpreted cautiously.

The number of named strategies for each participant was calculated in total and collated into one of three mutually exclusive, previously determined categories: (1) Buffering the Effects of Alcohol, (2) Changing the Manner of Drinking, and (3) Reducing Alcohol Consumption. These variables were also unimodal and approximately normal, with some skewing. Strategy categories were examined numerically and after transformation into categorical variables in two ways: a dichotomous variable (none, or at least one, strategy named within the category), and a three-category variable which allowed for nuance in number of strategies (one two or more). The dichotomous variable was the primary focus of categorical analyses.

After confirming that the distribution of safer-drinking strategy variables (total number endorsed and implemented) met the criteria for Poisson regression, we examined strategies in comparison

to each sociodemographic variable of interest (race, ethnicity, sex assigned at birth, and age) individually.

We also conducted bivariate analysis within the dichotomized strategy categories utilizing chi-square tests for categorical sociodemographic variables and t-tests for age in its numeric form.

3. Results

3.1 Qualitative

Content analysis interrater reliability reached 84% using a two-way mixed effects model for single ratings of strategy endorsement at week 0 and 2 and implementation at week 2 and month 1. Strategies were gathered into the three strategy categories. At both week 0 and week 2, the most highly endorsed safer-drinking category was reducing alcohol consumption, followed by changing the manner of drinking and buffering the effects of alcohol. Table 2 shows the rank-ordered list, of safer-drinking category and strategy frequency at the baseline and follow-up appointments, sorted by the follow-up appointment frequencies. Table 2 also shows the participants' "retention" of a given strategy at the Week 2 session, after previously endorsing that same strategy at Week 0.

Frequency analysis of overall strategy retention showed "drinking water," "eating more," "drinking less," and "taking vitamins" to be the four most frequently endorsed and retained strategies.

Table 2.

Safer-Drinking Strategies Named at Baseline and Follow-up Appointments

Safer Drinking Strategy	Strategy Named at Baseline Week 0 (n=84)		Strategy Named at Follow-Up Week 2 (n=66)		Signif (McNemar) p	Strategy Retained from Baseline to Follow-Up* (n=66)	
<i>Sorted by Category</i>	n	(%)	n	(%)		n	(%)
Reducing Alcohol Consumption	69	(.82)	60	(.91)	0.30		
Drink water	32	(.38)	34	(.52)		12	(.18)
Drink less alcohol	31	(.37)	21	(.32)		12	(.18)
Abstinence	13	(.15)	12	(.18)		4	(.06)
Stay busy, distracted	5	(.06)	10	(.15)		2	(.03)
Avoid withdrawal	6	(.07)	9	(.14)		1	(.02)
Avoid triggering people, situations	4	(.05)	8	(.12)		2	(.03)
Replace alcohol with cannabis	10	(.12)	3	(.05)		1	(.02)
Buffering the Effects of Alcohol	45 *	(.54)	47	(.71)	0.09		
Eat more	30	(.36)	27	(.41)		9	(.14)
Take vitamins	26	(.31)	26	(.39)		14	(.21)
Count drinks	9	(.11)	7	(.11)		3	(.05)
Eat while or before drinking	1	(.01)	3	(.05)		0	(.00)
Drink water while drinking alcohol	1	(.01)	1	(.02)		0	(.00)
Changing the Manner of Drinking	47	(.56)	35	(.53)	0.99		
Drink in a safer place	18	(.21)	18	(.27)		7	(.11)
Space drinks, pacing	14	(.17)	12	(.18)		4	(.06)
Avoid mixing drugs and alcohol	10	(.12)	11	(.17)		3	(.05)
Drink lower proof alcohol	10	(.12)	8	(.12)		3	(.05)
Avoid drinking non-beverage alcohol	1	(.01)	2	(.03)		0	(.00)
Avoid certain kind of alcohol	1	(.01)	1	(.02)		0	(.00)
Other	4	(.05)	11	(.17)		1	(.02)

Table ranked according to most endorsed safer-drinking category at Follow-up

* Strategy named by same participant at both Baseline and Follow-up appointments.

3.1.1 Buffering the Effects of Alcohol

Overall increases in eating was the most highly cited safer-drinking strategy within this category.

Participants reported strategies such as “try to eat when drinking” or “eating when I drink.”

The second most highly endorsed strategy was taking vitamins to replenish nutrients utilized in the metabolism of alcohol. Doing so effectively works to limit negative drinking-related

symptoms. Drinking non-alcoholic beverages while drinking was endorsed at a much lower frequency with only one participant citing it as a strategy.

3.1.2. Changing the Manner of Drinking

The top cited strategy within this population was drinking in a safer place (i.e., “drinking by self,” “use at home,” waiting until indoors to drink”). The second most highly endorsed strategy was spacing drinks or pacing ones drinking. This category has a significant amount of strategies listed. Other less commonly referred to categories included drinking lower-proof beverage, avoiding mixture of drugs and alcohol, counting drinks, avoiding withdrawal symptoms, and avoiding specific kinds of alcohol.

3.1.3. Reducing Alcohol Consumption

The dominant strategies cited by participants in this category were drinking water and drinking less overall. This manifested in numerous ways such as establishing a limit of 6-8 beers per day, reducing drinking, and slowing down while drinking. Other strategies listed included replacing alcohol with cannabis (i.e., “replace alcohol with cannabis edibles”), engaging in non-drinking activities (i.e. “increase exercise via biking.” “walking”) and avoiding triggering people/situations (i.e. “staying away from old friends”).

3.2 Quantitative results

All except 2 participants (n=84) endorsed at least one strategy at Week 0 (range 0-7), and all participants at Week 2 (n=66) endorsed at least one (range 1-8). On average, participants

endorsed 2.8 strategies at Week 0 (mean; standard deviation, sd, 1.6; n=84) and 3.4 (sd 1.7; n=66) at Week 2. This was a significant increase between Weeks 0 and 2, even after allowing for attrition at Week 2 (paired t-test, $p=0.01$). The increase in number of endorsed strategies was evident within each of the three strategy categories: reducing alcohol consumption, mean change +0.24; buffering the effects of alcohol, +0.11; changing the manner of drinking, +0.15 (changes were not significant at this subtotal level; each, $p \geq 0.08$, Wilcoxon signed rank or paired t-test).

Most participants had implemented at least one strategy at Week 2 (range 0-7), and all except two at Month 1 (range 1-8). On average, participants had implemented 2.1 strategies at Week 0 (mean; sd, 1.5; n=84) and 2.8 (sd 1.6; n=66) at Week 2. This was a significant increase between Weeks 0 and 2, even after allowing for attrition at Week 2 (paired t-test, $p=0.01$).

With two relatively isolated exceptions, none of the sociodemographic variables showed a significant association with: total number of strategies endorsed or implemented; or total number of endorsed strategies when collating them into their respective categories. One exception was age. Older participants were more likely to report one or two “Buffering effects of alcohol” strategies, at Week 2 ($p=0.03$, chi-square test for trend), but not at Week 0 ($p=0.90$). The other exception was sex assigned at birth. Women were more likely to report two “Buffering effects of alcohol” strategies, at Week 2 ($p=0.02$, chi-square test for trend), but not at Week 0 ($p=0.47$). Given the large number of comparisons conducted, the observations at Week 2 but not Week 0, and the small number of women, these could be false-positive findings and thus should be interpreted cautiously.

4. Discussion

Our findings indicated that all study participants successfully endorsed safer-drinking strategies by Week 2, and all except two had implemented one or more strategies by Month 1.

Endorsement and implementation of strategies increased significantly during the study period.

Reducing alcohol consumption (e.g. drinking water, drinking less alcohol, abstaining from alcohol) was the most frequently documented category followed by buffering the effects of alcohol (e.g. eating before or while drinking, taking vitamins) and changing the manner of drinking (e.g. drinking in a safe place, drinking lower-proof beverages, counting drinks).

The aim of our study was to qualitatively and quantitatively document the extent to which people experiencing homelessness practice safety while drinking, and to test whether those strategies change throughout a six-week time frame. Upon review of the specific strategies we see that “drinking less alcohol” was the only strategy to see a decrease in frequency of safer-drinking strategies endorsed between Week 0 (n=31) and Week 2 (n=21). The lack of abstinence-oriented strategies in comparison to other categories reflects the importance of a harm reduction perspective in decreasing the negative consequences of alcohol use disorder. The literature indicates that there is an inverse relationship between distinct types of safer-drinking strategies/protective behavioral strategies (SDS/PCS) and alcohol-related outcomes. (Araas & Adams, 2008; Pearson, 2013; Pearson & Henson, 2013). Although assumptions about success could be made by nature of the categories that were retained most by participants, our study was based only on self-reported success and therefore did not provide contextual information on shifts in amount and nature of alcohol use. Future studies could capitalize on this information and expand similar studies to include data on alcohol use.

Regarding the quantitative findings, participants endorsed an average of three strategies across the intervention. The mean number of endorsed strategies increased significantly from 2.8 at Week 0 to 3.4 at Week 2 ($p=0.01$, paired t-test), as did the number of implemented strategies, from 2.1 at Week 2 to 2.8 at Month 1 ($p=0.01$). These findings could be due to participants keeping pace with the amount of safer-drinking strategies they endorsed and achieved throughout the study. Our findings suggest that those experiencing homelessness and AUD are interested in implementing and adopting harm reduction approaches such as safer-drinking strategies that minimize alcohol-related harm. Although future randomized control trials are needed, these results indicate that safer-drinking strategies can be used as a promising intervention component for populations severely affected by the negative consequences of heavy alcohol use such as those experiencing homelessness.

5. Limitations

There were several limitations to this study. Due to the nature of the secondary analysis of existing data, this data was not collected to address the needs of our analysis. Furthermore, those who conducted the analysis of this data were not the same individuals involved in the data collection process. Although this introduced the potential for inaccuracy by way of misinterpreting specific variables in the data set, careful examination of all relevant documents was utilized to mitigate the risk.

The Seattle homeless population is reflective of local demographics and therefore may not be representative of the larger US population or communities with different racial/ethnic distributions. Additionally, our sample excludes youth and young adults (<21 years) so these

findings are not generalizable to youth experiencing homelessness. Furthermore, our sample size was relatively small (n=86) in contrast to the thousands of people experiencing homelessness in the Pacific Northwest. In addition, the participants volunteered for the study rather than being randomly selected. Both of these conditions increase the likelihood of making errors in our analysis and conclusion. Our data interpretations and conclusions, however, were relatively conservative.

Our participant sample had substantial variability in the duration of experiencing homelessness and is not necessarily representative of those experiencing chronic homelessness. That said, prior research among chronically homeless individuals with alcohol dependence has elicited nearly identical outcomes (Grazioli et al., 2015).

Although there are understandable concerns with self-report data (Ekholm, 2004), our research team has found that self-report measures among individuals experiencing homelessness and alcohol problems can be reliable (Clifasefi, Collins, Tazor, Hoang, & Larimer, 2011). Social desirability may also influence the outcome. As alcohol use is a sensitive behavior, participants may have provided more goals and reported more positively on their achievement or progress to present themselves in a positive light.

Despite these limitations, the current study provides important information regarding the desire for, and type of, safer-drinking strategies employed by adults experiencing homelessness. Future studies should aim to elaborate beyond our one-month analysis to determine if effects persist over a more extended timeframe.

6. Conclusion

These findings support the contention that people experiencing homelessness and AUD adopt strategies that minimize alcohol-related harm, including ways that change the amount and manner of drinking and buffering the effects of alcohol. This may offer insight to clinicians on how clients experiencing homelessness respond to the effects of alcohol-related harm and facilitate the utilization of known and acceptable strategies to support progress towards an attainable, realistic goal. Future studies should examine whether certain strategies or a composite of multiple strategies are more effective among the general homeless population and whether other factors such as perceived social support can mediate how effective certain types of strategies are.

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