SOCIAL SUPPORT AND SUBSTANCE USE RECOVERY

THE IMPACT OF SOCIAL SUPPORT ON SUBSTANCE USE RECOVERY AND
EXPLORING POTENTIAL PROTECTIVE AND RISK FACTORS DURING THE COVID-19
PANDEMIC

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**This is a Master's Thesis that has been approved by an internal thesis committee composed of faculty members, but has not been peer-reviewed by external reviewers.*

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Abstract

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COVID-19 and stay-at-home orders have caused disruptions in social interactions. Vulnerable populations, such as those in early substance use recovery, that rely on social support and social engagement have faced many challenges. The purpose of this study was to explore potential associations between perceived social support and recovery related outcomes, correlates of recovery related outcomes among face-to-face and virtual engagement, and identify characteristics that are predictive of perceived social support. Results revealed that social support was positively associated with quality of life and abstinence self-efficacy, and negatively associated with psychological distress. Additionally, recovery related outcomes differed among face-to-face and virtual interactions. Lastly, characteristics such as gratitude, mindfulness, and coping were positively associated with perceived social support.

Keywords: Substance Use Recovery, Social Support, Social Engagement, COVID-19

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Chapter 1

Introduction

In the beginning of March 2020, the COVID-19 pandemic began to rapidly spread throughout the United States. To combat the outbreak and attempt to slow the transmission rate of the virus, cities and states across the country issued stay-at-home orders. While these orders were vital to public health because of the nature of the disease and the unprecedented number of individuals becoming hospitalized, there have been concerns about the unintended consequences for mental health stemming from these orders, specifically that they resulted in social isolation for many vulnerable populations (Kavoor, 2020). One aspect of social isolation that is of concern is the loss of perceived social support, especially in vulnerable populations such as those with substance use disorders in early recovery (Brooks et al., 2020), given that most substance use recovery programs are largely based on social support and social interactions. The consequences of stay-at-home orders for an extended period are unknown for individuals in the most vulnerable time of recovery who rely heavily on social support and social engagement (Smith et al., 2021).

Past research has shown that the early phase of recovery is a very vulnerable time. During this early phase, there is an increased risk of the individual relapsing and returning to active addiction (DiClemente et al., 1994). Prior research has shown that social support is an important tool that helps people cope with stressful or challenging situations (Fondacaro & Moos, 1987). In addition to social support from the individual's personal social network, social interactions between people new to recovery and those with extended time in these programs can be important in contributing to a person's overall social support (Stevens et al., 2014). Given the unprecedented restrictions on personal interaction brought on by COVID-19, it is important to

understand how social support and engagement, or the lack thereof, impacts individuals in early recovery. Furthermore, because stay-at-home mandates were issued on a nationwide scale for the first time in U.S. history, it is important to explore potential risk and protective factors during the COVID-19 pandemic so that we may better understand the impact social isolation has on the substance use recovery community.

Chapter 2

Literature Review

Substance Use Recovery and Social Support

Social support has been shown to be vital to long-term recovery and positively impacts an individual's goal to remain abstinent (Lookatch et al., 2019). Additionally, perceived social support has been shown to influence quality of life and is associated with greater self-efficacy (Laudet & Stanick, 2010). Social support can be defined as the available resources an individual has access to outside oneself. This type of support structure is divided into three distinct subcategories which included emotional, instrumental, appraisals and informational support. These three subcategories include support such as love, sympathy, and esteem gained from another individual, help in obtaining financial or external resources, and advice or information (Thoits, 1995; Weiss, 1974).

Perceived social support is an individual's perception of support available at any given point. These perceptions may be influenced by internal factors such as long-standing personality traits or one's current mood (Procidano & Heller, 1983). Therefore, it is important to examine the individual's perception of support available to them during the period of isolation that stemmed from the pandemic. Past research has shown that perceived social support is an important aspect of a person's ability to protect themselves against relapse and to remain

abstinent during early recovery. Social support has also been associated with greater psychological health and has been linked to greater lengths of abstinence in substance users after detoxification (Atadokht et al., 2015). Conversely, low social support may increase psychological distress, which is shown to be a predictor of relapse (Lakey & Cassady, 1990).

Conservation of Resources Theory

The Conservation of Resources theory (COR) helps to explain potential relationships between social support and social isolation in the substance use recovery population. COR suggests that people are motivated to gain, keep, and hold on to resources in which they value (Hobfoll et al., 1990). Interestingly, research has shown that those with high levels of resources are overall less vulnerable to the loss of those resources and have greater ability to attain more resources. Likewise, those with few resources are more likely to lose resources during times of stress and are less able to acquire additional resources (Halbesleben, 2006). Individuals in recovery with a large number of resources may experience less stress during the pandemic compared to those with less resources, and therefore, may express greater perceived social support. However, those who possess few resources may experience greater levels of stress and have more negative outcomes.

According to Barrera (1986), social support is a meta-construct made up of social embeddedness, social transactions, and received and perceived support. One aspect of COR describes the loss of resources as occurring when an individual places a large amount of self-worth into a social identity that may be lost or diminished (Hobfoll & Lilly, 1993). Therefore, individuals who place a high amount of self-identification into programs such as Alcoholics Anonymous may experience greater losses with the disruption caused by COVID-19 in comparison to those who do not identify with the program as strongly. Conversely, COR

suggests that individuals must invest their resources to limit the loss of current resources, protect their current resources, or gain additional resources. Previous literature suggests that people carry resources with them and accumulate resources throughout their lifetime. This has been referred to as *resource caravans*; conversely, *risk factor caravans* are the loss or draining of resources. Research has shown that the positive association between social support and self-efficacy is an example of a resource caravan, where trauma would be a risk factor caravan (Holmgreen et al., 2017)

Individuals with greater levels of resources and social support prior to stay-at-home orders may perceive greater levels of social support than those with less resources prior to stay-at-home orders. However, because many individuals entering substance use recovery are more likely to have less resources available to them due to the nature of their disorder, those in early recovery may rely heavily on the social support given in substance use programs (e.g., Alcoholics Anonymous [AA], Narcotics Anonymous [NA], etc.) In theory, the possible disruption of social support from recovery programs during a vulnerable time of recovery could lead to further social isolation, lower overall quality of life, and greater levels of psychological distress.

Other Protective and Risk Factors

In addition to the role of social support and isolation in substance use recovery, it is also important to consider other protective and risk factors that might influence people's experiences with recovery during the pandemic, particularly factors that could be relevant to the layered stressors associated with social isolation in this context. One potential protective factor is trait gratitude, defined as the proneness to experience gratitude in daily life (McCullough et al., 2002). Gratitude generally is associated with a wide range of positive outcomes and has been

found to be negatively correlated with relapse in past studies (Chen, 2016). Likewise social connectedness within peer-support recovery groups has been shown to reduce relapse and increase recovery rates. Feelings of connectedness and community becoming disrupted by social isolation and stay-at-home orders may influence an individual's perceived social support (Reif et al., 2014). Another possible protective factor is mindfulness, defined as a nonjudgmental attitude or awareness. Research in mindfulness and its effectiveness in substance use treatment has shown promise over the last decade. Specifically, studies have shown that Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy for depression have been associated with lower rates of relapse and overall greater quality of life (Bowen et al., 2009).

Personality traits differ from person to person, but when looking at individuals who abuse and overuse substances, research has shown similarity in many personality characteristics. When exploring potential risk factors, past studies have shown that among the Five Factor Model of personality, individuals with a history of heavy substance use have been characterized by low extraversion, agreeableness, and conscientiousness, as well as high neuroticism (Walton & Roberts, 2004). These characteristics could lead individuals to cope with negative situations by using substances. It has been widely accepted that these individuals may drink or use substances to alleviate emotions (Cooper, 1994). Additionally, it is important that a person's coping style be taken into consideration. Coping styles, such as instrumental coping and emotion-focused coping, align with the principles of some recovery communities such as AA, NA, and SMART Recovery. Individuals utilizing these styles of coping may perceive greater social support within these communities. Researchers have found that a majority of people experiencing problems with substance use have adapted an avoidance coping style in attempts to avoid stressful situations and depression. This coupled with possible inadequate coping skills has been

associated with habitual relapse over time (Moos, 2008). Therefore, it may be important to examine an individual's ability to cope in a new situation that also involves social isolation.

Chapter 3

Current Study

Although there is extensive research on the relationship between social support and substance abuse recovery, little is known about how the COVID-19 pandemic and subsequent, extended stay-at-home orders have affected perceived social support within the recovery community. Because social isolation is a common behavior for those in active addiction, it is important to explore potential risk and protective factors that could impact recovery in the context of forced social isolation. As an at-risk population, those with substance use disorders may be more susceptible to negative mental health outcomes including possible relapse and return to active addiction. Therefore, the purpose of this study was to better understand how social engagement is associated with individuals in early recovery and identify potential risk and protective factors of social isolation within the recovery population. The purpose of this paper includes three aims: (1) examine the associations between perceived social support, quality of life, psychological distress, and abstinence-related outcomes among people in substance use recovery during the COVID-19 crisis;. (2) investigate the associations between levels of social engagement (e.g., face-to-face, virtual) and quality of life, psychological distress, and abstinence-related outcomes among individuals in recovery from substance use during the COVID-19 crisis; and (3) explore which traits and characteristics (e.g., personality, coping strategies) serve as predictors of perceived social support within individuals in recovery from substance use during the COVID-19 crisis.

For the first aim, there are four hypotheses: (1a) Perceived social support will be associated with higher quality of life; (1b) perceived social support will be associated with lower psychological distress; (1c) perceived social support will be associated with higher self-efficacy related to the ability to abstain from substances in specific tempting situations; (1d) and within 1 year. The remaining aims were exploratory without any a priori hypotheses.

Chapter 4

Materials and Methods

Participants and Procedures

All materials and procedures were approved by The University of Texas at Tyler Institutional Review Board. Recruitment for pilot data began in October of 2020. A total of 504 participants were recruited to complete the survey. After inspection of the pilot data, minor adjustments were made to the survey to reduce the length of time it took to complete the survey. Specific adjustments included removing three exploratory measures, which were deemed unnecessary, and using a brief 6-item scale to assess connectedness. Additionally, a single item question was added to assess change in perceived social support. Data collection resumed in January of 2021 and ended in May of 2021. A total of 464 participants were recruited to complete the second phase of the survey, with a total of 504 participants recruited across the entire study. The sample was drawn from online support groups for individuals in recovery (e.g., Facebook recovery groups, university recovery centers, Reddit, etc.) and through snowball sampling methods. Participants who completed the survey had the option to be entered into a raffle to win one \$100 Amazon e-gift card.

To be eligible for participation, participants had to be 18 years or older, reside in the United States, and provide informed consent. The survey included two screeners for recent drug

and/or alcohol use, which was used to determine eligibility for being included in data analysis. Participants screened positive for recent substance use based on scores from the DAST-10 (Skinner, 1982) and the AUDIT (Saunders et al., 1993). Participants screened positive for drug use if they reported a total score of one or higher on the DAST-10 (Skinner, 1982) and screened positive for alcohol use if they reported a total score of 7 or higher on the AUDIT (Babor et al., 2011). Following the screening, participants were given a battery of self-report questionnaires. Several attention screeners were also included to assess whether participants were carefully following instructions when answering survey items. First, one attention question was embedded within the survey (e.g., “*Please click on the little blue circle at the bottom of the screen. Do not click on the scale items that are labeled from 1 to 9*”) and participants were excluded if they failed to respond accurately to that item. To further screen for inaccurate responses, participants were excluded if they answered questions inappropriately in reference to count questions asking how many days during the week they engaged in social interaction (e.g., in the past *seven* days I have spent *nine* days socially interacting with another person). In total, 359 participants were excluded from analysis: 2 did not provide consent, 96 did not screen positive for past drug or alcohol use, 208 failed the attention screen question, 15 provided inappropriate responses to count questions, and 38 IP addresses were duplicates. The final sample size included 145 participants.

Measures

Demographic Information

Demographic information of participants was collected to assess participant characteristics including age, gender, minority status, and relationship status.

History of Drug and Alcohol Use

To screen for alcohol and/or substance use in the past 12 months, participants were asked to complete the Drug Abuse Screening Test (DAST-10; Skinner, 1982) to assess for recent drug use and the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) to assess for recent alcohol use. The DAST-10 includes 10 items rated on a dichotomous yes (1) or no (0) scale. A total score was obtained by summing all 10 item scores, with higher scores indicating a higher degree of problems related to drug use. The DAST-10 has demonstrated validity and reliability in past work (Yudko et al., 2007). The AUDIT includes 10 items rated on a 0 (*never*) to 4 (*4 or more times a week*) scale. A total score was obtained by summing all 10 item scores, with higher scores indicating a higher severity of alcohol use. The AUDIT has demonstrated validity and reliability in past work (Daeppen, 2000) and good reliability in this study ($\alpha = .88$).

Recovery History and Information

Recovery related data was collected from those who recorded some alcohol and/or substance use in the past 12 months. First, participants were asked whether they are currently using those substances. Additionally, participants were asked their approximate length of abstinence (if applicable), participation in recovery-based meetings (e.g., AA, NA, etc.), type of meetings attended (e.g., in person, virtual meetings, or phone call), and if they currently have a sponsor.

Perceived Social Support

The 12-item Multidimensional Scale of Perceived Social Support Questionnaire (MSPSS; Zimet et al., 1988) was used to assess participants' perceptions of support. Items were rated on a 7-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). The MSPSS includes a total score and three subscale scores for perceived support from distinct sources: family, friends, and a significant other. The total scale score was calculated by summing

all items and dividing by 12, with higher scores indicating higher levels of global perceived social support. Individual subscale scores were calculated by summing four items from each subscale, then dividing by four. This measure has demonstrated reliability and validity in past studies (Canty-Mitchell & Zimet, 2000). In this study, Cronbach's alpha was estimated for each dimension: total score ($\alpha = .93$), significant other ($\alpha = .85$), family ($\alpha = .82$), and friends ($\alpha = .86$).

Quality of Life

The 26-item World Health Organization Quality of Life Instruments (WHOQOL-BREF; World Health organization, 1993) was used to assess the following domains: physical health, psychological health, social relationships, and environment. The scale also includes two single items covering overall quality of life and general health. Items were rated on a 5-point Likert scale ranging from 1 (*not at all, very dissatisfied, etc*) to 5 (*an extreme amount, very satisfied etc.*). The WHOQOL-BREF was scored by summing each of the items per domain with higher scores indicating a higher quality of life. This measure has demonstrated reliability and validity in past studies (Ainger et al., 2006). In this study, Cronbach's alpha was estimated for each dimension: physical health ($\alpha = .81$), psychological health ($\alpha = .59$), social relationships ($\alpha = .65$), and environment ($\alpha = .82$).

Psychological Distress

The 21-item Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) was used to assess depression, anxiety, and stress in the past week. Items were rated on a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much*). Higher scores represent higher levels of symptomatology. The DASS-21 contains three subscales, each of the 7 items per scale were summed to yield three separate total scores. This

measure has demonstrated reliability and validity in past studies (Antony et al., 1998). In this study, Cronbach's alpha was estimated for each dimension: depression ($\alpha = .90$), anxiety ($\alpha = .91$), and stress ($\alpha = .86$).

Situation-Specific Self-Efficacy for Abstinence

The 8-item Drug-Taking Confidence Questionnaire (DTCQ-8; Sklar & Turner, 1999) was used to assess participants' self-efficacy related to their ability to abstain from substances in specific tempting situations. Items were rated on a 6-point Likert scale ranging from 0 (*not at all confident*) to 6 (*very confident*). The DTCQ-8 was scored by summing all items, with higher scores indicating higher levels of coping self-efficacy. This measure demonstrated reliability and validity in past studies (Sklar & Turner et al., 1999) and good reliability in this study ($\alpha = .86$).

Long-Term Abstinence Self-Efficacy

A single-item question asked participants how confident they are that they will be completely abstinent in one year. The item was rated on a sliding scale ranging from 0 (*not at all confident*) to 10 (*extremely confident*).

Gratitude

The 6-item Gratitude Questionnaire (GQ-6; McCullough et al., 2002) was used to assess dispositional gratitude. Items were rated on a 7-point Likert scale ranging from 0 (*very unlike me*) to 6 (*very much like me*). The GQ-6 was scored by summing all items, with higher scores indicating higher levels of gratitude. This measure has demonstrated validity in past studies (McCullough et al., 2002) and good reliability in this study ($\alpha = .81$).

Personality

The Ten-Item Personality Inventory (TIPI; Gosling et al., 2003) was used to assess dimensions of personality based on the Five Factor Model of personality. Items were rated on a

7-point Likert scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). Scores were calculated for each of the five personality factors (e.g., extraversion, agreeableness, conscientiousness, emotional stability, and openness) by taking the average of the two items in each subscale with a higher score indicating higher levels of a given personality trait. The TIPI has demonstrated adequate validity and reliability in past studies (Gosling et al., 2003). In this study, Cronbach's alpha was estimated for each dimension: extraversion ($\alpha = .45$), agreeableness ($\alpha = .11$), conscientiousness ($\alpha = .17$), emotional stability ($\alpha = .41$), and openness ($\alpha = .32$).

Mindfulness

The 10-item Cognitive and Affective Mindfulness Scale (CAMS-R; Feldman et al., 2007) was used to assess trait mindfulness. Items were rated on a 4 point-Likert scale ranging from 1 (*rarely/not as all*) to 4 (*almost always*). All items were summed to create a total score with higher values reflecting greater mindfulness. The CAMS-R has demonstrated adequate validity and reliability in past studies (Feldman et al., 2007) and adequate reliability in this study ($\alpha = .68$).

Coping

The 28-item Brief COPE scale (B-COPE; Carver, 1997) was used to assess coping style. The B-COPE is a multidimensional scale that measures strategies for coping and regulating emotions. This scale comprises 14 subscales including self-distraction, active coping, denial, substance use, emotional support, instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Items were rated on a 4-point Likert scale ranging from 1 (*I haven't been doing this at all*) to 4 (*I've been doing this a lot*). The B-COPE was scored by summing the 2 items that make up each subscale with higher subscale scores indicating greater use of each coping strategy. The brief COPE has demonstrated

adequate internal reliability in previous work (Carver, 1997) and adequate reliability in this study (α range = .43 - .74).

Connectedness

The 6-item Friendship Scale (FS; Hawthorne, 2006) was used to assess symptoms of social isolation and social connectedness. Items were rated on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*almost always*). The FS total score was calculated by summing all six items, with higher scores indicating higher levels of connectedness. The FS also contains two subscales (e.g., perceived social isolation and emotional loneliness), each of the 3 items per scale were summed to yield two separate total scores. This measure has demonstrated good validity and reliability in past studies (Hawthorne, 2005). In this study, Cronbach's alpha was estimated for each dimension: total score ($\alpha = .72$), perceived social isolation ($\alpha = .76$), and emotional loneliness ($\alpha = .72$).

Social Engagement

Several count questions were used to assess the frequency of social engagement, including both face-to-face and virtual interactions. First, participants were asked, "*How many people live with you?*" Then, a series of six questions assessed the level of social engagement the past week. Face-to-face engagement was assessed by asking, "*How many days did you...*": 1) "*have a face-to-face interaction with another person who doesn't live with you?*"; 2) "*have a face-to-face interaction with a person in your recovery support system?*"; 3) "*have a face-to-face interaction with a stranger?*". Virtual engagement was assessed by asking, "*How many days did you...*": 1) "*have a virtual interaction with another person who doesn't live with you?*"; 2) "*have a virtual interaction with a person in your recovery support system?*"; 3) "*have a virtual interaction with a stranger?*".

Change in Social Support

To assess whether there was a change in an individual's perception of social support, participants were asked, "*Has your social support changed since COVID-19 began?*" This single item was rated on a sliding scale ranging from 0 (*not at all*) to 10 (*extremely*).

COVID-19 Variables

Participants were asked six questions related to COVID-19. First, participants were asked to rate their level of worry regarding COVID-19 using a single item that was rated on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Participants were then asked to answer two items related to COVID-19 social distancing guidelines: 1) "*In the past week, have you been practicing social distancing by limiting gathering to less than 10 people and maintaining at least 6 feet from others?*"; and 2) "*When you are out in public, do you typically wear a facemask?*". Lastly, participants were asked to respond to three items related to COVID-19 exposure: 1) "*Have you ever been diagnosed with COVID-19 or experienced significant COVID-19 symptoms?*"; 2) "*Has anyone close to you been diagnosed with COVID-19?*"; and 3) "*Has anyone close to you died due to COVID-19 or related complications?*" The last five items were rated on a dichotomous yes (1) or no (0) scale.

Analytic Strategy

To address the first aim, linear regression analysis was used to test four separate models in which perceived social support (X) was entered as the independent variable and quality of life (Y1), psychological distress (Y2), Situation-specific self-efficacy for abstinence (Y3), and long-term self-efficacy for abstinence (Y4) were set as the dependent variables. Because stress could influence mental health symptoms, quality of life, and recovery, COVID-19-related stress was added as a covariate to understand the unique contribution of perceived social support on our

outcome variables. For the second aim, correlations between levels of social engagement and quality of life, psychological distress, and abstinence-related outcomes were examined using Spearman correlations. Lastly, for the third aim, multiple regression analysis was used to test potential predictors of perceived social support, such as personality, gratitude, connectedness, coping style, and mindfulness. All analyses were completed using R (R Core Team, 2017). The collection of packages called tidyverse (Wickham, 2019) and ggplot2 (v3.3.3; Wickham, 2016) were used to analyze data and produce figures.

Chapter 5

Results and Discussion

Participants in the sample were on average 33 years old ($M_{\text{age}} = 33.21$, $SD = 10.01$), predominantly male (54.48%), and white (88.28%). From this sample, participants reported a moderate change in social support ($M = 5.73$, $SD = 1.65$, range = 0-10). When asked about recovery meeting attendance, over half reported attending meetings (59.31%). Of those meetings, a majority of participants attended virtual recovery meetings (54.69%) followed by face-to-face meetings (26.56%), and over the phone (17.19%). Additionally, a slight majority (51.03%) reported having a sponsor within a recovery based program.

Perceived Social Support as a Predictor of Recovery Related Outcomes

Perceived Social Support and Quality of Life

A series of simple linear regression models was used to test if perceived social support was significantly associated with quality of life across all four domains: physical health, psychological health, social relationships, and environment. Even after controlling for the effects of COVID stress, perceived social support was significantly positively associated with physical health ($\beta = 0.59$, $SE = 0.07$, $p < .001$), psychological health ($\beta = 0.56$, $SE = 0.08$, $p < .001$), .

social relationships ($\beta = 0.68$, $SE = 0.07$, $p < .001$), and environment ($\beta = 0.65$, $SE = 0.07$, $p < .001$).

Perceived Social Support and Psychological Distress

A series of simple linear regression models was used to test if perceived social support was significantly associated with psychological distress across all three domains: depression, anxiety, and stress. Even after controlling for the effects of COVID stress, perceived social support was significantly negatively associated with depressive symptoms ($\beta = -0.31$, $SE = 0.08$, $p < .001$) and anxiety symptoms ($\beta = -0.30$, $SE = 0.08$, $p < .001$). However, perceived social support was not significantly associated with stress ($\beta = -0.11$, $SE = 0.09$, $p = .224$).

Perceived Social Support and Self-Efficacy

For model 3, a simple linear regression model was used to test if perceived social support was significantly associated with situation specific self-efficacy for abstinence. Even after controlling for the effects of COVID stress, perceived social support was significantly positively associated with an individual's self-efficacy in staying abstinent in high-risk situations ($\beta = 0.47$, $SE = 0.07$, $p < .001$).

Lastly, for model 4, a simple linear regression model was used to test if perceived social support was significantly associated with long term abstinence self-efficacy. Even after controlling for the effects of COVID stress, perceived social support was significantly positively associated with an individual's self-efficacy in staying abstinent long term ($\beta = 0.28$, $SE = 0.09$, $p < .01$). See Table 1 for a summary of Aim 1 models. Fit statistics for all regression models are included in Supplementary Table 1 (S1).

Table 1.

Examining perceived social support (PSS) as a predictor of recovery related outcomes.

Examining perceived social support (PSS) as a predictor of recovery-related outcomes.								
	Model 1a: DV = Quality of Life – Physical health		Model 1b: DV = Quality of Life – Psychological Health		Model 1c: DV = Quality of Life – Social Relationships		Model 1d: DV = Quality of Life – Environment	
	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p
PSS	0.59 (0.07)	<.001	0.56 (0.08)	<.001	0.68 (0.07)	<.001	0.65 (0.07)	<.001
Covid Stress	0.02 (0.07)	.836	0.16 (0.08)	.033	0.25 (0.07)	<.001	-0.06 (0.07)	.412
	Model 2a: DV = Depression		Model 2b DV = Anxiety		Model 2c: DV = Stress			
	β (SE)	p	β (SE)	p	β (SE)	p		
PSS	-0.31 (0.08)	<.001	-0.30 (0.08)	<.001	-0.11 (0.09)	.224		
Covid Stress	0.32 (0.08)	<.001	0.43 (0.07)	<.001	0.31 (0.09)	<.001		
	Model 3 DV = Situational Self Efficacy		Model 4 DV = Long-Term Self Efficacy					
	β (SE)	p	β (SE)	p				
PSS	0.47 (0.07)	<.001	0.06 (0.02)	<.001				
Covid Stress	-0.18 (0.07)	.017	0.12 (0.09)	.257				

Note. *p*-values below .05 are in **boldface**.

Correlations of Levels of Social Engagement and Recovery Related Outcomes

A series of Spearman's rho correlation coefficients were used to assess the relationship between levels of social engagement (e.g., face-to-face engagement, virtual engagement) and quality of life, psychological distress, and self-efficacy. Results indicated face-to-face engagement was significantly positively correlated with three domains of quality of life: psychological health, social relationships, and environment (See Table 2); however, the correlation with physical health was nonsignificant. face-to-face engagement was negatively correlated with all domains of psychological distress including depressive symptoms, anxiety symptoms, and stress. Lastly, there was a significant positive correlation with face-to-face engagement and long term abstinence self-efficacy, but the correlation with situation specific

self-efficacy for abstinence was nonsignificant. All correlations with virtual engagement were nonsignificant.

Table 2.

Correlations between recovery related outcomes across levels of social engagement.

Variable	Face to Face Engagement		Virtual Engagement	
	r	p	r	p
Quality of Life				
Physical health	.13	.134	-.03	.694
Psychological Health	.22	.013	.06	.516
Social Relationships	.19	.026	-.00	.953
Environment	.20	.023	-.02	.844
Psychological Distress				
Depression	-.26	.003	.07	.411
Anxiety	-.28	.002	-.16	.078
Stress	-.19	.032	.14	.113
Self-Efficacy				
Situational	.06	.506	.02	.812
Long term	.18	.039	.10	.263

Note. *p*-values below .05 are in **boldface**.

Predictors of Perceived Social Support

Multiple linear regression was used to test if personality, gratitude, connectedness, mindfulness, and coping style were significantly associated with perceived social support. First, five personality domains were not significantly associated with perceived social support: extraversion ($\beta = 0.07$, $SE = 0.09$, $p = .251$), agreeableness ($\beta = 0.20$, $SE = 0.10$, $p = .220$), conscientiousness ($\beta = -0.08$, $SE = 0.08$, $p = .330$), emotional stability ($\beta = -0.02$, $SE = 0.07$, $p = .697$), and openness ($\beta = 0.13$, $SE = 0.08$, $p = .085$). Connectedness was also a nonsignificant predictor ($\beta = 0.11$, $SE = 0.09$, $p = .231$). However, trait gratitude was significantly associated with higher perceived social support ($\beta = 0.23$, $SE = 0.09$, $p = .011$), along with mindfulness (β

= 0.33, $SE = 0.08$, $p < .001$). Lastly, the coping style of emotional support was significantly associated with higher perceived social support ($\beta = 0.22$, $SE = 0.08$, $p = .007$), but instrumental support coping was nonsignificant ($\beta = -0.01$, $SE = 0.08$, $p = .874$).

Discussion

COVID-19 and stay-at-home orders have had a profound effect on how people engaged with each other. Interruptions to typical, in-person social interactions can have detrimental effects on an individual's mental health and wellbeing (Brooks et al., 2020; Holt-Lunstad et al., 2015; Venkatesh & Edirappuli, 2020). Those in substance use recovery are at a greater risk for experiencing negative mental health consequences including relapse when exposed to additional stress such as disruptions to recovery related activities. Additionally, disruptions in feelings of social connectedness can lead to feelings of isolation and loneliness which may negatively impact an individual's quality of life and recovery (Bergman et al., 2021). The present study aimed to better understand the role of perceived social support and social engagement during the midst of the COVID-19 stay-at-home orders and individuals in early recovery. Overall, we found that on average individuals perceived a moderate level of social support change during the height of these stay at home orders. Because data was collected during lockdown, this research offers a unique perspective on perceived social support and recovery-related outcomes in the context of COVID-19.

Perceived Social Support as a Predictor of Recovery Related Outcomes

Our first aim was to examine the relationship between perceived social support and recovery-related outcomes. As hypothesized, there was a positive relationship between social support and quality of life across all four domains. First, the positive association between social support and physical health is consistent with prior research that found social support to be an

influential factor in physical health outcomes (Berkman et al., 2000, Holt-Lunstad et al., 2015, Uchino, 2004). In a meta-analysis conducted by Holt-Lunstad and colleagues (2015), they found that social support was also significantly related to a reduced risk of mortality. This finding is important to this particular population because past research suggests that an individual's physical health plays an important role in resisting substance use (Jeynes & Gibson, 2017).

The positive relationship between social support and psychological health is consistent with the main effect model of social support theory, which suggests that an increased level of social support is beneficial to an individual's mental wellbeing, despite other stressors (Cohen & Wills, 1985). Experiencing higher levels of quality of life in regard to psychological health is important for the recovery community because a person's mental wellbeing can influence the risk of relapse. Current research has found that taking a holistic approach to recovery and focusing on wellbeing can improve prevention of relapse (Gutierrez et al., 2020).

There was a positive relationship between perceived social support and social relationships. There is currently very little research exploring perceived social support and social relationships, however our results were consistent with a study by Ates and colleagues (2019), which found that perceived social support was positively correlated with all domains of quality of life in a SUD population. These findings expand and coincide with newly emerging research and is important because prior research has linked reduced social support networks to an increased risk of relapse for those in recovery (Longabaugh et al., 1998).

Perceived social support in this study was also significantly positively associated with environment-related quality of life. Similarly, a study by Tartaglia (2012) found that environment-related quality of life was influenced by social support. This is important because past research indicates that a healthy environment may strengthen an individual's resolve to

remain abstinent (Tracy et al., 2012). Having access to a safe environment, income opportunities, transportation, and a safe place to live support overall quality of life and are fundamental to positive recovery outcomes (Mawson et al., 2015).

Results from this study indicated perceived social support was negatively associated with psychological distress. Specifically, there was a negative association between social support and both anxiety and depression in individuals in early recovery. Results suggest that perception of social support can be an important factor in protecting against distress within a substance use recovery population (Margetić et al., 2021). Consistent with the stress-buffering model, social support is considered influential in reducing psychological problems that present situations as threats, and in turn, helps to enhance the belief that resources are available to the individual (Aneshensel & Stone, 1982). Therefore, social support may help combat psychological distress for people in substance use recovery and may aid in providing positive recovery outcomes. However, social support was not a significant predictor for stress, contrary to hypotheses. One potential explanation for this finding could be related to the unique social features that are associated with depression and anxiety, but not necessarily stress. Specifically, both depressive and anxiety symptoms are associated with significant disruptions in social engagement and functioning, such as social isolation and avoidance; however, general stress is not necessarily linked with significant social impairment, by definition. Therefore, perhaps social support is more relevant to lower levels of depressive and anxiety symptoms.

Lastly, social support was positively associated with self-efficacy, both situational and long term. One possible explanation for this relationship could be that individuals in early recovery heavily rely on and invest in abstinent-focused social networks. Davis and Jason (2005) conducted a study of residents living in an Oxford House, a recovery community home, and

found that greater levels of social support were associated with higher confidence in the ability to remain abstinent when confronted with high risk situations. Additionally, the relationship between social support and long-term self-efficacy could be explained in part by coping skills acquired in recovery programs by observing and learning from fellow peers in recovery who may have modeled effective coping strategies (Humphreys & Noke, 1997). This is important to note because both social support and self-efficacy has been shown to influence positive substance use outcomes, especially within the earlier stages of recovery (Kadden & Litt, 2011; Laudet et al., 2004).

Correlations of Levels of Social Engagement and Recovery Related Outcomes

The second aim was to explore how recovery related outcomes differ across levels of engagement such as face-to-face and virtual. Face-to-face engagement was positively correlated with quality of life across three domains: psychological health, social relationships, and environment. This is consistent with past literature suggesting the importance social interactions have on quality of life and wellbeing (Shek, 2021). However, face-to-face engagement was not related to quality of life on the physical health domain. This outcome was somewhat unexpected as past research has indicated general communication, whether virtual or face-to-face, promotes greater physical and mental wellbeing. (Lee et al., 2010). Future research should expand upon these findings to better understand face-to-face engagement and physical health within the recovery community.

The level of face-to-face engagement was also correlated with lower depression, anxiety, and stress. Similarly, past research has suggested that face-to-face interactions promote connectedness which influence positive mental health outcomes (Vacchiano & Bolano, 2020). Face-to-face engagement was also positively related to abstinence self-efficacy. Higher face-to-

face interactions were correlated with a greater sense of confidence in the ability to stay abstinent long term. Given the importance of modeling skills used by recovery peers, this finding could suggest that face-to-face engagement may provide greater opportunities to model peers and maintain a close connection to important people in their community (Majer et al., 2002).

Face-to-face engagement was not related to situational abstinence self-efficacy. This finding is somewhat unexpected, especially given the positive correlation with long-term abstinence and prior research showing significant increases in abstinence self-efficacy with the attendance of in-person, 12-step recovery meetings (Majer et al., 2015). One possible explanation for these findings may be explained by a conceptualization proposed by Mischel (1973), which states that underlying or dormant traits may appear or be realized only when specific stimuli are present. In the case of people in substance use recovery, this might manifest as impulsivity or the inability to handle stress in high risk situations which promote substance use. This could explain why there was an association between long-term abstinence self-efficacy, but not situational abstinence self-efficacy; however, further research is needed to explore this more in depth.

Virtual interactions were not correlated with any of the recovery-related outcomes. This suggests that virtual interactions may be largely unrelated to relevant factors of recovery, whereas face-to-face interactions might play a vital role in quality of life, distress, and abstinence self-efficacy within the recovery community. These findings are supported by previous research that similarly demonstrates the importance of face-to-face interactions, such as a study by Barrett and Murphy (2020) that compared face-to-face 12-step meetings and virtual conference meetings within 12-step community members. They found that those who participated in face-to-face interaction had many advantages in positive recovery outcomes over videoconferencing such as a

higher sense of meeting effectiveness, better quality of support, and higher social network connectedness. Hence, virtual interactions may not be sufficient for an individual in the recovery community. Further investigation is warranted to understand the differences in specific features of face-to-face versus virtual social engagement that may facilitate desired recovery outcomes.

Predictors of Perceived Social Support

Aim 1 of this study focused on the importance of perceived social support and its influence on recovery outcomes. Due to its vitalness, it is also crucial to explore potential characteristics that might be linked with higher levels of social support. First, personality and connectedness were not significant predictors of social support; however, several characteristics that could be considered as modifiable factors were significantly associated with higher social support including gratitude, mindfulness, and coping. First, results of this study suggest gratitude is positively associated with social support. Given that higher levels of trait gratitude are associated with a greater tendency to be aware of and appreciate benefits received from others, people with higher levels of gratitude may also appreciate and value perceived social support (You et al., 2020). Furthermore, these findings are in line with past research which has shown that gratitude plays an important role in a person's recovery and is associated with greater social support and positive recovery outcomes (LaBelle & Edelstein, 2018).

Results also indicate a positive association between mindfulness and social support. Limited research has been conducted examining the relationship between mindfulness and social support, although select studies have identified similar findings with evidence of a bidirectional relationship between the two constructs (Wilson et al., 2020). One potential explanation for this link could be similar to that of trait gratitude: mindfulness is associated with greater awareness of the present moment and current circumstances, which may include the presence of social support

for those in recovery. Because this study suggests mindfulness is a potential correlate of social support, but it is largely untested in the literature, additional research is needed to examine a possible causal relationship and explore other potential benefits of mindfulness as it pertains to social support and connectedness for those in substance use recovery.

Additionally, results indicated the use of emotional support coping was associated with greater levels of social support, whereas instrumental support coping was not. The relationship between emotional support coping, which involves both seeking and receiving support, and someone's perception of support has been well established. Haber and colleagues (2007) discuss in their meta-analysis that received support and perceived support are subcategories of social support which is seen as a meta-construct. Relatedly, emotional support coping was positively associated with reduced substance use (Emmanuel, 2021). Therefore, this coping style could be both relevant and important in efforts to positively impact perceived social support and improve substance use outcomes.

Chapter 6

Limitations

This study contributes to our understanding of social support and social engagement within the recovery community during the global pandemic. However, there are limitations that should be noted. Long term abstinence self-efficacy was assessed using a single item which limits validity and reliability of the measure (Cronbach & Meehl, 1955). Additionally, due to the nature of our findings, future research would benefit from developing and validating a measurement for long-term abstinence self-efficacy. Another limitation to note is the measurement of social engagement. Social engagement was only assessed for one week, which may not be an accurate representation of an individuals' general interaction. Also, the frequency of the type of interaction was not asked, therefore it is unknown if these interactions were

recovery based. Lastly, this study's design was cross-sectional, meaning that causality cannot be inferred between social support and recovery-related outcomes, nor predictors of social support. Also, due to the nature of the pandemic and data collection, there was no baseline measurement of perceived social support prior to stay-at-home orders. Future research would benefit from examining longitudinal data to understand the impact of social support on recovery-related outcomes and what factors are predictive of social support.

Chapter 7

Conclusion

Our study provides novel data on social support and social engagement within a population of people in substance use recovery, during a unique time in history. Data collected during the COVID-19 pandemic stay-at-home orders provided a unique insight into perceived social support and social engagement within an at-risk population whose recovery tools are largely based on social interactions. Exploratory research has identified associations between social support and positive recovery outcomes, which require further investigation. Additionally, this study identified characteristics associated with social support and explored the potential impacts they may have on individuals in recovery. Our findings suggest that social support within this population may play an important role in recovery outcomes. Because of the severe nature of substance use disorders, it is essential to continue to build upon research in this field. Future studies should expand on these findings and identify additional ways in which social support can effectively be utilized for those in recovery.

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Appendix A

Supplementary Table

Table S1

Fit statistics for all regression models.

Model	Model Summary
Model 1A	$R^2 = .34, F(2, 127) = 32.71, p < .001$
Model 1B	$R^2 = .30, F(2, 127) = 27.45, p < .001$
Model 1C	$R^2 = .45, F(2, 127) = 52.94, p < .001$
Model 1D	$R^2 = .42, F(2, 126) = 46.38, p < .001$
Model 2A	$R^2 = .23, F(2, 123) = 18.49, p < .001$
Model 2B	$R^2 = .32, F(2, 125) = 29.77, p < .001$
Model 2C	$R^2 = .12, F(2, 124) = 8.25, p < .001$
Model 3	$R^2 = .29, F(2, 127) = 26.23, p < .001$
Model 4	$R^2 = .08, F(2, 121) = 5.01, p = .008$
Multiple Regression Model	$R^2 = .64, F(10, 115) = 20.57, p < .001$