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Optimizing the Aging Services Network to Identify and Respond to Older Adults at Risk of Suicide

Mary Chase Breedlove Mize
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This dissertation, OPTIMIZING THE AGING SERVICES NETWORK TO IDENTIFY AND RESPOND TO OLDER ADULTS AT RISK OF SUICIDE, by MARY CHASE BREEDLOVE MIZE, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education & Human Development, Georgia State University.

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OPTIMIZING THE AGING SERVICES NETWORK TO IDENTIFY AND RESPOND TO

OLDER ADULTS AT RISK OF SUICIDE

by

MARY CHASE BREEDLOVE MIZE

Under the Direction of Laura R. Shannonhouse, Ph.D.

ABSTRACT

The population of older adults (65+) is increasing, and this growth is accompanied by increased

mental health concerns such as social isolation and suicide, which are argued to be exacerbated

by the COVID-19 pandemic. In chapter 1, I sought to discover if Aging Service Network (ASN)

volunteers obtain and utilize suicide-intervention skills with older adults after receiving a 14-

hour evidenced based training and identify characteristics of volunteers who perform suicide

interventions as a result of being trained. In chapter 2, I sought to identify baseline relationships

among suicide desire, chronic pain, social connections, perceived social support, loneliness, and

depression among older adults who receive home-delivered meals in six metro-Atlanta counties.

From this, I determined how chronic pain, depression, perceived social support, and loneliness

may predict suicide desire among older adults in the sample. Further, I developed a social

connections survey to determine if specific types and manner of social connections may yield

insight to understanding loneliness, perceived social support, and suicide desire among older

adults during COVID-19. Based on results from the analysis on social connections, I identified

which older adults in this sample may be most at risk of suicide based on predictors that have

been found to be part of a causal pathway to suicide grounded in Joiner's Interpersonal Theory of

Suicide. Implications for how the ASN may optimize the selection and training of volunteers is presented, along with potential ways to screen for older adult clients at risk of suicide. This may enable intentional matching of those trained volunteers with older adults at risk. Implications for future research is provided.

INDEX WORDS: Suicide desire, suicide intervention, older adults, aging network

OPTIMIZING THE AGING SERVICES NETWORK TO IDENTIFY AND RESPOND TO

OLDER ADULTS AT RISK OF SUICIDE

by

MARY CHASE BREEDLOVE MIZE

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Philosophy

in

Counselor Education and Practice

in

Counseling and Psychological Services Department

in

the College of Education and Human Development

Georgia State University

Atlanta, GA
2021

DEDICATION

My dissertation is dedicated to my family, who gave me the gift of education. To my parents, Morris and Pam Breedlove, and my aunt and uncle, Joe and Jo Ann Moss, who made my world limitless with their unceasing love, sacrifice, and support. I am so proud to be your daughter and your niece, and I love you with all of my heart. To my sister, Jayme Breedlove Porter, the strongest woman I know, who loves me like only a twin sister can. To the memories of my great-aunt Dona Breedlove, my uncle Arnold Breedlove, and my aunt Ellen Davis, whose lives and legacies continue to ripple in my life. To my in-laws, Larry and Pam Mize, Meredith, Zack, Scarlett, Lydia, and Nolan Reuter, Bernice Swann, Carolyn Mize, and Chip, Kelly, Rebekah, Will, and Greyson Carter – being a part of your family has been one of my life's greatest blessings. And to my husband, Christopher, the person I want beside me for all seasons of life. My love for you and for our baby is endless.

My dissertation is also dedicated to every single participant of this project, and every single client who has trusted me with their inner world over the past five years. It has been a sacred honor to witness your vulnerability, strength, and wisdom. Thank you for trusting me.

"Look with mercy, O G-d our Father, on all whose increasing

years bring them weakness, distress, or isolation. Provide for

them homes of dignity and peace; give them understanding

helpers, and the willingness to accept help; and, as their

strength diminishes, increase their faith and their assurance

of your love."

-Prayer for the Aged, Book of Common Prayer (1979)

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

SUCIDE INTERVENTION AMONG AGING NETWORK PROVIDERS

By 2030, one in every five Americans will be over age 65, and by 2047, there will be more older adults than children globally for the first time in history (Federal Interagency Forum on Age Related Statistics, 2016; United Nations [UN], 2013). This unprecedented growth is accompanied by an increased number of physical and mental health concerns among older adults, including social isolation, depression, and suicide (Phillips, 2014). In the United States, an older adult dies by suicide every 65 minutes (Drapeau & McInstosh, 2020). Suicide mortality data have consistently shown older adult rates of suicide as comparable to or higher than any other age group in the U.S (Barry & Byers, 2016).

Unfortunately, suicide is often missed among physical and mental health care providers, and due to the inevitability of increased suicide risk due to COVID-19 for older adults (Reger et al., 2020), experts have called for innovative approaches to promote life such as "training nontraditional groups to provide psychological first aid, helping teach the lay public to check in with one another and provide support" (Galea et al., 2020, p. 818). In one sample, physicians reported less willingness to treat older persons at risk of suicide compared to younger patients at risk and believed suicidal ideation among older adults is normal (Uncapher & Arean, 2000). More recent studies have found physicians may be able to recognize suicide risk in their older adult patients but were unable to go beyond initial assessment in terms of intervention and treatment (Vannoy et al., 2011). Stene-Larsen and Reneflot (2019) conducted a meta-analysis of 44 studies over the span of 17 years and found contact with primary care providers among adults who died by suicide was highest within the year prior to their death; approximately 44% of those who died by suicide saw their primary care physician within one month of their death. Larsen

and Reneflot (2019) found those over 50 years old had the highest rates of contact with their health care providers prior to suicide. Similarly, Walby et al. (2018) found contact with mental health clinicians prior to death by suicide was common and increasing; in the year before their death, 18.3% of patients had contact with inpatient mental health services, and 26.1% had contact with outpatient mental health services. Despite the lethality of suicide among older adults, there is a lack of adequate training for health care providers and mental health clinicians to respond to older adults at risk of suicide (Heisel & Duberstein, 2005), and research on suicide prevention among older adults remains sparse (Lapierre et al., 2011).

Nutrition service volunteers often serve as important life connections for older adults who receive home-based services (Thomas et al., 2018), as previous scholars have found loneliness and well-being improved for older adults after just two months of receiving home delivered meal services (Wright et al., 2015). Depression rates are three times higher among older adults who require in-home care compared to community samples (Centers for Disease Control, 2015), and 13.4% of older adults who receive home-based services reported suicidal thoughts to a nutrition services volunteer (Sirey et al., 2008). Consistent with a public health framework to suicide prevention (Center for Mental Health Services Office of the Surgeon General, 2001), equipping natural helpers in the aging network, particularly those who provide home delivered meal services to older adults most isolated, with evidence-based suicide intervention skills may help combat the problem of older adult suicide.

Suicide in Older Adults

Suicide is defined as "death caused by self-directed injurious behavior with an intent to die as a result of the behavior" (Centers for Disease Control and Prevention, 2018). In 2016, adults in the U.S. over age 85 had the second highest rate of all deaths by suicide (American

Foundation for Suicide Prevention Suicide Statistics, 2018), and older adults make up 16% of the U.S. population, yet account for 18.8% of all deaths by suicide (Drapeau & McIntosh, 2020). Suicide behavior and attempts are more lethal in later life; among adults over 65, there are only four attempts per every death by suicide (AFSP Suicide Statistics, 2018; Barry & Byers, 2016), whereas there can be as many as 200 for younger persons (CDC, 2017). Older adults on average use more fatal methods for suicide such as firearms, accounting for 67% of suicides among older persons, and voluntary drug ingestion (Barry & Byers, 2016; Blazer, 2003). Further, for every reported suicide there are five to 25 times more who die by suicide; these deaths often go unreported due to stigma or are mis-categorized as accidents (Lang et al., 2013). For instance, voluntary stopping of eating and drinking, and withholding medical treatment are two forms of older adult suicide that tend to go unnoticed and have been anecdotally reported by home delivered meal volunteers. In general, suicide predictors for older adults include loneliness, comorbid chronic medical conditions, loss of control, reduced sense of purpose, poor perceived health status, living alone, experiencing stressful life events, and medical conditions that result in inpatient hospitalization, the need for home healthcare, or the loss of activities of daily living (ADL) functioning (Conwell et al., 2002; Conwell et al., 2010).

Although there are hundreds of correlates to suicide, as suicide is very individual, there are three states underscored in the Interpersonal Theory of Suicide (IPTS; Joiner, 2005) that have been found to be a part of a causal pathway (Van Orden et al., 2010). Deaths by suicide are most likely to occur when an individual experiences a combination of a) a sense of **thwarted belongingness**, characterized by chronic loneliness and lack of reciprocally caring relationships, or a person's lack of belonging and social connection; b) **perceived burdensomeness**, characterized by liability and self-hate, or a person's sincere belief that they are a burden to their

loved ones and/or society; and c) **acquired capability** of completing suicide, or the ability to inflict lethal self-injury, which requires a tolerance for pain and fearlessness about death. The presence of either thwarted belongingness *or* perceived burdensomeness has been found to result in "passive" thoughts of suicide (Van Orden et al., 2010); for example, belief that one does not belong in their family or community may yield passive thoughts such as *"I wish I was dead"* (Joiner, 2005). However, together, the presence of thwarted belongingness *and* perceived burdensomeness may move a person at risk of suicide from passive thoughts, with no intent to die by suicide, to a place of active desire for death such as *"I want to die,"* (Joiner, 2005).

Need for Training Non-Traditional Groups

Social isolation and loneliness are known risk factors for poor mental and physical health outcomes with older adults, and social isolation plays a key role in the lethality of suicide in later life (Conwell et al., 2011). Federally funded programs through the Older Americans Act (OAA), such as home and community-based services programs (HCBS), provide nutrition and socialization at low cost to older adults, and have been found to prevent mental deterioration as well as social isolation (Driskill, 2004; Thomas et al., 2016). Older adults who receive home-based services have limited social contacts (Pavela, 2015), including 20% who have infrequent contact with friends or family (Thomas et al., 2016). Home delivered meal (HDM) volunteers have been argued to function as *natural helpers*, defined by Wyman et al., (2008) as those who "already have close communication with [persons at risk of suicide] either through their ongoing job role or by virtue of personal qualities, such as warmth and empathy" (p. 114). HDM volunteers who provide nutritious meals and social connection to older adults who receive home-based services (who are often isolated and experience loneliness) may be among very few community members who interact on a *regular basis* with them.

Whether HDM volunteers are situated in more rural or urban contexts may impact the duration of HDM visits. According to Meals on Wheels America (n.d.), HDM volunteers who deliver meals in more rural settings typically have fewer clients on their routes during a shift affording potentially more time for connection, whereas volunteers in more urban settings may visit more clients in close proximity to each other with less time available for each older adult. While the context of the volunteering may make conditions more or less favorable for HDM volunteers to promote life with older adults, already they have been found to serve a vital role in helping older adults who receive home-based services remain safe and living in the community (Thomas & Mor, 2013). Despite the life promoting roles HDM volunteers play with older adults who receive home-based services, and the research that older adults at risk of suicide told HDM volunteers about their distress (Sirey et al., 2018), they have not yet been trained to identify and respond to suicide risk, nor is there any suicide intervention programming on the National Council on Aging's evidence based registry. HCBS may be a strategic context to promote life with older adults at risk at a moment needed the most; however, the effectiveness of suicide intervention skill training among HDM volunteers within the ASN is a needed first step.

Applied Suicide Intervention Skills Training

Applied Suicide Intervention Skills Training (ASIST; Lang et al., 2013) may be a standardized and measurable means to equip HDM volunteers in the ASN who interact regularly with older adults with skills to perform a life assisting intervention when one is needed. ASIST is an evidence-based, standardized, manualized 14-hour training that has been adopted by multiple states and branches of the U.S. Armed Forces (U.S. Army, 2009; U.S. Navy, 2017; U.S. Marines, 2018), utilized in crisis centers across the U.S. (Gould et al., 2013), recognized by the Centers for Disease Control (CDC, 2017), and recognized globally in crisis centers and among mental health

commissions (Government of Western Australia Mental Health Commission, 2020). The standardized ASIST training manual has been rigorously evaluated and continually revised since its inception and is currently in its 11.1 edition (Lang et al., 2013).

ASIST has been evaluated in a variety of settings, with pretest–posttest differences in natural helpers' comfort to intervene with a person at risk of suicide (Griesbach et al., 2008; McAuliffe & Perry, 2007, Rodgers, 2010), and demonstrated intervention skills in responding to a simulation involving a person at risk of suicide (Illich, 2004; Tierney, 1994; Turley et al., 2000). Turley et al. (2000) found significant improvements in suicide risk assessment, perceptions of the unfolding process, and knowledge regarding application of suicide interventions through simulations. Tierney (1994) found those trained in ASIST were better able to ask directly about suicide thoughts and behaviors, assess risk, identify ambivalence about dying, and develop mutually agreed-upon safe plans than non-ASIST trained peers in a comparison group. More recently, natural helpers in K-12 schools (Shannonhouse et al., 2017) and natural helpers in collegiate contexts (Shannonhouse et al., 2018) acquired statistically significant increases in suicide intervention skills after having received the ASIST training. Further, Elston et al. (2019) found beginning counseling students who were trained in ASIST identified over 50% more clients at risk of suicide than a comparison group of their non-ASIST trained peers. Further, Shannonhouse and colleagues (2018) found beginning counseling students who were trained in ASIST not only learned suicide intervention skills, but also retained their skills over time. In a qualitative analysis of the impact of ASIST on counselor trainees, participants experienced constructive changes in their attitudes, beliefs, and views toward suicide after receiving ASIST training (Shannonhouse et al., 2019).

ASIST is one of the only intervention programs to demonstrate clinical outcomes with

persons at risk of suicide, which has been identified by scholars as a field in "desperate need of development" (Linehan, 2008, p. 483). In 2013, Gould and colleagues evaluated the impact of ASIST interventions with persons who called into the National Suicide Prevention Lifeline (NSPL). In this double-blind randomized hierarchical linear modeling study, outcomes of 1,507 calls with 1,410 persons at risk of suicide were evaluated from 17 crisis centers. Callers were "significantly more likely to feel less depressed, less suicidal, less overwhelmed, and more hopeful" after speaking with ASIST-trained volunteers compared to volunteers who did not receive training in ASIST (p. 676). The outcome of this study enabled ASIST to be recognized by the Substance Abuse and Mental Health Services (SAMHSA) evidence-based registry and the National Registry of Evidence Based Programs and Practices (NREPP). Despite ASIST's potential to promote life with older adults, the most at risk age cohort, to date, there are no studies exploring the ASIST training within the context of the ASN.

Determining if HDM providers and providers trained in ASIST acquire suicide intervention skills, and whether or not they utilize the skills, is needed to equip natural helpers in the ASN with evidence-based skills to prevent suicide and promote life with older adults. Specifically, strategically identifying volunteers to train in this program is a beneficial way for the ASN to invest in terms of cost, duration, and time needed to implement ASIST. Therefore, a needed first step includes exploring the context (rural vs. urban/suburban) and characteristics (gender, age) of those HDM volunteers who have been trained to determine if there are any patterns in implementation of skills, to better understand those that used the intervention. Specifically, we aim to answer the following research questions:

RQ1: Do individuals within the ASN (e.g., volunteers, providers, and staff) increase suicide intervention skills after receiving ASIST training?

RQ2: Do individuals within the ASN (e.g., volunteers, providers, and staff) use suicide intervention skills with older adults at risk of suicide?

RQ3: What are the characteristics of volunteers who are most likely to use intervention skills with older adults who are at risk of suicide?

Method

Participants

Participants were NS volunteers and providers ($n = 93$) across the six metro Atlanta counties who received the two-day 14 hour standardized and manualized ASIST training. Volunteers came primarily from urban and suburban counties ($n = 77$), with fewer from more rural counties ($n = 16$). Eligibility criteria included being a home-delivered meals (HDM) volunteer or senior services provider/administrator who received Applied Suicide Intervention Skills Training (ASIST). Participants ranged in age from 21 to 88 ($M = 55.99$, $SD = 16.79$). The majority of the sample included HDM volunteers (75.0%), with aging network providers and administrators accounting for 23.9% and other nutrition staff (1.1%). Most HDM volunteers were women (73.8%) with none who identified as transgender or a different gender identity. Regarding race, 42.7% of participants identified as African American or Black, 45.6% as White, 3.9% as other (identified as Aboriginal and Caribbean Black), 1.9% as Asian, 3.9% as Biracial/Multiracial, and 1.0% as Hispanic/Latinx.

Procedures

Researchers collaborated with six metro Atlanta counties housed within the Atlanta Regional Commission (ARC), the metro-Atlanta Area Agency on Aging ("triple A") to identify HDM volunteers and providers who served as natural helpers consistent with Wyman and colleagues' (2008) criteria. Participants were recruited by the researchers as well as county

senior services directors. IRB approval was obtained prior to ASIST training and data collection.

Participants were provided the informed consent verbally in person prior to receiving training.

The trainings were offered regardless of whether or not participants chose to participate in the

research. NS volunteers were provided a $200 stipend for completing the 14-hour training,

whereas NS staff members were paid for their time to attend the training for two days.

Instruments were administered via a pre-test immediately before the training began, and

posttest at the conclusion of the training. The instruments were offered through either a Qualtrics

link for participants to complete on their phone or tablet, or in paper and pencil format if they did

not bring or were having trouble with their compatible device.

Eleven ASIST trainings were held between September 2019 and February 2020. The

majority of the trainings ($n = 8$) were provided by one doctoral student and one Assistant

Professor who were both ASIST master trainers. Three trainings were conducted by the Assistant

Professor (a master trainer) and one additional registered ASIST trainer. All trainers had each

completed a 5-day ASIST training for trainers (T4T) and completed requirements for becoming

registered trainers. All trainings followed the standardized procedure in the ASIST 11.1 manual

(Lang et al., 2013), which requires standardized content for delivering identical training modules

but allows minor augmentations for context. In this case, we used a prior audio visual of a case

simulation of an older adult at risk of suicide (ASIST 11.0), a content module on the

Interpersonal Theory of Suicide (Joiner, 2005), and simulations specific using the model in the

HDM context.

Participants learned the three-phase, six-step Pathway for Assisting Life (PAL) model

(Lang et al., 2013) to provide a suicide intervention to persons with thoughts of suicide in the

moment life-assisting intervention is needed. The first phase is *connecting with suicide*, where

participants learn common indicators or signs that individuals at risk may be thinking about suicide and how to ask directly about suicide. The tasks of this phase may directly impact thwarted belongingness by communicating care and concern. The second phase of the PAL model is *understanding choices*, where participants learn how to hear the story of challenging life events that led persons with thoughts of suicide to consider suicide as an option while also identifying ambivalence toward suicide (e.g., confusion, uncertainty, hope, or reasons for living) as they talk about why they want to die. The tasks of this phase may directly impact perceived burdensomeness by demonstrating to persons with thoughts of suicide that the natural helper wants to understand their pain. The third phase of the PAL model is *assisting life,* whereby participants learn how to connect ambivalence and hope with an agreement for immediate safety (Lang et al., 2013). The tasks of this phase may directly impact acquired capability to enact lethal self-harm by disabling the suicide plan, putting distance between the person's plan for suicide and their means (means restriction), and expanding the support network. Emphasis is placed on the "quality of the interaction between the [NS volunteer] and the [older adult-at-risk]" and how that interaction can result in reduced risk through the creation of a safe plan that connects the person with a variety of community resources, including, if appropriate, counseling services (Rodgers, 2010, p. 9).

Throughout the trainings, a case study using an example of an older adult at risk of suicide was used during the content of the intervention training as well as experiential practice. After conclusion of the training, researchers provided a link to the ASIST intervention tracking tool to those trained via email. To ensure participants were able to use the tracking tool effectively, the team provided a phone call post-training to answer any questions about tracking. The researchers also provided five reminders via email to track interventions from September

2019 to February 2020. After each ASIST training, the trainers provided a detailed report on their adherence to the training modules and standardized procedure to the ASIST developer, LivingWorks, for ongoing quality assurance.

Measures

  Demographics questionnaire. Participants completed a demographics questionnaire, including gender identity, age, race, ethnicity, and job role (HDM volunteer, NS staff/admin, or other specified role).

  Suicide intervention skills. The 48 item Suicide Intervention Response Inventory – Second Edition (SIRI-2; Neimeyer & Bonnelle, 1997) was used to assesses suicide intervention skills. Participants were provided with 24 statements a person at risk of suicide may make, along with two natural helper responses for each suicide statement. Participants rated the appropriateness of each helper response from –3 (very unhelpful) to +3 (most helpful). Next, ratings were compared with criterion scores established by a panel of expert suicidologists, with the final SIRI-2 score consisting of the sum of differences between participant and expert ratings.

  In addition to traditional SIRI-2 scoring, new subscores for overestimation and underestimation recommended by Shannonhouse and colleagues (2017) were also calculated. *Overestimation* indicated improvement in suicide intervention skills as participant ratings were even more strongly in the direction of expert ratings (i.e., they recognized a "good/bad" response as more unambiguously so). Alternatively, *underestimation* with scores in the opposing direction of the criterion scores, shows that participants are not as likely to discern good/bad responses as such (Shannonhouse et al., 2017). For more information regarding the SIRI-2 over and underestimation scoring, please refer to Shannonhouse et al. (2017)

  The SIRI-2 validation contains an extensive discussion of both construct and discriminant

validity, with high internal consistencies (α = .90 and α = .93) and test–retest reliability (*r* = .92)

reported, although with a relatively small sample size (*n* = 62). A strong internal consistency (α =

.75) was also reported in a considerably larger (*n* = 980) Dutch study (Scheerder et al., 2010). In

the current study, the single-factor SIRI-2 produced adequate coefficients for internal

consistency at pretest (α = .87) and posttest (α = .86). Because participants over and

underestimate different items, and these constructs are inversely related, internal consistency was

only calculated on a single combination of under and over estimation, which resulted in pretest α

= .88 and posttest α = .90.

    Suicide Interventions. **The ASIST Intervention Tracking Tool** (ITT) is an outcome-

oriented, self-report measure of descriptive data on the evidence-based intervention components

employed by natural helpers in working with older adults at risk of suicide. The ASIST ITT

enabled participants to track a) whether or not they used ASIST skills during an interaction with

an older adult at risk, b) when the intervention took place, c) components of the PAL model they

used during the interaction, d) whether or not the interaction was with an older adult with active

thoughts of suicide, e) setting in which they used the skills (e.g., HDM route, work, church), and

f) relationship to the older adult (e.g., HDM client, community member, friend, family member).

Research Design and Data Analysis

    This study employed a single group within-subjects design. The first author cleaned and

matched data using anonymous codes generated by participants, and cross-matching by verifying

training dates and times. G*Power analysis yielded observed *a priori* power of .95, and Cohen's

d (1988) indicated medium effect size for SIRI-2 traditional scoring (*d* = .40) and large effect

size for SIRI-2 over/underestimation scoring (*d* = 1.6)

Results

Descriptive statistics on SIRI-2 analyses can be found in Table 1. To answer RQ1, two

paired sample *t*-tests were conducted to compare results of SIRI-2 scores at pretest with SIRI-2

scores at posttest. Using traditional SIRI-2 scoring, there were statistically significant increases

in suicide intervention skills at posttest, $t(92) = 3.80$, $p = <.001$, and 95% CI [3.59; 11.45] on the

improvement in SIRI-2 traditional. Shannonhouse et al.'s (2017) over and underestimation

scoring procedure was used to determine the degree to which participants underestimated the

harmful or helpfulness of responses less, and overestimated them more. A second paired sample

t-test using over and underestimation scoring yielded statistically significant changes at posttest,

$t(92) = -11.12$, $p = <.001$, and 95% CI [-27.88; -19.43] on the improvement in SIRI-2 over/under

combination scores. Correlations were calculated across all of the pre and posttest scores for the

different SIRI scoring methods, shown in Table 2.

To answer RQ2, we analyzed responses from the ASIST ITT. From September 2019 to

March 2020, 35 suicide interventions with older adults were tracked among 16 NS volunteers

and two NS providers for a total of 18 different volunteers, five of whom tracked multiple

interventions (i.e., four provided interventions with two different older adults, and one tracked

eight interventions with three different older adults). Volunteers used the ASIST intervention

with HDM meal recipients and senior service clients, as well as with family, friends, neighbors,

peers, and church members. The total number of HDM volunteers trained ($n = 78$) and the total

number of aging network providers/staff trained ($n = 15$) comprised the total sample size ($n =$

93). Full results can be found in Table 3.

To answer RQ3, we analyzed descriptive statistics from the ASIST ITT. Interventions were

tracked among volunteers in four of the six participating counties, and 66% of the tracked

interventions occurred in two of the six counties. Of the five volunteers who tracked multiple

interventions, four who each tracked two separate interventions were White females between ages 53 and 65; the volunteer who tracked eight interventions identified as a 63-year-old Black female. Descriptive characteristics of volunteers who tracked interventions can be found in Table 4.

Discussion

Findings support previous research indicating natural helpers increase suicide intervention skills as a result of being trained in ASIST (Illich, 2004; Tierney, 1994; Turley et al., 2000, Shannonhouse et al., 2017; Shannonhouse et al., 2018). These results extend the literature by demonstrating increases are consistent with a new population: natural helpers in the aging network who have "close communication with [older adults] through their ongoing job role" (Wyman et a l., 2008, p. 114). Furthermore, our results support previous arguments (Galea et al., 2020) to equip the lay public to help persons at risk during COVID-19. These natural helpers are unusually suited to promote life with older adults during this pandemic, as they deliver nutritious meals to older adults who receive home-based services, who may be isolated and at risk of suicide (Fullen et al., 2020). Although suicide intervention skills increased, with considerably large effect sizes and good power, no statistically significant conclusion can be drawn from SIRI-2 scoring correlation analysis. However, this research does support examining underestimation scores, which may be a more sensitive metric to observing changes in suicide intervention skill acquisition after a particular training or experience, compared to SIRI-2 traditional scoring (Shannonhouse et al., 2017).

Results support previous arguments that natural helpers trained in ASIST use the skills they acquire from the training with persons at risk of suicide (Elston et al., 2019; Gould et al., 2013; Tierney et al., 1994; Turley et al., 2000). Equipping HDM volunteers and providers with

suicide intervention skills may enable them to support older adults at risk of suicide in the moment they need it the most. Most all gatekeeper trainings equip natural helpers to recognize signs of suicide and immediately refer the person at risk to someone who can help (e.g., QPR Institute, n.d.). For aging network volunteers who receive suicide *intervention* training, such as ASIST, they become the person who can help by intervening directly with the older adult at risk in the moment needed, with their newfound suicide first aid skills.

It is noteworthy HDM volunteers and providers tracked 34 total interventions, both in their job role and as well as in their personal life, in just six months of having received the training. There was variance in the HDM volunteers' and providers' roles across counties that participated in this study; some volunteered on a monthly basis through their employer (their employer had a relationship with the county senior services department), and a couple of HDM providers were paid drivers whose full-time job was to deliver meals to the greatest number of older adult clients.

The paid drivers worked in the most urban county and were bound by an optimized routing system called WorkWave (www.workwave.com) that changed routes daily to optimize efficiency. HDM volunteers in these systems are assigned different older adults each day for meal deliveries as opposed to maintaining regular routes. This may have had an impact on our findings, as just two interventions were performed in the most urban county which operated from the WorkWave system. Also, some HDM volunteers were either partially or fully retired volunteers. Although we did not anticipate studying this a priori, retirement status may have enabled them time to volunteer more regularly or afforded more time to provide a life assisting intervention when needed.

HDM volunteers who tracked interventions delivered meals in more rural counties. Of the 18 tracked interventions with an HDM client, six of them took place in a rural county, in which only 17.2% of the total number of volunteers were trained. This is consistent with volunteers who live in more rural counties having fewer clients than volunteers in more urban settings, therefore positioned to potentially have more time to connect with clients during their shift (Meals on Wheels America, n.d.). HDM volunteers who serve in rural counties may have the time needed to develop stronger, more authentic relationships with older adult clients. This is a contrast to more urban counties in our study, who were situated in systems that prioritize meal delivery efficiency. It is possible those HDM volunteers on regular routes have more established relationships with older adults they serve, and one reason why there were more interventions in more rural communities that maintain consistent routes.

Finally, it is worth noting the potential impact of equipping aging network volunteers who provide home-delivered meals with suicide intervention skills. Training volunteers in ASIST also provides support that interventions are personalized to older adults. Each participant who tracked an intervention used components of ASIST during their interaction with older adults. Several of the interventions were tracked with older adults who were not at risk of suicide but showed warning signs based on their interactions with the participants. These HDM volunteers were able to utilize the ASIST intervention to help older adult clients discuss their feelings of distress and identify sources of support. For many older adults who receive home-based services, a meal delivery provider may be one of the only sources of regular communication with one who is equipped to respond to their needs (Thomas et al., 2016), with regard to their mental well-being.

Limitations

Results provide insight into the effect of receiving ASIST on HDM volunteer and provider suicide intervention skills and responder behavior. However, these results need to be reviewed in the context of limitations that may affect the generalizability of the findings. There may have been a self-selection bias as HDM volunteers and providers chose to participate in the ASIST training and may have had a desire to help older adults at risk of suicide. Though our data yielded a potential trend regarding HDM volunteers in the rural counties, caution should be taken in generalizing to rural contexts due to the small sample size of volunteers, as well as understanding why some volunteers provided complete information in tracking interventions while others did not.

The sample was purposive and not randomized. The within-subjects design limits the ability to draw conclusions regarding a causal relationship between receiving the ASIST training and improvement in suicide intervention skills. Despite encouraging findings regarding increased suicide intervention skills and use of skills with older adults, the ASIST training effect should be examined with more rigorous research designs, such as quasi-experimental studies that compare those trained with a control group that was not trained, as well as experimental designs with randomization, and quality of interactions as reported by older adult clients.

It is possible HDM volunteers and providers used their suicide intervention skills without tracking them. While anecdotal, several participants indicated apprehension about completing the tracking tool via Qualtrics, with several noting that they did not use smartphones, check their email, or use the internet in general. Although permission was obtained at every level for the completion of the tracking tool, participants may have been hesitant to provide detailed information out of fear of violating the privacy of clients on their routes. Further, home delivered meal delivery was halted or significantly changed due to the COVID-19 pandemic. For instance,

daily hot meal delivery shifted to delivery of frozen pre-packaged meals once a week with limited interaction to protect older adults' health and wellness. This may be evidenced by several incomplete responses as participants started the tracking tool and did not finish it. Incomplete responses from volunteers may be because of technical difficulties, fatigue, or a challenge in translating intervention skills learned with volunteers who are not comfortable using the survey software we provided via email.

Implications for Future Research and Training

There are several opportunities for future research exploring the impact of training HDM volunteers and providers in suicide intervention skills. First, replicating this study with a control group will yield results regarding suicide intervention skill acquisition. Second, collection of suicide intervention skills at subsequent time points may help determine if volunteers and providers retain the skills they learn over time. Future qualitative research is needed to explore characteristics and contexts of volunteers who use suicide intervention skills with their older adult clients. Though anecdotal in the context of the results of this study, the Aging Services Network may wish to invest in providing ASIST trainings to volunteers in counties with more regular HDM routes. This may help volunteers in these counties more readily recognize and respond to distress among HDM clients, which is aligned with Wyman and colleagues (2008) guidelines for 'ongoing interaction through one's job role' to make conditions favorable for connections with older adult clients. Because of the limitation of self-report and subsequent challenges with the use of technology in tracking, a study which observes skill use prospectively, in real time, is needed to determine the effectiveness of ASIST training with older adults. Prospective outcome research may enable better understanding of the impact of ASIST interventions on older adults at risk of suicide.

Finally, there are additional implications of this study for the future of research and training of professional counselors and other helping professions. Understanding the role of the ASN is vital to understanding how to work and advocate with older adult clients who may receive home-based services, and this study provides evidence that HDM volunteers may be important sources of connection, and may even provide life-assisting interventions to older adults at risk of suicide.

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Table 1

Summary of Descriptive Statistics for SIRI-2 Scoring

SIRI-2	*M*	*SD*
Traditional *(lower is more skill)*		
Pretest	74.9	21.9
Posttest	67.4	20.7
Improvement	7.5	19.1
Overestimation *(higher is more skill)*		
Pretest	8.4	4.8
Posttest	16.4	8.4
Underestimation *(lower is more skill)*		
Pretest	66.5	24.7
Posttest	50.9	23.7
Combination (Over – Under) *(higher is more skill)*		
Pretest	-58.1	28.1
Posttest	-34.5	28.9
Improvement	23.7	20.5

Note: $N = 93$.

Table 2

SIRI-2 Scoring Correlations (N = 93)

Variables	1	2	3	4	5	6	7	8	9	10
1. Pretest Traditional	.83									
2. Posttest Traditional	.60**	.86								
3. Pretest Overestimation	-.50**	-.23*	–							
4. Posttest Overestimation	-.46**	-.18	.68**	–						
5. Pretest Underestimation	.99**	.58**	-.64**	-.55**	–					
6. Posttest Underestimation	.69**	.94**	-.45**	-.51**	.70**	–				
7. Pretest Over-Under Total	-.95**	-.55**	.74**	.60**	-.99**	-.69**	.88			
8. Posttest Over-Under Total	-.70**	-.82**	.56**	.71**	-.73**	-.97**	.74**	.90		
9. Improvement - Traditional	.50**	-.40**	-.32**	-.34**	.50**	-.23	-.50**	.09	–	
10. Improvement - Over/Under	.32**	-.41**	-.21*	.18	.33**	-.42**	-.32**	.40**	.81**	–

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 3

ASIST ITT Responses

Job Role	HDM Volunteers	ASN Providers	Total
Used with HDM clients	16	0	16
Used with ASN clients	0	2	2
Used with Family or Friends	6	3	9
Used with Community Members	5	3	8
Total Tracked Interventions			*35*
Skills used in suicidal situation			26
Skills used in non-suicidal situation			9

Note: Community Member includes church members, coworkers, neighbors, and strangers.
Family includes cousins, siblings, and children.

Table 4.

Demographic Characteristics of Volunteers who Tracked Interventions (N = 18)

Demographics	N	%
Job Role		
HDM Volunteer	16	88.89%
ASN/Other Nutrition Services Staff	2	11.1%
Tracked Multiple Interventions	5	27.78%
County		
Central Fulton/DeKalb	2	11.1%
Clayton	3	16.6%
Cobb	5	27.8%
Henry	7	38.9%
North Fulton	1	5.6%
Gender Identity		
Women	14	77.88%
Men	4	22.2%
Race/Ethnicity		
Asian	0	1.9%
Black/African American	10	42.7%
Biracial/Multiracial	1	3.9%
Hispanic/Latino/a	0	1.9%
White	6	45.6%
Other (identified as Aboriginal and Caribbean Black)	1	3.9%

CHAPTER 2

IMPACT OF SOCIAL CONNECTIONS ON SUICIDE DESIRE AMONG COMMUNTY-DWELLING OLDER ADULTS DURING COVID-19

Suicide among older adults (age 65+) is a major global public health crisis (Conejero et al., 2018). In the United States, older adults die by suicide every 65 minutes (Drapeau & McIntosh, 2020). As of 2018, the reported suicide rate for older adults in the U.S. was 17.4 per 100,000, compared to the national rate of 14.8 per 100,000 (Drapeau & McIntosh, 2020). However, these data only reflect officially reported suicides; many more suicides are categorized incorrectly or go unreported (Lang et al., 2013). These data do not reflect suicide behaviors or suicidal ideation. There are also racial disparities in reporting suicides among Black individuals, which are more likely to be miscategorized as deaths by other causes than for any other racial group (Phillips & Ruth, 1993; Crosby, 2006). Among 493 predominately Black, community-dwelling older adults pre-COVID-19 pandemic, 15.62% scored above the suicide risk cutoff, 23.73% reported a history of suicidal ideation or behavior, and 13.18% reported they may attempt suicide in the future (Fullen et al., 2020). Alarmingly, the impact of the COVID-19 pandemic has been argued to exacerbate older adult suicide, due to increased disconnection and loneliness as a result of physical distancing requirements (Santini et al., 2020).

The Interpersonal Theory of Suicide (IPTS; Joiner, 2005) provides a framework for understanding suicidal behavior among older adults (Van Orden et al., 2012; Cukrowicz, et al., 2011), and the increase in suicide desire during the COVID-19 pandemic (Reger et al., 2020). The IPTS developed by Thomas Joiner (2005) has over a decade of empirical support (Chu et al., 2017) and posits passive suicidal ideation emerges with the presence of either *thwarted belongingness*, an unmet fundamental need of belonging with others (Joiner, 2005), or *perceived*

burdensomeness, a sense that one is a burden to others and society (Van Orden et al., 2010; Joiner, 2005). When thwarted belongingness and perceived burdensomeness are experienced together, hopelessness that things will never change and a desire for death emerges (Joiner, 2005; Mitchell, 2017). The simultaneous presence of both thwarted belongingness and perceived burdensomeness creates the most dangerous form of suicide desire (Van Orden et al., 2010). When one experiences suicide desire and *acquires the capability* to enact lethal self-injury, lethal or near lethal suicide attempts are highly likely (Joiner, 2005).

At the onset of the COVID-19 pandemic, medical ethical guidelines prioritizing the care of younger patients (Liu et al., 2020) conveyed messages that older adults' lives were less of a priority and ultimately more expendable than the lives of younger patients (Sheffler et al., 2020). Such messages may foster perceived burdensomeness among vulnerable older adults (Helfand et al., 2020). Older adults who receive home-based services, often due to chronic pain and limited mobility, may be particularly isolated and at risk; Sirey and colleagues (2008) found 13.4% of older adults who receive home delivered meals (HDM) reported thoughts of suicide to an HDM volunteer. Unfortunately, meal deliveries for older adults who receive home-based nutrition services through the Aging Services Network (ASN) have been interrupted and/or reorganized with fewer opportunities for social connection due to COVID-19 (Meals on Wheels America, 2020). Despite increased thwarted belongingness and perceived burdensomeness as a result of COVID-19, ASN providers and volunteers may be uniquely positioned to buffer social isolation and loneliness that contributes to suicide desire and suicidal behavior among older adults.

Home and Community-Based Services (HCBS) that provide HDM to older adults through the ASN have been found to reduce loneliness, depression, and isolation – which are common predictors of suicide among older adults (Lee et al., 2015). Further, the social

connections that emerge from these programs may contribute to feelings of inclusion and belonging and may serve as protective factors that buffer suicide among older adults (Conwell et al., 2011). However, the impact of these life connections on suicide desire remains understudied. HDM volunteers who have regular, ongoing contact with older adults who receive HCBS may be able to effectively intervene, because they are positioned to notice suicide behaviors such as voluntary stopping of eating and drinking or non-adherence to medications and medical interventions. Before trained ASN volunteers can be positioned to deliver meals on the routes of older adults most at risk of suicide, a closer understanding of suicide desire (and contributing risk factors) among older adults who receive HDM and are impacted by COVID-19 is needed. Further, understanding which specific social connections may contribute to perceived social support is a needed next step in better identifying older adults in the ASN who may be at risk of suicide.

Interpersonal Theory of Suicide with Older Adults

Thwarted belongingness has two components, chronic loneliness and the absence of reciprocally caring relationships, and develops when the "fundamental need to belong" is unmet (Baumeister & Leary, 1995, p. 497). Thwarted belongingness can emerge from loneliness and disconnection older adults experience from living alone, having few social supports, and not having contact with family (Van Orden et al., 2010). Furthermore, one's network of social supports often decreases with age (Ajrouch et al., 2005). Thwarted belongingness also develops in the absence of reciprocal care. Older adults need frequent, positive interactions that occur in a framework of long-term, stable care and concern (Van Orden et al., 2010). Factors that influence the absence of reciprocal care include social withdrawal, family conflict, and experiencing loss, such as death of a loved one or divorce (Van Orden et al., 2010). Social isolation is one of the

most reliable predictors of suicide desire (Van Orden et al., 2010) and plays a key role in lethality of suicide among older adults (Conwell et al., 2014). Parkhurst et al. (2016) found (1) thwarted belongingness was significantly associated with lower social network connections and lower social support among older adults at risk of suicide, and (2) low social support was associated with both thwarted belongingness and perceived burdensomeness in older adults.

Perceived burdensomeness also has two components, liability and self-hate (Van Orden et al., 2010), or the belief that the self is so flawed one is a burden or liability on others or on society (Joiner, 2005). Perceived burdensomeness is a result of an unmet fundamental need to feel effective with others (Joiner, 2005). Perceived burdensomeness may contribute to greater suicide risk and mortality in later life by eroding perceived meaning (i.e., feeling life is meaningful, feeling like one has something to live for) (Van Orden et al., 2012). Further, Shannonhouse et al. (*under review*) found perceived burdensomeness to be especially strong among Black older adults due to the emotional toll of chronic pain. In another sample, perceived burdensomeness mediated the relationship between depression and suicide ideation among older adults, accounting for 68.3% of variance in suicide ideation scores (Jahn et al., 2011). Perceived burdensomeness may be a standalone risk factor for suicide that warrants closer examination (Cukrowicz et al., 2011; Jahn et al., 2011; Van Orden et al., 2012).

While thwarted belongingness and perceived burdensomeness together encapsulate suicide desire, death by suicide requires one to also obtain a fearlessness toward behaviors that may result in severe pain, harm, or death (Van Orden et al., 2010; Joiner, 2005). Acquired capability, the third construct in the ITPS theory involves the capacity to enact lethal self-harm and has two components: increased pain tolerance and reduced fear of death, both of which tend to be experienced in later life (Van Orden et al., 2010). Acquired capability develops through

habituation to pain "through repeated practice and exposure, an individual can habituate to the physically painful and fearful aspects of self-harm…making it possible to engage in increasingly…lethal forms of self-harm" (Van Orden et al., 2010, p. 15).

Impact of COVID-19 on Older Adult Suicide

Older adults have experienced disconnection from critical sources of support and increased risk of suicide from the COVID-19 pandemic (Santini et al., 2020; Wand et al., 2020). Older adults, especially those with marginalized racial and ethnic identities, are also at the greatest risk of severe disease and death due to COVID-19 (CDC, 2020). In a sample of racially diverse older adults who receive home-based services, Shannonhouse et al. (2021) found suicide desire among older adults who received HDM increased by 20% from March 2019 (pre-COVID) to July 2020 (during COVID) to meet clinical suicide risk criteria. This clinical suicide risk criteria were associated with particular types of resource loss from COVID-19 (i.e., feeling valuable to others, losing one's sense of optimism).

The manner, relational type, and frequency of social interaction, which have been argued protective factors buffering suicide among older adults who receive HCBS services, have been interrupted by COVID-19. For instance, Meals on Wheels America (2020) found 59% of programs surveyed reported an increased demand for meals, while costs rose 97% due to obtaining personal protective equipment and safety supplies. Counties across the U.S. have implemented safety guidelines from the Administration on Community Living to manage meal delivery complications and revised protocols for HDM volunteers. Rather than delivering meals three to five times per week to the home of an older adult client which includes some level of socialization and connection, volunteers may drop off a week's worth of frozen food with a no-

contact, non-touch delivery method during the COVID-19 pandemic (ACL COVID-19 Response, 2020).

The physical distancing interventions such as these, needed to keep older adults physically safe, have been argued to intensify thwarted belongingness (Liu et al., 2020), and the extra resources needed to care for older adults (i.e, personal protective equipment, ventilators, etc.) may exacerbate feelings of perceived burdensomeness (Sheffler et al. 2020). However, these states are highly responsive to intervention (Joiner, 2005; Conwell et al., 2011). Joiner argued:

"Perceived burdensomeness and failed belongingness… are relatively fluid states and thus represent a therapeutic path of least resistance [during intervention]. This [therapeutic approach and way of connecting] works because it systemically corrects and amends the [person's] view that they are a burden on others and that they do not belong to valued relationships and groups" (2005, p. 218).

Promoting and strengthening connection across multiple societal levels have been argued to serve as early intervention to prevent suicide among older adults (Van Orden et al., 2012), as social connection buffers feelings of thwarted belongingness, interrupting the pathway to suicide desire (Joiner, 2005; Van Orden et al., 2010). However, little is known about the impact of specific types and manner of social connections among older adults who may be at risk of suicide. Understanding the specific types and manner of social connections among older adults receiving HDM and their relationship with perceived social support and suicide risk factors (i.e., thwarted belongingness, perceived burdensomeness, loneliness, chronic pain, and depression) is needed to better prevent suicide during the COVID-19 pandemic and beyond. For many older adults who receive home-based services, meaningful, regular social connections and sources of

support may be found in interactions with their HDM volunteer. Further, the Centers for Disease Control and Prevention (2018) have recognized social connectedness as a key strategy for suicide prevention among older adults. Therefore, volunteers in the ASN may be well-positioned to respond to suicide risk among older adults

Suicide Risk Factors for Older Adults

Chronic pain among older adults is associated with greater acquired capability for suicide (Van Orden et al., 2010). In addition to chronic pain, Fassberg and colleagues (2012) compiled evidence from several studies confirming suicide ideation, suicide behavior, and death by suicide among older adults can be partly explained by low frequency of social contact (Rowe et al., 2006), low social integration (Rowe et al., 2006; Dennis et al., 2005), low social support (Raue et al., 2007), and loneliness (Wiktorsson et al., 2010). In addition to social support variables, depression rates are three times higher among older adults who require in-home care services compared to others living in the community (CDC, 2015). Therefore, it is worth examining chronic pain, social interactions, perceived social support, loneliness, and depression more closely to better understand suicide desire among older adults.

Chronic pain amplifies suicide desire and is associated with loneliness and social isolation for older adults who may be at risk of suicide (Conejero et al, 2018; Smith et al., 2019). Suicide attempts result in more deaths among older adults compared to other ages of the lifespan; in general, there are 25 attempts per every death by suicide among adults across the lifespan; however, there are only four attempts on average per death by suicide among adults over 65 (AFSP Suicide Statistics, 2018; Barry & Byers, 2016). Older adults may acquire the capability to die by suicide partly through habituation to pain. However, putting distance between older adults

at risk and their means for suicide behavior (i.e., means restriction; Yip et al., 2012) has been efficacious in promoting life (Joiner, 2005).

Social interactions and social support may also impact suicide risk among older adults. Social networks among older adults tend to shrink with age, and smaller social networks may result in increased loneliness, which may exacerbate suicide risk in later life (Ajrouch et al., 2005; Van Orden et al., 2012). Holt-Lunstad, Smith, and Layton (2010) found the presence (or absence) of social relationships is a comparable risk of mortality compared to other established risk factors, such as chronic illness. In other words, having fewer social relationships can be deadly in terms of health outcomes and mortality.

Fortunately, older adults may have higher quality, positive relationships within their smaller networks (Shaw et al., 2007). In a study examining the impact of digital technology to enhance social connectedness among older adults, Barbosa Neves et al. (2017) found older adults' use of a digital app to engage in asynchronous communication resulted in increased perceived social interaction within their social network ties.. However, meaningful social connection was not reported by all older adults. Some participants experienced increased loneliness after not receiving replies in the asynchronous format. To date, little is known about the impact of synchronous and asynchronous communication in the context of understanding perceived social support, loneliness, and suicide desire among older adults.

Low perceived social support has resulted in increased feelings of thwarted belongingness and perceived burdensomeness among older adults (Van Orden et al., 2012). Perceived social support, or the perception of "the availability of people whom [an] individual trusts, can rely, and feel cared for and valued as a person" (McDowell & Newell, 1996, p. 125) involves social interaction and social satisfaction components (Wardian et al., 2012). The

presence of perceived social support has had a positive impact on mental health outcomes of older adults (Antonucci et al., 2014; Nazari et al., 2020). Shaw et al. (2007) found older adults experienced declines in satisfaction of support as one aged. In a sample of older adults who received home health care, Rowe et al. (2006) found those who were more likely to have suicide ideation reported perceptions of low social support. Kang and colleagues (2018) found in a study of Korean older adults that levels of perceived social support effected loneliness among older adults (e.g., higher perceived social support resulted in lower loneliness, lower perceived social support resulted in higher loneliness). Low perceived social support resulting in loneliness has been a risk factor for suicide among older adults (Van Orden et al., 2012).

Loneliness is "a situation that occurs from lack of quality relationships" (Gierveld & Tillburg, 2006, p. 583). In a longitudinal study of health outcomes among older adults in England, Banks et al. (2006) found individuals over 80 were most vulnerable to loneliness, and older adults may experience an elevated risk of loneliness as they age. Van Orden et al. (2010) described living alone and having few sources of social support as observable variables that contribute to loneliness. Further, Van Orden et al. (2012) identified loneliness as a contributing factor to thwarted belongingness among older adults, and Petersen et al. (2016) found high levels of social isolation were associated with greater likelihood of loneliness among older adults.

In addition to loneliness and chronic pain, suicide rates in older adults have also been associated with major depression, and 27% percent of older adults who receive HCBS services met criteria for a major depressive episode (Richardson et al., 2011a). Depression is the most common mental health condition of older adults who complete suicide (Conwell et al., 2011). However, it is worth noting depression is not a universal factor among older adults who die by suicide; in 2018, the Centers for Disease Control and Prevention (CDC) argued more than half of

individuals who die by suicide did not have a known mental health condition. That being said, researchers have continued to identify depression as a risk factor for suicide in later life (Conwell, Van Orden, and Caine, 2012). Further, Wang et al. (2018) found older adults who have heightened depression also experience worse health outcomes and have lower perceived social support, which is a contributing factor of heightened suicidal ideation among this population (Rowe et al., 2006).

Preventing Suicide through the Aging Network

For many older adults who receive home-based services, interactions with HDM volunteers through nutrition services programs may be one of the only consistent forms of social connection they receive. Suicide desire is buffered by effective intervention (Joiner, 2005); for older adults who receive HDM and may be at risk of suicide, intentionally positioning a volunteer with suicide intervention skills among meal delivery routes of those at risk may help alleviate suicide desire while simultaneously building social support. Efforts that enhance belongingness, such as meaningful relationships and interactions that foster reciprocal care, may be protective factors against suicide desire (Joiner, 2005). HDM volunteers may provide a unique and consistent from of social connection to older adults who receive home-based services.

Researchers have also identified a need for scholarship to explore the relationships between social connectedness and suicide desire among older adults, specifically calling for research examining an assessment of subjective amounts of social connection, such as perceived social support and loneliness (Fassberg et al., 2012). Understanding specific aspects of social connections, and their relationships with perceived support and loneliness, may yield greater insight to the presence of thwarted belongingness and perceived burdensomeness (suicide desire)

among older adults who receive HDM. With this knowledge, the ASN may be able to determine which older adults in their communities are most at risk of suicide and position trained volunteers on routes of those most at risk. However, a needed first step is to examine the relationship between social connections, perceived social support, loneliness, and suicide desire in the context of causal pathways to suicide desire among older adults who receive HDM. Therefore, the goal of this study is to answer the following research questions:

RQ1: What are the correlations between (a) suicide desire (thwarted belongingness and perceived burdensomeness), (b) chronic pain, (c) the types, frequency, and durations of social connections, (d) perceived social support, (e) loneliness, (f) depression, and (g) demographic variables among older adults who receive nutrition services from home-delivered meals (HDM) during the COVID-19 pandemic?

RQ2: While controlling for chronic pain and depression, to what extent do perceived social support and loneliness predict suicide desire among community-dwelling older adults who receive HDM during the COVID-19 pandemic?

RQ3: What aspects of social connections promote perceived social support, reduce loneliness, and reduce suicide desire among community-dwelling older adults who receive nutrition services though home-delivered meals during the COVID-19 pandemic?

RQ4: Are the relationships between these social connections and suicide desire among older adults who receive HDM during the COVID-19 pandemic mediated by perceived social support and/or loneliness?

RQ5: Can specific aspects of social connections yield information about which participants in the sample may be more at risk of lower perceived social support, higher loneliness, and suicide desire?

Method

This cross-sectional study is part of a Department of Health and Human Services grant-funded longitudinal project (Innovations in Nutrition, Grant # 90INNU0010-01-00), and participating counties were selected based on recommendations from the Atlanta Regional Commission and the metro Atlanta Area Agency on Aging. Access to contact information for participants were provided from each participating county. Measures were piloted with a group of older adults using cognitive interviewing techniques (Peterson et al., 2017) and appropriate changes were made to the length and flow of items based on their feedback. A team of master's-level counselors-in-training data collectors were then trained to administer the measure set. Training included practice and supervision regarding directions (for clarity), perception checks, and pacing. Because measures of suicide ideation and risk were included, the data collectors were also trained in a safety protocol. Screening for cognitive impairment/dementia was conducted by case managers of older adults in participating counties. Older adult participants were recruited via telephone, due to the safety concerns of the COVID-19 pandemic. This resulted in a one to three-hour telephone interview with the trained data collector, with the average interview lasting approximately 90 minutes. IRB approval was obtained prior to data collection (Georgia State University H19166). Participants were compensated $20 for their participation.

Participants

Participants ($N = 320$) were racially diverse older adults who received nutrition services through HDM and had experienced further restricted social mobility due to COVID-19 in six metro Atlanta urban/suburban counties. Eligibility criteria included: being over age 60, a recipient of HDM, no diagnosis of dementia or cognitive impairment precluding ability to

consent and participate, and prior participation in the first round of interviews for an ongoing longitudinal study which began prior to COVID-19.

With regard to race, 67.1% of participants identified as Black, 21.1% identified as White, 8.4% identified as biracial, 0.3% identified as American Indian/Alaskan Native, 0.3% identified as Asian, and 2.8% identified as another race. With regard to gender identity, 24.2% of participants identified as male, 75.2% identified as female, and 0.6% identified as transgender. With regard to religion, 81.7% of participants identified as Christian Protestant, 5.0% identified as Catholic, 0.9% identified as Jewish, 1.6% identified as Agnostic, 0.9% identified as Atheist, 0.3% identified as Hindu, 0.3% identified as Muslim, 0.3% identified as Russian or Greek Orthodox, 0.3% identified as Mormon, 4.7% identified as another religion, and 4.0% of participants preferred not to answer. With regard to income, 2.6% of participants reported a monthly income of under $500, 45.3% of participants reported a monthly income between $500 and $1,000, 34.4% reported between $1,000 and $1,500 per month, 12.2% reported between $1,500 and $2,000 per month, 3.9% reported between $2,000 and $2,500 per month, 0.3% reported between $2,500 and $3,000 per month, and 1.3% of participants reported over $3,000 of income per month. Data were collected during the onset of COVID-19 in May and continued to early July 2020.

Measures

Suicide Desire: Thwarted Belongingness and Perceived Burdensomeness. The Interpersonal Needs Questionnaire (INQ: Van Orden et al., 2012) assesses suicidal desire as part of the Interpersonal Theory of Suicide (Joiner, 2005). The instrument is composed of two subscales: Thwarted belongingness (9-items; internal consistency in this study was .85) and perceived burdensomeness (6-items; internal consistency in this study was .91). Each item is

scored on a 7-point Likert-type scale, in which 1 represents "Not true at all for me" and 7 represents "Very true for me." Sample items include *"These days, I often feel like an outsider in social gatherings"* (thwarted belongingness; higher scores indicate higher levels of thwarted belongingness) and *"These days, the people in my life would be better off if I were gone,"* (perceived burdensomeness; higher scores indicate higher levels of perceived burdensomeness). Thwarted belongingness and perceived burdensomeness were analyzed independently, as well as a combined score (thwarted belongingness + perceived burdensomeness) indicating suicide desire.

Chronic Pain. The Profile of Chronic Pain: Screen (PCP-S; Ruehlman et al., 2005) is a 17-item measure that addresses chronic physical pain. Sample items include *"What was your average level of pain on days when you had pain during the past 6 months?"* (pain severity subscale); *"How often, if ever, in the past 6 months have you had to give up enjoyable activities, such as hobbies, going to the movies, or fun activities, with friends of family because of your pain?"* (pain interference subscale); and *"How often over the past 6 months has your pain caused you to feel sad or depressed?"* (emotional burden subscale). The measure contains three subscales. The first subscale, Pain Severity, used to assess severity and intensity of pain in the past 6 months. The second subscale is Pain Interference, which assesses how physical pain has impacted functioning and activities of daily living. The third subscale is Emotional Burden, which assesses emotional burden associated with living with chronic pain. For this study, items were summed across each subscale for a total score of chronic pain, and higher scores indicate higher levels of chronic pain. Internal consistency in this study was .91.

Social Connections. The Social Connections Survey was developed to capture data regarding the types and manner of social connections older adults had within the past week. The

manner of contact was captured, including real-time, synchronous communication (i.e., in-person contact, phone call, video call) and asynchronous contact (i.e., text message, messaging on social media). The survey also captured the relationships of social connections (i.e., family, friends, ASN volunteers/providers, professional support, clergy, and neighbors). The survey also captured the frequencies (i.e., how many times per week the participant had synchronous communication, if the interaction took place within the past week or within the past 24 hours), duration of each social interaction, as well as the number of contacts across each category within the last week (i.e., how many interactions were among family, friends, etc.). Manner of communication was intended to capture the distinction between synchronous and asynchronous communication among older adults during COVID-19; for example, how many participants had real-time connections during this season of physical distancing? Relationship of connections was intended to capture information about who may be in the participant's life; for example, during COVID-19, how many participants have regular contact with family, friends, clergy, or ASN?

Sample items included, "In the last week, did you interact with a family member, friend, professional support such as a therapist or healthcare worker, aging network provider, or additional support such as clergy members or neighbors? If so, how many interactions did you have with this person?" and "How did you communicate with these individuals – in-person, phone call, video call, text, email or social media?" In a study with college students, a similar survey was created and analyzed as demographic variables to explore indices of social support and suicide ideation (Hollingsworth et al., 2018). To date, no such studies exist exploring specific indices of social connection among older adults who receive HDM.

This survey was piloted with a small group of older adults after several rounds of drafting, editing, and consultation with experts in community-based research with older adults.

The survey was scored by computing the manner of connection into variables to determine whether a participant had specific types of social connection and frequencies of social connection. Duration of social contact was captured in total number of minutes, and minutes were summed to provide the total time a person spent engaging in any social connection within the week. When participants had over 4 hours of contact per day with any one social connection, the time was truncated to "4 hours or more." Total number of interactions was captured by summing the total number of different interactions a participant had within a week. Risk categories were established by identifying varying levels of social support that may or may not be significant to mean scores of perceived social support, loneliness, and suicide desire, and identifying participants who received varying levels of those identified social connections.

Perceived Social Support. The Duke Social Support Index - Subjective Support (DSSI; Koenig et al., 1993; 2013) is a six-item measure of perceived social support. Participants were asked to rate on a scale of 1 = *hardly ever* to 3 = *most of the time* how often they experienced support from people who are important to them (e.g., *"Can you talk about your deepest problems with at least some of your family and friends?"*). Internal consistency for this study was .87. The DSSI-Subjective Support measure has been used in studies exploring examining social factors and suicide among older adults (Rowe et al., 2006; Raue et al., 2007). For this study, we reverse scored the measure to have an index of low perceived social support. Scores ranged from 7 to 21. Higher scores indicate lower perceived social support among participants.

Loneliness. The De Jong Gierveld Loneliness Scale (De Jong Gierveld & Van Tilburg, 2006) is a six-item measure of two factors of loneliness defined by Weiss (1973): social (absence of a social network or group of contacts) and emotional (absence of close relationships or attachments) loneliness. Participants were asked to rate on scale of 1 = *very much no* to 5 = *very*

much yes how often statements measuring social and emotional loneliness applied to them (e.g., *I experience a great deal of emptiness, I miss having people around*). Internal consistency in this study was .80. Penning et al. and (2013) found this measure to be a preferred instrument for assessing loneliness among older adults. Items in the social loneliness subscale were reverse coded, as they were positively worded items, and summed with responses from the emotional loneliness subscale for a total loneliness score. Scores in this analysis ranged from 5 to 30. Higher scores indicate higher levels of loneliness.

Depression. The Patient Health Questionnaire – 2 (PHQ-2; Kroenke et al., 2003) is the first two items of the Patient Health Questionnaire – 9 (PHQ-9; Kroenke et al., 2001), which assesses the degree to which an individual may have experienced depressed mood over the past two weeks. Participants respond to two items on a Likert-style scale from scale from 0 being *not at all* to 3 being *nearly every day* to items assessing for symptoms of major depression (e.g., *"In the past two weeks, how often have you felt down, depressed, or hopeless?"*). Internal consistency in this study was .83. Higher scores indicate higher likely levels of depression.

Demographics Questionnaire. Participants completed a demographics questionnaire including race, gender identity, religious affiliation, and income level (see Appendix G). Demographic information was obtained during initial participant recruitment in 2019.

Data Analysis

Demographics and study variables were cleaned and scored using Microsoft Excel. There was minimal missing data due to data being collected by trained graduate students via phone, and any missing or incomplete data cases were not used in the study ($n = 3$). After cleaning and scoring, data was analyzed using IBM SPSS. G*Power 3.1 program was used to conduct power analysis for multiple regression with a moderate effect size (.15) and .05 alpha level. G*Power

indicated a needed sample size of 173 participants based on this analysis, and our actual sample size was 320. Correlations, hierarchical regression analysis, Kruskal-Wallis H tests, mediation, means comparison, and odds ratios were utilized. Collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits for both hierarchical regression analyses, therefore the assumption of no multicollinearity was met (Pedhazur, 1997).

The Kruskal-Wallis H test used in RQ3 is a nonparametric alternative to one-way analysis of variance (ANOVA) and was used in this study due to unequal group sizes that emerged from the types and manner of connections older adults experienced. Further, because this is a community sample rather than a clinical sample, the distribution of scores for suicidality among this sample were skewed, which was expected due to the fact that only a subset of participants met clinical risk for suicide desire (Shannonhouse et al., *in press*). Because Kruskal-Wallis H test is an omnibus test, inherent designs to protect against type I error (Salkind, 2010) were utilized. To further protect against the possibility of type I error, each analysis of RQ3 was also conducted with one-way analysis of variance (ANOVA), followed by Levene's test of homogeneity of variances, and Welch's ANOVA if results yielded unequal variances (not shown for brevity). All reported significant results of the Kruskal-Wallis H tests were also deemed significant through the one-way ANOVAs with subsequent tests. Model 4 mediation analyses were performed using PROCESS in RQ4. All findings were analyzed and reported at a .01 alpha level to further avoid Type I error.

Results

To answer RQ1, a series of correlation analyses was conducted to determine relationships between suicide desire (thwarted belongingness and perceived burdensomeness), chronic pain, perceived social support, loneliness, depression, and real time social connections (i.e., manner of

social interaction, relational type of social connection, total number of social connections, and duration of social connections). Thwarted belongingness was significantly correlated with perceived burdensomeness, $r(318) = .55$, $p = <.001$; chronic pain, $r(318) = .27$, $p = <.001$; having lower perceived social support, $r(318) = .72$, $p = <.001$; greater loneliness, $r(318) = .59$, $p = <.001$; and depression, $r(318) = .47$, $p = <.001$. In addition to being correlated with thwarted belongingness, perceived burdensomeness was found to be correlated with chronic pain, $r(318) = .28$, $p = <.001$; having lower perceived social support, $r(318) = .48$, $p = <.001$; greater loneliness, $r(318) = .41$, $p = <.001$; and depression, $r(318) = .43$, $p = <.001$. Correlations between all study variables can be found in Table 5.

Next, correlations were run to explore any relationships between demographic variables and suicide desire (thwarted belongingness, perceived burdensomeness), chronic pain, perceived social support, loneliness, and depression. No demographic variables were significantly correlated with study variables. Complete results of this analysis can be found in Table 6.

Next, relationships between demographic variables and *relationships* of social contact within the past week were examined. Participants identifying as Christian Protestant were found to be correlated with having family contact within the past week, $r(318) = .20$, $p = <.001$. Participants who had contact with family were also found to be correlated to having contact with professional support (i.e., home health care, doctors, counselors, therapists) within the past week, $r(318) = .18$, $p = <.001$. Participants who had contact with friends had a significant correlation to having contact with the ASN in the past week, $r(318) = .15$, $p = .006$. Participants who had contact with the ASN within the past week also had a significant correlation to having contact with additional relationships, such as clergy or neighbors, $r(318) = .18$, $p = <.001$. Complete results of this analysis can be found in Table 7.

Finally, relationships between demographic variables and *manner* of social connection within the last week were examined. Participants who had synchronous communication (i.e., in-person contact, phone calls, video calls) were found to be correlated with having social contact within the past 24 hours, $r(318) = .46$, $p = <.001$. Participants who identified as Christian Protestant were found to be correlated with having social contact within 24 hours, $r(318) = .20$, $p = <.001$. Participants who attended church were found to be correlated to having social contact within 24 hours, $r(318) = .19$, $p = .001$. Complete results of this analysis can be found in Table 8.

To answer RQ2, a series of hierarchical regression analyses were conducted to determine if perceived social support and loneliness predicted suicide desire among this sample of community-dwelling older adults who receive home delivered meals, while controlling for chronic pain and depression. First, a hierarchical regression analysis with thwarted belongingness as the dependent variable was conducted by incrementally adding predictors in the following order: (1) chronic pain, (2) depression, (3) low perceived social support, and (4) loneliness. The regression model predicted 61% of the variance in thwarted belongingness. Low perceived social support accounted for more variance than any other variable at any step in the model, accounting for 23% additional variance overall, and loneliness accounted for approximately 5% additional variance in predicting thwarted belongingness, $F(1, 313) = 45.68$, $p = <.001$. Standardized (β) predictor coefficients and Semipartial (sr^2) predictor coefficients appear in Table 9 along with $R^2\Delta$ for each step.

Next, a hierarchical regression analysis with perceived burdensomeness as the dependent variable was conducted by incrementally adding predictors in the following order: (1) chronic pain, (2) depression, (3) low perceived social support, and (4) loneliness. For perceived burdensomeness, depression accounted for approximately 12% additional variance in step 2, $F(1,$

315) = 47.68, p = <.001. In step 3, low perceived social support also accounted for

approximately 12% additional variance, $F(1, 314)$ = 57.56, p = <.001. In step 4, loneliness

accounted for only 0.1% additional variance in predicting perceived burdensomeness and was

not statistically significant, $F(1, 313)$ = 3.23, p = .07. Standardized (β) predictor coefficients and

Semipartial (sr^2) predictor coefficients appear in Table 10 along with $R^2\Delta$ for each step.

To answer RQ3, a series of Kruskal-Wallis H-Tests were completed to determine mean

differences in scores of perceived social support, loneliness, thwarted belongingness, and

perceived burdensomeness across each element of the social connections survey. The differences

in the study variables (i.e., low perceived social support, loneliness, thwarted belongingness, and

perceived burdensomeness) were found between various groups; groups emerged due to aspects

of the social connections survey (i.e., whether or not the participant had contact with family,

synchronous communication, etc.).

Kruskal-Wallis H tests showed evidence of a difference between the mean scores of low

perceived social support among participants who engaged in synchronous communication during

the week (p = .01) and had social contact within 24 hours (p = .007). Kruskal-Wallis H tests also

showed evidence of a difference between mean score of loneliness among participants who

engaged in synchronous communication during the week (p = .01), had contact within 24 hours

(p = .002), and attended church (p = .01).

For thwarted belongingness, Kruskal-Wallis H tests showed evidence of a difference in

mean scores for participants who engaged in synchronous communication (p = <.001), had social

contact within the past 24 hours (p = <.001), live alone (p =.005), had contact with family (p =.

<.001), had an in-person interaction during the week (p =.008), and who engaged in a phone call

during the week (p = <.001). For perceived burdensomeness, Kruskal-Wallis H-tests showed

evidence of a difference in mean scores for participants who had contact within the past 24 hours ($p = .01$). Full results of this analysis can be found in Tables 11-14.

To answer RQ4, a series of Model 4 mediation regression analysis was completed using PROCESS. The social connections used in this analysis were those that emerged as most salient across differences in means scores of perceived social support, loneliness, thwarted belongingness, and perceived burdensomeness: synchronous communication and having social contact within 24 hours. In the first mediation analysis, the outcome variable was suicide desire (a combined score of thwarted belongingness and perceived burdensomeness), the predictor variable for the analysis was having synchronous communication, and the mediator for the analysis was perceived social support. The standardized indirect effect of low perceived social support on suicide desire was (-.54)(.70) = -.38. We tested the significance of this indirect effect by using bootstrapping procedures. Unstandardized indirect effects were computed for each of the 10,000 bootstrapped samples. The bootstrapped unstandardized indirect effect was -5.97, 95% CI = -11.43, -0.64]. Low perceived social support mediated the relationship between having synchronous communication and suicide desire among older adults in this sample. Results of this analysis can be found in Figure 1.

In the second mediation analysis, the outcome variable was suicide desire, the predictor variable was having contact within 24 hours, and the mediator for the analysis was perceived social support. The standardized indirect effect of low perceived social support on suicide desire was (-.36)(.69) = -.25. We tested the significance of this indirect effect by using bootstrapping procedures. Unstandardized indirect effects were computed for each of the 10,000 bootstrapped samples. The bootstrapped unstandardized indirect effect was -3.86 [95% CI = -6.93, -1.07]. Low perceived social support mediated the relationship between having contact within 24 hours

and suicide desire among older adults in this sample. Results of this analysis can be found in Figure 2.

In the third mediation analysis, the outcome variable was suicide desire, the predictor variable was synchronous communication, and the mediator was loneliness. The standardized indirect effect of loneliness on suicide desire was (-.68)(.66) = -.45. We tested the significance of this indirect effect by using bootstrapping procedures. Unstandardized indirect effects were computed for each of the 10,000 bootstrapped samples. The bootstrapped unstandardized indirect effect was -6.97 [95% CI = -12.85, -1.50]. Loneliness mediated the relationship between having synchronous communication and suicide desire in this sample. Results of this analysis can be found in Figure 3.

In the fourth mediation analysis, the outcome variable was suicide desire, the predictor variable was having contact within 24 hours, and the mediator was loneliness. The standardized indirect effect of loneliness on suicide desire was (-.39)(.65) = -.26. We tested the significance of this indirect effect by using bootstrapping procedures. Unstandardized indirect effects were computed for each of the 10,000 bootstrapped samples. The bootstrapped unstandardized indirect effect was -3.96 [95% CI = -7.06, -1.18]. Loneliness mediated the relationship between having contact within 24 hours and suicide desire in this sample. Results of this analysis can be found in Figure 4.

To answer RQ5, crosstabulations were used to determine which participants had both synchronous communication and contact within 24 hours, contact within 24 hours but no synchronous communication, synchronous communication but no contact within 24 hours, and no synchronous communication and no contact within 24 hours. Next, means and standard deviations were analyzed across these new variables. Participants ($N = 25$) who had no

synchronous communication and no contact within 24 hours had the highest scores of low perceived social support, loneliness, thwarted belongingness, and perceived burdensomeness. Full results of this analysis can be found in Table 15.

Next, odds ratios were calculated using two-by-two frequency tables for examining participants who met or did not meet clinical risk threshold (Mitchell et al., 2017) for thwarted belongingness (a score of 31 or higher) and perceived burdensomeness (a score of 22 or higher) and those who did or did not engage in synchronous communication during the week. Participants who did not have synchronous communication within the week were approximately four times more likely to meet the clinical threshold for thwarted belongingness, OR = 3.99, 95% CI = [1.66, 9.50], p = .003. Participants who did not have synchronous communication were also 1.82 times more likely to meet clinical threshold for perceived burdensomeness, OR = 1.82, 95% CI = [.50, 6.60], p = .36.

Finally, odds ratios were calculated using two-by-two frequency tables for examining participants who met or did not meet clinical risk threshold for thwarted belongingness and perceived burdensomeness (Mitchell et al., 2017) and those who did or did not have social contact within the past 24 hours. Participants who did not have social contact within the past 24 hours were twice as likely to meet clinical risk threshold for thwarted belongingness, OR = 2.02, 95% CI = [1.04, 4.94], p = .03. Participants who did not have social contact within the past 24 hours were 2.63 times more likely to meet the clinical risk threshold for perceived burdensomeness, OR = 2.63, 95% CI = [1.10, 6.29], p = .03.

Discussion

Findings from this study support previous research on suicide desire among older adults with a new sample: racially diverse community-dwelling older adults who receive home-

delivered meals through home and community-based services. The directionality of correlations between study variables are consistent with results of prior studies. There were strong positive relationships between suicide desire and chronic pain (Conejero et al., 2018; Smith et al., 2019; Shannonhouse et al., *under review*), suicide desire and loneliness (Van Orden et al., 2012; Petersen et al., 2016), suicide desire and depression (Conwell et al., 2011), and suicide desire and low perceived social support (Rowe et al., 2006; Raue et al., 2007; Van Orden et al., 2012).

Perceived social support and loneliness significantly predicted suicide desire among older adults in this sample, and perceived social support emerged as a critical factor in predicting suicide desire through both thwarted belongingness and perceived burdensomeness. These findings are similar to prior research that found loneliness and perceived social support to be significant factors in predicting suicide desire (Niu et al., 2020; Park et al., 2013). Our study extends this knowledge by demonstrating that perceived social support and loneliness are greater predictors than depression and chronic pain in this sample, accounting for a significant amount of variance, especially for thwarted belongingness.

These findings also support existing findings on older adult suicide in the context of the Interpersonal Theory of Suicide. The IPTS posits individuals develop suicide desire because they do not feel they belong and or are not valued in groups or relationships, while simultaneously feeling they are a burden to those around them (Van Orden et al., 2012). Having high perceived social support may be the result of having meaningful reciprocal relationships, which may be lifesaving in the context of preventing the development of suicide desire. Prior studies have found higher perceived social support may result in lower social isolation; social isolation has been associated with greater suicide risk among older adults (Rowe et al., 2006). Our findings

indicate low perceived social support was both associated with and predictive of suicide desire in community dwelling older adults receiving HDM.

As previously noted, strong social relationships buffer mortality (Holt-Lunstad et al., 2010) and limited social connectedness is associated with suicide in later life (Fassberg et al., 2012); however, this study extended prior knowledge regarding the specific types of social connection affiliated with social support, loneliness, and suicide desire by examining the relationships and manner of social connections in real time. Older adults who had synchronous, real-time communication (such as a phone call or in-person visit) within the week had lower mean scores of low perceived social support than those older adults who did not receive synchronous communication within the week. Older adults who received some form of social contact within 24 hours of their interview also had greater perceived social support than those who did not receive social contact within a day. Based on these findings, frequent, real-time interactions, regardless of relationship type (i.e., family, friend, neighbor), may enhance perceived social support and buffer suicide desire by reducing thwarted belongingness and perceived burdensomeness.

There were similar findings regarding the impact of specific social connections on loneliness among older adults who receive HDM. Participants who received synchronous communication within the week had significantly lower mean scores of loneliness than those who did not receive synchronous communication within a week. Similar to perceived social support, having frequent, real-time interactions (such as a phone call) may decrease loneliness, thereby buffering thwarted belongingness and perceived burdensomeness.

With regard to suicide desire, older adults who received synchronous communication, contact within 24 hours, contact from family members, in-person interactions, and phone calls

within the week of their interview had lower mean scores of thwarted belongingness than participants who had no such connections. Further, older adults who live alone were found to have higher mean scores of thwarted belongingness than those who do not live alone. Older adults who had contact within 24 hours had lower mean scores of perceived burdensomeness compared to participants who had no such connections. Participants who experience frequent social connection during the week may experience a stronger presence of reciprocal care in their relationships, thereby also buffering suicide desire (Joiner, 2005; Chu et al., 2017).

Perceived social support and loneliness mediated the relationship between these social connections (i.e. synchronous communication, contact within 24 hours) and suicide desire in this sample. Participants who did not have synchronous communication or frequent social contact experienced increased feelings of loneliness and decreased feelings of perceived social support, which exacerbated both thwarted belongingness and perceived burdensomeness (suicide desire). Increasing opportunities for real-time, frequent social connection may further buffer this pathway to suicide desire by decreasing loneliness and increasing perceived social support among older adults who receive HDM.

It is worth mentioning some of the types of social connection we anticipated to be significant but were not. Although there were significant mean differences in thwarted belongingness among participants who lived alone, their scores were not significant for loneliness, perceived social support, or perceived burdensomeness. Social connections such as having a pet, having contact initiated by others, and having contact with friends yielded no significant mean differences in scores of low perceived social support, loneliness, thwarted belongingness, or perceived burdensomeness. This may further illustrate the importance of

simply having a frequent, real-time connection with *someone* – regardless of relationship or who initiates the connection.

Finally, we were interested in potentially establishing risk criteria on what we learned from the significant types and manner of social connections as a result of exploring the impact of these on suicide desire. Again, this corroborates previous literature that has identified low social connectedness as a risk factor for suicide among older adults (Conwell et al., 2011) and extends prior knowledge by identifying two aspects of social connectedness that may impact suicide desire. Mean scores of low perceived social support were highest for participants ($N = 25$) who had no contact within the past 24 hours and no synchronous communication within the past week. Mean scores of loneliness, thwarted belongingness, and perceived burdensomeness were also highest among these participants who had no contact within the past 24 hours and no synchronous communication within the past week. In other words, based on these analyses, the 25 older adults who received HDM in this sample who had no real-time connections during the week and no recent interactions felt the least amount of social support, were the loneliest, felt the most like they did not belong, and felt the most like a burden. In other words, they reported the highest suicide desire. Specifically, older adults who did not have synchronous communication within the week were approximately four times more likely to meet clinical threshold for thwarted belongingness, and close to twice as likely to meet the clinical threshold for perceived burdensomeness. Older adults who did not have contact within 24 hours of their interview were twice as likely to meet the clinical threshold for both thwarted belongingness and perceived burdensomeness (suicide desire). These findings have implications for optimization of volunteers who provide home-delivered meals within the aging network and beyond.

Implications for Aging Network Optimization

The aging network is unusually suited to identify and respond to older adults at risk of suicide and can do so in some simple pragmatic ways. Because synchronous communication within the last week and having contact within 24 hours resulted in lower mean scores of loneliness and suicide desire, and greater perceived social support, it may be helpful to know which older adults are not receiving these social connections. Neither with whom this synchronous communication took place nor the quantity of interactions within a week were as important as the presence of real-time connections. One specific way the ASN can optimize its nutrition service programs (often considered to be "more than a meal") may be to identify older adult clients who do not receive regular social contact, and match volunteers who have been equipped with warm-calling skills to provide sincere, relational check-ins with the most isolated older adults. This optimization may result in preventing suicide desire from emerging among older adults by fostering reciprocally caring relationships though HDM volunteers.

Based on the findings of this study, one concrete strategy ASN providers may utilize is including concrete items about having synchronous communication and contact within 24 hours in Aging and Disability Resource Center (ADRC) screening protocols, so personnel who routinely assess older adult clients' needs may quickly identify those most isolated. This two-item assessment may be more efficient than extensive screeners which address isolation, loneliness, and suicide risk. While rigorous measures such as the INQ may yield the most robust understanding of suicide desire among older adults, implementing a couple of targeted questions regarding social connectedness may elucidate older adults who may be on or near a pathway to developing suicide desire. For example, questions such as, *"in the last week, did you talk with anyone?"* or *"when was the last time you had a meaningful conversation with another person?* may give ADRC personnel an idea of who has not engaged in synchronous, frequent

communication, and those clients may be prioritized for being matched with trained volunteers. With the limited number of resources and inconsistencies of screening across the ASN, simple items that capture real-time connections are needed in the context of a global pandemic that is disproportionately affecting racially diverse older adults (Reger et al., 2020).

Until vaccine distribution is saturated among all community-dwelling older adults and the risk of COVID-19 is eliminated, physical distancing interventions may continue to result in increased loneliness and social isolation among older adults (Berg-Weger & Morley, 2020). ASN providers may be uniquely positioned to potentially buffer suicide desire during the COVID-19 pandemic by understanding who in their network is most at risk, and intentionally connecting volunteers to facilitate meaningful, real-time connections through synchronous communication that can be done safely (i.e., warm phone calls).

Limitations

The findings of this study provide insight into the impact of social connections on suicide desire among older adults. However, these findings need to be considered in the context of limitations that may affect the generalizability of the results. First, this data was collected from a community sample, where a smaller number of participants experience suicide desire compared to data collected from a sample of older adults enrolled in some form of mental health or psychiatric treatment. While our sample provides a realistic snapshot of isolated older adults in a community who may be at risk of suicide, suicide desire data are often skewed in community samples. Non-parametric data analysis was used to account for this in examining the impact of social connections on perceived social support, loneliness, and suicide desire, and the results yielded small to moderate effect sizes. While noting the statistical significance of the analyses, it is also important to consider results in the context of the effect size.

Second, interviews with participants were completed over the phone. Although data collectors were trained to administer the interview over the phone to older adults, barriers such as survey fatigue or slowing down to connect with older adults who were hard of hearing may have impacted participant responses. Finally, the social connection survey was developed as a way to capture descriptive data of the types and manner of social connections older adults receive. Although development underwent several rounds of review and pilot testing, and the intent was to capture descriptive data, it is not a validated measure of social connections. Greater accuracy on understanding the impact of specific types of social connection may be accomplished with more research to establish the validity and reliability of the survey, rather than using it solely to capture descriptive, real-time data.

Implications for Future Research

Future research is needed to investigate the complex relationships between social connections, suicide risk factors, and suicide desire. Such studies could seek to examine these variables in rural samples of older adults receiving HCBS who have been found to have higher rates of suicidality (Kegler et al., 2017) with a larger sample of older adults receiving HCBS, and/or with a sample of older adults who are waitlisted and not yet receiving HCBS. Because suicide desire fluctuates over time and this cross-sectional study is part of a longitudinal project, future studies may prospectively examine these variables before and after the time point used in the current analysis. Evaluating these measures over time may enable profiles of older adults with more or less risk of suicide to emerge.

Examining these variables before, during, and after disasters such as the COVID-19 pandemic may further elucidate the relationships between salient social connections, suicide risk factors, suicide desire, and the role certain social connections play in buffering suicide desire

over time. Assessing suicide risk factors and suicide desire on a more frequent basis, perhaps using ecological momentary assessment (e.g., Kleiman et al., 2017) may be beneficial in better understanding older adult suicide. Ongoing evaluation of factors that may influence suicide related thoughts and behaviors is critical in older adults, especially in light of the COVID-19 pandemic that has disproportionately affected marginalized older adults and likely to continue to thwart connection due to the physical distancing interventions needed to keep older adults safe.

Future research could also better understand the types and manner of social connections that positively impacted older adults. For instance, synchronous communication, contact within 24 hours, contact from family members, in-person interactions, and phone calls were found to be life-promoting for older adults during COVID-19. Qualitative inquiry may yield greater insight to understanding suicide desire among community-dwelling older adults who receive HDM by understanding the quality of their relationships among social connections. For example, asking questions such as *"how important is it to you to have regular contact with a family member compared to a good friend?"* or *"tell me more about the people with whom you have regular contact – who are they, and how important are those relationships to you?"* may yield important information to further examine the impact of specific types of social connection on perceived social support, loneliness, and suicide desire. Finally, future research intended to better understand how the Aging Services Network contributes to these social connections may also be useful. Due to the interruptions of critical ASN services (i.e., HDM), understanding the importance of these services in buffering suicide also merits further attention.

Conclusion

In chapter 1, HDM volunteers who received suicide intervention training acquired the evidence-based skills to facilitate a suicide intervention with older adults in the moment needed

most. HDM volunteers used these skills in the context of their meal delivery job role, and also in their personal lives and communities. In chapter 2, I found specific types of social connections that predicted suicide risk factors and suicide desire and identified older adults in the sample who may be most at risk of suicide based on the absence of synchronous, real-time connections during the week, and having frequent social contact. Intentionally matching HDM volunteers (either by equipping them with warm calling skills or suicide intervention skills, or both) to connect meaningfully with older adults who may currently be at risk of suicide may contribute to building a suicide-safer community for older adults through the nutrition services within the aging network.

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Table 5.

Means, standard deviations, ranges, reliabilities, and correlations between suicide desire, pain, social interaction, perceived social support, loneliness, and depression

Variables	N	M	SD	Range	1	2	3	4	5	6	7	8	9
1. Thwarted Belongingness	320	18.03	10.76	9-63	.85								
2. Perceived Burdensomeness	320	9.01	6.97	6-42	.55**	.91							
3. Chronic Pain	320	41.69	29.38	0-91	.27**	.28**	.91						
4. Any Social Interaction	320	0.94	0.24	–	-.18*	-.07	-.08	–					
5. Total Interactions	320	23.28	32.56	–	-.11	.12	.06	.19**	–				
6. Interactions Duration	320	960.66	1513.44	–	-.09	.06	.11	.16*	.41**	–			
7. Low Perceived Social Support	320	9.94	3.45	7-21	.72**	.48**	.24**	-.10	-.07	.08	.87		
8. Loneliness	320	12.06	5.28	5-30	.71**	.42**	.29**	-.16*	-.13	-.10	.67**	.80	
9. Depression	320	1.23	1.63	0-6	.47**	.43**	.43**	-.15*	.01	.10	.35**	.49**	.83

Note: Reliabilities of measures run down the diagonal in italics
* Correlation is significant at the 0.01 level (2-tailed)
** Correlation is significant at the 0.001 (2-tailed)

Table 6.

Correlations between demographic variables, perceived burdensomeness, thwarted belongingness, perceived social support, depression, loneliness, and chronic pain (N = 320)

Variables	1	2	3	4	5
1. Race (Black)	–				
2. Gender (Female)	.01	–			
3. Christian Protestant	.10	.05	–		
4. Income	-.11	.01	-.06	–	
5. Chronic Pain	.00	.05	.05	.05	–
6. Perceived Burdensomeness	.04	-.08	-.01	.00	.28**
7. Thwarted Belongingness	-.00	.02	.02	-.09	.25**
8. Perceived Social Support	.06	-.02	-.02	-.06	.24**
9. Depression	.00	-.04	-.04	-.02	.43**
10. Loneliness	.07	-.06	-.03	-.10	.29**

Note. Race is coded as Black =1, Non-Black = 0; Gender as Female =1, Non-Female = 0; and Christian Protestant coded as 1 with other faiths coded as 0
* Correlation is significant at the 0.01 level (2-tailed)
** Correlation is significant at the <0.01 (2-tailed)

Table 7.

Correlations between demographic variables and relationships of social contact within the past week (N = 320)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Race (Black)	–										
2. Gender (Female)	.01	–									
3. Christian Protestant	.10	.05	–								
4. Income	-.11	.01	-.06	–							
5. Chronic Pain	.00	.05	.05	.05	–						
6. Family	.12	.05	.20**	.08	-.01	–					
7. Friends	-.04	-.03	-.02	.03	-.06	.04	–				
8. Professional Support	-.02	-.03	.02	.15	.13	.18**	.05	–			
9. ASN	.02	.01	.04	.06	.13	.14	.15**	.07	–		
10. Additional	.03	-.00	.07	.10	-.04	.10	.08	.13	.18**	–	
11. Roommate/Other	-.06	-.03	-.01	.04	.02	-.07	.12	-.09	.05	.09	–

* Correlation is significant at the 0.01 level (2-tailed)
** Correlation is significant at the <0.01 (2-tailed)

Table 8.

Correlations between demographic variables and manner of social connection within the past week (N = 320)

Variables	1	2	3	4	5	6	7	8	9
1. Race (Black)	–								
2. Gender (Female)	.01	–							
3. Christian Protestant	.10	.05	–						
4. Income	-.11	.01	-.06	–					
5. Chronic Pain	.00	.05	.05	.05	–				
6. Synchronous	-.01	-.06	.10	.11	-.07	–			
7. Asynchronous	.02	.02	-.02	.04	.05	.06	–		
8. Within 24 hours	-.01	-.01	.20**	.08	-.01	.46**	.07	–	
9. Attended Church	.02	.05	.07	.04	.03	.07	.13	.19**	–

* Correlation is significant at the 0.01 level (2-tailed)
** Correlation is significant at the <0.01 (2-tailed)

Table 9.

Hierarchical Linear Regression Analysis for Thwarted Belongingness

Variable	Step 1 sr^2	β	Step 2 sr^2	β	Step 3 sr^2	β	Step 4 sr^2	β
Chronic Pain	.07	.27**	.01	.09	.00	.01	.00	.00
Depression			.15	.43**	.04	.24**	.02	.15**
Low Perceived Social Support					.35	.64**	.12	.45**
Loneliness							.05	.34**
R^2		.07**		.23**		.58**		.63**
F for $R^2\Delta$		25.04		62.22		257.57		45.68
Degrees of Freedom		1, 316		1, 315		1, 314		1, 313

Note: sr^2 = Semipartial (part) coefficient of determination
* $p <.01$. ** $p <.001$
Step 1 $R^2\Delta$ = .074**, Step 2 $R^2\Delta$ = .153**, Step 3 $R^2\Delta$ = .349**, Step 4 $R^2\Delta$ = .054**

Table 10.

Hierarchical Linear Regression Analysis for Perceived Burdensomeness

	Step 1		Step 2		Step 3		Step 4	
Variable	sr^2	β	sr^2	β	sr^2	β	sr^2	β
Chronic Pain	.08	.28**	.01	.11	.00	.07	.00	.06
Depression			.12	.39**	.06	.28**	.04	.27**
Perceived Social Support					.12	.37**	.07	.34**
Loneliness							.01	.04
R^2		.08**		.20**		.31**		.32
F for $R^2\Delta$		26.01		47.68		52.76		3.23
Degrees of Freedom		1, 316		1, 315		1, 314		1, 313

Note: sr^2 = Semipartial (part) coefficient of determination
* $p <.01$. ** $p <.001$
Step 1 $R^2\Delta$ = .076**, Step 2 $R^2\Delta$ = .121**, Step 3 $R^2\Delta$ = .115**, Step 4 $R^2\Delta$ = .001

Table 11.

Means, Standard Deviations, and Kruskal-Wallis H Tests for Low Perceived Social Support and Social Connections

Social Connection	Yes			No			χ^2	η^2
	M	*SD*	*N*	*M*	*SD*	*N*		
Synchronous	9.80	3.35	295	11.67	4.18	25	4.99*	.02
Contact with 24 hours	9.59	3.19	228	10.82	3.91	92	7.30*	.02
Attended Church	9.55	3.34	163	10.27	3.46	143	5.33	.02
Lives Alone	10.22	3.55	187	9.48	3.17	132	3.46	.01
Family	9.78	3.34	258	10.66	3.82	62	3.40	.01
Friends	9.94	3.40	174	9.95	3.52	146	0.02	.000
Professional Support	10.17	3.64	82	9.87	3.39	238	0.28	.001
ASN	10.76	4.21	42	9.82	3.31	278	0.86	.001
Additional (i.e., clergy)	9.41	3.01	68	10.09	3.55	252	0.78	.002
Roommate/Other	10.10	4.09	20	9.93	3.41	300	0.001	.000
In-Person Interaction	9.82	3.46	232	10.28	3.43	88	1.67	.005
Phone Call	9.78	3.37	247	10.50	3.37	73	3.03	.009
Video Call	9.28	3.10	39	10.04	3.50	281	2.06	.006
Text	10.00	3.91	35	9.94	3.39	285	0.07	.000
Email	8.56	1.33	9	9.98	3.48	311	0.54	.002
Social Media	18.60	1.52	5	18.04	3.47	315	0.07	.003
Asynchronous	9.42	3.08	14	9.97	3.47	306	0.05	.000
Participant Initiated Contact	9.69	3.43	48	9.99	3.45	272	0.74	.002
Other Initiated Contact	10.13	3.74	154	9.77	3.16	166	0.17	.000
Mutual Initiation	9.76	3.34	247	10.57	3.76	73	3.33	.01
Has a Pet	10.51	3.95	82	9.75	3.25	238	0.86	.002

*p = .01 (2-tailed), **p = <.001 (2-tailed)

Table 12.

Means, Standard Deviations, and Kruskal-Wallis H Tests for Loneliness and Social Connections

Social Connection	Yes			No			χ^2	η^2
	M	SD	N	M	SD	N		
Synchronous	11.79	5.04	295	15.38	6.93	25	6.52*	.02
Contact with 24 hours	11.47	4.80	228	13.53	6.10	92	7.21*	.03
Attended Church	11.25	4.73	163	12.91	5.71	143	6.37*	.02
Lives Alone	12.48	5.27	187	11.43	5.24	132	4.05	.01
Family	11.77	4.99	258	13.28	6.22	62	2.43	.008
Friends	12.01	4.68	174	12.13	5.94	146	0.47	.001
Professional Support	12.24	5.13	82	12.00	5.34	238	0.32	.001
ASN	13.02	6.20	42	11.91	5.12	278	0.68	.002
Additional (i.e., clergy)	11.16	4.71	68	12.30	5.40	252	2.32	.007
Roommate/Other	12.50	5.75	20	12.03	5.25	300	0.13	.000
In-Person Interaction	11.74	5.08	232	12.94	5.71	88	2.76	.01
Phone Call	11.66	4.99	247	13.47	5.99	73	4.97	.02
Video Call	11.44	5.15	39	12.15	5.30	281	0.69	.002
Text	12.03	6.18	35	12.06	5.16	285	0.23	.000
Email	9.00	2.00	9	12.15	5.32	311	3.08	.01
Social Media	12.40	5.31	5	12.05	5.31	315	0.37	.001
Asynchronous	10.79	2.39	14	12.12	5.37	306	0.18	.001
Participant Initiated Contact	11.91	4.74	48	12.08	5.37	272	0.01	.000
Other Initiated Contact	12.20	5.54	154	11.93	5.03	166	0.01	.000
Mutual Initiation	11.78	4.89	247	13.03	6.39	73	1.00	.003
Has a Pet	12.01	5.48	82	12.07	5.21	238	0.50	.002

*p = .01 (2-tailed), **p = <.001 (2-tailed)

Table 13.

Mean Differences, Standard Deviations, and Kruskal-Wallis H Tests for Thwarted Belongingness and Social Connections

Social Connection	Yes			No			χ^2	η^2
	M	SD	N	M	SD	N		
Synchronous	17.45	10.14	295	26.62	12.92	25	15.37**	.06
Contact with 24 hours	16.62	9.40	228	22.07	12.50	92	16.16**	.05
Lives Alone	19.20	10.75	187	16.60	10.24	132	7.72**	.02
Family	16.97	9.81	258	23.24	12.51	62	17.76**	.06
In-Person Interaction	17.16	10.09	232	20.94	11.70	88	6.98**	.03
Phone Call	17.19	10.13	247	21.57	11.76	73	10.87**	.03
Friends	17.91	9.86	174	18.51	11.58	146	0.07	.001
Professional Support	18.00	10.40	82	18.27	10.78	238	0.15	.000
ASN	20.43	12.33	42	18.87	10.38	278	2.04	.007
Additional (i.e, clergy)	16.01	9.59	68	18.79	10.89	252	3.61	.01
Roommate/Other	20.90	13.97	20	18.02	10.42	300	0.42	.004
Video Call	15.92	8.44	39	18.52	10.92	281	1.45	.006
Text	19.48	12.31	35	18.05	10.47	285	0.49	.002
Email	16.78	6.08	9	18.24	10.78	311	0.04	.001
Social Media	17.00	7.52	5	18.22	10.72	315	0.04	.000
Asynchronous	17.27	6.96	14	18.25	10.82	306	0.21	.000
Participant Initiated Contact	16.57	10.97	48	18.48	10.76	272	2.35	.004
Other Initiated Contact	18.05	11.18	154	18.34	10.21	166	0.43	.000
Mutual Initiation	17.37	9.63	247	20.97	12.28	73	3.80	.02
Attended Church	17.26	10.07	163	18.92	11.04	143	1.71	.006
Has a Pet	18.41	10.99	82	18.12	10.58	238	0.28	.000

*p = .01 (2-tailed), **p = <.001 (2-tailed)

Table 14.

Mean Differences, Standard Deviations, and Kruskal-Wallis H Tests for Perceived Burdensomeness and Social Connections

Social Connection	Yes			No			χ^2	η^2
	M	SD	N	M	SD	N		
Synchronous	8.98	6.78	295	10.73	8.70	25	1.74	.005
Contact with 24 hours	8.43	5.91	228	10.81	8.84	92	5.98**	.024
Lives Alone	9.45	7.35	187	8.64	6.38	132	0.27	.003
Family	8.82	8.56	258	10.28	6.49	62	2.64	.001
In-Person Interaction	8.86	6.49	232	9.82	8.06	88	0.03	.004
Phone Call	8.91	6.74	247	9.84	6.96	73	2.67	.003
Friends	9.08	7.01	174	9.19	6.91	146	0.03	.000
Professional Support	9.39	7.24	82	9.03	6.87	238	0.02	.001
ASN	20.43	12.33	42	18.87	10.78	278	0.86	.007
Additional (i.e., clergy)	7.84	5.74	68	9.47	7.33	252	3.96	.009
Roommate/Other	11.08	9.90	20	8.99	6.73	300	0.97	.005
Video Call	8.74	7.08	39	9.12	6.96	281	0.73	.000
Text	10.83	9.97	35	8.92	6.49	285	0 .06	.007
Email	8.78	9.97	9	9.13	6.94	311	0 .41	.000
Social Media	11.40	10.48	5	9.09	6.91	315	0.21	.003
Asynchronous	9.07	6.97	14	9.13	6.97	306	0.06	.000
Participant Initiated Contact	8.19	6.65	48	9.29	7.01	272	3.98	.003
Other Initiated Contact	9.40	7.54	154	8.87	6.38	166	0.55	.001
Mutual Initiation	8.82	6.44	247	10.14	8.83	73	1.53	.006
Attended Church	9.01	7.27	163	9.37	6.92	143	1.41	.001
Has a Pet	9.49	6.35	82	9.00	7.17	238	0.28	.000

*p = .01 (2-tailed), **p = <.001 (2-tailed)

Table 15.

Means and Standard Deviations of Perceived Social Support, Loneliness, Thwarted Belongingness, and Perceived Burdensomeness among Significant Social Connections

| Variable	Communication Type	*N*	*M*	*SD*
Perceived Social Support	No 24hr, No Synchronous	25	11.67	4.17
	24 Hour, No Synchronous	0	-	-
	No 24hr, Synchronous	66	10.52	3.80
	24 Hour, Synchronous	229	9.94	3.45
Loneliness	No 24hr, No Synchronous	25	15.38	6.93
	24 Hour, No Synchronous	0	-	-
	No 24hr, Synchronous	66	12.87	5.69
	24 Hour, Synchronous	229	11.47	4.80
Thwarted Belongingness	No 24hr, No Synchronous	25	25.96	12.73
	24 Hour, No Synchronous	0	-	-
	No 24hr, Synchronous	66	20.31	11.97
	24 Hour, Synchronous	229	16.61	9.40
Perceived Burdensomeness	No 24hr, No Synchronous	25	10.86	9.01
	24 Hour, No Synchronous	0	-	-
	No 24hr, Synchronous	66	10.85	8.96
	24 Hour, Synchronous	229	8.43	5.91

Figure 1.

Standardized Regression Coefficients for the Relationship Between Having Synchronous Communication and Suicide Desire as Mediated by Low Perceived Social Support

Low Perceived Social Support

M_i

-.54*

.70**

-.67**

X

Y

-.38**

Synchronous
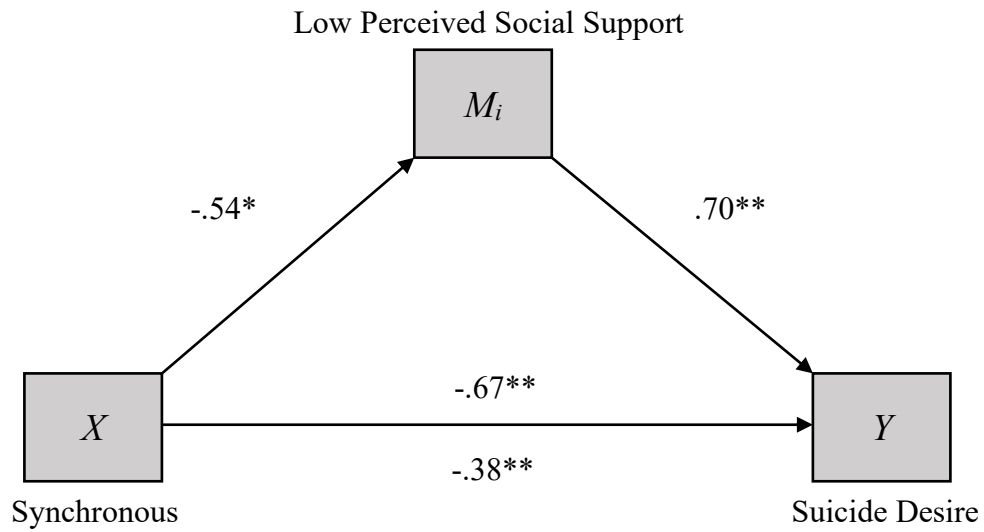
Suicide Desire

* *p* = .01, **p = <.001
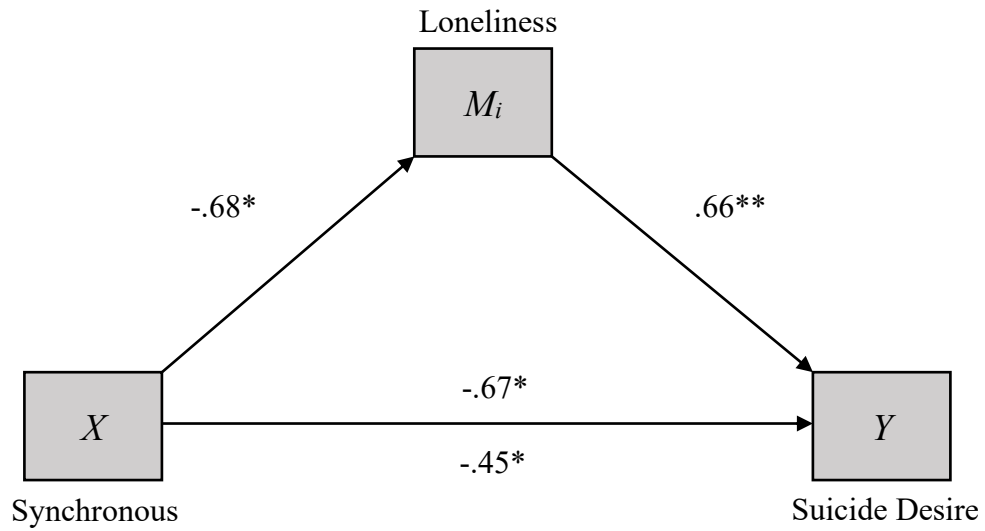
Figure 2.

Standardized Regression Coefficients for the Relationship Between Having Contact within 24 Hours and Suicide Desire as Mediated by Low Perceived Social Support

Low Perceived Social Support

M_i

-.36*

.69**

X

-.49**

Y

-.25**

Contact within 24hrs
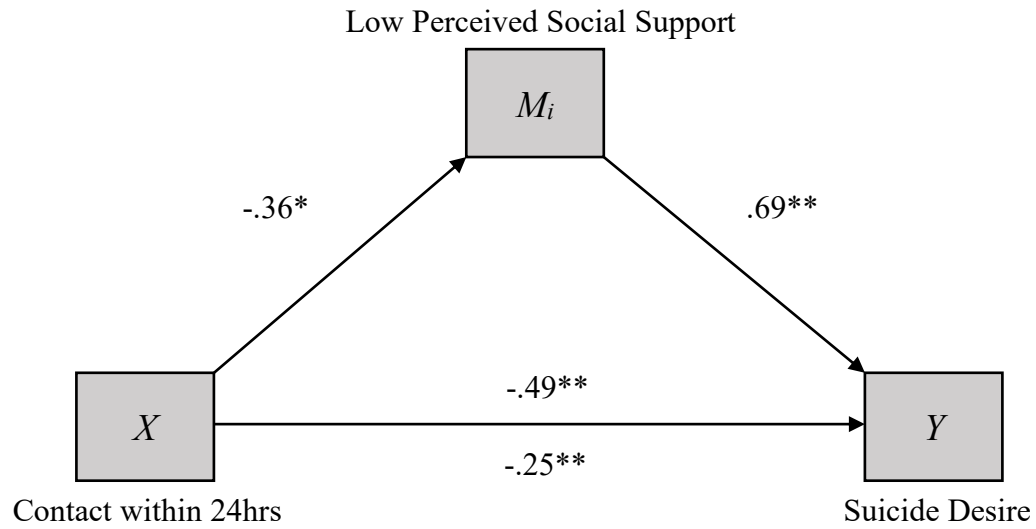
Suicide Desire

* *p* = .01, **p = <.001

Figure 3.

Standardized Regression Coefficients for the Relationship Between Having Synchronous Communication and Suicide Desire as Mediated by Loneliness

Loneliness

M_i

-.68*

.66**

X

Synchronous

-.67*

-.45*

Y

Suicide Desire

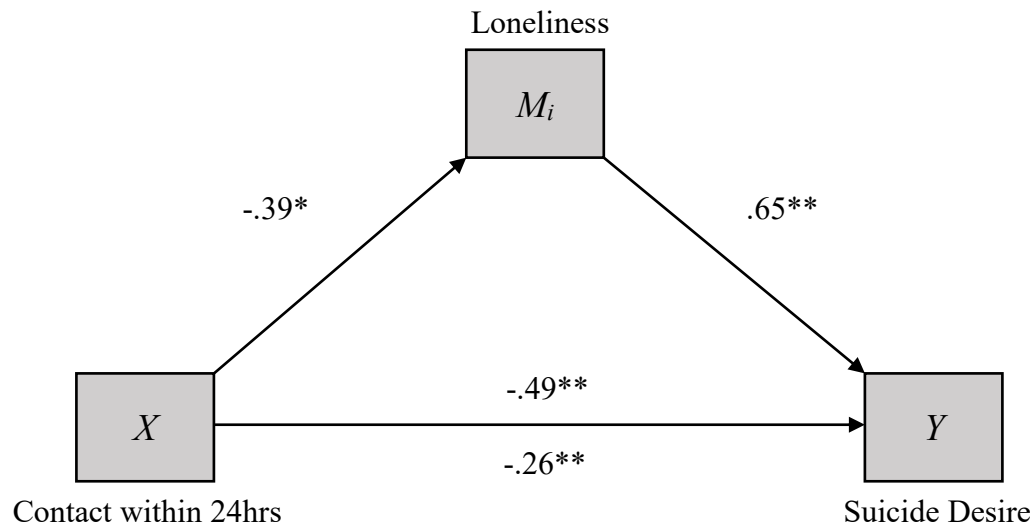* *p* = .01, **p = <.001

Figure 4.

Standardized Regression Coefficients for the Relationship Between Having Contact Within 24
Hours and Suicide Desire as Mediated by Loneliness

* $p = .01$, ** $p = <.001$

APPENDIX A

Interpersonal Needs Questionnaire

Directions: The following questions ask you to think about yourself and other people. Please respond to each question using your own current beliefs and experiences, NOT what you think is true in general, or what might be true for other people.

Base your responses on how you've been feeling recently. There are no right or wrong answers: we are interested in what you think and feel.

Rate each item **from 1 to 7**,
with 1 being "**Not true** for me",
to 7 being "**Very true** for me".

These days...

1. … the people in my life would be better off if I were gone

2. … the people in my life would be happier without me

3. … I think I am a burden on society

4. … I think my death would be a relief to the people in my life

5. … I think the people in my life wish they could be rid of me

6. … I think I make things worse for the people in my life

7. … other people care about me *(note: reverse-coded)*

8. … I feel like I belong *(note: reverse-coded)*

9. … I rarely interact with people who care about me

10. … I am fortunate to have many caring and supportive friends *(note: reverse-coded)*

11. … I feel disconnected from other people

12. ... I often feel like an outsider in social gatherings

13. ... I feel that there are people I can turn to in times of need *(note: reverse coded)*

14. ... I am close to other people *(note: reverse coded)*

15... I have at least one satisfying interaction every day *(note: reverse coded)*

APPENDIX B

Profile of Chronic Pain: Screen

1. How often in the PAST 6 MONTHS have you experienced physical pain or discomfort lasting more than a few minutes? This could be pain from an injury or a chronic problem. It could be pain in your head, neck, or back, shoulders, arms, or hands, muscles or joints, stomach, feet, legs, or anywhere else in your body.

    Never
    Less than once a month
    Once a month
    Twice a month
    Once a week
    Several times a week
    Daily

These next two questions ask about the intensity of your pain over the past 6 months. Using a scale from 0 to 10, with 0 being very little pain, and 10 being unbearable pain, On the days when you had pain...

    What was your average level of pain?
    What was your greatest amount of pain?

How often in the past 6 MONTHS have you had at least an hour's worth of severe pain? By severe pain, we mean pain that hinders you from your accomplishing your daily tasks.

    Never
    Less than once a month
    Once a month
    Twice a month
    Once a week
    Several times a week
    Daily

How often, if ever, in the past 6 months have you...

    ...had to give up enjoyable activities, such as hobbies, going to the movies, or fun activities, with friends of family because of your pain?

    ...not been able to fulfill your usual and expected responsibilities at home, such as chores, repair work, or cleaning because you were in pain?

...not been able to enjoy your relationships with your spouse or significant other, family, or friends because of your pain?

...not been able to pursue personal goals because of your pain?

...been unable to provide basic care for yourself, such as get out of bed, dress yourself, shower alone, prepare meals, eat without assistance, fix your hair, put on cosmetics, or shave because of your pain?

...been unable to think clearly, solve problems, concentrate, or remember accurately because of your pain?

Using a scale from **0 to 5**, with **0 being neve**r and **5 extremely often**, how often over the past 6 months has your pain...

...caused you to feel sad or depressed?

...caused you to feel tense, anxious, or jittery?

...caused you to feel angry?

...caused you to feel isolated or lonely?

...reduced your ability to enjoy your life?

APPENDIX C

Social Connections Survey

1. Do you live alone? Yes or No

2. We want to understand some of the social connections in your life. Within the last week, did you interact with anyone? Did you have any form of contact with any person? Yes or No
> If yes…

Who was it?

Please list as many people as you can remember within the last week. [Text Entry]

What is their relationship to you? Please complete for each person participant listed.
> Family
> Friend
> Professional support (i.e., health care, therapist)
> Aging network (i.e., HDM volunteer, case manager)
> Additional Support (like clergy or neighbor)
> Roommate (not family member or friend)

What was the type of communication you had with them? Please complete for each person participant listed.

> In-person, face-to-face interaction
> Phone Call
> Video Call
> Text message
> Email
> Social Media message

Who initiated the interaction? Please select one for each person participant listed.

> I did
> They did
> Some of both

When did you have this interaction? Please select one for each person participant listed.

> In the last 24 hours
> Sometime within the last week, not within the last 24 hours

How many times did you interact with this person total in the last week (including yesterday)? Please record responses for each person the participant listed. [Text Entry]

Focusing on phone calls, video calls, or conversations, when you think about all the time you've talked to this person over the past week, about how long were the conversations? Please record responses for each person the participant listed. [Text Entry]

Did you attend any form of religious service or gathering within the last week?

        Yes, I attended a service/gathering in person.
        Yes, I attended a service/gathering online.
        No

APPENDIX D

Duke Social Support Index – Satisfaction with Social Support Sub-Scale

Directions: For the following questions, please respond on a scale of 1 to 3; with

1 being "hardly ever,"

2 being "some of the time,"

and 3 being "most of the time"

1. Does it seem that your family and friends (people who are important to you) understand you?

2. Do you feel useful to your family and friends (people who are important to you)?

3. Do you know what is going on with your family and friends?

4. When you are talking with your family and friends, do you feel you are being listened to?

5. Do you feel you have a definite role (place) in your family and among your friends?

6. Can you talk about your deepest problems with at least some of your family and friends?

Satisfaction Question:

1. How satisfied are you with the kinds of relationships you have with your family and friends?

      1 – very dissatisfied

      2 – somewhat satisfied

      3 – satisfied

APPENDIX E

De Jong Gierveld Loneliness Scale

For the next few statements, I'd like you to tell me how well they apply to you.

Please rate each statement from 1 to 5,
with 1 being "Very much No",
to 5 being "Very much Yes".

1. I experience a general sense of emptiness.

2. I miss having people around.

3. I often feel rejected.

4. There are plenty of people I can rely on when I have problems.

5. There are many people I can trust completely.

6. There are enough people I feel close to.

APPENDIX F

Patient Health Questionnaire – 2 (PHQ-2)

Here are a few more questions about feelings that you may have had over the last <u>2 weeks</u>,

Again, I would like you to tell me how often you had these various feelings,
with your answer ranging from "Not at all,"
to "Several days,",
to "More than half the days"

to "Nearly every day"

…how often have you:

1. Felt down, depressed or hopeless

2. Had little interest or pleasure in doing things

APPENDIX G
Demographic Questions

1. What is your race?
   - Black
   - White
   - American Indian/Alaskan Native
   - Asian
   - Native Hawaiian/Pacific Islander
   - More than one race
   - Other

2. What is your gender?
   - Male
   - Female
   - Transgender (female to male)
   - Transgender (male to female)
   - Transgender/Non-binary
   - Unsure
   - Prefer not to say

3. What is your religion?
   - Atheist
   - Agnostic
   - Christian Protestant
   - Hindu
   - Jewish
   - Muslim
   - Prefer not to say
   - Catholic
   - Russian or Greek Orthodox
   - Mormon
   - Something Else

4. What is your average monthly income?
   - Under $500
   - Between $500 - $1,000
   - Between $1,000 - $1,500
   - Between $1,500 - $2,000
   - Between $2,000 - $2,500
   - Between $2,500 - $3,000
   - Over $3,000

APPENDIX H
Informed Consent for Older Adult Participants

Title: **Double Blind Randomized Control Trial on the Effect of Evidence-Based Skills Training on the Home-Delivered and Congregate Nutrition Program through the Atlanta Regional Commission – <u>Community Form</u>.**
Principal Investigator: Dr. Laura Shannonhouse, GSU
Co-Investigators: Mary Chase Mize (GSU), Dr. Matthew Fullen (Virginia Tech)
Sponsor: Department of Health and Human Services, Administration for Community Living

I.   Purpose:
You are invited to participate in a research study. The purpose of the study is to explore how training for nutrition services volunteers impacts the mental health and wellness of older persons. You are invited to participate because you are receiving services through the Atlanta Regional Commission. A total of 1,380 participants will be recruited for this portion of the study: 810 that receive home-delivered meals, 270 that do not receive meal services, and 300 that attend congregate meals.

II.   Procedures:
If you participate, you will be asked to complete a 125 item survey three times (in early 2019, and then 6 and 12 months later). Each session should take roughly 30-40 minutes. A masters level counseling or gerontology student from Georgia State University will give you the survey in person and can directly enter your responses for you on his/her electronic device. There is no paper and pencil survey to fill out. During the study period, if you are identified by your service provider or its volunteers as being in emotional distress, you may be contacted by Georgia State research personnel and asked to complete an additional survey for another 30-40 minutes.

You will not know what role the volunteers that you interact with have in the study, and those volunteers will not know whether you are participating. Your choice to participate will only be known by Georgia State and the study coordinator for your service provider. We will not tell you everything about the study in advance. When the study is over, we will tell you everything. At that time, you can choose whether you want to allow us to use the information/responses you have provided.

III.   Future Research:
Researchers will remove information that may identify you and may use your data for future research. If we do this, we will not ask for any additional consent for you.

IV.   Risks:
Your risks for participation are minimal. There is the possibility you may feel discomfort from completing surveys about your mental health and emotional state. The student that administers the survey has been trained in basic helping skills and can help you in the moment if you feel any distress. Furthermore, Dr. Shannonhouse, the study coordinator is a nationally certified and licensed professional counselor, and has extensive experience assisting individuals in distress. You have the right to stop participating at any time, and/or discuss your concerns with Dr. Shannonhouse.

In addition to study personnel, you may contact EmpowerLine, a resource clearinghouse managed by the ARC for how older persons can meet their needs, including emotional and mental health care: (404) 463-3333

V.   Benefits:
Participation in this study may benefit you personally. You will have an opportunity to reflect upon your mental health and wellness. Also, data from this study will assist us in understanding what best practices are for supporting the mental health and wellness of older persons.

VI.   Alternatives:
The alternative to taking part in this study is to not take part in the study.

VII.   Compensation:
You will receive $20 for participating and completing the initial survey. You will receive an additional $20 for each of the two follow-up surveys. If you have been identified by your service provider or its volunteers as being in emotional distress, and you complete an additional survey, you will also receive another $20.

VIII.   Voluntary Participation and Withdrawal:
Participation in this research project is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. Your desire not to participate will be respected. Also, your participation status will not impact the services that you receive from the Atlanta Regional Commission.

IX.   Confidentiality:
We will keep your personal information private. We will keep your records private to the extent allowed by law. When data is collected, only a timestamp, not your name will be attached to your survey. This timestamp will be known to the student collecting the data, and to Mary Chase Mize who coordinates data collection, but they will not have access to your timestamped survey data. Researchers Dr. Shannonhouse and Dr. Fullen will have access to your survey results only in de-identified, timestamped form. If you are identified by your service provider or its volunteers as being in emotional distress, then they will share your name with the study team so that they can provide you with the additional survey. Again, that survey data will not have your name attached to it, only a timestamp.

The health information you give us will be used in this research study. We will remove all information that can identify you. If you decide you want to be in this study it means that you agree to let us use and share your personal health information for the reasons we have listed in this consent form. While we are doing this research, the research team may use only the personal health information that you have noted below. The people and places that will be able to look at your personal health information are: Dr. Shannonhouse, Mary Chase Mize, and Dr. Fullen. They will look at it so they can work on this research study. We may also share your health information with the Georgia State University Institutional Review Board (IRB). Your personal health information may be shared by the people or places we have listed, but it will be shared in a way that does not fall under the protection of federal regulations that apply to the

privacy of health information. This research may be shown to other researchers. This research may be published, but we will take steps to make sure that you cannot be identified.
If you sign this consent form you are letting us use your personal health information until the end of the study. You have the right to say that you do not want us to use your personal health information after we have collected it.

If you decide you don't want us to use your information anymore you may provide a written note to the Graduate Student who is visiting you, or a letter to *Mary Chase Mize – ACL Study* at *30 Pryor Street, Room 950, Atlanta, GA 30303*, asking us not to use your information. The visiting student and Mrs. Mize are the only person who will be able to know which information is yours.

Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP), and the funding source, the Administration for Community Living, of the Federal Department of Health and Human Services).

De-identified survey data and personal health information will be kept for five years after the completion of this study and destroyed in Fall 2025. In Fall 2020, the sheet that links timestamped surveys to unique names will be destroyed. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

X. Contact Persons:
Contact Dr. Laura Shannonhouse at lshannonhouse@gsu.edu or 404-413-8167 if you have questions, concerns, or complaints about this study. You can also call if you think you have been harmed by the study. Call the GSU Office of Human Research Protection at 404-413-3500 or irb@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call this office if you have questions or concerns about your rights in this study.

XI. Copy of Consent Form to Participant:
We will give you a copy of this consent form to keep. If you are willing to volunteer for this research, please sign below.

_____
Participant   Printed Name

_____   _____
Participant   Signature   Date

_____   _____
Principal Investigator   Date
or Researcher Obtaining Consent

APPENDIX I
Oral Recruitment Script for Older Adult Participants

ORAL RECRUITMENT SCRIPT – Older Persons

Hello, my name is [*student*], and I am a graduate student at Georgia State University.

The Atlanta Regional Commission and its affiliates have partnered with Georgia State to conduct research on how nutrition services can best train volunteers to assist the mental health and wellness of older persons.

We have been given your contact information from the ARC and would like to invite you to participate in this study which has been funded by the Department of Health and Human Services. We hope to recruit a total of 1380 older persons for this study.

If you participate, you will be asked to complete a 30 to 40 minute survey now and again two more times, in six and twelve months. For each survey you complete, we will immediately give you a $20 gift card. You may also be invited to complete an additional survey if the ARC shares with us that their staff are particularly concerned about your mental health and wellness. If you complete that survey you will be given another $20 gift card.

You do not have to fill out any survey manually, but simple answer the questions and I can input them on a tablet device. Your data will be kept confidential and not stored with your name. In addition to your survey data, we would also like to obtain your records from the ARC. These would include the list of services that you receive from them, the needs assessment that they have on file, and any pertinent medical information. ARC will only share this data with us if you provide written consent.

Keep in mind that if you agree to participate, you can also choose to stop at any time. Also, only one supervising staff member at the Atlanta Regional Commission will know that you have elected to participate. No ARC staff or volunteers that you regularly interact with will know that you have chosen to be part of this study, so your choice to participate will not in any way impact the services that you receive. All information obtained in this study is strictly confidential unless disclosure is required by law.

Would you be interested in helping us learn about the mental health and wellness of older adults?