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Social Isolation's Influence on Loneliness Among Older Adults

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Abstract

Social isolation and loneliness are significant risks to health among older adults. Previous studies have found a significant association between social isolation and loneliness; however, few studies examined the association between social isolation and loneliness in a multivariate context and how specific types of social isolation influence loneliness. This study fills this gap by examining social isolation's overall influence on loneliness and how specific social isolation indicators influence loneliness. Data comes from 2014 Wave of the Health and Retirement Study, a nationally representative study of adults aged 50 and older. Social isolation was operationalized using seven indicators as social isolation from: (1) adult–children, (2) other family members, (3) friends, (4) living alone, (5) being unmarried, and (6) not participating in social groups or (7) religious activities. Loneliness was operationalized by the Hughes 3-item loneliness scale. Loneliness was regressed on social isolation and key socio-demographic factors. Results found when social isolation indicators were combined into an index, every unit increase in overall social isolation was associated with an increase in loneliness. Furthermore older adults who were isolated from other family members and from friends, lived alone, were single, and did not participate in social groups or religious activities reported greater loneliness. Study findings demonstrate that greater overall social isolation and specific social isolation indicators are associated with greater loneliness. Clinical practice with older adults can be enhanced by understanding the connections between social isolation and loneliness and which forms of social isolation are more meaningful for perceived loneliness.

Keywords Social isolation · Loneliness · Older adults · Social networks

Introduction

As a consequence of global aging, the world is becoming a much older place very quickly. Domestically, there will be over 80 million adults over the age 65 by 2040 (Administration on Aging 2017). Of the several challenges facing an aging world, the maintenance of strong and supportive social networks in old age is particularly important. The tangible absence of strong and supportive social networks is known as social isolation. In contrast, the perception or felt experience that one is without meaningful social connections is known as loneliness. Social isolation and loneliness are significant problems among older adults living in the United States. Recent estimates suggest that as many as 40% of older adults are socially isolated (Elder and Retrum 2012) and up to 60% of older adults have experienced loneliness (Ong et al. 2016; MacLeod et al. 2018). Furthermore, social isolation and loneliness are not strictly mutually exclusive— meaning that although some older adults can be socially isolated but not lonely, or lonely but not socially isolated, other older adults report being *both* socially isolated and lonely, while others are neither socially isolated nor lonely (Newall and Menec 2019).

Social isolation and loneliness are associated with several negative health outcomes, including mortality (Berkman and Syme 1979; Holt-Lunstad et al. 2010; Luo et al. 2012; Holt-Lunstad et al. 2015; Alcaraz et al. 2018), greater physical health morbidities (Tomaka et al. 2006), worse self-rate health, worse self-rated physical health, and worse self-rated mental health (Coyle and Dugan 2012; Cornwell and Waite 2009b), greater psychological distress and depressive symptoms (Taylor et al. 2018a, b), and greater cognitive decline and impairment (Shankar et al. 2013). In terms of the economic consequences of

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social isolation, Medicare spends $1643 per year more on socially isolated older adults in comparison to those who are socially integrated (Shaw et al. 2017).

Older age is characterized by life events that increase the risk of social isolation and loneliness. This includes retirement from work, deaths of a spouse relatives and close friends, geographic relocation, and becoming a caregiver for spouse and relatives. Previous research indicates that older adults often have smaller social networks in comparison to younger adults which places them at risk for social isolation and loneliness (Cornwell et al. 2008). In addition, older adults who are frail and have physical and cognitive vulnerabilities are at greater risk for experiencing social isolation and loneliness (Elder and Retrum 2012).

Given the prevalence of social isolation and loneliness among older adults and the harmful negative health outcomes associated with these conditions, various social welfare and health organizations, foundations, and educational and research agencies have been quick to mobilize effort to address and ameliorate these conditions. In the United States, the AARP Foundation has launched its Connect 2 Affect Initiative which seeks to eliminate social isolation and loneliness among older adults (Connect 2 Affect, n.d.). The Robert Wood Johnson Foundation has also launched an initiative to decrease social isolation in communities throughout the United States (Ladden 2019). Health insurance companies, such as CIGNA, are beginning to track loneliness in their medical records, and the National Academies of Sciences, Engineering, and Medicine are considering including indicators of social isolation in electronic health records to assess the relationship between social isolation and health (Institute of Medicine of the National Academies 2014). The Agency for Healthcare Research and Quality commissioned a rapid review of interventions targeting social isolation in older adults (Veazie et al. 2019). Additionally, several of the organizations listed above (e.g., AARP Foundation and Robert Wood Johnson Foundation) have developed grant opportunities to fund innovative social programs to decrease social isolation and loneliness among older adults (Ladden 2019; Connect 2 Affect, n.d.). The American Academy of Social Work and Social Welfare established "Eradication of Social Isolation" as one of its 12 Grand Challenges of Social Work (Lubben et al. 2015). International efforts to decrease social isolation and loneliness include the World Health Organization's Aging Friendly Cities Toolkit which underscores the importance of social inclusion and participation to improve older adults' health and well-being. Lastly, the United Kingdom, has taken steps to formally recognize this issue by establishing a minister of loneliness (United Kingdom Campaign to End Loneliness, n.d.).

Gaps in Social Isolation and Loneliness Literature: Understanding How Social Isolation Affects Loneliness

Several important questions regarding social isolation and loneliness remain unanswered. For example, how exactly does social isolation (i.e., the absence of tangible network connections) influence loneliness (i.e., perceptions or feelings of social isolation)? As described above, although social isolation and loneliness are similar, they are not the same condition. Research on social isolation and loneliness verifies that although they are correlated with each other, the strength of this association is typically moderate to weak (Cornwall and Waite 2009a; Coyle and Dugan 2012; Steptoe et al. 2013). Second, are specific social networks and connections (e.g., adult–children, other family members, friends) particularly important in terms of feelings of loneliness? Unfortunately, current studies typically examine *overall social isolation* which is measured by combining several domains including social isolation from family members, social isolation from friends, living alone, and having limited social participation. Combining several domains prevents assessing the separate effects of social isolation from specific social groups (e.g., adult–children, family and friends) on feelings of loneliness. For the purposes of intervention development to decrease social isolation and loneliness, it is important to determine which specific types/domains of social isolation influence loneliness among older adults.

Guiding Theoretical Frameworks for the Current Study

Loneliness is frequently theorized as the result of a lack of positive and fulfilling social relationships. For example, Weiss (1973) viewed loneliness as operating through a social deficit perspective, in which those who are lonely have limited social relationships with other people. Perlman and Peplau (1979) also described loneliness as a sense of dissatisfaction an individual has with members of their social network, or a discrepancy between the relationship an individual currently has versus the relationship the individual would like to have. Both of these theories on loneliness illustrate the importance of developing a deeper understanding of the nature and functions of social relationships.

The guiding theoretical framework for the current study is the Evolutionary Theory of Loneliness proposed by Cacioppo and Cacioppo (2018). In this model, social isolation and loneliness interact with each other and may reinforce and perpetuate each other over time. The theory

indicates that older adults who are feeling lonely often begin to perceive their social environment as threatening and dangerous. In addition, lonely older adults also have more negative expectations of their social environment and stronger recollections of negative social events as compared to positive social events. These maladaptive cognitions can also lead to maladaptive behaviors in which lonely older adults are more likely to have negative social interactions with family members and friends.

The accumulation of maladaptive cognitions and behaviors can exacerbate social isolation in two distinct ways: (1) they can cause older individuals who are lonely to further disengage with their family members and friends; or (2) they can cause their family members and friends to further disengage with them. Unfortunately, if loneliness is not addressed, the older person's perception of not having connections with friends and family members could become their objective reality. The present study is based, in part, on the Evolutionary Theory of Loneliness by examining specific types of social isolation and determining whether they and/or overall social isolation influence loneliness among older adults.

Study Aims

The purpose of this study is to understand how social isolation, and specific aspects of social isolation, influence loneliness among older adults. Previous studies have found weak to moderate correlations between loneliness and social isolation (Cornwall and Waite 2009a; Coyle and Dugan 2012; Steptoe et al. 2013). However, these studies do not tell researchers and practitioners which aspects of social isolation are critical for addressing loneliness among older adults. Information of this type is important for developing targeted interventions to decrease these social isolation and loneliness among older adults.

The overarching purpose of this study is to determine the effects of social isolation on loneliness by comparing two different ways of assessing social isolation; overall social isolation (measured as a combined index) vs. social isolation measured as separate indicators. Based on the Evolutionary Theory of Loneliness and previous studies indicating that social relationships are an important precursor to experiences of loneliness, it's hypothesized that overall social isolation will be associated with loneliness. The study also hypothesizes that several of the specific types of social isolation will be individually and independently associated with loneliness. However, given few studies have examined different types of social isolation as they relate to loneliness, no specific predictions are made concerning which particular types of social isolation will be associated with loneliness.

Methods

Dataset

The dataset for the current study is from the Health and Retirement Study (HRS). The HRS is one of the largest nationally representative longitudinal panel surveys of adults aged 50 and above living in the United States of America (Fisher and Ryan 2017). The HRS selects its respondents through a multistage probability sample design. Data for the HRS was initially collected in 1992 and the HRS has continued to collect data on respondents once every two years. Data for the core HRS is collected through face to face interviews. There are multiple topics covered in the HRS including health and well-being, cognition, wealth, income, and assets, family structures, and housing. Given attrition, the HRS sample is replenished once every six years. The HRS also oversamples for Black and Hispanic populations. The HRS contains a Cross-Wave Census Region/Division and Mobility dataset which provides additional information for if respondents lived in urban, suburban, or rural areas. Given the complexities of the HRS Core datasets, the RAND Corporation was commissioned to create a streamlined dataset of the HRS Core known as the HRS RAND dataset; this was especially important for creating assets, wealth, and income variables. For more information on the HRS Core and HRS RAND datasets, please visit the following websites: http://hrsonline.isr.umich.edu/ and http://hrsonline.isr.umich.edu/modules/meta/rand/.

The HRS also initiated (in 2006) a Self-Administered Psychosocial Leave-Behind Questionnaire (HRS LBQ). Approximately half of the respondents who complete the HRS Core face-to-face interview are selected to participate in the HRS LBQ. After respondents complete the face-to-face interview, respondents are left with the HRS LBQ questionnaire and are asked to complete and mail the questionnaire back to the Institute of Social Research at the University of Michigan. The HRS LBQ utilizes a rotational study design with two equally sized samples which are surveyed once every four years. The first sample was surveyed in 2006, 2010, and 2014 while the second sample was surveyed in 2008, 2012, and 2016. The HRS LBQ further extends the content of the HRS Core by including survey items addressing the respondents' social relationships and social networks, their social participation, and their loneliness. For more information on the HRS LBQ dataset, please see Smith et al. (Smith et al. 2013).

The analytic sample for the current study comes from combining three separate datasets; the HRS Core dataset, the HRS RAND dataset, and the HRS LBQ dataset. After combining all of these datasets, there were a total of

38,186 respondents. Respondents who were not selected for the 2014 HRS LBQ, and those who did not complete the 2014 HRS LBQ were deleted, reducing the total sample size to 7536 respondents. Of this sample, all individuals who did not have an individual level person weight from the HRS LBQ were deleted. Lastly, all respondents who did not identify their race/ethnicity were deleted, further reducing the final sample size to 6962 respondents.

Variables

The dependent variable for the current study is loneliness which was operationalized using the Hughes loneliness scale (Hughes et al. 2004). The Hughes loneliness scale, initially developed for use in large surveys, is comprised of 3-items: (1) How much of the time do you feel a lack of companionship? (2) How much of the time do you feel left out? and (3) How much of the time do you feel isolated from others? Response options for these items are (1) Often, (2) Some of the time, and (3) Hardly Ever or Never. Response options reverse coded so that higher scores were representative of greater loneliness and these items are then summed into a single scale. The Hughes 3-item measure of loneliness has been proven valid and reliable (Hughes et al. 2004).

The key independent variable for the study is social isolation. Social isolation was operationalized in two ways: 1) as a summed social network index and 2) using the individual indicators that comprise the social network index. The seven individual indicators used to form the social network index were: socially isolated from adult children (less than once per month contact with adult children by face to face, telephone, or written/email), socially isolated from other family members (less than once per month contact with other family members by face to face, telephone, or written/email), socially isolated from friends (less than once per month contact with friends by face to face, telephone, or written/email), no social participation in clubs groups or activities, if they lived alone, if they were unmarried, and if they reported no religious participation; items scored as 0 = no; 1 = yes. When combined as an index, the range of scores was from 0 to 7, with higher scores representing greater social isolation.

Covariates include the sociodemographic factors: race, gender, employment status, years of education, total household income, age, and living environment. Race was measured by three categories: White, Black, and Other. Gender was measured dichotomously (men and women). Employment Status was measured dichotomously as either working or not working. Years of education, total household income, and age were measured as continuous variables. Total household income is a comprehensive measure taken specifically from the HRS RAND dataset and combines all forms of income from every member in the household including the

respondent's and spouse's individual earnings, pensions, Social Security disability and Supplement Security disability income and retirement incomes (see Bugliari et al. 2016 for the full description of the HRS household income measure). Given that total household income is highly skewed, this variable was transformed to achieve a normal distribution. The last covariate is living environment; respondents can live in urban, suburban, or rural environments.

Analysis

The current study presents univariate statistics for the dependent, independent, and control variables and two multivariate regression models. The first multivariate model assesses overall social isolation by using the social network index. This method assesses whether overall social isolation is associated with loneliness while controlling for other variables. The second multivariate regression model assesses individual social isolation indicators that comprise the social network index. This second model determines the independent effects of each social isolation indicator on loneliness. All multivariate analyses utilize the survey weights used by the HRS which takes into account the multi-stage cluster sampling protocol of the HRS.

Given significant missing data for the dependent variable loneliness (n = 231) and the key independent variable social isolation index (n = 367), missing data were imputed using multiple imputation. Twenty different imputed datasets were created using the chained equation method, also known as the full conditional specification method, which can be used to impute data for both discrete and continuous variables. The multivariate regression model is then run on each of the twenty imputed datasets and the parameter estimates from each dataset are then combined/"rolled up" to determine the final estimates (Berglund and Heeringa 2014). Issues of multicollinearity were assessed in each of the 20 imputed datasets using the tolerance, variance inflation, and condition index statistics. No issues of multicollinearity were found. All analyses were conducted in SAS v9.4.

Findings

Univariate Findings

In total, approximately 43% of older adults did not experience loneliness (having a loneliness score of 3), 31% were moderately lonely (having a loneliness score of 4–5), and 26% were severely lonely (having a loneliness score of 6–9). In addition, approximately 19% of older adults were socially isolated from their adult children, 25% were socially isolated from other family members, 19% were socially isolated from

Table 1 Univariate statistics (N=6962)

Variable	Mean or percentage (SE or N)	N missing
Loneliness mean score	4.45 (0.03)	231
Loneliness score		231
3	42.50% (2901)	
4	17.09% (1181)	
5	14.11% (939)	
6	14.76% (958)	
7	5.31% (361)	
8	2.97% (195)	
9	3.26% (196)	
Social isolation index mean score	1.78 (0.02)	367
Social isolation index score		367
0 indicators	23.82% (1506)	
1 indicator	23.89% (1591)	
2 indicators	22.60% (1578)	
3 indicators	16.36% (1090)	
4 indicators	8.35% (543)	
5 indicators	3.63% (217)	
6 indicators	1.21% (64)	
7 indicators	0.14% (6)	
Objectively isolated from adult children		173
Isolated	19.06% (1170)	
Not isolated	80.94% (5619)	
Objective isolation from other family members		102
Isolated	24.75% (1633)	
Not isolated	75.25% (5227)	
Objective isolation from friends		108
Isolated	18.55% (1285)	
Not isolated	81.45% (5569)	
Objective isolation from social participation		46
Isolated	23.86% (1771)	
Not isolated	76.14% (5145)	
Living arrangements		0
Living alone	23.49% (1695)	
Live with other people	76.51% (5267)	
Marital status		0
Married	38.67% (2904)	
Unmarried	61.33% (4058)	
Objective isolation from religious attendance		22
Isolated	30.39% (1869)	
Not isolated	69.61% (5071)	
Race		0
White	83.36% (5290)	
Black	10.22% (1179)	
Other	6.41% (493)	
Gender		0
Female	54.14% (4112)	
Male	45.85% (2850)	
Employment status		0
Not working	57.74% (4597)	
Working	42.26% (2365)	
Years of education	13.23 (0.08)	30

Table 1 (continued)

Variable	Mean or percentage (SE or N)	N missing
Total household income	82,791 (3127.60)	0
Age	66.96 (0.30)	0
Living environment		26
Urban	48.84% (3506)	
Suburban	23.80% (1565)	
Rural	27.37% (1865)	

Table 2 Loneliness regressed on social isolation index and covariates (N = 6962)

Variable	Regression coefficient (standard error)
Intercept	5.49 (0.28)***
Social isolation index	0.25 (0.02)***
Race	
White (ref.)	–
Black	0.06 (0.07)
Other	− 0.16 (0.11)
Gender	
Male (ref.)	− 0.14 (0.05)**
Female	–
Employment status	
Not working (ref.)	–
Working	− 0.12 (0.06)*
Education	0.02 (0.01)
Total household income	− 0.00 (0.00)***
Age	− 0.02 (0.00)***
Living environment	
Urban (ref.)	–
Suburban	0.03 (0.05)
Rural	0.21 (0.06)***

*Statistical significance at the 0.05 level

**Statistical significance at the 0.01 level

***Statistical significance at the 0.001 level

their friends, 24% had no social participation, 23% lived alone, 39% were unmarried, and 30% had limited religious participation. When combined as an index, the average participant had 1.78 social isolation indicators.

In terms of sociodemographic factors, fifty-four percent of the sample were women, 58% were not currently working, 83% identified as white, 10% identified as Black, and 6% identified as another race/ethnicity. The average participants' age was 67, the mean total household income was $82,791 and participants had an average of 13 years of education indicating some college. In terms of living environment, approximately forty-nine percent lived in urban areas, 24% lived in suburban areas, and 27% lived in rural areas (Tables 1).

Multivariate Findings

In the first multivariate model using the social isolation index, greater social isolation was associated with greater loneliness when controlling for sociodemographic factors and living environment. The average R^2 value for this first multivariate regression model was 0.09, indicating the sociodemographic factors, living environment and overall social isolation explain approximately 9% of loneliness in older adults. In the second multivariate model using separate indicators of social isolation, greater loneliness was independently associated with being isolated from friends, being isolated from other family members (outside of children), having limited social participation, living alone, being unmarried, and having limited religious participation. The only social isolation indicator not associated with greater loneliness was social isolation from adult children. The average R^2 value for the second multivariate regression model was also 0.09, indicating the sociodemographic factors, living environment and social isolation indicators accounted for approximately 9% of the variation in loneliness (Tables 2, 3).

Discussion

The current study is one of the first studies to empirically examine different types of social isolation in relation to perceptions of loneliness. Approximately 57% of older adults had experienced loneliness; of this group, 31% were moderately lonely while 26% experienced severe loneliness. This prevalence rate for loneliness is somewhat high but is within the range reported in previous studies (MacLeod et al. 2018). The prevalence rate of specific social isolation indicators, however was higher than previous studies. For example, Taylor et al. (2018) study of social isolation among older adults found only 6% of older adults were isolated from their family members (compared to 19% being isolated from their adult children and 25% being isolated from other family members in the current study) and 10% were isolated from their friends (compared to 19% of older adults in the current study).

For the first aim of the study, greater overall social isolation was associated with greater loneliness when also

Table 3 Loneliness regressed on social isolation indicators and covariates (N = 6962)

Variable	Regression coefficient (standard error)
Intercept	7.31 (0.31)
Objectively isolated from adult children	
Isolated (ref.)	–
Not isolated	− 0.12 (0.07)
Objective isolation from other family members	
Isolated (ref.)	–
Not isolated	−0.17 (0.06)**
Objective isolation from friends	
Isolated (ref.)	–
Not isolated	− 0.41 (0.08)***
Objective isolation from social participation	
Isolated (ref.)	–
Not Isolated	− 0.21 (0.08)**
Living arrangements	
Live Alone (ref.)	–
Live with other people	− 0.28 (0.08)***
Marital status	
Unmarried (ref.)	–
Married	− 0.41 (0.07)***
Objective isolation from religious attendance	
Isolated (ref.)	–
Not Isolated	− 0.17 (0.07)*
Race	
White (ref.)	–
Black	− 0.00 (0.07)
Other	− 0.17 (0.12)
Gender	
Female (ref.)	–
Male	− 0.11 (0.05)*
Employment status	
Not working (ref.)	–
Working	− 0.14 (0.06)*
Education	0.02 (0.01)
Total household income	− 0.00 (0.00)***
Age	− 0.02 (0.00)***
Living environment	
Urban (ref.)	–
Suburban	0.03 (0.05)
Rural	0.21 (0.06)**

*Statistical significance at the 0.05 level

**Statistical significance at the 0.01 level

***Statistical significance at the 0.001 level

controlling for key socio-demographic factors. This finding confirms that overall social isolation does affect loneliness in that older adults who are more socially isolated overall also experience greater loneliness. The second aim of the

study sought to determine which types of social isolation influenced loneliness when compared to each other. With the exception of social isolation from adult children, this analysis found all of the social isolation indicators were independently associated with greater loneliness among older adults. *In other words, most types of social isolation were individually and independently associated with greater loneliness.*

It was interesting that social isolation from adult children was not associated with greater loneliness. This finding is counterintuitive given many studies note the importance of intergenerational support between older parents and their adult children (Umberson 1992; Fingerman et al. 2016; Silverstein et al. 2006; Swartz 2009; Taylor et al. 2014). There are numerous potential explanations for this finding. First, frequent interactions between older parents and their adult children does not necessarily guarantee high quality relationships. Previous studies (Ward 2008; Umberson 1992; Luescher and Pillemer 1998) have found older parent-adult children relationships are not universally positive and can include ambivalence and conflict. Furthermore, these conflicting and straining relationships can produce negative emotional well-being states and worse mental health, including loneliness (Lincoln 2000; Shiovitz-Ezra and Leitsch 2010). This can be particularly apparent in caregiving relationships between the adult child and their aging parents (Pearlin et al. 1996, Vitiliano et al. 2003; Sherwood et al. 2005). The current study did not adjust for the quality of relationships (or other factors which could significantly influence the quality of relationships including caregiving burden), which could be an important confounding (or meditating) variable which explains the association between social isolation and loneliness. Examining the association between relationship quality, social isolation, and loneliness is an important area of future research studies.

Second, another important consideration is the measurement of social isolation from adult children. In this study, three different types of interaction including face-to-face interactions, telephone interactions, written letter and email interactions were combined into a single measure; however, each of these types of interactions could independently have a different influence on loneliness among older adults. Future research studies should tease out the effects of these different types of interaction between aging parents and their adult children.

The average R^2 value found was .09, meaning approximately 9% of the variance in loneliness is associated with social isolation and the other covariates. Stated another way, sociodemographic factors and specific types of social isolation explain approximately 9% of loneliness for this sample. Supplementary analyses excluding the social isolation variables, found that the average R^2 value was around 0.04-0.05 (or 4-5%), meaning the inclusion of the social isolation variables approximately doubled the R^2 or explanatory value of

the regression. Although the explained variance is modest, the findings further confirm that social isolation and loneliness are two distinct constructs. That is, if social isolation and loneliness were more highly related to each other, this R^2 value would have been much higher.

Study findings also supported the tenets of the Evolutionary Theory of Loneliness, by demonstrating that (1) greater overall social isolation was associated with higher levels of loneliness, and (2) the majority of individual types of social isolation were associated with greater loneliness (Cacioppo and Cacioppo 2018). Although not the specific focus of this study, these findings could be attributable to the negative interactions, low quality relationships, and maladaptive cognitions and behaviors associated with both social isolation and loneliness as suggested by the work of Cacioppo and Hawkley (2009). Building on the findings of this study for the influence of overall social isolation, and types of social isolation, on loneliness, future work should begin to identify the pathways which link social isolation and loneliness together by examining negative interactions, maladaptive cognitions and behaviors, and overall low quality social relationships.

Limitations

This study does have limitations which should be discussed. First, the current study is cross-sectional; therefore, causality between social isolation and loneliness cannot be assessed. Said another way, it is not possible to determine if an older individual's social isolation influences their loneliness or vice versa. Future studies should utilize a longitudinal study design which would allow for disentangling temporal precedence between social isolation and loneliness. Furthermore, a longitudinal study design would help determine how the relationships between the types of social isolation and loneliness evolves over time. Older adults could adjust and learn to cope with being social isolated or could become more active in a different domain of their social life (for example, someone who is recently widowed could learn to cope with the death of their spouse by joining a church or engaging in more social activities), which could decrease their loneliness. Examining these relationships over time would provide more details and subtle nuances about social relationships that are frequently overlooked in cross-sectional analyses.

The second limitation to this study is regarding the utilization of the Evolutionary Theory of Loneliness by Cacioppo and Cacioppo (2018). This theory is longitudinal and examines the nature of social relationships over time (e.g., social isolation over time) in how they affect loneliness. The current study is cross-sectional and was not able to determine how social isolation and loneliness affect each other over time. Future studies should fully evaluate this theory with longitudinal panel data (including the HRS dataset) and longitudinal methods (including mixed effects modeling or latent growth curve modeling) to track social isolation and loneliness at different time points and determine their impact on each other.

Third, as comprehensive as the HRS dataset is, several sources of information were not assessed. This study examines loneliness generally and does not examine specific types of loneliness. Loneliness could have specific domains as well, while it is currently measured as general loneliness. Information about the geographic proximity of respondents to their family members and friends, or whether the older adult had recently relocated would have been useful to assess. These factors are very important because they could influence both the older adults' social isolation and perceptions of loneliness. For example, closer geographic proximity to family and friends could result in less social isolation and loneliness. Similarly, information about the quality of social relationships would be important to assess as they may be associated with both social isolation and loneliness. Several additional covariates that could be associated with both loneliness and social isolation (transportation access, neighborhood context, quality of social relationships, negative interactions, proximity of family members and friends, personality) were not included in the current analysis. The inclusion of these variables, however, are likely to provide a more accurate perspective of the relationship between different types of social isolation and how they influence loneliness.

Fourth, the average R^2 for the multivariate models was very modest at 0.09, indicating social isolation and the sociodemographic covariates explain 9% of the variance in loneliness. Given this modest R^2 value, the findings from this study should be interpreted with caution as social isolation is associated with loneliness but other factors (including quality of social relationships, frequency and severity of maladaptive cognitions, frequency and quality of social support, and frequency and severity of negative interactions) may have a stronger influence on loneliness. These variables could significantly increase the explanatory power (R^2 value) of loneliness in the multivariate regression models.

Lastly, social isolation is often context specific and can be difficult to measure, both in research and clinical settings. This is partially attributable to the difficulty in measuring social isolation; for example, an individual could live alone, be unmarried, and have no children, but they could also have thriving relationships with their friends and family members and frequently attend social activities; therefore, an older adult could be at high risk for social isolation, but not actually be socially isolated. There is also social desirability bias associated with social isolation and loneliness (Cattan et al. 2005; Pinquart and Sorensen 2001; Theeke 2010; Cohen-Mansfield et al. 2016) such that individuals are frequently reluctant to admit they are feeling lonely or

are socially isolated. Novel approaches to measuring social isolation and loneliness among older adults are warranted to increase our understanding of these conditions. This could include utilizing the perspectives of health and service professionals (such as managers in a senior housing community or primary care physicians) to assist in identifying and intervening with isolated and lonely older adults (Taylor et al. 2016; Due et al. 2018).

In addition, utilizing a qualitative approach may also be beneficial to understand social isolation and feelings of loneliness among older adults. Utilizing a qualitative approach/ methodology can allow the researcher to earn the respondents' trust and to build rapport. This can mitigate social desirability bias between the researcher and respondent and allow the researcher to gain an in-depth understanding of the respondents' social isolation and loneliness. This will also allow the respondent to define their own sources and experiences of social isolation and loneliness (Cohen-Mansfield et al. 2016; Machielse Machielse 2015); this information is critical for determining appropriate interventions among socially isolated and lonely older adults.

Practice Implications

The findings of this study have several implications for clinical social work practice as it relates to social isolation and loneliness among older adults. First, this study found a high prevalence rate of both loneliness (57% had experienced at least moderate or severe loneliness) and different types of social isolation (ranging from 19 to 39%) throughout the older adult population. This demonstrates that many older adults are experiencing these conditions and it is likely clinical social workers will encounter isolated and lonely older adults in their practice. Therefore, it is important to assess the older adult's social isolation and loneliness during their initial intake and psychosocial assessment, as well as throughout treatment. Luckily, assessment and screening tools for social isolation and loneliness are available including the Lubben Social Network Scale 6, the Social Network Index, and the Hughes 3 item loneliness scale (Lubben et al. 2006; Berkman and Syme 1979; Hughes et al. 2004). If it appears an older adult screens positive for social isolation or loneliness, further assessment should be conducted to verify if this is correct.

It will be important for clinicians to determine the extent (both frequency and severity) of social isolation and loneliness their clients are experiencing. It will also be important to determine whether their clients are simultaneously experiencing social isolation and loneliness, social isolation only, loneliness only, or neither social isolation nor loneliness as these patterns have very different implications for treatment and intervention. Any changes in social isolation and loneliness could be an important indicator of a change in social

circumstance (e.g., unable to meet with family members and friends) or a change in physical and/or mental health. It will be important for clinicians to understand if the onset of social isolation and loneliness reflect relatively new conditions or if this has been a chronic condition which they have been experiencing their entire life.

Second, this study found social isolation and loneliness are similar, but distinct conditions and that both overall social isolation and different types of social isolation are associated with greater loneliness among older adults. Other studies similarly indicate that social isolation and loneliness should not be conflated with one another (de Jong Gierveld et al. 2006; de Jong Gierveld et al. de Jong Gierveld et al. 2016; Shankar et al. 2013; Coyle and Dugan 2012) and that clinicians need to know these differences so as to provide the best treatment possible to alleviate these conditions. Further, empirical systematic reviews identify different interventions and best practices for addressing social isolation and loneliness. For example, best practices for social isolation among older adults are group-based intervention, which are shown to be more effective than one-to-one interventions and community interventions (Dickens et al. 2011; Findlay et al. 2003). In addition, client involvement in planning their own intervention are more effective than interventions planned by program managers/staff (Dickens et al. 2011). In contrast, for loneliness, best practices emphasize interventions that mitigate maladaptive thoughts and behaviors (e.g., decreasing the older adult's hypervigilance, negative thoughts/beliefs) and reducing negative interactions with family members and friends (Masi et al. 2011). Given that social isolation and loneliness often influence each other and many older adults experience both conditions simultaneously, clinicians and social workers should develop individualized treatment plans that combine best practices for alleviating social isolation and loneliness. This may include having clients participate in social groups and activities while concurrently engaging in cognitive behavioral therapy to diminish their maladaptive thoughts and behaviors. Furthermore, given social isolation and loneliness are frequently associated with increases in negative health behaviors (e.g., smoking and physical inactivity; Pantell et al. 2013; Shankar et al. 2011) and worse physical and mental health outcomes (Miyawaki 2015), clinicians will need to concurrently address both their client's isolation and loneliness while seeking to improve their health. A team approach may be necessary to address all of the health and social needs of the older adult.

One potential method of ameliorating loneliness among older adults is through enhancing their current social connections or creating new social connections. However, not all loneliness necessarily stems from being socially isolated. Lonely individuals may be socially engaged with others, but still feel emotionally disconnected from those around them. When working with an older adult who is feeling lonely,

it will be important to determine if their loneliness stems from their social isolation; if it does, it will be important to determine which type of social isolation is most affecting their loneliness. It is also important to remember loneliness can also be context specific; an older adult could feel lonely in some of their social relationships (e.g., lonely with family members or wanting to be in a romantic relationship) but could not feel lonely in domains of their social relationships (e.g., not lonely with friends and actively participate in social activities/events). When creating a treatment plan, it will be important for clinicians to determine the extent of older adults' social isolation by discussing each of these different types of social isolation with them, and also discussing which domains they would like to 'work on' or improve.

Related to this, it is important to emphasize clients' sense of self-determination in understanding and assessing their social isolation and loneliness. An older adult may be socially isolated from some of their relationships with family members and friends because they experience them as strained and toxic. In fact, the older adult may be isolated from these individuals, but not experience loneliness in these types of relationships because they are stressful. In cases like this, it may be more beneficial and health promoting for the older adult to develop relationships with new individuals.

The incorporation and application of theoretical models is another important issue to consider when conceptually defining social isolation, loneliness and creating interventions to mitigate these conditions among older adults. Dickens et al. (2011) found social isolation interventions utilizing theory were more likely to be effective in comparison to interventions with no theoretical basis. Furthermore, more research is necessary to determine how older adults cope with their social isolation and loneliness. This research would be important for generating new theories on social isolation and loneliness or confirming if previous theories were applicable to understanding these conditions among older adults (such as the selection, optimization, and compensation model or the socio-emotional selectivity theory; Carstensen et al. 1999). Understanding how individuals cope with their social isolation and loneliness could potentially help increase the effectiveness of interventions to mitigate these conditions for older adults.

Lastly, social isolation and loneliness are often stigmatizing conditions and it may be difficult for an older adult to admit they are socially isolated or are feeling lonely. Previous research studies indicate that lonely individuals are substantially less likely to claim they are lonely because it is stigmatizing and reflects personal weakness or vulnerability (Wenger 1983; de Jong Gierveld et al. 2006). Socially isolated older adults are less likely to participate in research studies (Taylor et al. 2016) and may also be less likely to participate in interventions to improve their social connectedness and decrease the isolation and loneliness. Labeling and branding are important issues to consider when creating interventions to address social isolation and loneliness, being careful to frame the intervention in a positive light and the benefits to be gained from the intervention. Finally, when working with socially isolated or lonely older adults, it is important to remain persistent and continue to work with clients and encourage all steps and progress in reaching their treatment goals.

Conclusion

There are moral, health, and financial imperatives to addressing social isolation and loneliness among older adults. Researchers and social scientists have largely spent time and resources in investigating the health, economic, and social costs of social isolation and loneliness while fewer resources have gone towards understanding risks for these conditions and how these conditions reinforce each other. In order to truly eradicate these conditions, we, as applied social scientists, social workers, and the broader community of mental health clinicians and practitioners will need to understand how social isolation and loneliness manifest in individuals and communities. Additionally, we will need to develop a knowledge base of best practices to understand how to prevent and mitigate these conditions. This current study contributes to this effort by illustrating the effects social isolation has on loneliness, and also showing these conditions, while often correlated with each other, are unique constructs. Given the prevalence of social isolation and loneliness among older adults, the negative associative health outcomes associated with these conditions, and the growth of the older adult population, we must continue to strive towards the eradication of social isolation and loneliness; the longer we wait, the more severe the consequences will become. Clinical social workers can apply this information to understand and mitigate social isolation and loneliness.

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