Review Article **IJPRR (2023) 6:68**

International Journal of Psychological Research and Reviews
(ISSN:2639-6041)

Loneliness in Aging Adults: A Narrative Review

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ABSTRACT

The recent literature on loneliness in aging adults (last five years) is predominantly focused on negative effects of being lonely along with some studies on risk factors, buffers, and interventions. Aging is typically defined as ages starting at 60 or 65. The prevalence rates for loneliness in aging adults were highly variable in this literature, ranging from a low of 11% in Norway to a high of 76% in San Diego. Negative effects have included ageism attitudes, anxiety, depression, memory loss, low heart rate variability, short telomere length, frailty, frequent falls and trips to the emergency room. Risk factors have included aging anxiety, sensory loss, neuroticism, losing a partner, and COVID-19. Buffers/protective factors have included being in a relationship, continued working, internet use and being with pets and robots. And personality traits have been protective including agreeableness, wisdom, and narcissism. Interventions have included social networking, personal voice assistants, writing and laughter therapy. Although the recent research suggests that loneliness and aging are related on some variables like frailty, it has not suggested that loneliness is more prevalent among the aging than younger adults. In addition, most of the data are based on self-report surveys that have yielded mixed results across countries.

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How to cite this article:
Tiffany Field. Loneliness in Aging Adults: A Narrative Review. International Journal of Psychological Research and Reviews, 2023, 6:68

eSciPub LLC, Houston, TX USA.
Website: https://escipub.com/

This narrative review involved entering the terms loneliness and aging into PubMed and PsycINFO. The search yielded 197 papers for the last five years. However, following exclusion criteria including case studies and non-English papers, this review is a summary of the research reported in 47 papers. The recent literature on loneliness in aging adults is predominantly focused on negative effects of being lonely along with some studies on risk factors, buffers and interventions. This narrative review is accordingly divided into sections on prevalence, effects, risk factors, buffers and interventions.

Prevalence of Loneliness in Aging Adults

Loneliness has been defined as a subjective, negative experience of being isolated and having an inadequate meaningful connection. It has been differentiated from social isolation which has been defined as the objective state of having fewer or infrequent social relationships. Aging is typically defined as ages starting at 60 or 65. The prevalence of the aging population is expected to double from 420 million in 2002 to 973 million in 2030 (Nguyen et al, 2021). The prevalence rates for loneliness in aging adults have been highly variable, ranging from a low of 11% in Norway (Ormstad et al, 2020) to a high of 76% in San Diego (Lee et al, 2019) (see table 1). The high prevalence in San Diego was explained by lumping different age groups that had the greatest prevalence of loneliness including those in their late 20s, mid 50s and late 80s.

Other prevalence rates include 23% from Canada (Chamberlain et al, 2022) to a range of 30 to 40% in western countries (Spreng et al, 2021) and to 60% in Sweden (Svensson et al, 2022). This significant variability in prevalence doesn't seem to be explained by long winters given that Norway had a low prevalence of 11% while Sweden had a high of 60% and it didn't seem to relate to COVID given that a couple rates during the COVID years were low while the highest rates were reported for non-COVID years. This range may simply be cultural variation on factors like average retirement age, government support, extended family size or any of the risk factors noted below.

Negative Effects of Loneliness on Aging Adults

The negative effects of loneliness on aging adults have also been highly variable across studies, typically depending on the "pet variables" of the researchers. These have focused on psychological distress including ageism attitudes, anxiety and depression (see table 2). Physiological effects have included low heart rate variability and short telomere length. Surprisingly very few studies have focused on cognitive function except for memory loss in the case of two studies. Physically, the aging have been affected by inflammation and frailty which probably, in turn, explains the limited activities of daily living for the aging adults, their frailty, their frequent falls and their trips to the emergency room. Data on these problems have resulted in references to morbidity and mortality related to loneliness in aging adults.

Psychological Effects

In the survey on western countries, several negative effects were noted including susceptibility to psychiatric disorders as serious as suicidality, cognitive decline and dementia, hypertension and immune system dysfunction (Spreng et al, 2021). The authors referred to these conditions as being greater than obesity and smoking more than 15 cigarettes per day. In their discussion, they suggested that the default network was affected involving the connection of regions located in the brain's midline with a spatial overlap with the social brain that is vulnerable to age-related decline. They further referred to it as a "neural substrate linking loneliness, aging and brain health". Unfortunately and surprisingly, the fMRI data they referred to do not appear in the recent literature.

Ageism. In a study that was focused on ageism or aging anxiety and negative attitudes towards aging, ageism was a moderator of loneliness effects on anxiety and depression in a sample of

1038 aging adults (Bergman et al, 2021). That negative attitudes towards aging might moderate effects of loneliness on negative mood states is not surprising. Negative attitudes about aging would be expected to exacerbate the negative effects of loneliness on depression and anxiety. Ageism might have also been a risk factor for loneliness via rejection by aging peers if the variables of interest had been entered into data analysis differently, especially when they are collected cross-sectionally rather than longitudinally, as in this study.

Psychological Distress. Psychological distress in general has been noted to occur in aging adults. For example, in a Canadian longitudinal study (N= 30,079 aging adults), a logistic regression analysis was performed on the variables of loneliness and social isolation combined (Menec et al, 2020). The results suggested that although being socially isolated and lonely led to a greater likelihood of psychological distress, loneliness was the more significant predictor of psychological distress in this sample.

Similar findings were noted among older people in Ghana (Gyasi et al, 2019). Again, loneliness and living alone contributed to greater psychological distress. These studies highlight the importance of examining profiles that combine both social isolation and loneliness in terms of identifying the profile that is most indicative of the need for intervention.

Depression. Loneliness has also been more prevalent than social isolation in some samples including from a Swedish population study (N = 5804) (Svensson et al, 2022). In this study, 60% reported being lonely occasionally while only 6% were socially isolated. Greater loneliness led to increased symptoms ranging from 67% for gastrointestinal-urinary problems to 96% for depression in those who were experiencing constant loneliness. These surprisingly different rates between loneliness and social isolation highlight the probability that social isolation may not be a necessary or sufficient condition for loneliness and that aging adults can be lonely without being socially isolated.

Loneliness has also been entered as a mediator variable in a couple studies. For example, in a study entitled “Self-perceptions of aging and depressive symptoms: the mediating role of loneliness”, the Health and Retirement Survey spanning eight years suggested that the self-perception of aging leads to depression with loneliness as the mediator (Segel-Karpas et al, 2022). The a priori selection of each type of variable for the analysis in several studies like this one is seemingly arbitrary.

In a similar longitudinal study on 75-year-old adults who were followed for 11 years in Amsterdam, decreased physical function and social network size led to increased depression via loneliness and further decreases in social network size (Domenech-Abrlla et al, 2021). These results are based on a very complex cross-lagged panel analysis which has technical problems in that the chosen time lag may not be appropriate for each effect. In addition, the authors suggested that the differential loss to follow-up and collider bias in the study may have led to an underestimation of effects (a distortion that modifies an association between an independent and dependent variable by trying to control for a common effect of those variables).

Anxiety and depression. In contrast, a recent study has reported that older adults have less anxiety and sadness and loneliness than middle-age and younger groups (Liruela-Baltar et al, 2020). In this study on 18-to-88-year-olds (N= 1501), those participants who had high levels of comorbid anxiety and sadness had more negative self–perceptions of aging. This study, like many others, was limited by being a correlation study which cannot interpret findings as suggestive of causality or direction of effects.

Physiological Effects

Only one study could be found on physiological effects that is entitled “Loneliness and telomere length: immune and parasympathetic function are associated with accelerated aging“ (Wilson

et al, 2019). In this sample of 40-to-85-year-olds (N=113), lonelier people with lower heart rate variability had viral reactivation and shorter telomere length (a biological marker of aging). In those with higher heart rate variability, there was no association with loneliness, viral reactivation or telomere length, However, this is not a longitudinal study, so directionality again cannot be determined.

Cognitive Effects

The shorter telomere length may contribute to the cognitive deficits that have been noted in aging inasmuch as it is a biomarker for Alzheimer's and dementia. Surprisingly, only two studies addressed the relationship between loneliness and cognitive deficits. In a study on a Canadian sample, loneliness was correlated with memory loss three years later (Kyrolainen et al, 2020). But only one item was used for loneliness in the study and predictive validity as well as test-retest reliability were very low. In a longer longitudinal study, a similar relationship was reported. In this 10-year longitudinal study, loneliness was related to poor memory and verbal fluency at baseline and a stronger rate of memory and verbal fluency loss occurred over 10 years (Yin et al, 2019). This linear increase in memory loss was related to an increase in loneliness in a relationship that was likely bidirectional, suggesting that loneliness could lead to memory loss and memory loss, in turn, could contribute to loneliness.

Physical Effects

Frailty. Frailty is one of the most frequently studied physical effects of loneliness in aging adults. In a longitudinal study from England (N=2,817 adults older than 60), high levels of loneliness led to greater frailty over a six-year period (Gale et al, 2018). High social isolation also led to frailty, but only in men for some unknown reason. Similar findings were noted in the Survey of Health, Aging and Retirement in Europe (Jrach et al, 2021). In this sample of 13,069 aging adults, average and high levels of loneliness and social isolation were associated with robust people becoming frail and people who were frail at baseline becoming more frail. Because this is a cross-sectional study, not a longitudinal survey, it is conceivable that these effects were bidirectional. The degree to which loneliness and social isolation contributed to the effects of the frailty was also unclear.

Frailty has also been studied in a community dwelling sample of adults greater than age 65 (N= 1427) (Hoogendijk et al, 2020). In this sample, the prevalence of frailty was 13%, frailty plus loneliness was 5.9%, and frailty plus social isolation was 6.2%. It's not clear whether the sample of frailty plus loneliness was the same sample or overlapped with the frailty plus social isolation sample.

In a scoping review of the literature on 26 studies, frailty contributed to greater health problems but was unrelated to loneliness and social isolation (Mehrabi et al, 2020). This finding was surprising given the positive relationship between loneliness and frailty in the studies previously described. Loneliness may have been a mediator of the effects of frailty on poor health but was not analyzed as a mediator.

Limited Activities of Daily Living. The significant increase in frailty may have contributed to limited activities of daily living, the falls and trips to the emergency room that have been related to loneliness in this literature, although frailty has not been mentioned in these studies. In the report on activities of daily living, for example, loneliness was associated with increasing difficulties with activities of daily living but frailty was not measured (Shankar et al, 2017). In this sample from the English Longitudinal Study of Aging (N=3070 adults whose mean age was 69), loneliness was also related to reduced gait speed, although the relationship between gait speed and activities of daily living was not given.

Falls. Frailty might also contribute to the frequency of falls reported in this literature. In a study from the National Social Life, Health and Aging project that was a longitudinal study over five years, 51% had at least one fall and 23% had greater than two falls (Zeytinoglo et al, 2021).

An Increased odds of loneliness related to falls in the 65-to-85-year-old group. Although this is a longitudinal sample and loneliness was said to predict falls, the greater incidence of falling may have also predicted loneliness, again as in a bidirectional relationship.

Emergency Room Visits. Frequent falling would be expected to lead to emergency room (ER) visits. The only study on emergency room visits, however, related those to loneliness, not falling (Chamberlain at all, 2022). In this sample (N= 44,413) from the Canadian Longitudinal Study of Aging, the prevalence of loneliness was 23% and the prevalence of emergency room visits was 27%. Greater odds were noted for the lonely visiting the ER and loneliness was associated with ER visits more frequently in women which might have related to their greater frailty, although that variable wasn't included in the data analysis. One of the limitations of the study is that the multivariate logistic regression that was used to analyze the data controlled for variables that were not the primary variables of interest but that might have been significant predictors such as frailty. In addition, both the loneliness and emergency room visits were dichotomous variables which have limited reliability.

Morbidity and Mortality. Reaching 90 years of age was negatively correlated with social loneliness in a longitudinal study from Amsterdam on 64-90-year-old men and women (N=2,080) (Brandts et al, 2021). Greater morbidity and mortality have been associated with loneliness. In a review of the literature, increased morbidity predicted greater loneliness and loneliness predicted morbidity (Nguyen et al, 2021). These authors spoke of "deaths of despair" due to suicide and opioid abuse in lonely aging adults which they claimed contributed to more deaths than those secondary to lung cancer or stroke. The increased odds of mortality for lonely aging adults was 30%. In a study they described, loneliness mediated the relationship between pain and suicidal ideation in 200 elderly unmarried men (single, divorced, widowed) but not partnered or married men (Lutzman et al, 2020). In addition, they suggested that it was data like these that led the UK to appoint a minister for loneliness in 2018 and WHO (the World Health Organization) to create the Global Network of Age Friendly Cities and Communities.

Risk Factors/Predictors for Loneliness in Aging Adults

It should be noted that many of the effects just discussed could also be considered risk factors in the same way that the following risk factors could be treated as effects of loneliness (see table 3). Examples of these reciprocal or bidirectional relationships are reduced physical function as related to frailty which has been noted as an effect of loneliness while it is also a risk factor (Shankar et al, 2017). The same could be said about memory loss (Kyrolainen et al, 2020) and about aging anxiety (Hu et al, 2022) that have both led to loneliness. These factors have been arbitrarily assigned in this review according to the direction in which they have been analyzed, namely as independent or dependent variables. In this section the risk factors of aging anxiety, sensory loss, neuroticism, losing a partner COVID-19 risk factors are reviewed.

Table 1. Prevalence of loneliness in aging adults.

Prevalence	First Author
11% Norway	Ormstad
76% San Diego	Lee
23% Canada	Chamberlain
30-40% western countries	Spreng

Table 2. Negative effects of loneliness on aging adults.

Effects	First Author
Psychological	
Suicidality, cognitive decline	Spreng
Anxiety and depression	Bergman
Psychological distress	Menee, Gyasi
Depression	Domenech-Abrilla, Losada-Baltar, Segel-Karpas, Svennson
Suicidal ideation	Lutzman
Physiological	
Lower heart rate variability, viral reactivation, shorter telomere length	Wilson
Cognitive	
Memory loss	Kyrolainen, Yin
Verbal fluency loss	Yin
Physical	
Frailty	Gale, Jrach, Mehrabi, Hoogendijk
Limited activities of daily living	Shankar
Falls	Zeytinoglo
Emergency room visits	Chamberlain
Morbidity	Nguyen
Mortality	Brandts

Table 3. Risk factors for loneliness in aging adults.

Risk Factors	First Author
Aging anxiety	Ayalon, Hu
Sensory loss	Mick
Neuroticism	Wang, Ormstad
Agreeableness in women	Ormstad
Functional limitations, low family support and strained friendships	Hawkley
Losing a partner	Boger
COVID-19	Peng, Field, Losada-Baltar, Chamberlain

Table 4. Buffers for loneliness in aging adults.

Buffers	First Author
Social factors	
Being in a relationship	Itzick
Intergeneration relationship quality	Liu
Neighborhood cohesiveness	Gam
“Aging in place”	Umer
Continued working	Cheng, Itzick
Internet use	Yu, Casanova
Pets, robots and interactive manikins	Ramesh, Chiu
Personality traits	
Agreeableness in men	Itzick
Wisdom	Lee, Nguyen
Narcissism	Carter

Table 5. Interventions for loneliness in aging adults.

Interventions	First Author
Social networking	Heins
Personal voice assistants (Alexa)	Jones
Writing therapy	Moieno
Laughter therapy	Kuru

Aging Anxiety

Aging anxiety or negative attitudes towards aging have received most of the attention as risk factors. In some studies they've been treated as effects, as discussed in that section. But, in other studies they have been treated as risk factors. Aging anxiety has been defined as worries from imagining negative consequences and losses associated with old age (Ayalon et al, 2018). In this study on adult day care funded by the government as compared to continuing care retirement communities in Israel, the adult daycare aging adults reported more loneliness and negative attitudes regarding aging. Inasmuch as the government supported daycare centers likely served lower socioeconomic (SES) folks, these results would suggest that lower SES may be related to negative attitudes about aging and greater loneliness.

In an eight-year longitudinal study (N = 3597 adults), latent growth curve modeling and path analysis were performed (Hu et al, 2022). In this sample, negative self-perceptions of aging had a direct effect on loneliness and an indirect effect on social disconnectedness via loneliness. The origins of the self-perceptions of aging were not addressed, but were clearly influential on loneliness.

Sensory Loss

Sensory loss including loss of vision and audition has been associated with loneliness in the Canadian Longitudinal Study on Aging (Mick et al, 2018). Having a sensory loss would not only be stigmatic in terms of socializing but would also make it more difficult to communicate in interactions with others. Less socializing, in turn, would be expected to lead to greater loneliness.

Neuroticism

Neuroticism has been a risk factor for loneliness in a study on Chinese adults (N= 3157) living in Chicago (Wang et al, 2018). In a logistic regression that adjusted for confounding factors, high levels of neuroticism led to 3.59 times greater likelihood of feeling lonely. In contrast, high consciousness led to a 24% lower risk of loneliness. Again, directionality cannot be determined from cross-sectional data and the designation of dependent versus independent variables is arbitrary. Further, the logistic regression may have removed confounding variables that are risk factors.

Neuroticism has also been a risk factor for loneliness in a five-year follow-up study, but only for men (Ormstad et al, 2020). High neuroticism, low agreeableness and low conscientiousness led to loneliness in men while, surprisingly, high agreeableness in women contributed to their loneliness which is difficult to interpret. In this sample, loneliness occurred in 14% of the women and in 11% of the men. These data are tenuous, however, as they may not be as relevant today as they were two decades ago when they were collected (between 2002 and 2007).

Multiple Variables

Multiple variable studies may yield more valid predictors as the data analyses have less often controlled for confounding variables. Multiple risk factors contributed to the frequency of loneliness in the five-year follow-up of the National Social Life, Health and Aging project (Hawkley et al, 2018). The predictive factors included functional limitations and low family support as well as strained friendships. Another interesting aspect of this study was the reporting of the factors explaining the changes from lonely to non-lonely and non-lonely to lonely. The factors that were associated with transitioning from being lonely to non-lonely status included better self-related health and greater socializing as well as less family strain.

Losing a Partner

Losing a partner would be expected to be a significant variable in the relationship between aging and loneliness, but it was only reported in one study in this recent literature. In this study, the authors addressed the predictive validity of losing a partner resulting in loneliness (Boger et al, 2020). Surprisingly, with advancing age, partnership status was less predictive of

loneliness. This finding was noted in the German Aging Survey on 40-to-85-year-old adults (N=6188). The authors concluded that the relevance of partnership for social well-being was neither universal nor stable but appeared to decrease in the course of aging as well as across historical time. Although these are old data from 2014, continuity of these results might be expected. A possible reason for the decreasing relationship between partnerships and loneliness with increasing age is that older adults are more likely living in communities where they have formed friendships that attenuate the effects of loss on loneliness. Friends and caregivers may be buffers for the loss of partnerships.

COVID-19 as a Risk Factor

COVID-19 was explored as a risk factor for loneliness and aging in a few studies. In the two waves of the longitudinal Health and Retirement Study on adults older than 50 years, changes from 2016 to 2020 occurred including increased physical isolation and social isolation (Peng et al, all, 2022). However, there was no change in digital isolation or loneliness probably related to more time on social media. In a Survey during the COVID-19 lockdown, the young living alone experienced more loneliness than the old living alone, probably because the old were more accustomed to living alone (Field et al, 2021). In similar results from another study during the COVID-19 lockdown, psychological distress was noted to be less in the aging adults (Losada-Baltar et al, 2022). In this sample from Spain (N= 1549), the authors interpreted their results as the aging adults being more resilient. The results could also be interpreted as the older adults being accustomed to being lonely or at least living alone.

In contrast, in a study from Canada (N= 12,469), loneliness was measured by the three-item UCLA Loneliness Scale which was associated with depression (Chamberlain et al, 2022). However, covariates were also associated with depression including caregivers, working and having greater than two chronic diseases. Nonetheless, the covariates were controlled by the data analysis so that only loneliness and depression remained as the primary variables. The UCLA Loneliness Scale only has three items including how often do you feel left out, isolated from others and not having companions.

Buffers for Loneliness in Aging Adults

Buffers /protective factors have been more frequently researched than risk factors in this recent literature on loneliness in the aging. These have included social factors and personality traits (see table 4).

Social Factors

Being in a Relationship. In a study on predictors of loneliness among older men in Israel (N=392), being in a relationship was associated with lower levels of loneliness (Itzick et al, 2020). Given that there were no women in this study, the data are not generalizable.

Intergenerational Relationship Quality. High quality relationships with younger generation family members have also been a buffer for loneliness as well as for greater attitudes toward later life in a study on adults greater than 50-years-old (N=801) (Lru et al, 2022). That relationships with adult children would decrease loneliness and enhance more positive attitudes toward later life is not surprising but is not often mentioned in this literature as a buffer for loneliness.

Neighborhood Cohesiveness. Friends in the neighborhood have also been a protective factor in the Canadian Longitudinal Study (N=14,301) (Gan et al, 2022). In this study, loneliness mediated 27 to 29% of environmental influences on mental well-being versus walking only mediated .4 –.9% of those influences. Social support and socialization related to neighborhood cohesion would be expected to reduce loneliness.

“Aging in place”. This phenomenon relates to social support. In a study entitled “The relationship among aging in place, loneliness, and life satisfaction in the elderly in Turkey, the Aging in Place Scale was used (Umer et al,

2022). The Aging in Place Scale includes items on perceived social support, physical competence, and achievable social support. These qualities led to increased life satisfaction and lower scores on the Loneliness Scale for the Elderly. Although this is a correlation study, it suggests that "Aging in Place" can decrease loneliness.

Continued Working. Working and the workplace has also been a source of social contact for aging adults. In a study on adults over 60 years of age (N= 2037), continued working and volunteering led to not only less loneliness but also less depression (Cheng et al, 2021). These data were not surprising inasmuch as the workplace would offer more opportunities for socialization. In the study already discussed on older men in Israel, being employed was also a protective factor for loneliness (Itzick et al, 2020).

Internet Use. Social contact has also been facilitated by Internet use which, in turn, has reduced loneliness. In a sample from the Health and Retirement Study, internet use led to decreased loneliness as well as increased social contact over the eight years of the study (Yu et al, 2021). Unfortunately, as in several of these studies, loneliness was measured by only three items on the UCLA Loneliness Scale and internet use was a dichotomous measure, limiting the reliability of these data.

In a review of 11 papers on social network use and old people's well-being in relation to loneliness, social network use led to less loneliness, although the causal relationship was weak (Casanova et al, 2021). This is a surprising finding in that it is the opposite of the negative effects of Internet use on adolescents (Field, 2021).

Pets, Robots and Interactive Manikins. Increasingly, the aging population has turned to pets and novel technologies in the form of robots and interactive mannikins for companionship (Ramesh et al,2021). In a study entitled "Associations between loneliness and acceptance of using robots and pets as companions among older Chinese", 68% of the participants who felt lonely, accepted companionship of robots and 58% accepted pets (Chiu et al, 2022).

Personality Traits

Personality traits have been researched as buffers/protective factors for loneliness in aging adults. These include agreeableness, wisdom, and narcissism.

Agreeableness. Agreeableness was a buffer for the loneliness of older men in the study from Israel (Itzick et al, 2020). However, In another study, agreeableness was not a protective factor but a risk factor for women (Ormstad et al, 2020).

Wisdom. Wisdom has been considered a buffer for loneliness in aging adults in at least two studies. In a study entitled "High prevalence and adverse health effects of loneliness in community dwelling adults across the lifespan: the role of wisdom as a protective factor ", the San Diego Wisdom Scale was used (Lee et al, 2019). In this sample (N= 340), 76% experienced moderate to high levels of loneliness. No sex differences were noted on the prevalence or severity of loneliness. However, age differences were noted including that loneliness was most prevalent in the late 20s, mid 50s and late 80s. Wisdom based on the San Diego Wisdom Scale accounted for as much as 45% of the variance in the UCLA-3 Loneliness Scale.

In a review paper entitled "Wisdom as a potential antidote to loneliness in the aging" , wisdom was defined as a prosocial behavior involving emotion regulation, self-reflection, acceptance of divergent values, decisiveness and social advising (Nguyen et al, 2021). The authors suggested that the neurocircuitry of wisdom involves the prefrontal cortex and limbic striatum. Across the 36 studies reviewed, loneliness was strongly negatively correlated with wisdom (r= .50–.60). Most particularly, the prosocial behavior factor of the wisdom scale (empathy, compassion, and social cooperation) moderated the relationship between social network and

loneliness. Wisdom is likely a buffer for many social–emotional problems, although it is rarely considered that way.

Narcissism. Narcissism was also surprisingly a buffer for loneliness. In a study entitled "The aging narcissist: just a myth?" 100 middle-age (Mean= 48 years) and 100 older age adults (Mean= 70 years) were given the 3-item UCLA Loneliness Scale and the 40-item Narcissism Scale (Carter et al, 2018). In this study, narcissism decreased over age and moderated (lessened) the relationship between age and loneliness. These results were surprising inasmuch as narcissism has typically been considered a negative trait, although narcissistic folks notably have good social, mental and physical health and reputedly live longer and certainly would not be lonely. The methodological problem for this study is that loneliness was measured by a 3-item scale and narcissism by a 40-item scale raising the question of the differential reliability of these measures.

Interventions for Loneliness in Aging Adults

Only a handful of intervention studies have been found in this recent literature on loneliness in aging adults. The interventions have varied widely from social networking to personal voice assistants to writing exercises and to laughter therapy (see table 5).

Social Networking

In a review of 36 studies on technological interventions, most of the studies evaluated social networking technology and Internet training (Heins et al, 2021). Limited effects were noted for these interventions on loneliness, social isolation and social support. Further, the studies were of very limited methodological quality.

Personal Voice Assistants

In a study on 75-year-old adults (N= 16), the participants used personal voice assistants such as Amazon Echo (Alexa) for eight weeks (Jones et al, 2021). After four weeks of using Alexa, loneliness was significantly decreased. Themes were coded and the semantic analysis suggested that they were 1) greetings to a close friend; 2) second person comments/questions; 3) polite interactions; and 4) interactions with Alexa. The relational greetings especially led to decreased loneliness in the first four weeks, and baseline loneliness led to increased greetings over the eight-week intervention. Surprisingly, the greetings had greater effects than the interactions with Alexa.

Writing Therapy

In a study that involved writing about life experiences and sharing advice with others, 73 women were randomly assigned to six weeks of that condition or a control group that involved writing about neutral topics (Moieno et al, 2021). Those participants who expressed more positive expectations regarding aging also perceived more social support and had less loneliness. Given that this sample was exclusively women, it's not clear that it would generalize to a sample that included both women and men. This study was unusual in that it randomly assigned participants to intervention and control groups and the results highlighted the positive effects of writing especially about positive expectations regarding aging. However, it is a small sample study that needs to be replicated.

Laughter Therapy

In a laughter therapy study, 20 participants from a nursing home were given laughter therapy two times per week for five weeks and compared to a control group. (Kuru et al, 2018). The total scores for the long scale for loneliness called the DeJong Giervald Loneliness Scale and its subscale scores for emotional and social loneliness were decreased in the intervention group. No differences were noted on the death uncertainty and pain scales. Although the scale includes 11 items making it a more comprehensive measure than the three-item UCLA Loneliness Scale, the responses are simply yes, more or less or no, as in a dichotomous rating scale. The scale has been popularly used likely because it has been translated in several languages.

Methodological Limitations

Several methodological limitations can be noted about these recent studies on loneliness in aging adults. Significant variability has been reported on the sampling methods, on the sample sizes, and the prevalence and results of the studies. Most of the methods have been self-report surveys.

The key variables, as often happens, have been pet variables or those favored by the authors And often the data have been analyzed via logistic regression analysis which controls for confounding variables that might instead be risk factors or mediating/moderating variables if they had been analyzed by mediation/moderation or structural equations analysis.

More studies have appeared on buffers or protective factors versus risk factors. Several of the effects that have been noted could also be risk factors as in bidirectional, reciprocal variables.

Several of the scales are short as in the UCLA three item measure or simply dichotomous as in lonely or not lonely which limits the reliability of these measures. Directionality cannot be determined as most of the studies are correlational and others that are longitudinal have simply analyzed cross-sectional data.

Many of the results are relationships between loneliness and other effects, risk variables or protective factors selected by the researchers. Rarely has loneliness been compared in the aging versus the young adults. And when that comparison was made in at least one study, loneliness was most prevalent in the late 20s, mid 50s and late 80s (Lee et al, 2019). Surprisingly, sex differences have been rare, although several studies were exclusively male or female, limiting generalizability. The prevalence of loneliness, its measures and its effects are so variable that reviews have been inconclusive and meta-analyses have not been conducted.

Virtually no mechanism studies appear in this literature and potential mechanisms have not been discussed. And, only a few intervention studies could be found in this recent literature. Despite these methodological limitations, the recent literature highlights the relationships between loneliness and aging, although it doesn't conclude that aging is associated with more loneliness necessarily than other stages of life.

Conclusion

The recent literature on loneliness in aging adults is predominantly focused on negative effects of being lonely along with some studies on risk factors, buffers, and interventions. Aging is typically defined as ages starting at 60 or 65. The prevalence rates for loneliness in aging adults have been highly variable, ranging from a low of 11% in Norway to a high of 76% in San Diego. Negative effects have included ageism attitudes, anxiety, depression, memory loss, low heart rate variability, short telomere length, frailty, frequent falls and trips to the emergency room. Risk factors have included aging anxiety, sensory loss, neuroticism, losing a partner, and COVID-19. Buffers/protective factors have included being in a relationship, continued working, internet use and being with pets and robots. And personality traits have been protective including agreeableness, wisdom, and narcissism. Interventions have included social networking, personal voice assistants, writing and laughter therapy. Although the recent research suggests that loneliness and aging are related on some variables like frailty, it has not suggested that loneliness is more prevalent among the aging than younger adults. In addition, most of the data are based on self-report surveys that have yielded mixed results across countries.

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