A Faith-Based Healthcare Intervention to Address Social Isolation and Loneliness in Older Adults

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Abstract

Social isolation among community-dwelling older adults has been a growing health concern for several years, which has been exacerbated by the ongoing COVID-19 pandemic. Social interaction is vital to human existence, so much so that even the perception of isolation can cause feelings of loneliness and increase stress levels. Older adults with chronic illness are at risk for adverse health outcomes due to a lack of social support. The goal of this quality improvement project was to determine if a nurse practitioner could utilize virtual, faith-based spiritual resources for socially isolated older adults to reduce loneliness and improve their quality of life. A volunteer sample of 16 adults over the age of 55 was recruited from local communities to participate in this 2-month intervention and follow up. The primary outcome measures were a reduction in social isolation and loneliness as indicated by the De Jong Gierveld scale and improved quality of life as measured by the World Health Organization quality of life scale brief version. The healthcare system must innovate to handle the rising costs of providing care to an aging population. Including patients' existing frameworks of spirituality can create a holistic approach to their individual healthcare. Providing community intervention to target loneliness and social isolation may be an economic means to impact measures that influence the utilization of healthcare as well as morbidity and mortality, thus reducing strain on the healthcare system.

Keywords: social isolation, quality of life, spirituality, religion, church, aged, geriatric, social distancing, coping

Social Isolation and Loneliness in Older Adults

Aging presents many challenges to those who experience it, including the possibility of becoming more vulnerable due to social isolation. Older adults can experience a loss of their social networks, bereavement, and a greater likelihood of living alone (C. Coyle & Dugan, 2012). Social isolation increases the risk of all-cause mortality, morbidity, depression, and cognitive decline in older adults (Tomaka et al., 2016). Strong meta-analytic evidence indicates a 50% increased likelihood of survival for people who have stronger social relationships, revealing that social relationships can predict mortality (Holt-Lunstad et al., 2016). Barriers to addressing the impact that societal integration has on health are the difficulties measuring social isolation and defining the link between social isolation and loneliness (Valtorta & Hanratty, 2012).

Infection with COVID-19 results in severe and fatal respiratory disease in a higher percentage of older individuals (Chen et al., 2020). Consideration of contributing factors to severe disease, including social components of health is key to providing effective treatment. Data on loneliness and social isolation among older adults shows clear and significant negative impact on outcomes for this population. Exacerbating the negative impact of loneliness and social isolation are the social distancing measures recommended by the Centers for Disease Control and Prevention (CDC, 2020) to slow the spread of the disease by limiting social contact and interaction and halting large gatherings of people. Social distancing is a practice that is projected to continue. It is possible that prolonged or intermittent social distancing may be necessary into 2022 so as to not exceed critical care capacities within the infrastructure of the U.S. healthcare system (Kissler et al., 2020). This projection highlights the importance of addressing any adverse effects that social distancing measures may have on our society, culture, and health practices.

By the year 2030, approximately 20% of the U.S. population will be considered older adults (United States Census Bureau, 2017). Data reveal that demographic shifts have advanced the proportion

of older adults within the population, which has increased the average acuity of healthcare consumers presenting for services at the emergency department (Pines et al., 2013). Failure to address the issue of loneliness in older adults could have a profound impact on the healthcare system. Social isolation and loneliness in older adults have been associated with incidence and progression of cardiovascular disease (Banerjee et al., 2014), cognitive decline (Hajek et al., 2020), Alzheimer's disease (Wilson et al., 2007), and impaired cellular immunity (Hawkley & Cacioppo, 2010). The correlation between perceived social isolation and medical service utilization in older adults has been demonstrated by more frequent primary care physician visits (Zhang et al., 2018) and 1-year rehospitalization rates that are four to five times higher than in low-isolation-risk patients (Mistry et al., 2001).

The implementation of social distancing prevention measures during the pandemic has made it difficult for people to engage in satisfactory social interaction. A novel concept of health promotion in vulnerable older adults that incorporates the social aspects of existence is necessary to provide opportunities for meaningful social participation. Technology has created numerous avenues for pursuing social interaction while maintaining social distance. Providing opportunities to prevent vulnerable older adults from becoming socially isolated and lonely could have a drastic and positive economic impact on their healthcare utilization.

Traditionally, a large portion of older adults have found church and faith-based practices to provide sufficient social interaction. In 2014, over 70% of adults within the United States self-identified as Christian (Pew Research Center, 2014). The United States contains vast potential for utilizing a personalized, faith-based intervention approach to promote social networking within faith communities, thereby improving the health maintenance of older adults. The use of existing religious frameworks would minimize the cost of implementing this intervention and promote well-being and improved health status compliance (Koenig et al., 2004). Positive spiritual and religious coping has been shown to be significantly associated with improved quality of life (QOL) and health status (Vitorino et al., 2016). In

value-driven healthcare environments, where value is defined as the outcome relative to cost (Porter, 2010), patient-centered interventions incorporating personal worldviews could be immensely valuable due to the limited cost of implementing such programs.

The ongoing barriers to face-to-face interaction due to social distancing illustrate the vital importance of creating alternatives to minimize the impact of social isolation and loneliness in older adults. A quality improvement (QI) program designed for the community setting could reduce social isolation and loneliness among older adult populations during pandemics by integrating social connectedness via virtual interaction. As previously stated, social isolation and loneliness are associated with a higher risk of cardiovascular disease; however, older adults who attend religious services more than once per week have a lower prevalence of coronary heart disease, diabetes, and high blood pressure (Banerjee et al., 2014). Furthermore, religiosity and spirituality have been shown to improve QOL among patients (Abu et al., 2018), suggesting that implementing spiritual care for all patients who desire it could be practically beneficial. Online forms of corporate worship have been shown to be beneficial for older adults' QOL (Russell, 2016). Knabb and Vazquez (2018) found that online Christian-sensitive mindfulness in the form of a virtual program improved psychological and spiritual health as well as spiritual and religious coping.

Theoretical Framework

The spirituality of an individual refers to how each person seeks and expresses meaning and purpose, as well as the relationship of self to others, the moment, the environment, and the sacred (Vitorino et al., 2016). The Spirituality and Health Theory was created by researcher Joanne Coyle of Queen Margaret University College, Edinburgh. The theory came out of a growing pool of research that suggests that spirituality enhances health and the need to define the relationship between the two factors. The framework can be used to explore the relationship between spirituality and health (Coyle,

2002). The theory designates three approaches to spirituality that can be implemented to provide a foundation for spiritual intervention within a care plan:

1. The 'transcendent' approach to spirituality
2. The 'value guidance' approach to spirituality
3. The 'structural-behaviorist' approach to spirituality

(Coyle, 2002)

While attempting to define a highly subjective term such as spirituality, the personal and individualistic aspects are poorly included in many personal definitions. The definition provided is a generalized attempt to identify common concepts that are present in almost all personal experiences of spirituality. The exercising of spirituality is regarded by most research as a behavioral concept, which includes a person's predisposition or attitude, as well as reference to their identity or quality and meaning of the social relationships in which he or she is involved (Layder, 1998).

As previously stated, the theory includes three approaches to spirituality, and all are relevant to research exploring this topic. The "Transcendent" approach is how an individual view his or herself in relationship to 'God' or higher power. There are two distinctions of the transcendent spirituality:

1. Transpersonal: How an individual understands personal connectedness to God/higher power/consciousness/universe etc. All knowledge originates from God, and truth is sacred.
2. Intrapersonal: How an individual recognizes potentialities of self. Knowledge is derived from contemplation of inner resources and truth is derived from connectedness to self, others and the divine.

Faith in each distinction supplies many of the beneficial effects to health status such as hope, motivation, enabling, empowering, and self-identity.

The second approach is the 'value guidance' approach. This approach to spirituality derives meaning and purpose from connectedness to value/principles, ideals, and beliefs. The individual drawn

to this approach finds motivating and enabling in a set of values or personal beliefs. There are rules, orientation, and guidance from adopting a framework of values while constructing relationships and life experiences using said values.

Finally, the 'structural-behaviorist' approach, which is deeply rooted in a religious commitment to practices associated with an organized community of faith. This format of spirituality finds fulfillment in church attendance, religious affiliation, structured prayer, and networks/social support in religious community. This approach is strongly tied to this project, in which social participation is encouraged, reducing social isolation and loneliness in practice.

Literature Review

A systematic review of the literature was conducted to identify studies evaluating the effectiveness of QI interventions focused on older adults who are socially isolated and how these interventions impact overall health (Bartlett & Arpin, 2019; Borji & Tarjoman, 2020; Cavanagh et al., 2013; Knabb & Vazquez, 2018; Morledge et al., 2013; Saito et al., 2012; Spijkerman et al., 2016). The QI strategies implemented in each study were based on well-developed cognitive therapies and included patient education, patient reminders, promotion of social interaction, structured prayer, Christian-sensitive mindfulness, and promotion of connectedness to a community of faith. The interventions improved outcomes in older adults who were impacted by social isolation and loneliness. The interventions also offered adjunctive therapies for providers to assist older adults in managing stress and coping with adverse events in later life (Table A1).

Bartlett and Arpin (2019) investigated and implemented strategies to intervene in factors affecting subjective loneliness in older adults that have a direct impact on well-being and health systems across conditions. Direct correlations between cognitive therapy and improved loneliness were illustrated throughout a 3-week study period. Cognitive therapy, such as gratitude exercises, promoted a positive emotional experience stemming from the recognition that relationships with God and other

community members alleviated perceived isolation. Furthermore, a reduction in loneliness was evidenced to have a secondary impact on health, well-being, and health symptoms models in the treatment group compared to the control group. This effect model found that "loneliness acted as a mechanism for gratitude's impact on subjective well-being and health symptoms across conditions" (Bartlett & Arpin, 2019, p. 772). Participants were educated in the practice of gratitude and were given clear instruction on completion of daily exercises prior to filling out a daily survey. Implementation of this program was administered via a distance survey method (such as a drop box for paper surveys), illustrating the viability of cognitive therapeutic interventions that are not delivered face to face. Bartlett and Arpin (2019) concluded that simple gratitude writing exercises influenced the treatment group by improving loneliness, therefore preventing associated sequelae.

Cavanagh et al. (2013) demonstrated the ability of online mindfulness programs to influence participants' psychological conditions. Education on mindfulness practice was provided in the form of a 2-week curriculum, with participants filling out a questionnaire after completing the program. Improvement in outcome measures such as mindfulness, perceived stress, depression, and anxiety demonstrated how online mindfulness programs have the potential be used in a community setting with positive effects. For perceived stress scores in particular, the study found a significant decrease in scores among the intervention group. However, attrition rates were high; this was attributed to the online self-guided nature of the program, which has been shown to increase dropout rates (Alfonsson et al., 2016). Cavanagh et al. (2014) concluded that more research is needed to optimize the design and personalization of the intervention to maximize its impact on target populations. The results of this mindful and acceptance-based intervention underscore the potential that online cognitive therapies have for value-based treatment within the community setting. The authors indicated that utilization of distance interventions, such as books, audio programs, online programs, and apps, may increase the affordability, ease of access, and efficiency of mindfulness interventions.

As previously discussed, older adults suffering from social isolation and loneliness experience subjective distress stemming from perceived deprivation of desired social interaction, connectedness, and proximity. Saito et al.'s (2012) QI intervention, which focused on alleviating social isolation in older adults suffering from perceived isolation or loneliness, was shown to have a significant effect on subjective well-being and social support. The mean subjective well-being scores were significantly higher for the intervention group than the control group. Importantly, Saito et al. (2012) found that tailor-made interventions based on the specific needs of individuals were most effective. These data confirm that QI projects targeting social isolation and loneliness can improve overall health. Utilizing existing community resources such as churches, combined with personalized interventions based on an individual's religious worldview, can provide economic improvement in the care of lonely older adults.

Within the Christian community, prayer is identified as a form of communication, connection, and communion between the self and the divine. Within the realm of cognitive therapeutic interventions, prayer can be recognized as a fundamental mindfulness procedure that can improve mental self-awareness, attention, compassion, openness, and curiosity (Kabat-Zinn, 1990). Knabb and Vazquez (2018) designed a 2-week program focusing on the impact of prayer on short-term indicators of spiritual experience, perceived stress, and spiritual and religious coping. The daily intervention was delivered online, and internet surveys were used to evaluate the effectiveness of the daily guided prayer on the three outcome measures. This Christian-sensitive program was adapted from and influenced by mindfulness-based cognitive therapy, adjoining spiritual components that focused on surrender of inevitable and unalterable environmental demands to God's care, acknowledgement of the role of Jesus Christ as sovereign in one's decision making, and "shifting their focus to Him during moments of stress, reappraising their experience in the process" (Knabb, & Vazquez, 2018, p.46). The study demonstrated that personalizing the QI approach to conform to a Christian worldview will make the practice consistent with acceptable religious practice and promote compliance with the QI program.

Morledge et al. (2013) conducted an 8-week internet-based program for the management of psychological stress to determine the feasibility of an online form of mindfulness training. The program included weekly modules covering techniques to improve coping and stress management. Morledge et al. (2013) demonstrated the efficiency and sustainability of internet-based programs and compared the results of the targeted outcome measures to traditional programs. They found significant improvements in psychological well-being, perceived stress levels, and subjective vitality. The relevance of this study is the illustration of how online forms of mindfulness and related interventions can be employed to provide valuable benefits to targeted populations.

The above findings are consistent with Spijkerman et al.'s (2016) review and meta-analysis of 15 randomized controlled trials that examined the effectiveness of online mindfulness-based interventions on mental health. An increasing number of mindfulness-based interventions are being offered in an internet format, making these interventions accessible to many populations that were previously unable to participate in the traditional programs. Spijkerman et al. (2016) found that the studies had small to moderate negative effects on depression, anxiety, and stress and positive effects on well-being and mindfulness. The effects demonstrated by these internet-based mindfulness programs support the theory that cognitive behavioral therapy is beneficial to mental health. Similar effects were found in a study of older patients incorporating spiritual and religious coping mechanisms (Vitorino et al., 2016), showing that mindfulness therapy shares many common benefits with spiritual and religious practice in terms of mental health.

Religious therapies hold increased potential to reach beyond basic cognitive levels of understanding to induce positive psychological change within an individual. Religious involvement has been shown to hold various physiological, psychological, and social benefits (Dobbs, 2017). Borji and Tarjoman (2020) showed that the provision of spiritual support in the form of religious practice, prayer,

and theological discussion diminished the sense of loneliness and enhanced subjective vitality in older adults within community healthcare centers.

In summary, there is clear evidence that online and distance forms of mindfulness therapy have the potential to influence outcome measures such as social isolation and QOL. Evidence shows that faith-based interventions impact the same outcome measures as traditional mindfulness programs. This QI project implemented online measures incorporating faith-based spiritual interventions such as prayer, scripture meditation, gratitude practices, and online church services. Each aspect of the intervention supplied to participants was supported by prior research that displayed a strong affiliation between these practices and the outcome measures of the project, namely, reduced loneliness/social isolation and improved QOL. Both outcome measures accompany enhanced social integration in an uncertain period of social distancing and lack of corporate worship opportunities.

Method

This 2-month prospective QI project implemented virtual spiritual and religious interventions, including mindfulness, prayer, scripture meditation, gratitude practices, and online church services offered by local ministers to older adults who are at risk of being socially isolated or lonely. Each participant completed the De Jong Gierveld and World Health Organization quality of life brief version (WHOQOL-BREF) surveys pre- and post-intervention.

Three local pastors were utilized to implement this program within the local faith community in rural North Carolina. A voluntary sample of 16 older adults (> 55 years of age) were recruited via flyers and verbal promotion in local churches and on social media within the community. Inclusion criteria were adults over 55 years of age living in the community setting. Exclusion criteria for this QI project were difficulty accessing or responding to the program, language barriers, cognitive impairment, failure to provide consent, or any other medical diagnosis interfering with participation. Participation in the program was on a voluntary basis, and all participants were included in the intervention group.

Measures

De Jong Gierveld Scale

Social isolation and loneliness create serious health risks for a significant portion of older adults and yet remain underappreciated as a public health concern. It is estimated that over one-third of adults ages 45 and older feel lonely, while almost one-fourth of adults ages 65 and older are socially isolated (National Academies of Science, Engineering, and Medicine, 2020). The De Jong Gierveld loneliness scale aims to quantify the degree in which participants perceive undesirable aloneness, which can be present with or without social isolation. Both loneliness and social isolation are associated with increased mortality (Steptoe et al., 2013). Aging-related factors, including marital status changes, alterations in social contact participation, new contacts, sensory deficits, mobility issues, and a lack of financial resources have been shown to be associated with an increase in loneliness. The De Jong Gierveld loneliness scale is an open-source tool that has been validated for use in the evaluation of loneliness for middle-aged and older adults (Penning et al., 2014). Quality improvements focusing on decreasing social disconnectedness and perceived isolation were measured using this 11-item scale. The scale evaluates social and emotional aspects of loneliness (De Jong Gierveld & Van Tilburg, 2010) and was used to determine the intervention's effectiveness. In research, loneliness is defined as the equivalent designation to the emotional state of perceived isolation (Stall et al., 2019). This tool has been validated as an effective method for evaluating both objective and subjective aspects of isolation in relation to loneliness and provides a measure to evaluate the impact of QI interventions on social isolation in older adults.

WHOQOL-BREF

The WHOQOL Group (1995) defines QOL as the following:

> Individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad

> ranging concept affected in a complex way by the persons' physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment. (p.1403)

The WHOQOL-BREF is a reliable and valid tool for the evaluation of QOL, and it contains spiritual, religious, and personal beliefs modules (O'Connell et al., 2000). Quality of life is a subjective concept of the human experience and has been associated with mortality in the general population (Phyo et al., 2020). Therefore, improvement in WHOQOL-BREF scores could indicate a reduction in mortality and improved health status based upon self-reported values of health quality (Phillips et al., 2010). The WHO developed this QOL tool to provide a standard means to assess subjective well-being; the brief form was created for use in situations that require minimization of respondent burden. This QI project required assessment of subjective well-being, particularly regarding social and physical health, while minimizing the complexity and time burden of the survey procedure. This model possesses items assessing five domains: psychological health, physical health, social relationships, environment, and level of independence. These domains correlate to assessment of the impact of the project intervention on participants who are socially isolated. Oliveira et al. (2016) demonstrated the validity and reliability of this tool, with Cronbach's alpha values of 0.85 for psychological health, 0.73 for physical health, 0.73 for social relationships, 0.68 for environment, and 0.77 for level of independence.

Both the De Jong Gierveld and WHOQOL-BREF surveys were provided to participants pre- and post-intervention in an online format. The surveys were hosted via a secure online survey provider, with links emailed to participants. Follow up was done via email and phone as needed for participation.

Procedures

This social isolation and loneliness QI project used a community-based approach to provide the intervention by employing the specialized skills of faith leaders within the community and extended churches. All adults received the intervention based on a guided curriculum, with pastors and church

leaders from local churches administering the intervention while the principal investigator coordinated data collection. The collaboration of family and church members was encouraged during each participant encounter by utilizing a personalized approach that included shared decision making of invested parties and respecting all cultural, spiritual, and religious diversity within the population. The intervention was based on data from similar interventions to deliver a culturally congruent and competent experience to all participants (McClimens et al., 2014).

The project was approved by the Institutional Review Board at Lenoir Rhyne University, Hickory, North Carolina. Single-signature consent was obtained from all participants who volunteered for the QI project prior to initiation of the program.

After consent was obtained, participants were asked to provide contact information and their preferred methods of communication with the project administrators. Each participant was designated a participant number, and a preliminary assessment of the De Jong Gierveld and WHOQOL-BREF surveys was conducted to acquire a baseline score. The questionnaires were stored online, and no identifying information outside of the participant number was collected. Participants were informed that the intervention would begin following the initial assessment and conclude 2 months later, with the De Jong Gierveld and WHOQOL-BREF survey scores being collected again at the end of the program.

Upon implementation of the social isolation and loneliness program, participants received extensive instruction on daily gratitude practices (Bartlett & Arpin, 2019) and contemplative prayer (Knabb & Vazquez, 2018). Participants were provided resources to guide their practice and encouraged to keep a journal during the experience to track their progress. Social media, telephone, and email were employed as means to improve social connectedness with local faith community leaders, who encouraged communication.

Results

A two-tailed Wilcoxon signed-rank test was conducted to examine whether there was a significant difference between initial and final scores for social loneliness, social QOL, and physical health QOL. A non-parametric test was used to avoid distribution assumptions and evaluate the effect that the intervention of faith-based virtual small groups had on social loneliness and social and physical health QOL. The two-tailed Wilcoxon signed-rank test is a non-parametric alternative to the paired samples t-test and does not share its distributional assumptions (Conover & Iman, 1981).

The results of the two-tailed Wilcoxon signed-rank test showed that the intervention had a significant impact on social loneliness based on an alpha value of 0.05 (V = 25.50, z = -1.98, p = .047). This significant reduction in loneliness scores indicates a reduction in loneliness in participants. This indicates that the differences between participants' initial and final social loneliness scores were not due to random variation. The median score of initial social loneliness (Mdn = 0.50) was significantly higher than the median score of final social loneliness (Mdn = 0.00). Figure B1 presents a boxplot of the ranked values of initial social loneliness and final social loneliness.

The same analysis was performed on initial social QOL and final social QOL scores. The results of the two-tailed Wilcoxon signed-rank test were not significant based on an alpha value of 0.05 (V = 33.50, z = -0.04, p = .964). This indicates that the differences between initial social QOL (Mdn = 69.00) and final social QOL (Mdn = 72.00) could be explained by random variation. Figure B2 presents a boxplot of the ranked values of initial social QOL and final social QOL.

Despite the lack of a significant impact upon the social QOL of participants, there was a significant impact on their physical health QOL. The two-tailed Wilcoxon signed-rank test results were significant for this variable based on an alpha value of 0.05 (V = 16.00, z = -2.08, p = .038). This indicates that the differences between initial physical health QOL and final physical health QOL were not likely due to random variation. The median of initial physical health QOL (Mdn = 78.00) was significantly lower than the median of final physical health QOL (Mdn = 88.00). The significant increase in the median score for

physical health QOL indicates an improvement in QOL as it relates to the perceived health of the participants. Figure B3 presents a boxplot of the ranked values of the initial physical health QOL and final physical health QOL.

Discussion

The use of the QI strategy to implement a community-based intervention using faith community frameworks led to significant improvements in perceived loneliness and physical health QOL. The social QOL, however, remained unchanged, which indicates that for those older adults who felt that their social network was inadequate, online faith group meetings were not perceived as improving these social networks. The success of this QI project in terms of the impact on participants' loneliness indicates a potential avenue for healthcare providers to pursue interventions within the community setting to mitigate the impact of loneliness and social isolation on the health of their older adult patients. Coordination within local faith groups and encouragement to participate in the evidence-based practices used in this project represent an innovative approach to providing holistic care as well as an economical means to improve outcomes within the community.

The intervention had limitations for the individuals participating within the program. First, the project measures such as loneliness and QOL are subjective means of evaluation. The improvement or lack thereof could be attributed to any life event, circumstance, or personal bias. Second, the 2 months of intervention and follow up do not exclude the possibility that the intervention effect would diminish over time.

A barrier to the implementation of the QI project was a lack of technological capability among the older adult population. Within the rural setting of this project, all participants were required to have email, access to the internet, and the ability to log onto voice and video conferencing. While all participants were assisted by their prospective group leaders, ease of access to virtual groups was a difficulty that could impact the perception of the program for its participants.

In conclusion, this faith-based virtual intervention for older adults living in a rural setting was successful. The significant decrease in social loneliness and improvement in health QOL indicate that this QI measure is viable for improving the care of older adults. The outcome achieved by this project is encouraging for intervention within the community setting utilizing existing faith frameworks such as the church.

This evidence-based intervention had significant impact on social loneliness and health QOL, indicating that social aspects are essential to maintaining health in older adults. As virtual means of communication continue to evolve, healthcare providers should consider any methods that potentially ease technological barriers for older adults to access and utilize online communication formats. This QI project illustrates that a doctoral prepared nurse practitioner who has evaluated a need within the community, could utilize evidence-based practice to implement and promote positive outcomes in the lives of vulnerable populations.

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Appendix A

Table A1

Randomized Control Studies that address Quality Improvement Strategies in Socially Isolated Older Adults.

Author/Year	Sample Characteristics	Quality Improvement Interventions	Significant Outcomes
Bartlett & Arpin, 2019	42 older adults (80% female, avg age 73, SE=6.43)	Patient education; Gratitude exercise; daily paper survey; Patient financial incentives;	Gratitude negatively correlated with perceived isolation, positive impact on health.
Cavanagh et al., 2013	109 adults (19-51)	Patient education; daily online self-guided mindfulness.	Increased mindfulness with corresponding decreased stress levels, anxiety, and depression.
Saito et al., 2012	60 older adults (avg age 72.6)	Educational, cognitive, and social support program; Telephone survey	Significant positive effect on subjective well-being
Knabb & Vazquez, 2018	102 Christian Adults (Avg age 22.43)	Patient education; Guided prayer, contemplative prayer, Daily Spiritual Exercise (DSE).	Medium effect on perceived stress, increased spiritual awareness.
Morledge et al., 2013	551 adults, 49.1% of whom were age 50-79.	8-week online program including mindfulness, meditation, guided imagery, forgiveness, compassion, and confidence.	Significant stress reduction illustrating viability of online programs across the lifespan.
Spijkerman et al., 2016	2360 adults aged 18-58.	Mindfulness-based Stress Reduction (MBSR), Mindfulness-based Cognitive Therapy (MBCT), Acceptance and Commitment Therapy (ACT), internet based guided programs.	Small but significant effects on depression, anxiety, well-being, and mindfulness. Online Mindfulness Based Interventions (MBIs) shown to be efficacious.
Borji & Tarjoman, 2020	110 adults, aged 65 and over (Avg age 74.34)	Faith based religious intervention program, prayer, gratitude, forgiveness, group discussion.	Implementation of faith-based intervention within the community setting elevates subjective vitality and reduces loneliness.

Appendix B

Figure B1

Ranked values of Initial Social Loneliness and Final Social Loneliness

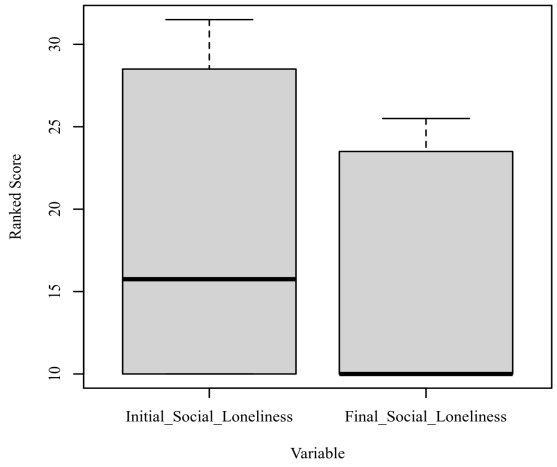


Figure B2

Ranked values of Initial Social QOL and Final Social QOL

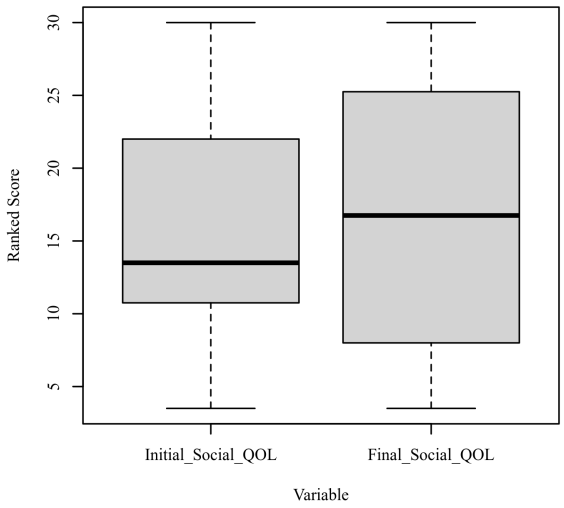
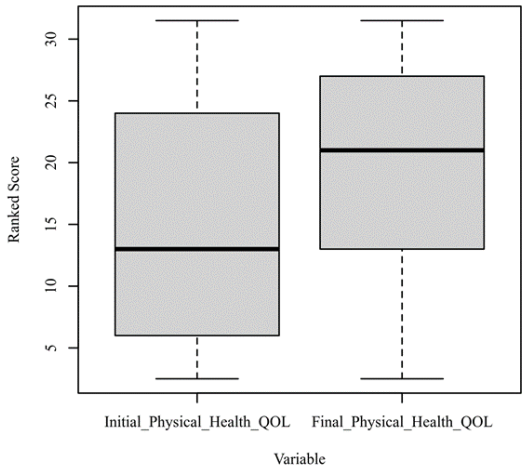


Figure B3

Ranked values of Initial Physical Health QOL and Final Physical Health QOL


Ranked Score
5
10
15
20
25
30
Initial_Physical_Health_QOL
Final_Physical_Health_QOL
Variable