

THE BENEFIT OF INTERGENERATIONAL INTERACTIONS ON GERIATRIC  
PATIENT SATISFATION AND WELL-BEING

By

GABRIELLE MARIE ROWLISON

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Approved by:

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Dr. Elizabeth Glisky  
Department of Psychology

## **Abstract**

This project aimed to address social isolation, decreased morale, and negative perceptions of healthcare in older adult communities such as assisted and independent living facilities by introducing intergenerational interactions as an intervention. This intervention, which took place in Spring 2019, was a component of a course taught by Elizabeth Glisky, PhD of the Department of Psychology. The students of the class visited an assigned elder at three different sites in Tucson, and spent some time interacting with their elders and learning about their lives. The college students then created “Life Story” booklets for the adults with whom they interacted. Questionnaires addressing the older adults’ psychological well-being, level of depressive symptoms, and perception of care they receive from their primary care provider were administered before and after the intervention. There were marginally significant improvements in overall psychological well-being and in the subcategory of autonomy. There were no changes in depression or perceptions of care. Although the main goal of this study was to improve older adults’ perceptions of their relationship with their primary care provider by increasing comfort in interacting with younger adults, we were unable to observe such changes. Possible reasons for this null finding are suggested in the discussion.

**Keywords:** intergenerational interactions, patient-provider relationship, well-being, older adult communities, depression

## Introduction

Social isolation is defined by an objective measure of the quantity of social contacts a person has, while loneliness is a subjective, and often self-reported, gap between one's desired level of social contact and actual level of social contact (Wigfield, Alden, Turner, & Karania, 2018). Objective social isolation is mainly due to aspects of the individual's social network, which is the person's set of social relationships, such as quantity (number of social contacts) and type, which will be explained in the subsequent section. Loneliness, which is also called perceived or subjective social isolation, is often attributed to the lack of relationships the individual deems significant and meaningful. While one is considered objective and the other subjective, social isolation can cause feelings of loneliness—and vice versa—and both can occur simultaneously (Wigfield et al., 2018). Loneliness has been shown to be a predictor of a number of different maladies, including hypertension, increased vascular resistance, irregular sleep patterns, sedentary lifestyle, cognitive decline, and a greater risk for Alzheimer's disease (Cacioppo, Hawkley, Norman, & Berntson, 2011). Social isolation and loneliness, along with the emotional and psychological well-being of the residents of independent and assisted living homes, are topics of concern in psychology, sociology, and geriatric medicine.

Whether social network size or emotional well-being has an effect on geriatric patient satisfaction has been studied by many in these disciplines, and introducing intergenerational social contact as an intervention for these residents has been shown to decrease depressive symptoms (George, Whitehouse, C., & Whitehouse, P, 2011; Hernandez & Gonzalez, 2008), improve self perception (Hernandez & Gonzalez, 2008; Pinguart, Wenzel, & Sö Rensen, 2000), and increase life satisfaction (Gaggioli, Morganti, & Bonfiglio, 2014; Markides, Costley, & Rodriguez, 1981).

The effect of intergenerational interactions on geriatric patient satisfaction has not been studied as much as other factors contributing to geriatric patient-provider relationship, such as depression (La Monica, Oberst, Madea, & Wolf, 1986), self perception (Sun & Smith, 2017), and loneliness (Williams, Haskard, & DiMatteo, 2007). The studies discussed in this literature review will include articles on social isolation and loneliness in assisted living and other institutionalized care facilities for older adults, followed by factors that contribute to geriatric patient satisfaction and the issues in doctor-geriatric patient communication, and will conclude with the effects that intergenerational interactions have on the well-being of older adults.

The goal of this review is to provide the rationale for introducing intergenerational interactions in assisted and independent living facilities as a means to improve geriatric patient satisfaction and geriatric patient-doctor relationships.

## **Background**

### **Social Isolation in Older Adult Communities**

Older adults are at an increased risk of social isolation because of many factors, including the physical and cognitive changes they undergo as they age, which further set them apart from their younger friends and family members (Grenade & Boldy, 2008). People who transfer from aging at home to residing in older adult communities such as independent and assisted living facilities experience a transformation in their social network that often involves a decrease in their social contacts (Grenade & Boldy, 2008). When these communities contain residents with different levels of physical and cognitive abilities, residents tend to dissociate themselves from others different from them (Pirhonen, Tiilikainen, & Pietilä, 2017), or be unable to interact with other residents (Grenade & Boldy, 2008), which contributes to their sense of social isolation. Although residents of these facilities may interact frequently with staff, these encounters tend to be task-oriented and less representative of a social interaction (Marquis, 2002). Therefore, people who have moved into assisted and independent living communities have a further increased risk of social isolation because of the combined effects of their disrupted contact with their current relationships outside the facility, and their lack of affiliation with the other residents and staff inside the facility (Pirhonen et al., 2017).

Studies that looked at sense of loneliness and well-being as a function of social support, network size, and quality have found that loneliness and social network type influenced well-being, sense of hopelessness, and level of depressive symptoms (Golden, Conroy, & Bruce, 2009; Prieto-Flores, Forjaz, Fernandez-Mayoralas, Rojo-Perez, & Martinez-Martin, 2011). In a study conducted by Golden et al. (2009), social network type was defined based on G. Clare Wenger's five support network type model: family dependent (mostly familial relationships),

locally integrated (close relationships with friends, family, and neighbors in their community), local self-contained (characterized by little contact with anyone outside community, but has relationships with neighbors and at least one family member), wider community focused (active relationships with relatives outside of town, mainly children, and few neighbors), and private restricted (very little contact with neighbors and an absence of family in town) (Wenger, 1991).

It was found that both objective social isolation (non-integrative social support type) and subjective social isolation (self-rated feelings of loneliness) together were contributors to psychological well-being, accounting for 70% of the participants with depressive symptoms. They also found that hopelessness was correlated with loneliness, social isolation, and depression (Golden et al., 2009).

Studies that compared community dwelling individuals and those living in residential care facilities (Grenade & Boldy, 2008; Prieto-Flores et al., 2011) found that risk factors contributing to loneliness and social isolation differed between individuals in these settings. A study conducted by Prieto-Flores et al. (2011) found that people living in assisted living homes were twice as likely to report feeling loneliness than people aging in the community. Their sample of participants that dwelled in institutionalized settings (assisted living homes) also had more health problems, such as worse self-rated health status (which includes factors such as pain/discomfort, anxiety, mobility, and self-care), medical conditions, depressive symptoms, and the inability to perform activities of daily living (ADLs) independently. They noted that these are factors that could also contribute to social isolation and loneliness. They also found that depressive symptoms contribute to an interruption of the person's current social relationships, and concluded that the relationship between social isolation and depression is reciprocal (Prieto-Flores et al., 2011).

Overall, the literature indicates that older adults tend to be at increased risk for both social isolation and loneliness, which differ in that social isolation is objective, while loneliness is usually based on subjective reporting (Tomaka, Thompson, & Palacios, 2006). This can be attributed to the physical and mental changes people undergo as they age, and transference into an independent or assisted living facility can further foster these feelings of social isolation and loneliness by disrupting the resident's current relationships (Pirhonen et al., 2017). Social isolation and loneliness can have adverse health outcomes, including depression (Golden et al., 2009; Prieto-Flores et al., 2011), and studies have shown that a lack of social contact and support can predict disease outcomes, such as diabetes, hypertension, heart disease, and stroke (Tomaka et al., 2006). These findings show that social isolation in individuals who are living in assisted and independent living facilities is a growing concern, and that there may be health benefits in interventions involving social interaction.

### **Geriatric Patient Satisfaction and Patient-Provider Relationship**

Geriatric patient satisfaction is of concern to geriatric medicine, and can have effects on other aspects of society. A negative interaction with a health professional can lead to fewer doctor visits and non-adherence to medication, which could result in poorer health outcomes and in turn higher healthcare costs (Iuga & McGuire., 2014). Since aging individuals tend to have more medical conditions, they utilize the healthcare system more than other age groups. Therefore, medical non-adherence in older patients can have a large impact on society. Furthermore, a dissatisfaction with providers may discourage patients from engaging in preventative and regular medical services, which in turn could have negative health outcomes.

As stated before, patients who are socially isolated and are lonelier have an increased risk for cardiovascular issues, depression, anxiety, Alzheimer's, and living a sedentary lifestyle. The

health status of a patient has been shown to have an impact in their satisfaction with health care. A study examining how health status in older patients changes throughout a hospital stay, found that patients who had similar health statuses upon discharge from the hospital, had similar satisfaction in the care they received, regardless of what their health status was upon admission. The researchers were able to conclude that the healthier a patient is, the more likely they are to report being satisfied with their medical care (Covinsky, Rosenthal, & Chren, 1998).

Communicating with older patients presents a set of challenges that differs from communicating with younger patients, because older patients tend to have more medical issues that are unique to their population. The aging process in itself can contribute to healthcare-seeking behaviors in geriatric patients. A study examining the relationship between older adults' self-perception during the aging process and how often they seek medical care, found that adults that believed and identified with more negative self-aging stereotypes had more barriers to care, and their care was more likely to be delayed. These healthcare delays were caused by three main factors: limited healthcare access, being too busy to visit the doctor, and a dislike for visiting the doctor. The authors' reasoning behind this correlation was that self-perception could affect the decision making process that patients go through when deciding whether they want to see a doctor (Sun & Smith, 2017).

Differences in how physicians interact with patients based on age has also been studied by social scientists and physicians. Researchers have found that older patients tend to have a harder time keeping the attention of their physician (Greene, Adelman, Charon, & Hoffman, 1986), and that physicians will tend to accredit their older patient's concerns to the "natural processes" of aging (Adelman, Greene, & Ory, 2000). In a study that aimed to discover factors that determine older patient satisfaction with an initial medical encounter with a physician, it was

found that geriatric patient satisfaction was correlated with the physician's level of support on issues that were brought up by the patient, the length of the visit, physician satisfaction, and shared laughter between the patient and doctor (Greene, Adelman, Friedmann, & Charon, 1994).

A large difference in age between the doctor and the patient can cause barriers in communication, and patients may not feel like their needs are being addressed. Patients who feel as though they are not being supported by their physician tend to be dissatisfied with a medical encounter. Patients who are dissatisfied with the care they receive from their providers may tend not to partake in regular preventative medical services, such as screening. The lack of participation in preventative measures may in turn contribute to negative health outcomes, which can further feed into the cycle of social isolation, depression, and negative encounters at the doctor's office. Introducing intergenerational interactions can increase the sense of comfort for a geriatric patient interacting with health care professionals, who are younger. As explained before, social isolation can increase the risk of depression, which can contribute to a disruption of the individual's current social relationships, reduce the maintenance of these relationships, and even hinder the ability to form new relationships. This can contribute to an inability to communicate with the patient's own health care provider, which can lead them to feel as though their needs are not being met.

### **Intergenerational Interactions as an Intervention**

Many studies have looked at the effects of intergenerational interactions and social support from younger family members, and found benefits including a decrease in depressive symptoms (George et al., 2011; Hernandez & Gonzalez, 2008), increase in life satisfaction (Gaggioli et al., 2014; Markides et al., 1981), and an increase in positive self-perception

(Hernandez & Gonzalez, 2008, Pinquart et al., 2000). These studies included older participants aged 65 or older interacting with volunteers varying in age, from five years to college-age.

Some studies involved interactions between older participants and young children, in which they participated in creative activities such as puppet making and writing stories (Pinquart et al., 2000). Along with looking at the effects that these interventions have on elders, the children's perspectives of the older participants were also recorded. A study found that, after a group of 8-11-year-old children spent the day writing and performing puppet shows with seniors, the older participants had improved ratings of the children, and the children had improved ratings of the seniors (Pinquart et al., 2000). In another study involving young children, conducted over the course of a year, young children were asked before and after interacting with older adults in a nursing home, "What do old people do?" Before the intervention, half of the children used negative descriptors to describe the older adults, and after the intervention, all of the children used positive descriptors (Holmes, 2009). Older adults in a study in which they took part in activities such as singing, reading, and writing activities with children aged 5-14 years had decreased levels of stress and depression after the intervention (George et al., 2011). Studies involving group reminiscence, in which the older adults told the younger participants about their lives, have found that, after the intervention, the older adults reported significantly lower values of loneliness and increased values of quality of life. The children also had improved perceptions of elders (Gaggioli et al., 2014).

Studies have also shown that intergenerational social support from younger family members can have a positive impact on elder well-being (Mutran & Reitzes, 1984); however, residents of independent and assisted living facilities may lose these familial contacts in transitioning from aging at home to aging in these facilities. There is support from a number of

studies, including literature reviews and interventional studies, that introducing intergenerational social interactions to older community-dwelling and institutionalized-living adults shows benefits in the elder's well-being, and that intergenerational social support can even offset some negative health outcomes (Antonucci, Jackson, & Biggs, 2007). Most of these studies suggest intergenerational support programs as a means to improve the well-being of residents in assisted and independent living facilities. A review on different "intergenerational learning" programs and the effectiveness of these programs suggest that the universities can play a role in implementing these intergenerational learning programs (Newman & Hatton-Yeo, 2008).

Intergenerational interactions as an intervention directly address the issue of social isolation and loneliness in older adults by introducing social interactions. Having the adults participate in creative activities with younger people, especially reminiscence and mentoring activities in which the adults are giving life advice to the younger participants, have been shown to increase self-esteem and life satisfaction. Not only has it been found that interventions involving intergenerational social contact can have health benefits in older adults, introducing these interactions can improve an older adult's ability to communicate with people of other age groups. This increased comfort in communicating with younger people can improve their communication with their health care provider, which in turn can lead to a more positive medical encounter.

### **Conclusion**

Social isolation and loneliness in older adults, especially older adults living in institutionalized facilities, is of growing concern in the fields of psychology, sociology, and geriatric medicine, and most studies looking at this issue suggest that interventions involving social interaction would provide a means to alleviate negative symptoms seen in this population.

Some of those negative symptoms associated with social isolation also contribute to low geriatric patient satisfaction, and negative encounters with the physician. Interventions involving intergenerational interactions have been found to improve well-being in older adults, and decrease the level of self age-stereotyping (Hernandez & Gonzalez, 2008). However, using intergenerational interactions as an intervention to improve patient satisfaction and geriatric perception of healthcare has not been studied.

The present study proposed involved introducing college students to the residents of two assisted and one independent living facilities in the Tucson community. The students interacted with and learned about the lives of these residents, and created “Life Story” booklets based on the residents of these facilities. Pre- and post-intervention questionnaires were administered, including Carol Ryff’s psychological well-being questionnaire, the Geriatric Depression Scale, and a questionnaire measuring the quality of the participants’ relationship with their primary care provider, including questions such as, “My primary care provider understands me,” and “My primary care provider is dedicated to helping me.” The goal was to explore whether a relationship exists between intergenerational interactions as an intervention and the participants’ perception of the care they receive from their primary care provider.

The reasoning behind this study was as follows: Given that social interactions, specifically intergenerational social interactions, have been seen to decrease depressive symptoms and increase psychological well-being, and that depression and decreased levels of well-being can contribute to a negative interaction with a physician, introducing intergenerational interactions may improve the older participants’ ability to communicate with their provider, who is most likely younger than they are (Haug & Ory, 1987). Ageist stereotypes, whether augmented by the physician or accepted in the elder, can affect the way health

information is communicated between the doctor and the patient, and being aware of these stereotypes can enhance this communication (Sparks-Bethea & Balazs, 1997). The goal would be to increase comfortability in older adults in communicating with younger people and people outside the community in which they live. This increase in comfortability might help the participants feel more comfortable talking to their doctor about certain topics and voicing their health concerns, which might be reflected in better evaluations of their relationship with their primary care provider.

## Methods

### Participants

Participants included nine older adults from St. Luke's Home and nine older adults from the Fountains at La Cholla Senior Living (Age:  $M = 87$ ,  $SD = 7.57$ ). St. Luke's Home houses low income residents and provides subsidized housing, while The Fountains houses middle to high income residents. All participants were given the Montreal Cognitive Assessment (MoCA) to screen for dementia (Nasreddine et al. 2005). We used a relatively liberal criterion ( $M = 21.44$ ,  $SD = 2.94$ ), reflecting primarily the ability of the individuals to engage in normal conversation and tell their life story. Demographics for the participants are shown in Table 1.

*Table 1. Demographics of Older Adults*

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Age $M (SD)$	87 (7.57)
Gender % male (n)	44.44% (8)
Years of Education $M (SD)$	15.5 (3.67)
Ethnicity	
Caucasian	17 (94.4%)
Hispanic	1 (0.6%)
MOCA $M (SD)$	21.44 (2.94)

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### Materials

All participants completed the following questionnaires before and after the intervention.

The Geriatric Depression Scale (GDS) is a questionnaire with thirty "yes or no" questions, each inquiring about a different symptom of depression. One point is allotted for every depressive symptom the participant endorses. A score between 10 and 19 is suggestive of

depression, while a score greater than or equal to 20 is almost always indicative of depression. A normal score is considered between 0 and 9.

The Ryff Psychological Well-being Scale (Ryff) consists of forty-two statements in which a number between 1 and 6 is given to each statement, 1 for “Strongly Disagree,” and 6 for “Strongly Agree.” Higher scores are associated with better well-being. Well-being, in the context of this scale, is defined by sufficiency in the Six Dimensions of Well-being: Autonomy, Environmental Mastery, Personal Growth, Positive Relations, Purpose in Life, and Self-acceptance (Ryff, 1989). The total score is out of 252 points.

The Patient Doctor Relationship Questionnaire (PDRQ-9) consists of nine statements about the participant’s perception of care received from their primary care physician (PCP). The individual rates each statement from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). Higher scores correspond to a better relationship with the participant’s PCP.

### **Procedure**

Between October and December 2008, prior to the intervention, all participants completed the three questionnaires. The intervention took place between January and April of 2019, and was part of a course titled “Adult Development and Aging” taught by Elizabeth Glisky, PhD of the University of Arizona, Department of Psychology. The students enrolled in this course, and participated in pairs, visiting with the older adults in each of the two locations, first at St. Luke’s and then at The Fountains. Each pair of students was assigned an older participant at each location, and spent three one-hour visits with each elder, during which the elders told the students about their lives, while the students asked questions. The interactions were recorded and uploaded to a file-sharing software, accessible only to the professor, graduate teaching assistant, and student pair. The students were then tasked with writing a biography of their assigned elder

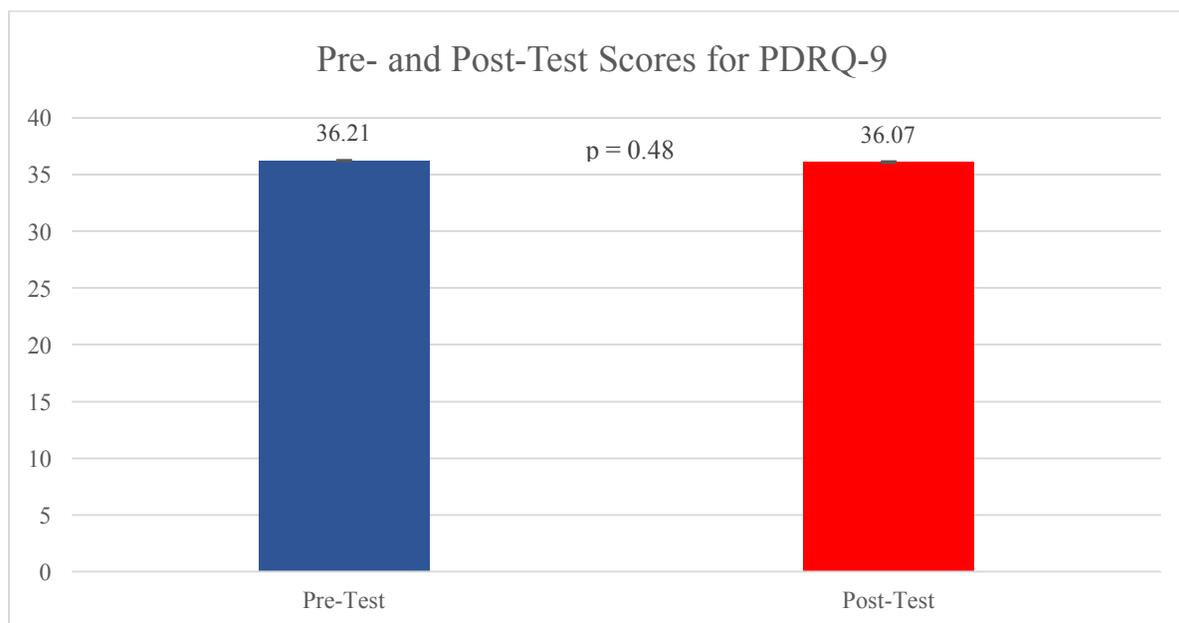
based on the three interviews, and their biographies were printed in a laminated booklet, called a “Life Story” booklet. These booklets were then delivered to their respective elder for them to keep. After the intervention but before the participants received their “Life Story” booklets, the GDS, Ryff, and PDRQ-9 were administered again to the group. This occurred approximately 4 months after they had previously completed these questionnaires.

## Results

A within-group t-test was used to analyze the pre- and post-intervention questionnaire scores. This was used to test for differences between scores before and after the intervention. Of the 18 participants that participated in the intervention, four had to be excluded from the PDRQ-9 analysis, five had to be excluded from the GDS and four of the Ryff subcategories (Autonomy, Environmental Mastery, Positive Relations, and Purpose in Life), six from the Personal Growth Ryff subcategory, and nine from the Self-Acceptance Ryff subcategory and the total Ryff score. Two of the exclusions were due to a desire to withdraw from the study, one could not be reached for post-testing, and the rest of the exclusions were due to omitted questions.

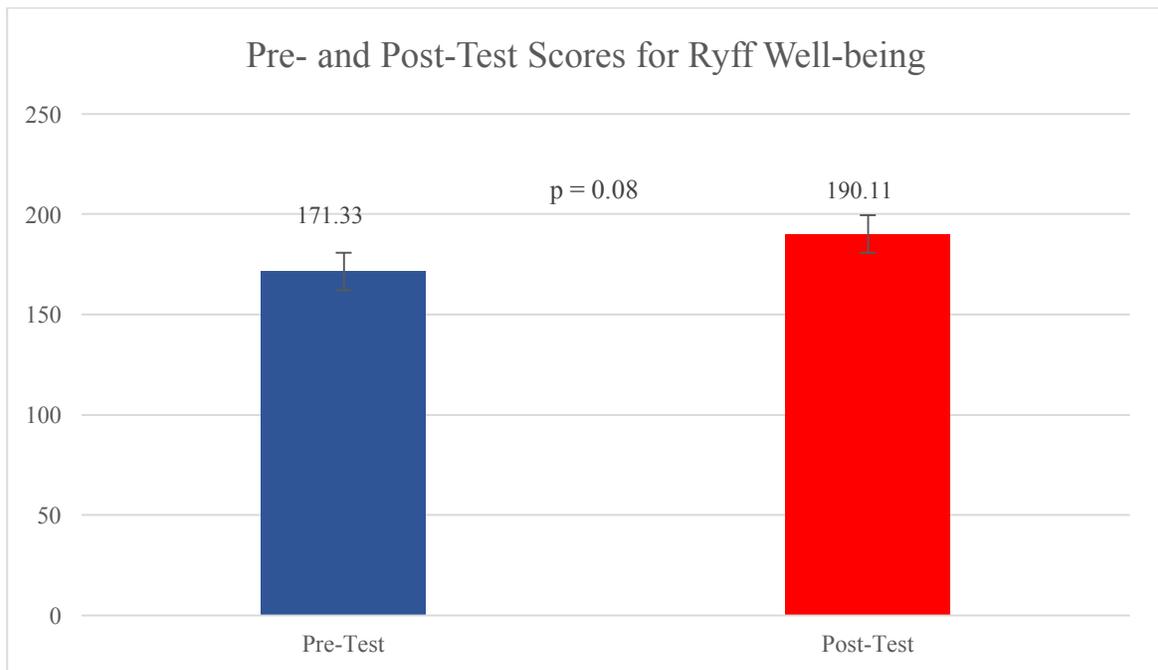
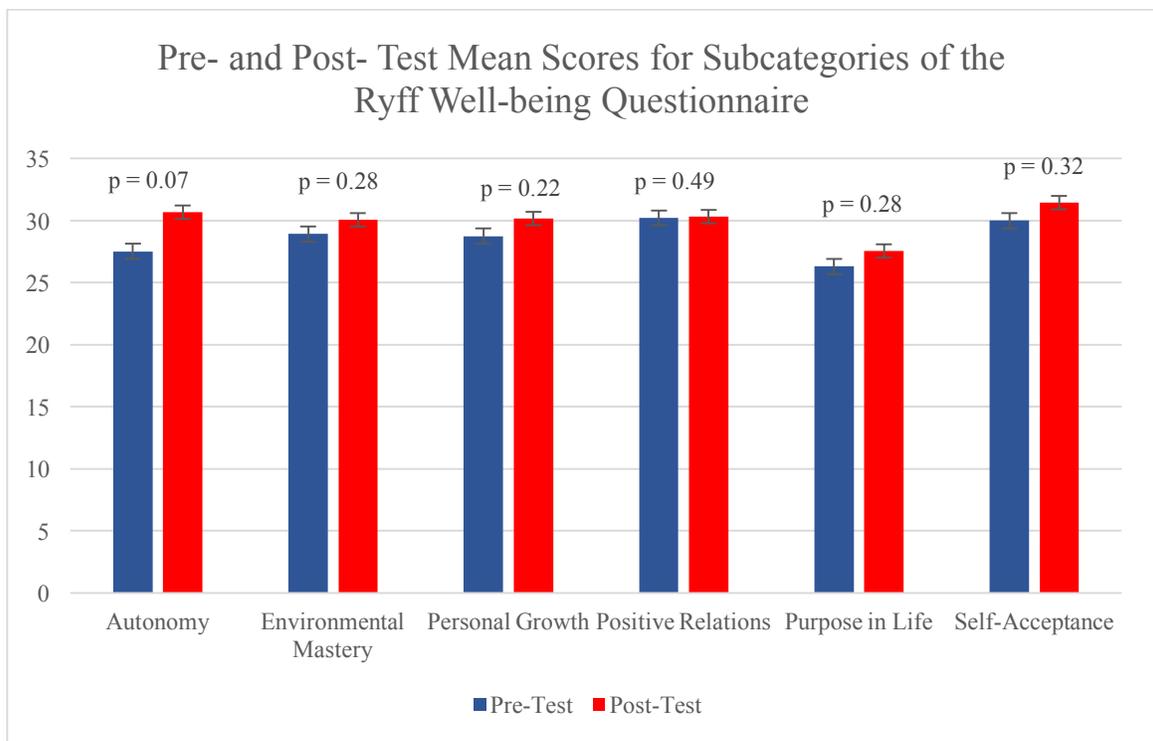
### **Patient-Primary Care Provider Relationship**

Contrary to our hypothesis, there were no significant differences in PDRQ-9 scores from pre- to post-testing, ( $M = -0.14$ ,  $SD = 2.37$ ,  $t(13) = 0.06$ ,  $p = 0.48$ ,  $d = 0.02$ ) (see Figure 1). Scores on this test range from 9 to 45, with higher scores indicating a better relationship with the participant's primary care provider. The pre-intervention scores ranged from 21 to 45 while the post-intervention scores ranged from 29 to 45. The largest improvement observed was 11 points, while the largest decrease in score observed was 12 points. One participant omitted two questions while completing the pre-intervention questionnaire, so a proportion adjustment was performed for that participant's score.

**Figure 1**

### **Psychological Well-being**

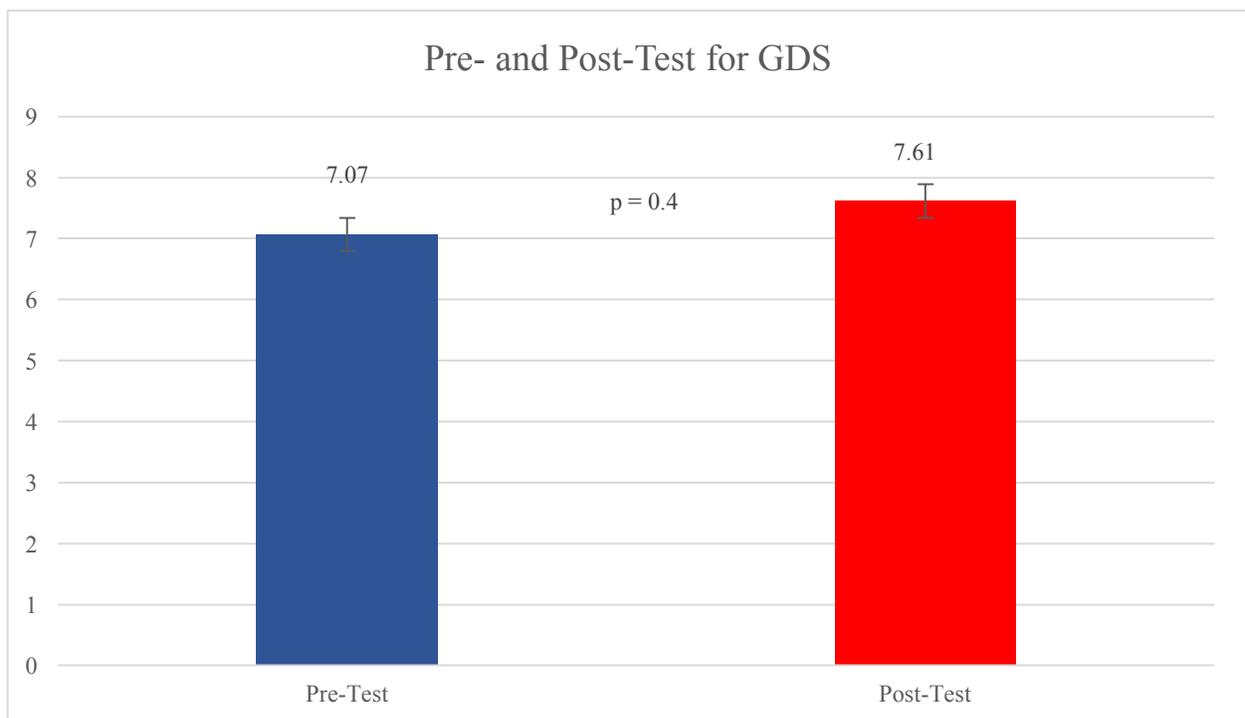
An improvement was seen in every subcategory and the total score for the Ryff Psychological Well-being questionnaire, though none met the standard of significance ( $p < 0.05$ , see Figure 2). The total score increased by an average of 18.78 points ( $SD = 12.23$ ,  $t(8) = -1.53$ ,  $p = 0.08$ ,  $d = 0.72$ ). Note, however, that only 9 individuals completed the whole Ryff questionnaire. Observed mean changes for each subcategory were as follows (see Figure 3): Autonomy ( $M = 3.15$ ,  $SD = 2.06$ ,  $t(12) = -1.53$ ,  $p = 0.07$ ,  $d = 0.6$ ), Environmental Mastery ( $M = 1.15$ ,  $SD = 1.91$ ,  $t(12) = -0.6$ ,  $p = 0.28$ ,  $d = 0.24$ ), Personal Growth ( $M = 1.42$ ,  $SD = 1.78$ ,  $t(11) = -0.8$ ,  $p = 0.22$ ,  $d = 0.33$ ), Positive Relations ( $M = 0.08$ ,  $SD = 2.72$ ,  $t(12) = -0.03$ ,  $p = 0.49$ ,  $d = 0.01$ ), Purpose in Life ( $M = 1.23$ ,  $SD = 2.1$ ,  $t(12) = -0.59$ ,  $p = 0.28$ ,  $d = 0.23$ ), and Self-Acceptance ( $M = 1.44$ ,  $SD = 3.09$ ,  $t(8) = -0.47$ ,  $p = 0.32$ ,  $d = 0.22$ ). Scores in each subcategory range from 7 to 42, while the total score ranges from 42 to 252, with higher scores indicating higher well-being. Of the 6 subcategories, only Autonomy showed a marginally significant improvement.

**Figure 2****Figure 3**

### Number of Depressive Symptoms

The GDS scores did not change following the intervention ( $M = 0.54$ ,  $SD = 2$ ,  $t(12) = -0.27$ ,  $p = 0.4$ ,  $d = 0.11$ ). GDS scores range from 0 to 30, with higher scores indicating more symptoms of depression. The largest observed increase in depressive symptoms was 6, while the largest observed decrease in depressive symptoms was 4. GDS scores can fall into one of three severity categories: 0-9 is considered normal, 10-19 suggests mild depression, and 20-30 suggests severe depression. During pre-intervention testing, 4 of the 13 participants fell in the “mild depression” category, while the rest fell under “normal.” During post-intervention testing, 6 of the 13 participants fell in the “mild depression” category, while the rest were “normal”.

**Figure 4**



## Discussion

Overall, this study did not find any significant effects of the intervention on perceived doctor-patient relationship, psychological well-being, or number of depressive symptoms. Although the PDRQ-9 and GDS scores did not change following the intervention, the scores for all six of the psychological well-being subcategories increased somewhat, along with the total score, albeit not significantly. However, the overall Ryff score and the score for the subcategory of Autonomy were marginally significant ( $ps = .08/.07$ ), despite the small numbers of participants for which we were able to obtain data. Furthermore, the calculated Cohen's  $d$  coefficients for the overall Ryff score and the Autonomy subcategory indicated medium effect sizes,  $d = 0.72$  and  $d = 0.6$ , respectively. This might suggest that some of the older people may have felt a renewed sense of control, accomplishment and well-being as a result of relating and perhaps re-evaluating their life stories. Our intervention was also quite short, just three hours of personal contact. It is possible that given a longer intervention with more frequent contacts between the young people and the elders, we might observe greater improvements in the psychological well-being of older adults in assisted and independent living facilities. This is consistent with the current literature, which supports an increase in psychological well-being after introducing intergenerational interactions as an intervention to older adults (Gaggioli et al., 2014; George et al., 2011; Hernandez & Gonzalez, 2008; Markides et al., 1981; Mutran & Reitzes, 1984; Pinguart et al., 2000).

Our primary goal in the present study was to see whether we could see benefits in the perceived relationship between older people and their primary care provider. However, we did not observe any changes in the PDRQ-9. This may be attributable to a number of factors. The literature indicates that older patients who have less health issues (Covinsky et al., 1998) and

more positive perceptions of themselves (Sun & Smith, 2017) tend to be more satisfied with a medical encounter. Most of the older people in this study did not have serious health issues, and in fact, some obtained the highest possible score (45) on the first PDRQ-9 test, indicating an extremely positive relationship with their medical service provider. It could be, therefore, that the participants did not have much room for improvement before the intervention even began.

A possible alternative way to improve geriatric patient satisfaction and older patient comfort in a medical encounter might be to introduce medical students as the young people in this intervention. If older adults became more comfortable talking to younger aspiring medical professionals in a casual setting, it might enable them to have a more effective and comfortable conversation when seeing their physician. An intervention in which older adults interacted directly with medical students might have yielded stronger findings.

A very small but insignificant increase was seen in the scores for the GDS (0.54), suggesting that depressive symptoms did not change following the intervention. We had expected that symptoms of depression might decline after the intervention, but it appeared from the quantitative measure that this was not the case. Verbal and written comments made by the participants while testing suggested that the participants may have been answering the questions based on things that were happening in their lives at the moment they were tested, rather than things they were feeling over the longer term. In addition, although this scale was developed specifically for geriatric participants, there are a few questions, such as “Is your mind as clear as it used to be,” “Do you feel full of energy,” “Is it hard for you to get started on new projects,” and “Have you dropped many of your activities and interests,” that participants tend to answer based on their physical abilities, and their responses may not in fact be a sign of depression.

## Limitations

It is worth discussing ways in which this study could have been improved. Like most studies, a larger sample size than  $n = 18$  would be beneficial; however, given the time constraints and the resources given, 18 was all that was possible. Even though this study was conducted over the course of a semester, the participants only got to interact with the students three times, each encounter occurring weekly and only lasting 45 minutes to an hour. Many of the participants had not seen their primary care physician during the time of the intervention, and had no new experiences to reflect on when taking their post-intervention test. If one were to recreate this study or use this study as a model, increasing the frequency, number, and length of the visits by the younger students may enhance the effects of the intervention and perhaps limit the influence that other confounding variables may have on the participants' answers to their post-intervention questionnaires.

A major issue with data collection in this population was the actual completion of the questionnaires. For each of the questionnaires—the GDS, the Ryff, or the PDRQ-9—there was at least one participant that did not finish, and most of the participants could not complete the Ryff questionnaire in a single session and had to be revisited to finish the missed questions. Nine of the participants had to have their Ryff responses excluded from the data analysis because they could not be reached in time to complete them. These participants had complete PDRQ-9 and GDS questionnaires, which were used when analyzing those responses. The Ryff questionnaire was the longest in the packet: 42 questions. The small font size and the close proximity of the questions made the questionnaire difficult for older adults to complete. Each question also required the participant to rate a given statement 1 (for “Strongly Disagree”) to 6 (for “Strongly

Agree”), and given the length of the questionnaire, it is also possible that participants forgot the directionality of the ratings and put something they did not actually mean.

The pre-intervention questionnaires—but not the post-intervention questionnaires—were given with a series of several other questionnaires and tests for other studies. The Ryff and the PDRQ-9 were placed at the end of the packet, and it is possible that participants may have felt fatigued toward the end of the 2-hour long packet. This may have been the case for a few participants, whose Ryff scales contained several of the same ratings in a row and some unanswered questions. Many of the participants explicitly expressed how tiring the pre-testing was, and two even refused to complete the post-testing because of this.

Although the Ryff questionnaire addresses psychological well-being from a number of different perspectives with its six subcategories, this questionnaire, in its present format, was not the best option for a population of participants that included those at the oldest ages. Perhaps a reprinted version in which the questions appear larger on the paper, or even an abbreviated version with less questions would have increased compliance in the participants.

Along with recording quantitative data by means of scoring the questionnaires, the comments participants made in response to some of the questions they received were also recorded. For a few of the participants, some of the questions were answered based on other occurrences happening in their lives, instead of what the participant actually felt about themselves. For example, one of the questions on the GDS asks “Are you afraid that something bad is going to happen to you?” One of the participants kept trying to answer the question in reference to a family member who was in the hospital, and wanted to answer the question as “Yes.” When possible, participants were redirected to solely focus on themselves and how they felt about their lives. It is possible that some of the participants who completed the

questionnaires by themselves had this mindset when answering the questions, and their responses may not have been a true reflection of themselves, but rather a reflection of what was currently happening in their lives and to the people they love. As stated above, increasing the frequency, number, and length of time of the interactions between the students and the elder participants may also reduce the potential influence of outside factors.

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