The Role of Health Congruence in Functional Status and Depression

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Few studies have attempted to examine the meaning of health congruence, particularly in the oldest old. Participants were drawn from a longitudinal study of the oldest old (N = 151; M = 90 years). Dichotomized objective health was cross classified with dichotomized subjective health, producing four health congruence groups: good health realists, poor health realists, optimists, and pessimists. Both good health realists and pessimists had good objective health, yet pessimists had the highest depression, lowest functional status, and frequent reports of hospitalization. By contrast, the poor health realists and optimist groups had poor objective health, but the optimists had better outcomes on depression. This suggests that discrepancies between objective and subjective health may have significant implications for health outcomes.

In this investigation, we examine the congruence between subjective and objective health in a sample of the oldest old. Specifically, we cross-classified participants’ subjective health ratings with their objective health status to determine congruence between subjective and objective ratings and whether patterns of congruence are related to depressive symptoms, functional status, and health care utilization.

Self-rated health was first established as a unique predictor of mortality by Mossey and Shapiro (1982) and is now one of the most widely used constructs in research on older people. Many studies across various samples have been able to replicate self-rated health as a strong predictor of mortality, even when established health correlates are controlled for (see Idler & Benyamini, 1997). Research documenting the relationship between self-rated health and mortality has been growing rapidly, and, consequently, health perceptions have been established as a reliable predictor of future health status (Idler & Benyamini, 1997). Specifically, individuals who rated their health as poor had between 1.5 and 3 times greater risk of mortality when they were compared with individuals who rated their health as excellent (Menec, Chipperfield, & Perry, 1999). In their review, Idler and Benyamini (1997) reported that 23 of the 27 examined studies showed a “dose-response pattern.” That is, individuals who rated their own health as poor had the highest mortality rate; this rate was lower for those who endorsed fair health, and it was least for those endorsing excellent health. This pattern of results was significant even when other known health risk factors were controlled for.

Though clearly informative, an individual’s self-rated health is not always in line with objective measures of his or her health. Some studies have shown that, in older adults, there is quite a disparity between objective and subjective health (Borawski, Kinney, & Kahana, 1996; Chipperfield, 1993). In fact, some studies suggest that, despite declining objective health and functional status, participants continue to rate their health positively (Cockerham, Sharp, & Wilcox, 1983; Ferarro, 1980; Maddox & Douglass, 1973; Tornstam, 1975). For example, Van Doorn (1999) found that, among participants who had significant health problems, 58% felt that they were in excellent, very good, or good health. However, other studies show that older adults are prone to rating their health as worse than their objective measures would indicate (Blazer & Houpt, 1979; Goldstein, Siegel, & Boyer, 1984). Levkoff, Cleary, and Wette (1987) found that, compared with middle-aged adults, older adults perceived their health in a more pessimistic manner.

There are several explanations that can address reasons for differences in subjective and objective health. Idler and her colleagues (Idler & Benyamini, 1997; Idler, Hudson, & Leventhal, 1999) speculate that self-rated health may be tapping into a more holistic view of health. For example, self-rated health may serve as a summation of such health-related experiences as risky health behaviors, emotional or spiritual variables, severity of illness, and symptoms not yet diagnosable. From this explanation, one can see that subjective ratings of health may be a broad index of health, which might explain why it does not match more narrowly defined measures of objective health.

Self-assessments of health may also differ from objective health as a result of comparisons of one’s own health to that of others. Wills (1981) hypothesized that persons dealing with health problems may compare their health with a sicker individual to make themselves feel better. This downward comparison may lead people to feel more optimistic about their health because they are viewing their health in comparison with someone who is worse off. Upward comparison, which involves evaluating one’s health with someone who is faring better, has also been hypothesized to facilitate problem-focused coping through strategies of self-improvement (Taylor & Lobel, 1989). Other theories have indicated that both upward and downward comparisons can have a negative or positive effect, depending on whether one believes that his or her health will improve (Wood & VanderZee, 1997) and how one interprets the comparison (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990).

Although a number of studies have examined the concept of self-rated health, few have specifically examined the congruence between subjective and objective health, and none have examined this in the oldest old. The relation of subjective health
to objective health assessments was first examined by Maddox (Maddox, 1962; Maddox & Douglass, 1973), and recently this concept was termed “health congruence” by Chipperfield (1993). In that study, Chipperfield (1993) utilized a self-rated health measure asking participants to rate their own health compared with others their age, and she cross-classified this with self-reports of diseases and chronic health problems. Results from this study showed that older adults (average age of 75 years) tended to overestimate their health and that this over-estimation of health was linked with longevity and survivorship. Similarly, in another study, Borawski and colleagues (1996) found that older adults (average age of 80 years) who were classified as health optimists, when compared with poor health realists, were less likely to die within a 3-year period. These authors considered health optimists as participants who rated their own health better than their physical health status, whereas those who rated their health accurately were classified as health realists. Though sparse, the extant literature on the congruence between subjective and objective health has shown it to be a promising and important avenue of research.

The relation of subjective and objective indicators of health has potential relevance for several areas, including depression, functional status, and health care utilization. People who are more pessimistic about their health, despite their objective health status, may be prone to depressive feelings, whereas, conversely, optimism about one’s health, even in the face of significant objective health problems, might be associated with fewer depressive feelings (Peterson & Bossio, 1991). Research on depression indicates that rates of major depression are relatively low in later life, though they rise with advancing age (see, e.g., Paevaerinta, Verkoniemi, Niinistoe, Kivelae, & Sulkava, 1999). Mild symptoms, however, are quite common, with the prevalence rates of minor depression ranging from 12% to 18.9% (Paevaerinta et al., 1999; Xavier et al., 2002). Depression in older adults has been associated with increased mortality (Blazer, Hybels, & Pieper, 2001; Lavretsky et al., 2002), lower self-reports of physical ability, lower physical performance (Blazer et al., 2001; Pennix, Deeg, van-Eijk, Beekman-Aartjan, & Gurianinik, 2000), lower self-rated health (Blazer et al., 2001; Han, 2002), and poor physical health (Paevaerinta et al., 1999). These findings suggest that self-rated health may be an indicator for health outcomes as well as depression. However, to our knowledge, there are no studies that have examined whether a lack of congruence between objective and subjective health is associated with depression.

Functional status, which is the amount of difficulty one has with performing actions in daily life, has also been associated with mortality (Harris, Kovar, Suzman, Kleinman, & Feldman, 1989) and has been used as a key element in determining quality of life (Bowling, 1991). Physical abilities gradually decline with age, with the oldest old having the most disabilities and functional limitations (Andersen-Ranberg et al., 1999; Nybo et al., 2001). Hoeymans, Feskens, Kromhout, and Van Den Bos (1997) found that functional status had an independent effect on self-rated health, even though a large part of the effects of functional limitations were mediated through the association with disabilities. Specifically, these researchers found that disability level was associated with self-rated health, but this relationship weakened with increasing age to the point of nonsignificance in the oldest old. They observed that participants based their subjective health evaluations only on current levels of disability and did not take into account past disabilities. This finding may explain, in part, the tendency for older adults to rate their health optimistically (Cockerham et al., 1983; Ferarro, 1980; Maddox & Douglass, 1973; Tornstam, 1975).

In turn, self-rated health may also have important implications for functional status. For example, Idler and Kast (1995) found self-rated health to be strongly associated with changes in functional status. That is, participants who reported themselves in poor health at baseline were close to two and a half times more likely to experience declines in functional status (up to 6 years later) when compared with participants who rated their health as excellent. This finding showed the strongest effects among people who were not disabled at baseline but who declined in functional status at subsequent follow-ups. These authors suggest that people who rate their health more pessimistically have an increased risk for functional decline.

Finally, self-rated health has also been associated with health care utilization. Those who rate their health poorly tend to have increased health care utilization (Blaum, Liang, & Liu, 1994; Mawby, Clark, Kalucy, Hobbin, & Andrews, 1996). More specifically, poor self-rated health has been associated with more physician visits (Mutran & Ferraro, 1988), hospitalizations (Mutran & Ferraro, 1988; Weinberger et al., 1986), nursing home placements (Weinberger et al., 1986), and prescriptions (Rosholm & Christensen, 1997). In a recent study, Menec & Chipperfield (2001) found that older adults who rated their health as “fair” or “bad–poor” had more frequent physician visits and more medical tests, and they were more likely to be hospitalized when compared with those who rated their health as “excellent.” These findings were substantiated even when objective health indicators, morbidity, functional status, and health care use in the past 12 months were controlled for. Given the relationship between self-rated health and health care utilization, the current investigation also sought to determine whether congruence between subjective and objective health was related to health care utilization.

The specific aims of our study are as follows: (a) to describe the congruence or incongruence between self-rated health and objective health in a sample of the oldest old; (b) to investigate whether the congruence between self-rated health and objective health is associated with elders’ level of depression and functional status; and (c) to describe the health care utilization within each classified group.

**METHODS**

**Participants**

This study was part of a larger ongoing longitudinal investigation (NONA) examining disability in the oldest old. Using the Swedish population registry, we randomly selected 100 people aged 86, 100 people aged 90, and 100 people aged 93–95 who lived in the city of Jönköping and surrounding areas, and we asked them to participate in the NONA study. Distinct segments of the oldest old were targeted to facilitate age-group comparisons within the larger study. Of the 300 persons contacted to participate in the study, a total of 157 persons agreed to participate, yielding a response rate of 52%. Of the other 143 persons contacted, 18 were deceased,
Participants were interviewed by one of three nurses in the fall of 1999 at their place of residence, including ordinary housing and institutional settings (mainly service apartments). A total of 157 older adults participated in the study; however, data from 6 participants were not used in the present analyses, as these individuals did not complete either the self-rated health or the objective health items. Consequently, the current study was conducted with 151 older adults who had complete data, and these participants ranged in age from 86 to 95 years with a mean age of 90 years. A majority of the sample were women (71%) and averaged 7 years of education. These demographic characteristics are consistent with other studies of the oldest old (Femia, Zarit, & Johansson, 2001; Van Exel et al., 2002).

**Measures and Procedures**

**Subjective health.**—We obtained subjective, global self-rated health by asking respondents, “How would you rate your overall health?” Choices were (a) good, (b) fair, and (c) poor. We created a dichotomous variable of self-rated health by combining the “fair” and “poor” categories. We selected this cutoff on the basis of previous, similar studies of self-rated health (e.g., Van Doorn, 1999).

**Objective health.**—During the interview, the nurse interviewers conducted a thorough health history, obtaining information about current illnesses and problems. We then classified these health problems by using the severity hierarchy developed by Gold and colleagues (2002). In this classification scheme, severity of health conditions was assessed by a five-member expert panel of physicians. Specifically, conditions were rated as “life threatening,” “somewhat life threatening,” or “not at all life threatening.” This method avoids the major drawback of simple summation measures of health conditions (e.g., summing the number of endorsed health conditions), which treat all conditions as equal in their seriousness. We then divided the sample into groups of individuals with good and poor objective health. Following the main criteria used in Borawski and colleagues (1996) and Van Doorn (1999), we used the following criteria for classifying an individual as having poor objective health: (a) having one or more life threatening, very severe health conditions; (b) having two or more somewhat life threatening, severe health conditions; or (c) having frequent and intense shortness of breath. We classified people who did not have these problems as having good objective health.

**Health congruence.**—We created a measure from the dichotomous measures of objective and subjective health. We created four possible categories: (a) people with good objective and good subjective health, who are called “good health realists”; (b) people with poor objective and subjective health, who are called “poor health realists”; (c) people with poor objective but good subjective health, called “health optimists”; and (d) people with good objective but poor subjective health, called “health pessimists.”

**Depressive symptoms.**—We measured depressive symptoms by using the Center for Epidemiologic Studies—Depression (CES-D) scale (Radloff, 1977). The CES-D scale is a widely used measure of depression with well-established psychometric properties. The reliability and validity of this measure have been demonstrated in older adult samples (see, e.g., Beekman et al., 1997). This instrument was composed of 20 items rated on a 4-point Likert scale measuring participants’ current level of depressive symptoms. We calculated a total score, with higher scores indicating more depressive symptoms.

**Functional status.**—Nurses administered these tests to the participants during their interview. After the nurses asked the participants to perform each test, they then rated each participant on the basis of four choices: (a) wholly unable to do—not feasible, (b) able to do with a great deal of difficulty, (c) able to do with some difficulty, and (d) able to do with no difficulty. In all, nurses utilized 10 functional tests measuring general mobility–posture, strength–coordination, and flexibility (Lundgren-Lindquist, Aniansson, & Rundgren, 1983; Lundgren-Lindquist & Jette, 1990; Lundgren-Lindquist & Sperling, 1983).

The tests of general mobility–posture measured general walking ability, walking speed, and standing balance, whereas tests of strength–coordination measured a participant’s ability to perform a 1-kg lift, pick up a pen from the floor, and touch the thumb to the little finger for each hand. For example, participants were asked, “Now I want you to walk at a normal speed next to this tape measure, and then turn and walk back.” Participants were then ranked by the nurse as (a) wholly unable to do–not feasible, (b) able to do with great deal of difficulty, (c) able to do with some difficulty, and (d) able to do with no difficulty. Finally, flexibility was measured with a series of tests that asked each participant to reach behind his or her head to touch the opposite ear lobe and to perform a seated toe touch.

We also assessed basic activities of daily living (ADLs), which included bathing, cleaning, dressing, toileting, and eating. Similar to the functional tests, ADLs were also coded so that lower numbers indicate more problems with performing the ADL. We created the functional status variable by taking the mean of the 10 functional status tests and the ADL items to form a single composite score representing functional status.

**Other measures.**—In addition, we used a series of yes–no questions to assess health care use, including whether the participants had been hospitalized in the past year, seen a doctor in the past 2 years, used medical aids (i.e., walker or cane), used a formal service in the home, or used other short-term institutionalized care (i.e., rehabilitation or convalescent center).

**RESULTS**

Our major aim in this study was to cross-classify participants on the basis of their subjective and objective health status to determine if the four health congruence groups differed on depression and functional status. Our additional aim was to describe each group’s health care utilization.

First, we dichotomized participants’ self-rated health ($M = 1.58, SD = .72$) into those participants who rated their health as good (56%, $n = 85$) and those who rated their health as fair or poor (44%, $n = 66$). We then cross-classified these groups with participants’ objective health indicators. We considered...
participants to have good objective health if they did not meet any of the poor health indicators (44%, n = 66), and we considered them to have bad health if they met any of the poor health indicators (56%, n = 85). From these two dichotomized indices, we formed four health differential groups (see Table 1). A majority of participants in this study had congruent perceptions of their health (58%). Those who rated their subjective health congruent with their objective health were identified as either good health realists or poor health realists (See Table 1). Of those who had incongruous reports of health (42%), pessimists were individuals who rated their health lower when compared with their objective indicators of health, whereas health optimists were individuals who rated their subjective health higher than their objective indicators of health. The four health congruence groups did not differ on age, education, or gender.

Next, we turned our analyses to determining whether these four groups of older adults differed in their level of depression as well as their functional status. The mean CES-D score for this sample was 9.6 (SD = 8.2) and ranged from 0 to 30.53, whereas the mean functional status score for the entire sample was 2.33 (SD = .78) and ranged from 0 to 3. Results from an analysis of covariance indicated that the mean level of depressive symptoms significantly differed across the four groups (see Table 2), F(3) = 6.88, p < .01, even when age, gender, and education were controlled for. Examining the mean depressive symptoms in each group, we see that pessimists (M = 13.48) and poor health realists (M = 12.47) had the highest levels of depression whereas optimists (M = 7.82) and good health realists (M = 6.68) had lower levels of depression. Bonferroni post hoc tests revealed that there were significant differences between pessimists and good health realists, indicating that the means for these groups were significantly different (p = .016). In addition, the mean level of depression differed for poor health realists and good health realists (p = .002) as well as for poor health realists and optimists (p = .012).

We also found a significant main group effect, F(3) = 9.18, p < .01, for functional status, even when controlling for age, gender, and education. Specifically, pessimists (M = 1.65) had the lowest performance on functional status tests whereas poor health realists (M = 2.27), optimists (M = 2.54), and good health realists (M = 2.52) did significantly better. Bonferroni post hoc tests showed that pessimists significantly differed from poor health realists (p = .013), optimists (p = .000), and good health realists (p = .000).

In our analysis we next examined the relationship between the four groups and frequency of health care utilization (i.e., hospital visits, use of medical aids, in-home formal services, and institutionalized care). As we can see in Table 3, the proportion of poor health realists, health pessimists, and health optimists who reported undergoing hospitalization in the past year was very similar. However, only 23% of the good health realists reported hospitalization: χ²(3) = 11.95, p < .05. Group classification was not significantly related to the other remaining four health care utilization variables.

**DISCUSSION**

Our main purpose in this study was to examine the health congruence or lack of congruence between participants’ own subjective evaluations of health and objective health. Specifically, our first aim in this study was to describe health congruence in a sample of the oldest old. Our second aim was to examine if differences between subjective and objective health were related to level of depression and functional status. Finally, our third aim was to describe the health care utilization in each subsequently classified group. We formed the four main groups in this study by cross-classifying participants’ rating on subjective health with their objective health status. This resulted in four groups: (a) pessimists, for whom subjective health was rated lower than their objective health; (b), poor health realists, for whom subjective health was congruent with their objective health; (c), optimists, for whom subjective health was rated higher than their objective health; and (d) good health realists, for whom subjective health was congruent with their objective health.

A little more than half of the sample (58%) had congruent ratings of health. This finding is higher than the 40% congruence reported by Chipperfield (1993), but it is lower than that given by other studies, which reported congruence rates of 67% (Van Doorn, 1999) and 73% (Borawski et al., 1996). Although some other studies with older adults have indicated both a tendency toward optimistic ratings of health (Cockerham et al., 1983; Ferarro, 1980; Maddox & Douglass, 1973; Torstam, 1975) and pessimistic ratings of health (Blazer & Houpt, 1979; Goldstein et al., 1984; Levkoff et al., 1987), we found that this sample of the oldest old were, for the large part, accurate in their self-assessments of health. However, some did show discrepancies between their subjective and objective health status. Our results indicated that 26.5% were optimistic, which is higher than the 14% reported by Borawska and colleagues (1996) and lower than other studies reporting 31% (Van Doorn, 1999) and 55.5% (Chipperfield, 1993). The current study also found that 15.2% were pessimistic regarding their health, and this is consistent with some studies (Borawski et al., 1996) but higher than other studies, which reported pessimists at 2% (Van Doorn, 1999) and 5.5% (Chipperfield, 1993). In sum, results were somewhat consistent with previous studies; some variations were present, but these were likely due to differences in study methodology, sample age, and health

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**Table 1. Congruence Between Subjective and Objective Health**

<table>
<thead>
<tr>
<th>Subjective Health</th>
<th>Good</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good health realists</td>
<td>Optimists</td>
<td>43 (28.5%)</td>
</tr>
<tr>
<td>Pessimists</td>
<td>Poor health realists</td>
<td>23 (15.2%)</td>
</tr>
</tbody>
</table>

**Table 2. Mean Level of Functional Status and Depression by Health Congruence**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Poor</th>
<th>Health Realist</th>
<th>Health Pessimist</th>
<th>Health Optimist</th>
<th>Good Health Realist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional status</td>
<td>(n = 149)</td>
<td>2.27 (0.80)</td>
<td>1.65 (0.94)</td>
<td>2.54 (0.51)</td>
<td>2.52 (0.69)</td>
</tr>
<tr>
<td>Depression</td>
<td>(n = 135)</td>
<td>12.47 (8.66)</td>
<td>13.48 (9.27)</td>
<td>7.82 (7.06)</td>
<td>6.68 (6.87)</td>
</tr>
</tbody>
</table>

*Note: n varies as a result of missing data.*
congruence criteria. Researchers conducting future studies in this area may want to focus on similar criteria for defining health congruence, perhaps by incorporating more standardized measures such as medical records or prescription information in defining objective health.

Results from this study indicated that mean levels of depression for those classified as optimists and poor health realists differed significantly. Despite the poor objective health status shared by both of these subgroups, the optimists experienced significantly lower levels of depression. This finding is in accord with other health congruence studies that have found a protective effect of optimism (Borawski et al., 1996; Chipperfield, 1993). Previous studies (Borawski et al., 1996; Van Doorn, 1999) have also found that optimists reported fewer negative attributions and more health transcendent statements when compared with poor health realists.

The remaining two groups, good health realists and pessimists, had good objective health in common but differed on their subjective ratings of health; subsequently they also differed in their performance on functional status, depression, and hospitalization. When compared with good health realists, the pessimists had significantly higher levels of depression and more problems in performing functional tests. Perhaps even more notable is that pessimists significantly differed in functional status when compared with the optimists and even the poor health realists. This finding is interesting because the pessimists were in good objective health as compared with poor health realists and optimists who were in poor objective health. Despite this fact, the pessimists still had more problems on functional status.

One possible interpretation is that emotional health and functional status are not captured in objective measures of health but are considered by the participants when rating their own health, so that participants rating their health as pessimistic simply included their own evaluation of their poor functional status in their self-rated health. Another equally plausible explanation might be that pessimistic attitudes of health are associated with feelings of depression and poor performance on functional status. If this were the case, these findings would suggest that the manner in which an individual conceptualizes his or her own health may have very substantial implications for health outcomes as well as some health care services, despite actual disease states. This is important because pessimism can then be conceptualized as a risk factor for negative health outcomes as well as costly health care usage. This information would be essential in health services research as well as in health care interventions.

Although causation cannot be determined in the current investigation, this finding does support other studies indicating that pessimism is associated with physical outcomes. For instance, Mahler and Kulik (2000) found that cardiac patients who had lower levels of pessimism at discharge had less surgery-related disruption of their normal activities during the year that followed discharge. Moreover, in a 35-year longitudinal study, Peterson, Seligman, and Vaillant (1988) found that men who had pessimistic explanatory styles at age 25 had poorer health and were more likely to have died when evaluated 25 to 35 years later.

One strength of the current study is that it extends previous work on the effects of congruity between subjective and objective evaluations of health to a sample of the oldest old. The average age of participants in the only two similar studies on health congruence, that by Borawski and colleagues (1996) and that by Chipperfield (1993), were 80 years and 75 years, respectively, compared with 90 years in the present study. The oldest old is an especially relevant group to examine such health appraisals because, on the one hand, they are an increasingly hardy group based on their survival to such an advanced age. However, on the other hand, the oldest old are also very much inundated with increasing health problems. Hence, given this natural paradox of advanced aging, the oldest old may be an especially important group in which to examine self-evaluations of health alongside physical conditions. Further, given previous findings linking subjective evaluations to mortality and morbidity, it is important to investigate how these very old individuals regard their health subjectively and in light of objective health conditions.

Another strength of the current study is that it utilizes performance-based measures of functional status as an outcome. Most previous studies of this age group have relied primarily on self-reported functional status data, which are subject to some of the same biases as self-reported health. Finally, in this study we used the health condition categories developed by Gold and colleagues (2002), which were objectively rated by physicians for severity. Most studies in this area utilize a summation of health conditions without regard to severity. Clearly, however, the type of disease is very important. Having a condition that is imminently life threatening such as cancer would likely affect one’s subjective ratings in a different way than chronic but non-life-threatening problems. Perhaps the use of this commonsense approach to rating severity of disease contributed to the finding that a majority of participants were accurate in their self-perceptions of health.

Though the results of this study suggest that being classified as a pessimist is associated with a variety of negative outcomes and that being optimistic is associated with less depression, these findings must be taken in consideration alongside the limitations of this study. First, because this study is cross sectional in nature, we cannot ascertain directionality. For example, we cannot differentiate whether those classified as pessimists became depressed as a result of their pessimism or whether they became pessimistic as a result of their depression. Similarly, being pessimistic could have led to more hospitalizations or being hospitalized could have led to depression. Moreover, pessimists

<table>
<thead>
<tr>
<th>Variable</th>
<th>Poor Health Realist (%)</th>
<th>Health Pessimist (%)</th>
<th>Health Optimist (%)</th>
<th>Good Health Realist (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalized in past year (n = 143)</td>
<td>55</td>
<td>58</td>
<td>53</td>
<td>23</td>
</tr>
<tr>
<td>Seen a doctor in past 2 years (n = 143)</td>
<td>96</td>
<td>84</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Use of medical aids (n = 102)</td>
<td>69</td>
<td>90</td>
<td>68</td>
<td>54</td>
</tr>
<tr>
<td>Use of in-home formal services (n = 102)</td>
<td>28</td>
<td>40</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Use of other institutionalized care in past 2 years (n = 143)</td>
<td>11</td>
<td>21</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: n varies as a result of missing data.*
were found to have more problems in functional status, and again the directionality of this finding cannot be confirmed. It could be that pessimism affected their performance on these functional tests, but it also could be the case that these individuals had a variety of functional limitations that spurred their pessimistic views of health.

Another limitation of this study includes the small cell sizes that resulted when we cross-classified subjective and objective health status. This may have limited the power for detecting effects, especially for health care utilization. The final limitation that should be noted is that objective health conditions are self-reported based on the nurse interview with the participant. Hence, it could be the case that biases in rating subjective health may also be present in the reporting of health conditions. In future studies, researchers may want to specifically address these issues when examining health congruence.

Moreover, future studies in this area might examine health congruence in regard to specific triggers or the onset of new health problems in regard to long-term health and the maintenance of independence. Researchers could also examine whether these groups are stable or change over time. That is, they may determine whether participants transition from one group to another over time and identify what is related to such transitions. Finally, a logical question that arises from studies showing both a protective effect of optimism and an association between pessimism and poor health outcomes is this: Could we curb pessimistic view points in favor of a more optimistic one? Moreover, would changing a person’s perception of his or her health improve health outcomes? At the present time, more work is needed to establish how pessimism and optimism work and to identify the specific mechanisms that link them to health outcomes. Ultimately, with enough information on how these processes work, it would be valuable to develop interventions to encourage optimistic perspectives. Studies examining the efficacy of such interventions with concrete effects on health outcomes would undoubtedly be valuable.

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