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Health-Related Perception and Responsibility Behavior Among
Individuals With and Without Chronic Illness

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Abstract

Few studies have examined perceptions of responsibility attribution and well-being, and health responsibility behaviors in individuals with none, one, and multiple chronic illnesses. Adults (N = 421) in medical clinics completed questionnaires for this cross-sectional descriptive study. The Revised Causal Dimensional Scale measured responsibility attribution whereas sub-sections of the Chronic Disease Self-Management Program evaluation measured well-being perception and the health responsibility behavior of communication associated with a clinic visit. Chi-square, Wilcoxon-Mann-Whitney U, and Kruskal-Wallis tests were used to examine demographic characteristics and group differences. Individuals with multiple morbidities and of advanced age perceived their illnesses as more stable and rated their well-being lowest. Females, participants of advanced age, and living with a partner engaged more in health communication. More information about responsibility attribution and chronic illness management is needed. Study results suggest regular assessment of well-being perception and communication training for individuals >45 years to support multiple chronic illness management.

Keywords: responsibility attribution, chronic illness, well-being, health behavior, multiple morbidity

Millions of Americans (45% or 133 million) have been diagnosed with at least one chronic illness (Raghupathi & Raghupathi, 2018). In 2016, an estimated 75% of Americans ≥ 65 years had been diagnosed with two or more chronic illnesses (Chronic Diseases, 2016), which are often accompanied with increasingly complex management (Jerant, von Friederichs-Fitzwater, & Moore, 2005; Koch, Wakefield, & Wakefield, 2015). With the increased number of patients with chronic illnesses, the increased complexity of care for chronic illnesses, and the increased demands for patients to manage their own care, more studies are needed examining patient perceptions that influence self-care.

A commonly held societal belief is that individuals are primarily responsible for their health behavior, in particular when that behavior is related to a managing a chronic illness (Auduly, Asplund, & Norbergh, 2010; Wong, Peterson, & Black, 2011). Some studies have found that: (a) health behavior decisions can directly affect an individual's health outcomes (Auduly, Asplund, & Norbergh, 2011; Cramm & Nieboer, 2012; Sommers, Gawande, & Baicker, 2017); and that (b) individuals who perceive they are responsible for and consistently engage in health behaviors to manage their chronic illness often have better outcomes (Auduly et al., 2010; Koch, Wakefield, & Wakefield, 2014; Pickett, Allen, Franklin, & Peters, 2014; Wells, Thorsteinsson, & Brown, 2012). In order to support individuals managing chronic illness, more studies are needed examining individuals' perceptions regarding their chronic illness and level of well-being, and whether these perceptions are associated with health behavior. This cross-sectional descriptive study examined demographic characteristics, perceptions of responsibility attribution and well-being, and health responsibility behaviors in individuals with no chronic illness and one or more chronic illnesses.

Responsibility attribution, well-being perception, and health responsibility behavior

A chronic illness is generally characterized by: multiple risk factors or idiopathic causes; progressive worsening over time; periodic exacerbations; lack of a cure; continuous or periodic requirement of medication and treatment; and development of irreversible physiologic changes that can result in functional impairment or disability (Audulv et al., 2010; Cramm & Nieboer 2012; Zalewska, Miniszewska, & Narbutt, 2007). These characteristics can negatively impact mental health and quality of life (Audulv et al., 2010; Cramm & Nieboer, 2016). Researchers have found that individuals who consistently engage in health behaviors to manage chronic illness have decreased mortality, less physical disability, slower chronic illness progression, and lower healthcare spending related to fewer emergency room and hospital admissions, which can result in elevated quality of life (Cramm & Nieboer, 2012; Jerant et al., 2005). Chronic illness characteristics and its associated challenges will influence the specific perceptions individuals develop about their illness. Because these perceptions affect decisions of which health behaviors individuals will engage in, health providers need to be aware of the implications of individuals' viewpoints. Three variables were examined in this study: (1) perception of responsibility attribution, (2) perception of well-being, and (3) health responsibility behavior. *Responsibility attribution* is a theory developed to explain how or why a present situation (a chronic illness for this study) came to be (Weiner, 1995). As defined by Bernard Weiner, "responsibility attribution relates to beliefs about the cause of an event, or outcome, or state" (Weiner, 1995, p. 753), where the individual is often associated with a negative outcome.

Responsibility attribution comprises three dimensions: locus of causality, stability, and controllability. *Locus of causality* dimension is the perception the cause was either external or

internal to the person. The perception that an individual's actions or decisions caused the illness affect not only psychological adjustment to the health situation, but also their level of engagement in activities related to chronic illness management (Audulv et al., 2010; Bonsaksen, Lerdal, & Fagermoen, 2015). The responsibility attribution dimension of *stability* is the degree by which a person believes the cause of a situation can change over time (Weiner, 1995). Few studies related to chronic illness have discussed stability perception. Wells et al. (2012) reported that individuals who perceived their chronic illness was stable experienced more severe symptoms compared to those who perceived their illness unstable (changeable). The responsibility attribution dimension of *controllability* refers to whether individuals believe the cause controlled by themselves or others or is uncontrollable. Individuals who believe they have control over their condition (i.e., personal control) are characterized as self-managers who seek information and believe they are responsible for their health (Wells et al., 2012). Conversely, individuals who rated low personal control (i.e. controlled by others) demonstrated less engagement in health behaviors to manage their chronic illness, relegated chronic illness health decisions to others, and attended fewer medical clinic appointments (Audulv et al., 2010; Zalewska et al., 2007).

Well-being is defined as an individual's overall perception regarding his or her level of health, inclusive of optimal quality of life or mental status (Banerjee, Perry, Tran, & Arafat, 2010; Cramm & Nieboer, 2016; Stanford Education, 2007). Well-being is a highly variable state that is sensitive to many factors, including individuals' socio-demographic status, adaptation to the chronic illness, and the complexity of their chronic illness management regimen (Cramm & Nieboer, 2012). An individual's well-being perception is an excellent predictor of future health

(Banerjee et al., 2010; Diener & Chan, 2011) and mortality (Sommers et al., 2017), and is an important consideration in chronic illness research.

Health responsibility refers to health behaviors individuals engage in regarding their chronic illness, including communication with a health provider; inquiring about health status or a diagnosis; seeking health care services; and keeping medical appointments (Auduly et al., 2010; Stanford Education, 2007). In this study, the individual's health responsibility was assessed as communication with the health provider, regarding treatment of his or her chronic illness or other health matters, before or during a medical clinic appointment (Stanford Education, 2007). Effective communication between an individual and their health provider is important not only because of it improves health care delivery, but also because of it enhances health behavior engagement level (Cramm & Nieboer, 2015; Jerant et al., 2005; Wong et al., 2011).

Purpose

This cross-sectional descriptive study has the following aims: (1) compare demographic characteristics (i.e., gender, age, partner status, education level, health coverage, and employment status) of participants in groups based on their chronic illness status: a) no chronic illness, b) one chronic illness, and c) two or more chronic illnesses; (2) compare responsibility attribution (locus of causality, stability, controllability), well-being perception, and health responsibility behavior in participants based on their chronic illness grouping and (3) compare responsibility attribution (locus of causality, stability, controllability), well-being perception, and health responsibility behavior based on participant demographic variables.

Methods

Design and setting. The study was conducted at medical clinics in a university setting, located in a moderate-sized city in the Midwest. Anonymous data were collected during two three-week periods using a self-administered pen and paper questionnaire made up of 63 questions. The self-report questionnaire comprised of demographic questions and previously validated tools designed to measure responsibility attribution, well-being perception, and health responsibility behavior. After the university's institutional review board approved the study, the questionnaire and information flyers were then reviewed and approved by the medical clinic managers. Questionnaire completion constituted participant consent to use the collected answers as part of the study.

Sample. A convenience sample of adults ($N = 421$) who attended a clinic visit completed the self-report questionnaire. Individuals who were eligible to complete the questionnaire included those who were aged ≥ 19 years (with no upper-age bound), able to read and write English, and diagnosed with either no chronic illness or one or more chronic illnesses. The sample size was determined with G*Power for Mac (<http://gpower.hhu.de>), using 0.5 effect size, a desired power of 0.90, and a significance level of 0.05 for a two-tailed t-test group difference using a non-parametric (Wilcoxon-Mann-Whitney) test. A single group sample size was determined at 90. The group sizes in this study were: no chronic illness, ($n = 87$); one chronic illness, ($n = 100$); and two or more illnesses ($n = 234$).

Measures. Participants responded to a checklist to indicate whether or not they had a chronic illness from a list of 16 medical condition categories. Their responses on the checklist were used to categorize them into one of the three chronic illness groups.

Responsibility attribution. The Revised Causal Dimensional Scale (McAuley, Duncan, & Russell, 1992) uses 12 questions of bimodal design to measure an individual's perception of the

responsibility attribution dimensions (locus of causality, stability, and controllability—measured as personal control and external control) she or he attributes to the first diagnosed chronic illness. Three positively and negatively worded statements measure each dimension using a scale with numbers ranging from 1 – 9. Participants indicated a number closest to the statement they most agreed with, e.g., “Is the cause something that you cannot or can regulate?”, beginning with 1 (*you cannot regulate*) through 9 (*you can regulate*). McAuley et al. (1992) validated the tool with confirmatory factor analysis and found four distinct but related constructs. In addition, goodness of fit index was 0.958, where 0.90 or greater is a strong indicator of how well the data supports the model. In this study the scale was found to have good inter-item reliability (12 items; $\alpha = .81$).

Well-being. A single question, “In general, your health is?” measured well-being using a Likert scale of 1 (*excellent*) to 5 (*poor*). This stand-alone question is part of the Chronic Disease Self-Management Program evaluation tool, which was developed to assess progress made by individuals who attended a chronic disease self-management program (Lorig et al., 1996). Test-retest reliability ($\alpha = .92$) was documented for 51 participants out of the 1,129 initial test-takers (Lorig et al., 1996).

Health responsibility. A sub-scale from the Chronic Disease Self-Management Program evaluation tool was used to measure communication of the individual with his or her health provider at the clinic visit. The health responsibility score is a mean of three statements that address the question, “when you visit your health provider, how often do you do the following?”. A five-point Likert scale of 0 (*never*) to 5 (*always*) addresses each statement: “prepare a list of questions about either your illness or treatment plan”; “ask questions about treatment of your illness you are uncertain about or do not understand”; and “discuss other personal problems that

may, or may not be related to treatment of your illness”. Lorig et al. (1996) reported internal consistency of tool with 1,130 patients ($\alpha = .73$), and test-retest reliability with 51 patients ($\alpha = .89$) (Lorig et al., 1996). For this study, inter-item reliability for the three questions was close to acceptable ($\alpha = 0.68$).

Analysis. Data were analyzed with IBM SPSS v 25 (IBM Corp.). Descriptive statistics (frequency, percentage) were analyzed for each demographic category and study variable based on the three chronic illness diagnosis groups (no diagnosis, one diagnosis, two or more diagnoses). Initial visualization of data via histogram revealed that the data were non-parametric; therefore Chi-square test for homogeneity, Wilcoxon-Mann-Whitney U, and Kruskal-Wallis ANOVA tests were used to identify between-group differences. Chi-square tests were conducted on gender, age, partner status, health coverage, employment, and education, and perceived well-being. Expected cell frequencies were greater than five for each analysis. Wilcoxon-Mann-Whitney U or Kruskal-Wallis ANOVA was used to compare self-reported responsibility attribution (locus of causality, stability, personal control, external control) and well-being perceptions, and health responsibility behaviors across the diagnosis groups. Wilcoxon-Mann-Whitney U or Kruskal-Wallis was also used to examine the age categories with responsibility attribution (locus of causality, stability, personal control, external control), well-being perceptions, and health responsibility behaviors. Each of the three questions that comprise health responsibility was individually analyzed with age, gender, and partner status.

Results

The five most frequently reported diagnoses in descending order include: hypertension (38%; $n = 160$); diabetes (types I and II) (28%, $n = 117$); back pain (26%, $n = 109$); kidney disease (20%, $n = 84$); and depression (17%, $n = 72$). The first aim of the study was to compare

participant demographic characteristics (gender, age, partner status, education level, health coverage, and employment status) based on their chronic illness diagnosis groups (none, and one or more than one chronic illness). Frequencies and percentages are presented in Table 1.

Table 1

Results of demographic characteristics across chronic illness diagnosis groups and aggregate sample

		No diagnosis n (%)	One diagnosis n (%)	Two or more diagnoses n (%)	Aggregate sample n (%)
Aggregate sample		87 (20.8)	100 (23.8)	234 (55.6)	421 (100)
Gender	Female	56 (62.9)	65 (64.4)	133 (56.4)	254 (60.3)
	Male	31 (34.8)	35 (34.7)	101 (42.8)	167 (39.7)
Age	≤ 45 years	47 (52.8)	44 (43.6)	57 (24.2)	146 (34.7)
	46 -65 years	33 (37.1)	45 (44.6)	131 (55.5)	206 (48.6)
	≥ 66 years	7 (7.9)	12 (11.9)	47 (19.9)	66 (15.7)
Living as married	Yes	60 (67.4)	50 (49.5)	139 (58.9)	248 (58.9)
	No	28 (31.5)	43 (42.6)	80 (33.9)	150 (35.6)
Employed	Employed	68 (75.9)	59 (59.0)	109 (46.6)	236 (56.1)
	Not employed	16 (18.4)	39 (39.0)	114 (48.7)	169 (40.1)
Health coverage	Private	66 (75.6)	47 (47.0)	103 (44.0)	199 (47.3)
	Public (Medicare, Medicaid, VA, SSI)	19 (21.8)	52 (52.0)	128 (54.7)	216 (51.3)
Education	< HS	11 (12.6)	20 (20.0)	53 (22.6)	84 (20.0)
	HS or GED	23 (26.4)	22 (22.0)	62 (26.5)	107 (25.4)
	Some college or Associate degree	39 (44.8)	41 (41.0)	89 (38.0)	169 (40.1)
	Bachelor degree	7 (8.0)	9 (9.0)	12 (5.1)	28 (6.7)
	Graduate degree	7 (8.0)	8 (8.0)	16 (6.8)	31 (7.4)

Note: Demographic data describes each group independently. For example, the number and percent for gender in Group 1 is the total for that group category.

No significant differences based on gender ($p = .26$), partner status (i.e., living as married; $p = .11$), and education level ($p = .58$) were found using Chi-square test across the chronic illness groups. Differences across the chronic illness groups were found with age, $X^2(4) = 33.49$, $p = .001$, health coverage, $X^2(2) = 28.30$, $p = .001$, and employment, $X^2(2) = 26.01$, $p = .001$. These results are presented in Table 2.

Across the chronic illness groups, participants aged 46 to 65 years represented nearly half and participants aged ≤ 45 years represented one third of the sample. Participants aged ≤ 45 years were relatively evenly distributed across the chronic illness groups. The largest proportions of participants managing two or more chronic illnesses were in the groups 46 to 65 years and ≥ 66 years. Although participants \geq age 66 years comprise the least of the sample, they had the highest proportion managing two or more chronic illnesses. Health coverage differences across the chronic illness groups showed that the proportion of participants with private insurance decreased as the number of chronic illnesses increased. The largest proportion of participants who reported having a type of public health coverage also reported managing two or more chronic illnesses, compared to a decreasing proportion of participants with public health coverage who had one or fewer chronic illnesses. A larger proportion of participants reported being employed than not, but overall the proportion of employed participants decreased as the number of chronic illnesses increased. Among unemployed participants the largest proportion were managing two or more chronic illnesses. Among participants without a chronic illness, one-tenth were unemployed and nearly one quarter had public health coverage.

The second aim of the study was to compare participants' responsibility attribution and well-being perceptions, and health responsibility behaviors, based on their chronic illness group.

Table 2

Cross-tabulations table for age, health coverage, and employment status across chronic illness diagnosis groups

	No diagnosis	One diagnosis	Two or more diagnoses	Diagnosis group total for demographic category
	n (%)	n (%)	n (%)	n (%)
Age Category				
≤ 45	47 (32.2) [55.3]	44 (30.1) [44.0]	55 (37.7) [23.6]	146 (34.9)
46 – 65	31 (15.0) [36.5]	44 (21.4) [44.0]	131 (63.6) [56.2]	206 (49.3)
≥ 66	7 (10.6) [8.2]	12 (18.2) [12.0]	47 (71.2) [20.2]	66 (15.8)
Age total in each diagnosis group	85 [20.3]	100 [23.9]	233 [55.7]	418 (100)
Health Coverage				
Private	66 (30.6) [77.6]	47 (21.8) [47.5]	103 (47.7) [44.6]	216 (52.0)
Public (Medicare, Medicaid, VA, SSI)	19 (9.5) [22.4]	52 (26.1) [52.5]	128 (64.3) [55.4]	199 (48.0)
Health coverage total in each diagnosis group	85 [20.5]	99 [23.9]	231 [55.7]	415 (100)
Employment				
Employed	68 (28.8) [81.0]	59 (25.0) [60.2]	109 (46.2) [48.9]	236 (58.3)
Not employed	16 (9.5) [19.0]	39 (23.1) [39.8]	131 (67.5) [51.1]	169 (41.7)
Employment total in each diagnosis group	84 [20.7]	98 [24.2]	223 [55.1]	405 (100)

Note: Row totals are in parentheses (%), and column totals are in brackets [%].

The perception of responsibility attribution regarding chronic illness was assessed via self-report by asking participants to consider their first diagnosed chronic illness when answering the

questions. Consequently, the groups with one and two or more chronic illnesses were analyzed using Wilcoxon-Mann-Whitney U. No differences were found with locus of causality ($p = .4$), personal control ($p = .75$), and external control ($p = .10$). Differences were found in perception of stability between the chronic illness groups, with higher scores indicating the degree the individual believes the illness is not changeable. Stability scores for participants with two or more chronic diagnoses (mean rank = 142.58) was higher than for participants with one chronic diagnosis (mean rank = 119.40), $U = 9,337$, $z = 2.30$, $p = .02$.

Perceptions of well-being and health responsibility behaviors across the three chronic illness groups were analyzed with Kruskal-Wallis ANOVA. The perception of well-being was different between each of the chronic illness groups, $H(2, 418) = 63.16$, $p < .001$, but no difference was found with health responsibility ($p = .78$). What is notable regarding well-being perception (see Figure 1) was that 44% ($n = 38$) of participants with no chronic illness rated well-being at a *Mdn* of 2 ($IQR = 1 - 3$) with a mean of 2.17 ($SD = 0.99$). By comparison, 44% ($n = 44$) of participants with one chronic illness rated well-being lower with a *Mdn* of 3 ($IQR = 2 - 3$) and a mean of 2.85 ($SD = 0.98$), whereas 41% ($n = 95$) of participants managing two or more chronic illnesses rated their well-being even lower at a *Mdn* of 3 ($IQR = 3 - 4$) with a mean of 3.22 ($SD = 0.95$).

The third aim was to determine if there were differences in perceptions of responsibility attribution and well-being, and health responsibility behaviors, based on the demographic characteristics of age, gender, and partner status. Perception of responsibility attribution was tested with Kruskal-Wallis ANOVA and found the perception of stability was different across age categories, $H(2, 281) = 9.74$, $p = .01$. Specific between-group differences were identified post-hoc with Dunn's test (Bonferroni correction, *adj. p* < .02). Individuals aged ≥ 66 years

reported that they perceived their illnesses as more stable than those ≤ 45 (*adj. p* = .01) years of age. No differences in stability were found with gender (*p* = .88), or with partner status (*p* = .49).

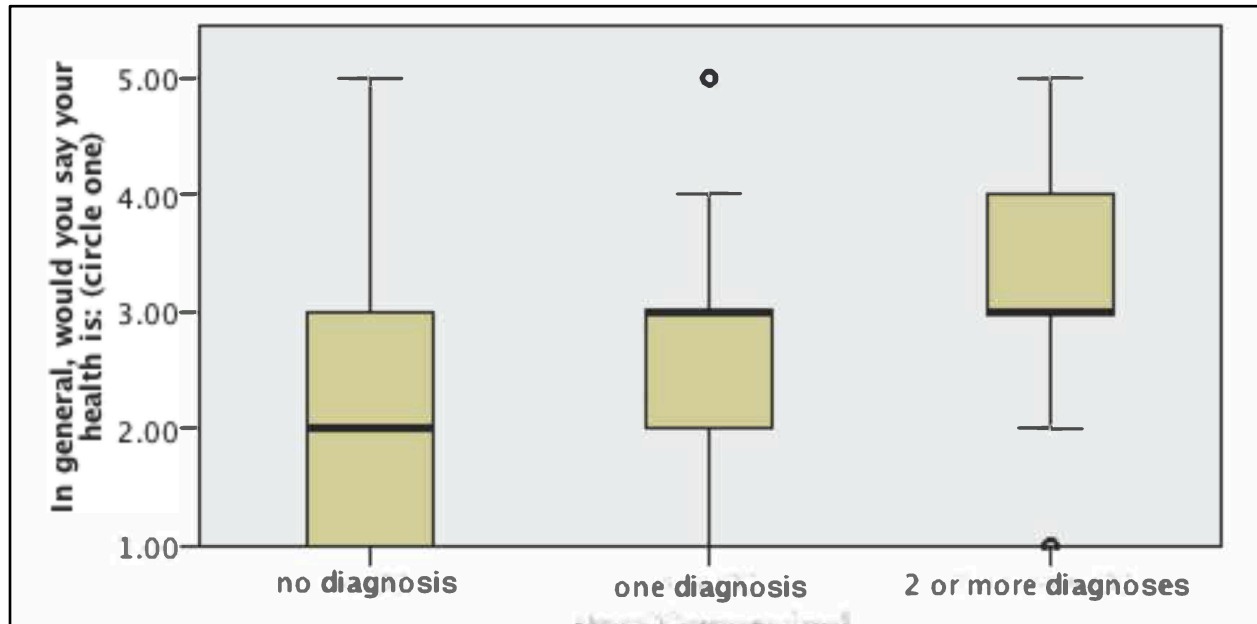


Figure 1. Well-being perception across the chronic illness diagnosis groups with 1 (*excellent*) to 5 (*poor*) was different between: no and one diagnosis, *adj. p* < .001; and no and 2 or more diagnoses, *adj. p* < .001; with one and 2 or more diagnoses, *adj. p* = .01.

Well-being perception was different across the age categories was analyzed with Kruskal-Wallis test, $H(2, 415) = 6.33, p = .04$, then followed post-hoc with Dunn's test (Bonferroni correction, *adj. p* < .02). Specifically, well-being perception was higher among participants who were ≤ 45 years when compared to those 46 to 65 years of age (*adj. p* = .04). No differences were found with well-being perception and gender (*p* = .26), or well-being and partner status (*p* = .12) after analysis with the Chi-square test. Differences were found with health responsibility behaviors and age, gender, and partner status. Using Kruskal-Wallis ANOVA to analyze health responsibility across the age categories, $H(2, 403) = 6.75, p = .03$, followed post-hoc with Dunn's test (Bonferroni correction, *adj. p* < .02), revealed that individuals ≥ 66 years demonstrated a higher level of health responsibility behaviors than those ≤ 45 years of age (*adj. p* = .03). Wilcoxon-Mann-Whitney U was used to analyze health

responsibility behavior with gender and partner status. Distribution of scores for females ($n = 253$, mean rank = 214.64) were higher scores for males ($n = 159$, mean rank = 186.20), $U = 16,886$, $z = -2.40$, $p = .02$. The distribution of scores for participants with a partner ($n = 240$, mean rank = 202.39) were higher than for participants without a partner ($n = 147$, mean rank = 176.01), $U = 19,655$, $z = 2.27$, $p = .02$.

Finally, each of the three questions that comprise health responsibility was then separately examined according to age, gender, and partner status. Age categories were analyzed with Kruskal-Wallis with differences examined post-hoc with Dunn's test (Bonferroni correction, $adj. p < .02$). Individuals ≥ 66 years more often came to a medical clinic appointment with a prepared list of questions, $H(2, 411) = 12.90$, $p = .002$, compared to those ≤ 45 years ($adj. p = .001$), and those between 46 – 65 years of age ($adj. p = .02$). Wilcoxon-Mann-Whitney U was used to analyze the three questions with gender and partner status. The distribution of females ($n = 251$, mean rank = 217.70) who asked questions during a clinic visit if they did not understand the treatment related to their illness was more than males ($n = 162$, mean rank = 190.43), $U = 17,646$, $z = -2.32$, $p = .02$. The distributions of scores for participants with a partner were different for the questions “prepare a list of questions” and “ask questions during the appointment”. Participants with a partner ($n = 244$, mean rank = 204.46) were more likely to prepare questions before their appointment than those without a partner ($n = 147$, mean rank = 181.96) $U = 19,996$, $z = 1.97$, $p = .05$. Participants with a partner (mean rank = 205.28) were more likely to ask questions during the clinic visit than participants without a partner (mean rank = 180.59), $U = 20,200$, $z = 2.15$, $p = .03$.

Discussion

This cross-sectional descriptive study examined perceptions of responsibility attribution, well-being, and health responsibility behaviors in participants with no chronic illness or one or more chronic illnesses. Results of this study demonstrated that participants with two or more chronic illnesses were more likely to be over aged 45 and less likely to have private insurance or be employed. More than half of the participants in this study reported managing two or more chronic illnesses, with three-quarters of them over the age of 45. These findings corroborate previous reports that the number of diagnosed chronic illnesses increases with age (Asay, Roy, Lang, Payne, & Howard, 2016; Chronic Diseases, 2016). In the current study, among participants managing two or more chronic illnesses, 51% of individuals were unemployed despite 56% between the ages of 46 – 65 years and 20% of individuals over age 64. This is consistent with literature findings that chronic illness may be a barrier to employment due to missed workdays. For example, Asay et al. (2016) reported that an individual's number of chronic illnesses corresponded with his or her number of missed workdays, resulting in lost productivity for the business and the individual. In the current study, 99% of participants (55% with public and 44% with private) had health coverage. An interesting finding from Sommers et al. (2017) was that health coverage, whether public or private, resulted in improved or positive health outcomes regardless of insurance source. The effect health coverage may have on perception of responsibility attribution and well-being, and health behavior should be examined.

In this study, participants who viewed their illnesses as stable were mostly aged 66 or older and were more likely to have two or more chronic illnesses. This is an important finding, given that health-related perception affects health behavior (Banovic et al., 2013; Bonsaksen et al., 2015). Stewart, Chipperfield, Perry, & Weiner (2012), reported that individuals who

attributed illness to advancing age engaged less in health behaviors because these individuals considered chronic illness an unavoidable accompaniment to old age—a stable situation that could not be changed. These individuals risked faster progression of the illness, worsening of symptoms, and earlier mortality (Stewart et al., 2012). Wells et al. (2012) examined responsibility attributions and health locus of control as predictors of chronic fatigue and found that individuals with higher perceptions of stability also had a perception of low personal control and experienced more severe fatigue. The few studies addressing the dimension of stability examined a single chronic illness. Because the numbers of individuals managing multiple chronic illnesses is increasing, more data are needed regarding the perception of stability and its effects on health behaviors when managing multiple chronic illnesses.

Participants with two or more chronic illnesses rated their well-being perception as significantly lower than those without illnesses. Several researchers have reported multiple morbidity is associated with low-rated well-being, as well as advanced age (Cramm & Nieboer, 2016; Diener & Chin, 2011; Piazza, Charles, & Almeida, 2007; Zalewska et al., 2007). A finding in this study inconsistent with the literature was that well-being perception was not significantly different between participants older than age 66 and those less than age 45 (i.e., younger age) or age 46 – 65 (i.e., middle age). However, younger age participants rated well-being perception higher compared with middle age individuals. One possible explanation for this finding is that middle age individuals often have greater family responsibilities (e.g. raising children, caring for aging parents) compared with other age groups, adding to the stress of managing a chronic illness (Piazza et al., 2007).

Well-being perception influences, and is influenced by, an individual's physical ability to manage their chronic illness (Banerjee et al., 2010; Cramm & Nieboer, 2012; Diener & Chan,

2011). Increasingly complex management of multiple chronic illnesses can interfere with an individual's ability to lead a regular life, maintain social roles with family, friends, and work colleagues, and engage in physical activities related to daily life (Cramm & Nieboer, 2016; Koch et al., 2015). In this study, the demands among those in middle-age associated with social roles and chronic illness management, combined with the proportion unemployed with public health coverage, may have contributed to their low-rated well-being.

Well-being is associated with physiologic responses that can affect chronic illness symptoms and health outcomes (Diener & Chin, 2011). Individuals who consistently report low well-being have 2 to 10 times greater mortality rates compared to individuals with higher well-being (Sommer et al., 2017). This finding underscores why health providers should regularly assess well-being among individuals beginning in their middle-age years as well as among those managing multiple chronic illnesses as an indicator of potential for poor prognosis.

Females, participants 66 years and older, and participants living as married (i.e., in a partner relationship) rated the health responsibility behavior "communication with a health provider" as higher. Participants who were female were more likely to ask questions during the clinic appointment, whereas participants of advancing age were more likely to prepare questions for their health providers before the clinic appointment. Participants with living as married with a partner were not only more likely to prepare questions before the clinic appointment, but also more likely to ask questions about their chronic illness or its treatment during the appointment. These findings are consistent with results by Schmidt, Schopf, & Farin (2016), that demonstrated positive health outcomes and good patient-provider interactions were strongly correlated. That study also found that an individual's knowledge about their chronic illness or his or her emotional awareness contributes to health communication competence (Schmidt et al., 2016).

The finding that females communicate better with health providers aligns with a previous report that females pay closer attention to their health compared to men and are also more likely to use a social platform to discuss the problem and successfully make lifestyle changes related to a chronic illness (Adili, Higgins, & Koch, 2013). Although no differences in communication between the chronic illness groups were found, a large proportion of patients who were older than age 65 reported having two or more chronic illnesses, which suggests that managing multiple illnesses may indeed have been a related factor in communication with health care providers. To manage multiple chronic illnesses, individuals must attend medical clinic appointments with multiple health providers and specialists (Koch et al., 2015). This added medical complexity may prompt individuals to prepare ahead of time and actively participate during the appointment. This study's findings indicate that individuals of advanced age managing multiple chronic illnesses may need to determine questions with a specific medical clinic appointment because their care is managed by multiple providers.

The results of this study distinguished the demographic characteristics of participants who actively communicate with their providers and those who don't; the latter group tended to be men, individuals with no or one chronic illness, and individuals not living as married (in a partner relationship). Other studies suggest these individuals may be passive information-seekers, use electronic sources (e.g. internet, apps, patient portals), and seek information from friends and family (Adili et al., 2013; Auduly et al., 2010; Cramm & Nieboer, 2015; Lubi, 2017). Individuals who were less knowledgeable about their condition were also reported to initiate less communication with a health provider (Schmidt et al., 2016). Another prominent factor that impedes communication is whether an individual views the interaction with his or her health provider as positive or negative (Kralik, Price, & Telford, 2010). Interactions considered positive

will enhance an individual's ability to engage in health behaviors (Wong et al., 2011) that can then lead to improved treatment or health outcomes (Schmidt et al., 2016). Kralik et al. (2010) reported that interactions considered negative, including sensing disapproval or negative judgment from the health provider, can undermine trust and confidence in the relationship between a patient and his or her health provider as well as limit what information a patient may disclose during a medical appointment. Wong et al. (2011) reported that for individuals with one or more chronic illnesses, quality of the interaction with their health provider was more important than the model of care delivery used. Therefore the findings support the importance of integrating communication training for individuals managing multiple chronic illnesses as part of health education programs, also noted by Schmidt et al. (2016).

Limitations associated with this study include the use of cross-sectional, convenience sampling at a single-site health center, which limits the generalizability of results and the ability to show causal relationships. Another limitation is use of non-verifiable self-report data. Self-report data is commonly used in health behavior research, and widely considered to have good reliability. However, participants may desire to 'help' the study by strategically providing answers they believe contribute to the study's purpose as well as positively portray themselves (e.g. opinions or behaviors) regardless if the questionnaire is anonymous (Cherulnik, 2001). Another consideration in this study is that for some participants, completing the questionnaire may have been the first time they had considered their perception of responsibility attribution and their chronic illness. This was evidenced by incomplete answers on the Revised Causal Dimensional Scale and anecdotal comments written on some questionnaires that indicated confusion. Some may not have participated due to illness or other reasons, and their perceptions and behaviors would have improved representation of the results. In this study, only *overall* (i.e.,

global) well-being was measured. However, well-being comprises emotional (Auduly, 2010; Piazza et al., 2007), social, and physical (Cramm & Nieboer; 2012; 2016) constructs that each affect overall well-being perception. Future studies of well-being perception should examine the effects of each construct on responsibility attribution and health responsibility behaviors in diverse patient groups.

In conclusion, participants with multiple chronic illnesses and of advanced age perceived their chronic illnesses as more stable and rated well-being as lower. Females, participants of advanced age, and those in a partner relationship communicated more often with their health provider about their chronic illnesses. Given the lack of information in chronic illness literature, future studies should expand on findings from this study regarding the responsibility dimension of stability and its possible affect on well-being perceptions and chronic illness-related health behaviors. Overall, results from this study indicate health providers should regularly assess individuals' well-being perceptions starting in middle-age and with those managing multiple chronic illnesses, as well as to integrate communication training into health education programs to enhance support for individuals as they take a more active role managing their chronic illnesses.

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