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Illness Stigma, Social Connectedness, and Health in People living with Chronic Illness: A Structural Equation Model

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STIGMA, SOCIAL CONNECTION, AND HEALTH

ILLNESS STIGMA, SOCIAL CONNECTEDNESS, AND HEALTH IN PEOPLE LIVING WITH
CHRONIC ILLNESS: A STRUCTURAL EQUATION MODEL

by

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THESIS CERTIFICATE OF APPROVAL

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Abstract

The complexity of chronic or unexplained conditions may lead to potential stigma for those suffering long-term symptoms as they do not follow the expected pattern of recovery following diagnosis and treatment. Experiencing such illness-related stigma has potential for leading to a belongingness identity of detachment with implications for health across physical, social, and psychological dimensions. This study aimed to examine the relationship between stigma, social connection, mental health, physical health, and social functioning in a group of 231 participants with ongoing symptoms of chronic illness through structural equation modeling. The fit indices all suggest that the model reasonably fits the data with greater stigma predicting poorer social connectedness, which in turn mediated quality of life across all areas of mental, social, and physical health. The pathway through social connection provided stronger results than the direct path for mental health and social functioning suggesting that social connectedness has a greater influence on these factors than stigma alone. Findings situate social connectedness as a psychosocial factor that is inversely associated with illness-related stigma and support theoretical predictions that this aspect of belongingness predicts all aspects of physical, social and mental health. Further theoretical development on stigma within the realm of health psychology may prove advantageous to increasing knowledge and producing more efficacious interventions.

Keywords: social connection, physical health, mental health, stigma, chronic illness, belongingness

Illness Stigma, Social Connectedness, and Health in People living with Chronic Illness: A Structural Equation Model

Chronic illness is the leading cause of death and disability, and related medical care makes up 90% of the United States' annual health care cost (CDC, 2022; Buttorff et al., 2017; Martin et al. 2021). Estimates show that between 16-58% of people around the world have multiple chronic health conditions, and this number is anticipated to continue increasing (Hajat & Stein, 2018). Unfortunately, because chronic illnesses often lack a straightforward pathology and treatment which deviates from the standard biomedical model, many individuals with chronic illness experience stigma related to their condition (De Ruddere & Craig, 2016).

Stigma is defined by Link and Phelan as the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination (2001). Research indicates that social connections are effective at reducing the negative impacts of stressors, while loneliness and isolation have been linked to numerous psychological and physical issues such as depression and coronary heart disease (Cohen & Wills, 1985; Christiansen et al., 2021; Valtorta et al., 2016). Public health efforts have focused on behavioral and educational interventions for preventing or treating chronic illness, yet incidence of chronic illness and mortality rates continue to rise (Raghupathi & Raghupathi, 2018; Morton et al., 2021). Altering societal views about chronic illness as well as strengthening social ties may have a more powerful effect on improving health outcomes for people suffering from chronic conditions.

Stigma and Health

Research on illness stigma is limited, typically focusing on HIV and lung cancer patients. Illness stigma has been associated with higher pain intensity and depressive symptoms,

especially for patients with a highly stigmatized illness like human immunodeficiency virus (HIV) (Wadley et al., 2019). In a sequential mediation model by Hobson et al. (2022), greater stigma related to HIV predicted greater depressive symptoms, which predicted greater insomnia severity, which then led to higher levels of pain. These relationships remained stable when researchers examined stigma related to chronic pain rather than HIV suggesting that stigma both directly and indirectly impacts health outcomes like depression, sleep, and pain.

Perceived stigma from healthcare providers can greatly impact a patient's healthcare utilization and quality of life (Chapple et al., 2004; Earnshaw and Quinn, 2012; Earnshaw et al., 2012). Through a qualitative study of 45 lung cancer patients, Chapple et al. found that patients had both perceived and blatant experiences of stigma where patients were accused of being "dirty" and blamed for their cancer regardless of smoking history (2004). The apprehension experienced by those with lung cancer caused some to hesitate when considering medical care for the fear that they would be refused, and many decided against asking family or friends for support from fear of having to expose their diagnoses (Chapple et al., 2004).

More generally, in a study on stigma and quality of life for people with chronic illnesses by Earnshaw et al., anticipated stigma from friends and family predicted social support and stress levels which impacted quality of life (2012). Specifically, higher levels of anticipated stigma from friends and family predicted lower levels of social support and higher levels of stress. Higher levels of social support predicted higher quality of life while higher levels of stress predicted lower levels of quality of life. In the same study, high levels of anticipated stigma from healthcare workers predicted decreased patient satisfaction and high levels of patient satisfaction predicted higher levels of quality of life. Another study by Earnshaw and Quinn examined

internalized stigma, anticipated stigma, and experienced stigma as separate variables impacting care access and quality of life for people with a chronic illness (2012).

Earnshaw et al. studied the effects of stigma on the quality of life for people suffering from chronic illnesses (2012). They discovered that anticipated stigma from family and friends led to lower levels of social support and higher stress, both of which negatively affected quality of life. In contrast, a higher level of social support corresponded with an increase in quality of life. The same study showed that high levels of anticipated stigma from healthcare workers predicted lower patient's satisfaction therefore decreased their quality of life. Earnshaw and Quinn conducted another research project focusing on internalized stigma, anticipated stigma, and experienced stigma as separate variables impacting care access and quality of life for people with a chronic illness (2012). Both Internalized stigma and experienced stigma predicted anticipated stigma, but experienced stigma had a stronger relationship suggesting that it is more influential on anticipated stigma than internalized stigma. Whether stigma is internal, experienced, or anticipated, stigma predicts poorer health outcomes for people with chronic illness and lower healthcare utilization (Earnshaw et al., 2012; Chapple et al., 2004; Earnshaw and Quinn, 2012; Wadley et al., 2019; Hobson et al., 2022).

Social Connectedness and Health

Humans are social beings and have a need for a sense of belonging often satisfied by relationships that provide frequent or meaningful interactions (Baumeister and Leary, 1995). These relationships can be examined as sources of social support or social capital while the feeling of belongingness with the world can be described as social connectedness (Baumeister and Leary, 1995; Cohen & Wills, 1985; Kawachi et al., 2008; Lange & Crawford, 2023). Having

a mental schema that implies you do not belong and feeling psychologically distant from your social group can alter how you perceive your interactions with others, amplifying the feelings of social seclusion and loneliness. On the other hand, fostering robust self-perceptions of belonging can heighten the sensation of social connection and inclusion among peers, thereby alleviating the emotional distress caused by isolation. Social connectedness was developed to measure a distinct aspect of belongingness that has wide reaching impacts on one's behavior (Lee & Robbins, 1995). The concept of social connectedness is aligned with belongingness theory which states that people have a strong innate need to belong which has both served reproductive and survival needs and is not fulfilled by a specific person or type of relationship (Baumeister and Leary, 1995). While some literature examines social connectedness directly, a significant portion examines loneliness or isolation which can be thought of as the product of a lack of social connectedness.

Deficiencies in social relations have been linked with several physical health problems like hypertension, migraine, stroke, and coronary heart disease (Christiansen et al., 2021; Valtorta et al., 2016). Loneliness is strongly associated with higher levels of stress hormones and lower numbers of natural killer cells which play an important role in the immune response (Cacioppo & Hawkley, 2003). In a meta-analysis of studies examining social relationships and mortality, Holt-Lunstad et al. found that individuals who had adequate social relationships were 50% more likely to survive over the course of 7.5 years as compared to individuals with lacking social relationships (2010). The impact of social relationships on mortality exceeds the impact of common risk factors like sedentary lifestyle or obesity (Holt-Lunstad et al., 2010; Pantell et al., 2013). In a longitudinal study in the US, Pantell et al. investigated mortality rates, social engagement, and typical risk factors like BMI over a course of up to 18.2 years in nationally

representative sample of adults 25 years old and older (2013). The analysis found that social isolation predicted mortality at a higher rate than obesity, high blood pressure, or high cholesterol for both men and women indicating that social connection should be a consideration for practitioners when estimating mortality risk. Social connectedness was found to be an independent robust predictor of physical health as well as a predictor of loneliness which decreased general health in a serial mediation model (Lange & Crawford, 2023).

In addition to loneliness' impacts on physical health, social connection has strong association with mental health (Christiansen et al., 2021; Duru & Poyrazli, 2011; Harandi et al., 2017; Kawachi & Berkman, 2001; Kintzle et al., 2018; Lee et al., 2001, 2002, 2008; McLoughlin et al., 2019; Nitschke et al., 2021). High levels of social connectedness have been linked to lower levels of adjustment issues, post-traumatic stress disorder, depression, anxiety, stress, and fatigue (Duru & Poyrazli, 2011; Kintzle et al., 2018; Lee et al., 2001, 2002, 2008; McLoughlin et al., 2019; Nitschke et al., 2021). Even during times of global upheaval and isolation such as the COVID-19 pandemic, social connectedness was protective against distress and fatigue (Nitschke et al., 2021). In online environments, social connectedness buffers against the negative psychological effects of cyberbullying (McLoughlin et al., 2019). Veterans' level of social connectedness can act as a buffer against PTSD while combat experience and non-honorable discharge status works to decrease social connectedness and increase PTSD risk (Kintzle et al., 2018). Support group interventions have demonstrated some success at improving social connectedness and mental health and social connection to family members and friends has a protective effect against mental stress (Kawachi & Berkman, 2001; Harandi et al., 2017). For chronically ill individuals in a rural location, peer support programs that utilize a combination of in person and online/phone meetings have demonstrated effectiveness in promoting social

connectedness and reducing stigma while increasing accessibility (Lauckner & Hutchinson, 2016).

Stigma and Social Connectedness

Despite the plethora of evidence suggesting both stigma and social connectedness impact mental health outcomes, very few studies examine the relationship between stigma and social connectedness together in relation to health, specifically physical health. Stigmatized groups tend to have smaller social networks and thus less social support making them more vulnerable to feeling disconnected and experiencing adverse health outcomes (Helliwell et al., 2021). Having a chronic illness may contribute to feeling like you do not belong or relate to others, especially those who occupy the world of the healthy. Stigma could serve to augment feelings of social disconnect.

Some studies examine stigma and social support. While social support is a distinct concept from social connectedness, they are related as having social support is likely to aid in one's feelings of belonging (Lange & Crawford, 2023). For that reason and the lack of literature examining social connection and stigma, the following studies utilizing social support are discussed. In a study of women with a variety of unexplained illnesses like fibromyalgia, high levels of social support predicted lower levels of perceived stigma (McInnis et al., 2015). Brener et al. (2020) indicate that social support moderates the relationship between HIV centrality (the degree to which one sees their diagnosis as a part of their identity) internalized stigma, and physiological distress. Regardless of level of HIV centrality, social support buffered against the negative impact of stigma indicating interventions focused on promoting social support may be successful.

Dealing with the challenges of a chronic illness can have a profound impact on one's sense of self as it relates to the social world and one's place in it, which colloquially can be described as going from the world of the healthy to the world of the ill. This can change social circles of belongingness as we relate more to those who understand with shared experiences. Even more so, experiencing stigma can contribute to a relational self-schema that is even more distant from others. Therefore, we propose that illness-related stigma could serve to impact social connectedness, such that individuals perceiving more stigma would alter their belongingness identity of interpersonal fit and place and therefore have negative health outcomes as a result.

Current Study

Given that little research has examined the relationship between stigma and social connectedness, this study aims to examine illness stigma, social connectedness, and health in chronically ill people through structural equation modeling. Structural equation modeling was selected due to its ability to examine relationships across multiple latent variables comprised of multiple manifest (measured) variables and the ability to test mediation all within one model. With the plethora of evidence for social connection as a key aspect of belonging, we developed a model to examine stigma's impact on three groups of health outcomes directly and indirectly through the path of social connectedness in alignment with the belongingness theory from Maslow (1943) and Baumeister and Leary (1995).

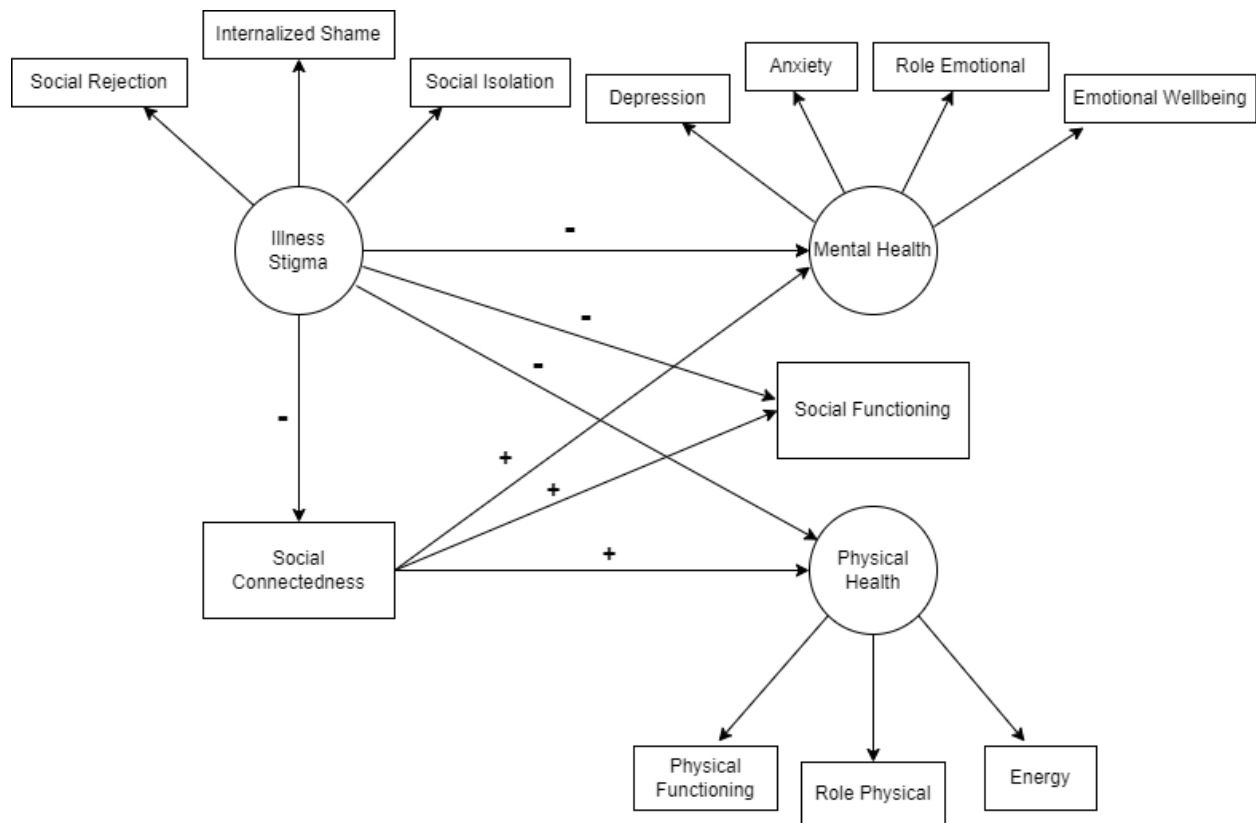
This study is unique in that we recruited participants who are dealing with ongoing symptoms of chronic illness, and thus may experience more illness-related stigma as their condition persists over time. We predict that higher levels of illness stigma will be associated

with lower levels of social connection (H1). We then build upon this model using belongingness theory to hypothesize that lower social connectedness will be directly associated with poorer quality of life across mental, physical, and social domains (H2). Finally, we propose that the relationship between stigma and health will be mediated by social connectedness (H3). Figure 1 illustrates the proposed model tested.

The model includes stigma, social connectedness, and health with stigma, mental health, and physical health as latent variables. These causal paths are theoretically and empirically based on findings from Lange and Crawford (2023) and the works of Baumeister and Leary (1995), Chapple et al. (2004), Earnshaw and Quinn (2012) and Wadley et al. (2019). Manifest variables for illness stigma include the Social Rejection sum, Social Isolation sum, and Internalized Shame sum from the Social Impact Scale (Fife & Wright, 2000). Manifest variables for physical health include these subscale averages from the Short-Form 36; Physical Functioning, Role Limitations (Physical), and Energy (Short Form-36; Ware et al., 2004). Manifest variables for mental health include Patient Health Questionnaire-8 (PHQ-8), Hopkins Symptom Checklist-Anxiety Scale (HSCL), and Short-Form 36 subscales; Role Emotional and Emotional Wellbeing (PHQ-8; Kroenke et al., 2008, Hopkins Symptom Checklist-Anxiety Scale; Derogatis et al., 1974, Short Form-36; Ware et al., 2004). Stigma was hypothesized to have a direct effect on social connection and an indirect effect on health mediated by social connection. A priori power analysis indicated that a sample size of 205 will be required to detect an effect size of 0.06 at 80% power, thus this sample of 231 should yield enough power to provide conclusive results for model support.

Figure 1

Proposed model



Methods

Participants

The sample consisted of 238 participants (Male=16.4% Female= 82.2%, 18-76 years old, $M=43.36$, $SD= 14.26$) who were at least 18 years old and consistently had chronic illness symptoms for at least three months prior to participation in the study. No monetary compensation was provided for those who participated in the study. Participants volunteered to complete the online surveys, with no impediments or penalties for withdrawing. Data was not used from participants reporting physical symptoms for less than three months, those who had

more than one primary diagnosis or had a primary diagnosis of a psychiatric or affective disorder, those who did not consent to completing the study, or participants who failed to complete all four surveys (N=231). For demographic information, please see Table 1.

Procedure

The *Verification of Illness, Coping, and Experience (VOICE)* study (Dischinger et al., 2019; Smith & Lange, 2023) was approved by the University Internal Review Board on January 29th, 2010, before collection of data commenced. Participants were recruited through online postings to discussion boards and forums of illness support groups from websites based primarily in the United States. Online recruitment notices were approved by the administrators of each website prior to posting and adhered to community guidelines. The notices contained information describing the *VOICE* study and directed participants to the online surveys. Participants reviewed and agreed to an electronic informed consent form before completing each survey. All surveys included an informed consent form with information regarding the project goals, privacy, time for completion, potential scientific benefits, researchers, and IRB contact information, as well as a mental health resource telephone number.

Participants completed four online surveys that collected information on 12 measures and eight open-ended questions. The surveys examined different aspects of illness experience including personal beliefs, coping/adjustment, and health outcomes. The measures contained in these surveys included variables meant to gauge participants' illness stigma (Social Impact Scale; Fife & Wright, 2000) including internalized shame, social rejection, social isolation, and demographic characteristics; relationships and degree of social connectedness (Social Connectedness Scale; Lee and Robbins, 1995); and the impact of these measures on participants' mental and physical health and social functioning (Short Form-36; Ware et al., 2004, PHQ-8;

Kroenke et al., 2009, Hopkins Symptom Checklist-Anxiety Scale; Derogatis et al., 1974). The first part of the surveys focused on medical information to determine the participants' diagnoses, as well as the magnitude and the duration of their symptoms. After completing the measures, the participants were directed to a debriefing form that thanked them for their input and addressed those participants who did not consent or did not qualify for the study.

Participants who failed to complete all four were not included in the final analyses. If the participants completed at least one survey and consented to be contacted via email, an email requesting the completion of the surveys was sent within six months of the initial participation in the study. Additionally, data were not used from participants reporting physical symptoms for less than three months, more than one primary diagnosis or a primary diagnosis of a psychiatric or affective disorder, or from those who did not consent to completing the study.

Measures

The measures contained within the surveys used in this study consist of demographic and socioeconomic variables, open-ended questions regarding participants' views of their illness, and items from various experimental tools designed to elucidate the phenomena of interest to this study. Although a plethora of data was collected from four surveys, only data pertinent to the current research question will be discussed here.

Demographic Information

Participants were asked to report demographic information including their sex at birth, age, ethnicity, level of education, employment status, annual household income, country of origin, and relationship status (i.e. single, in a relationship, married, cohabitating, divorced, separated, or widowed). Each survey requested participants to report their primary diagnosis, duration of intermittent or persistent symptoms, and secondary diagnoses.

Illness Stigma

The Social Impact Scale was used to measure illness stigma by summing scores from the Social Rejection and Internalized Shame subscales (Fife & Wright, 2000). Each subscale asked the participant to think on their experiences over the last four weeks then rate each statement on a 4-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) higher scores indicating higher level of perceived stigma. Examples of statements include, “I feel others avoid me because of my illness” (Social Rejection), “I feel the need to keep my illness a secret” (Internalized Shame) and “I feel set apart from those who are well” (Social Isolation). Each subscale demonstrates good internal reliability with Cronbach’s Alpha of .90, and .78, Social Rejection and Internalized Shame respectively. These subscales comprise the two manifest variables contributing to the latent variable titled “Illness Stigma.” Fife and Wright determined reliability by means of McDonald’s w estimation point estimate which was equal to 0.889 (95% CI lower bound = 0.862; 95% CI upper bound = 0.911).

Social Connectedness

Each participant’s level of social connection was measured using the Social Connectedness Scale developed by Lee and Robbins (1995). The scale consists of eight items that evaluate participants’ level of belongingness and their feelings of bonding with and connection to the social world, and is highly reliable ($\alpha = .91$, Lee & Robbins, 1995). Participants rated statements included in the measure on a six-point Likert type scale from *strongly disagree* to *strongly agree*, with the total sum value ranging from 8 to 48 points. Items on the Social Connectedness Scale include statements like “I feel disconnected from the world around me” and “I feel so distant from people”. Higher scores on this measure indicate a higher level of

connectedness to the social world as perceived by the participants. In this sample the scale was found to have high internal reliability with a Cronbach's alpha of .96.

Mental Health

Mental health outcomes were measured using the PHQ-8 (Kroenke et al., 2009) Hopkins Symptom Checklist-Anxiety Scale (Derogatis et al., 1974) and SF-36 Health Survey Manual and Interpretation Guide (Ware, Kosinski, & Gandek, 2004), which measures 36 health-related items on eight dimensions covering functional status, physical, emotional, social well-being, and overall health. For the mental health latent variable, we used the emotional wellbeing and role emotional subscales of the SF-36.

The Patient Health Questionnaire-8 (PHQ-8) is a measure that includes eight of the nine criteria stipulated by the DSM-IV for diagnosing depressive disorders, with the ninth criterion relating to suicidal thoughts (American Psychiatric Association & American Psychiatric Association, 1994). These eight aspects are assessed using a four-tier Likert scale, with 1 meaning "Not at all" and 4 indicating "Nearly Every Day". Examples of questions asked include "In the past four weeks, how frequently have you felt or been disturbed by: 1. feelings of hopelessness or depression 2. Lack of interest or enjoyment in activities". The total score is calculated by adding the scores of the eight individual items, the score range tops at 24. A higher score represents a greater level of depressive symptoms, with scores of 10 or more generally indicating the existence of a depressive disorder (Kroenke et al., 2009). The PHQ-8 has been validated in past research, demonstrating an internal consistency/reliability of $\alpha = .84$ and a confirmatory factor analysis goodness of fit index of .98 (Pressler et al., 2011). In this particular study, the alpha coefficient is .87.

The Hopkins Symptom Checklist Anxiety Scale (HSCL), developed by Derogatis et al. (1974), consists of six items and asks respondents to reflect on the question, "How have you felt during the past four weeks, including today?" A 1 to 4 graduated system is used to measure responses, where 1 represents "Not at all" and 4 signifies "Extremely". The scores are then averaged, with a higher average indicating a higher level of anxiety experienced by the respondent. The initial study by Derogatis and colleagues (1974) demonstrated a Cronbach alpha of .84 and a one-week test-retest reliability of .75 in both psychiatric and regular populations. Further, an interrater reliability correlation of .67 was determined. For this current study, the Cronbach's alpha is .87.

In a psychometric evaluation of the SF-36, Gandek and colleagues (2004) determined each health dimension scale to have strong validity and internal consistency (all Cronbach's $\alpha > .70$). The number of possible responses per item ranges from two to six. For example, for an item assessing role limitations (emotional), participants were asked to indicate if they had problems with work or other regular activity (e.g. "cut down on the amount of time you spent on work or other activities") due to emotional problems such as feeling depressed or anxious. Response options for that item included "yes" and "no". Regardless of response option number, each response is transformed to a scale of 0 to 100, with higher scores indicating better health. Scores were then averaged according to health dimension. In this sample the scale was found to have high internal reliability with a Cronbach's alpha of 0.86.

Physical Health

Physical health was measured using the physical functioning, role limitations (physical), and energy subscales of the SF-36 Health Survey (Ware, Kosinski, & Gandek, 2004), as described above. In an item assessing physical functioning, participants were asked to indicate

the extent to which their health limited them from certain activities (e.g. “climbing one flight of stairs”) ranging from “yes, a lot limited” to “no, not at all limited”.

Social Functioning

Social functioning was measured by the social functioning subscale of the SF-36 as described above. An item assessing social functioning asks, “During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?” Response options included “Not at all”, “Slightly”, “Moderately”, “Quite a bit”, and “Extremely.”

Statistical Analysis

The data were analyzed using Jamovi and R (v2.3.21, the jamovi project 2022; v4.3.0; R Core Team 2023). After examining data for normality and covariates, a robust maximum likelihood structural equation model analysis was applied to confirm the proposed model. First, the model was designed based on prior research, theory, and the proposed research questions. Next each parameter within the model was evaluated and model fit was appraised. Model fit was appraised through many statistics including a chi-square ration less than or equal to 2 and chi square p value of $p > .05$, a Goodness-of-fit Index (GFI) of .95 or above, A Tucker-Lewis Index of .95 or above, a Comparative Fit Index (CFI) of .90 or above, and a Root Mean Square Error of Approximation (RMSEA) of 0.8 or below as modeled by Rusli et al. (2008). Total, direct, and indirect effects were calculated using the standard regression weights of each pathway.

Results

Characteristics of observed variables

Table 1 contains the demographic characteristics of the study population. The sample consisted of 231 participants, with 82.7% identifying as female, 16.5% as male, and 0.8% not

responding to this question. The majority of participants identified as White (88.7%), followed by Multi-ethnic/Biracial (5.2%), African American/Black (3.0%), Hispanic/Latino/Latina/Latinx (1.7%), and Asian (1.3%). The mean age of the participants was 43.6 years ($SD = 14.2$).

Regarding relationship status, 68.6% of participants were in a committed relationship, while 31.4% were single or involved in uncommitted relationships. Most participants had attended some college (32.5%), or attained a bachelor's degree (21.2%). Of others in the study population 18.6% had an associate's degree. Regarding employment status, 31.2% were working for pay at a job or business and 26.4% of participants identified as disabled. With respect to annual household income, the majority of participants fell into the \$20,000-\$50,000 category (34.6%), followed by the \$50,000-\$100,000 category (25.5%), <\$20,000 category (25.1%), and >\$100,000 category (12.6%). See Table 1 for details.

Table 1

Demographics

	Total sample	Percent
Sex at Birth		
Female	191	82.7%
Male	38	16.5%
Did not respond	2	0.8%
Ethnicity		
White	205	88.7%
Hispanic/Latino/Latina/Latinx	4	1.7%
African American/Black	7	3.0%
Asian	3	1.3%
Multi-ethnic/Biracial	12	5.2%
Relationship Status		
Single or uncommitted	72	31.4%
Committed relationship	157	68.6%
Education Level		
Some high school or less	6	2.6%
High school graduate	13	5.6%
Some college	75	32.5%
Associate's degree	43	18.6%
Bachelor's degree	49	21.2%

Post-college graduate	44	19.0%
Employment Status		
Working for pay at a job or business	72	31.2%
Taking care of house or family	10	4.3%
Going to school	26	11.3%
Retired	17	7.4%
On family or maternity leave	1	.4%
On personal sick leave	1	0.4%
Temporarily unable to work for health reasons	14	6.1%
On layoff	2	0.8%
Disabled	61	26.4%
Looking for work	4	1.7%
Not employed, not looking for work	12	5.2%
Other	9	3.9%
Annual Household Income		
<\$20,000	58	25.1%
\$20,000-\$50,000	80	34.6%
\$50,000-\$100,000	59	25.5%
>\$100,000	29	12.6%

The mean and standard deviation (*SD*) of several variables were calculated. The mean score on the Social Connectedness measure was 24.5 (*SD* = 10.4), indicating low to moderate levels of belongingness among the sample. The mean score on the Social Rejection scale was 19.4 (*SD* = 6.62), suggesting that participants reported experiencing a moderate to high degree of rejection in their social lives. The mean score on the Internalized Shame scale was 10.7 (*SD* = 3.43), indicating that participants reported experiencing a moderate amount of shame. Social Isolation had an average score of 18.8 (*SD* = 5.50) indicating participants experience a moderate to high amount of social isolation.

In terms of mental health variables, the mean score for Depression was 11.5 (*SD* = 6.04), and Anxiety had an average score of 10.3 (*SD* = 3.98) both of which are moderate to high levels of depression and anxiety. Role Emotional, a measure of the impact of emotional state on role performance, had a mean score of 42.0 (*SD* = 43.7) meaning on average participants felt there

were performing at 42% regarding their role due to emotional disturbances. Meanwhile, the average score for Emotional Wellbeing, which measures positive affect and satisfaction with life, was 58.1 ($SD = 19.7$) meaning on average participants felt 58% emotionally well.

The mean score for Social Functioning was 37.7 ($SD = 23.6$), indicating participants experienced low levels of social functioning. The mean score on the Physical Functioning scale was 47.4 ($SD = 30.6$), indicating that participants reported low to moderate levels of physical functioning. Role Physical, a measure of the impact of physical health on role performance, had a mean score of 16.4 ($SD = 32.1$), indicating very low levels of role performance due to physical problems. The mean score on the Energy scale was 24.5 ($SD = 21.1$), suggesting that participants reported low levels of energy.

Correlation Coefficients

Table 2

Pearson's Correlation Coefficient Matrix of Measured Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Social Connection	—										
2. Social Rejection	-0.495***	—									
3. Internalized Shame	-0.458***	0.558***	—								
4. Social Isolation	-.639**	.659**	.546**	--							
5. Depression	-.534**	.328**	.317**	.561**	--						
6. Anxiety	-.344**	.096	.243**	.314**	.553**	--					
7. Role Emotional	.441**	-.209**	-.288**	-.366**	-.526**	-.414**	--				
8. Emotional Wellbeing	.450**	-.169*	-.266**	-.390**	-.560**	-.597**	.604**	--			
9. Social Functioning	.511**	-.394**	-.197**	-.518**	-.588**	-.282**	.289**	.285**	--		
10. Physical Functioning	.351**	-.326**	-.113	-.416**	-.445**	-.108	.135*	.042	.605**	--	
11. Role Physical	.352**	-.293**	-.184**	-.461**	-.474**	-.178**	.379***	.206***	.649***	.448***	--
12. Energy	.394**	-.312**	-.209**	-.428**	-.571**	-.220**	.265**	.310***	.579***	.429***	.470***

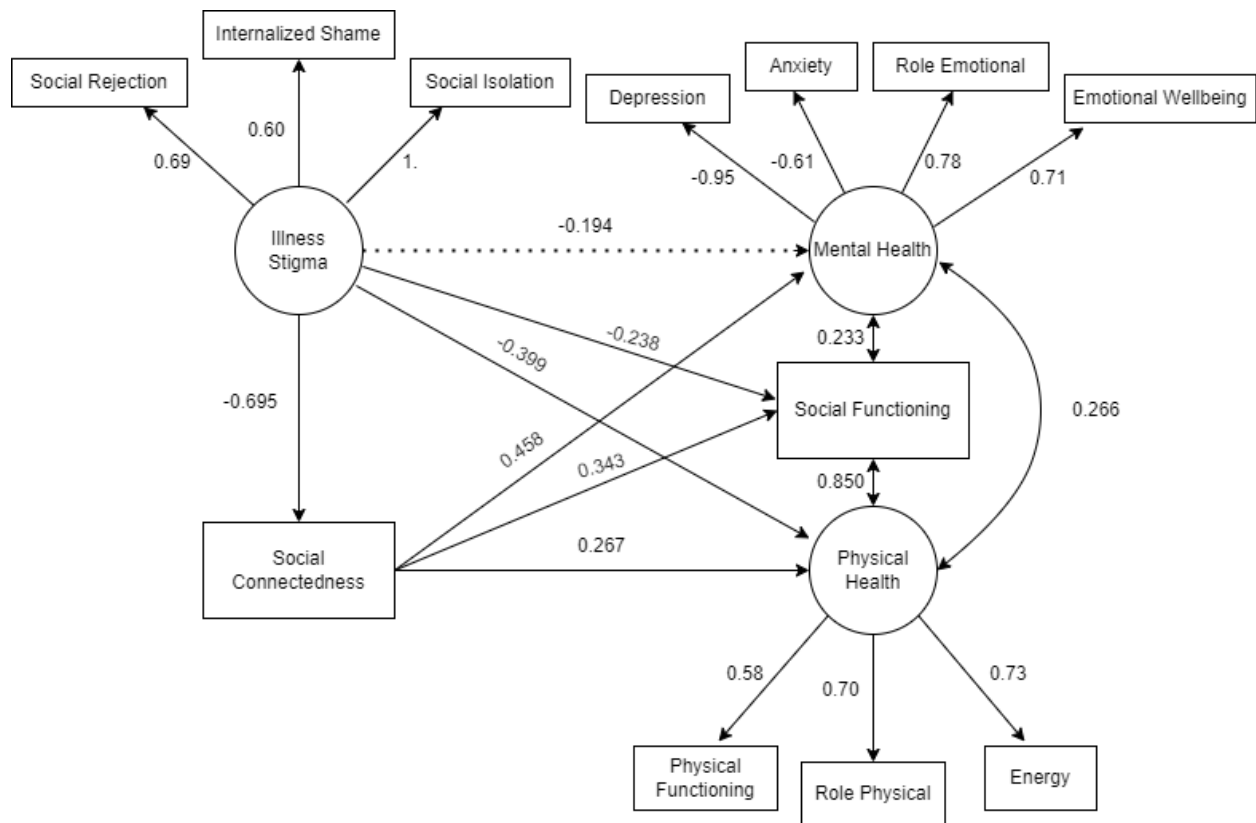
Note. * p < .05, ** p < .01, *** p < .001

Table 2 presents the Pearson's correlation coefficient matrix of measured variables. As shown in the table, there were significant correlations among several variables. All measures of stigma demonstrate positive correlations with depression and anxiety and negative correlations with emotional wellbeing, role emotional, social functioning, physical functioning, role physical, and energy. This indicates that our measured aspects of stigma are all related to poorer social functioning and mental and physical health. Conversely, social connection has negative correlations with depression and anxiety while positively correlating with physical functioning, emotional wellbeing, role physical, and energy.

Final model

Figure 2

Structural Equation Model of Social Connection, Stigma, and Health



Note. Standardized betas reported

Figure 2 shows the final model, pathways and factor loadings. The measures of model fitness were as follows: chi square for Goodness-of-Fit test ($\chi^2 = 62.94$, $df = 46$, $p = 0.049$), scaled chi square (177.58, $df=46$, $p < .001$), CFI (0.989), TLI (0.984), SRMR (0.071) and RMSEA (0.04). These indices all suggest that the model reasonably fits the data. All regressions were significant at the $p < .001$ level except for the relationship between illness stigma and mental health which was nonsignificant at the $p < .05$ level, $p=0.066$. Greater social connectedness predicted better quality of life across all areas of mental, social, and physical health ($B= 0.458$, $p < .001$; $B= 0.343$, $p < .001$; $B= 0.267$, $p < .001$, respectively). Furthermore, greater illness stigma was associated with lower social connectedness, social functioning, and physical health, but was not independently associated with mental health ($B= -0.695$, $p < .001$; $B= -0.238$; $p < .001$, $B= -0.399$, $p < .001$; $B= -0.194$, $p =0.06$, respectively).

Table 3

Standardized Direct, Indirect, and Total Effect of Social Connectedness as a Mediator

	Direct Effect	Indirect Effect	Total Effect
Mental Health	-0.194	-0.319***	-0.512***
Social Functioning	-0.238*	-0.239***	-0.477**
Physical Health	-0.399**	-0.186*	-0.718***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3 provides the standardized effects of illness stigma (predictor) and social connection (mediator) on the health outcomes. These results indicate the social connection is a significant mediator for all health outcomes. The direct effects are also displayed in Figure 2 above as these are the direct associations between illness stigma and the three health outcomes.

Indirect effect results can be interpreted as such; Each standard deviation unit change in illness stigma results in a -0.319 standard deviation unit change in mental health through the path of social connection ($p < .001$). Total effects are the sum of the direct and indirect effects. Social connection is a significant mediator for all health outcomes at the $p < .05$ level, therefore H3 is supported.

Discussion

The model investigated in this study begins to elucidate stigma as a predictor of health through the path of social connection. Social connection in this study is conceptually defined as a relational schema of self, describing how one sees themselves in reference to the larger social context (Lange & Crawford, 2023; Lee & Robbins, 1995). Logically, one's identity of social connectedness could be altered through the experience of chronic illness, especially if they experience stigma related to their illness. As predicted, stigma had a negative association with social connection such that those higher in stigma were lower in social connection supporting hypothesis 1. Furthermore, with the concept of social connectedness as a component of belongingness, stigma can have profound impacts on all aspects of health through influences on social connectedness. Low social connectedness predicted lower health across physical, mental, and social dimensions, which is in line with hypothesis 2. The impact of illness stigma on mental, physical, and social health, was significant through the path of social connection, in support of hypothesis 3. This research expounds on and contributes to the literature regarding stigma, social connection, and health by investigating the variables within a model simultaneously and model components are described in more detail below.

The finding that greater stigma was associated with decreased social connectedness is a contribution to the literature as it is the first known study to investigate this association. Findings further support the integration of the stigma concept with belongingness theory, identifying pathways by which stigma can impact health. Certainly, it is not a new finding that stigma demonstrates a strong relationship to health where those with higher stigma levels have lower health (Wadley et al., 2019; Hobson et al., 2022; Earnshaw et al., 2012). Previous studies indicate that deficiency in social relationships and belonging predicted mortality better than typical health indicators such as obesity or sedentary lifestyle (Holt-Lunstad et al., 2010; Pantell et al., 2013). It should be mentioned that one finding could be interpreted as contradicting the literature as we did not find a significant direct path from stigma to mental health as supported by Wadley et al. (2019). However, similar to our findings, Hobson et al. had similar findings where the indirect path from HIV stigma to pain was significant through depressive symptoms and insomnia in serial mediation, yet the direct path was non-significant (2022).

This study builds upon this research to identify social connectedness as a potential mechanism by which illness stigma may lead to adverse health effects holistically across social, physical and mental functioning. Social connection had significant effects to all outcome variables, both through the b pathway and as a mediator between stigma and health outcomes. The pathway through social connection provided stronger results than the direct path for mental health and social functioning suggesting that social connectedness has a greater influence on these factors than stigma alone. Our research not only reinforces earlier studies suggesting a link between social connectedness and mental health but also broadens this understanding to show its significant influence on physical health and social functioning (Lee 2001, 2002, 2008; Lange & Crawford 2023; Kintzle 2018). Collectively, our results are consistent with the theory of

belongingness, underscoring the idea that possessing a sense of social connection is a vital element of overall health.

This model provides support for stigma and social connection being important influences on health in a chronically ill population. We propose that the interpretation and behavior response to stigma has potential to influence health outcomes by serving to modify relational self-schemas of belongingness. Therefore, we suggest social connection is not only a measure of belonging but also serves as a lens by which individuals are influenced by and grapple with stigma with implications for psychosocial and physical health. Theories on social connection and stigma are scarce although the theoretical framework presented here was designed with Baumeister and Leary's work at top of mind (1995). Still, the exact mechanism by which stigma and social connection interact is unknown. Further theoretical development on stigma within the realm of health psychology may prove advantageous to increasing knowledge and producing more efficacious interventions.

Limitations

Even though hypotheses were based on empirical evidence and theory, there was no way to establish cause and effect because the study was correlational. We are only able to infer relationships between variables based on existing theories. To confirm directionality and causality, further research is needed using longitudinal and experimental designs. Additionally, the limitations of surveys should be taken into account when considering results. Our measures of health were all self-report thus, further studies involving physiological indicators such as blood pressure and cortisol levels are necessary to accurately understand the relationship between social connection, stigma, and health. However, in most cases, self-report data is the

best way to collect information on a large number of chronically ill patients' experience and perspectives.

Conclusion

In conclusion, this study provides valuable insights into the relationship between stigma, social connection, and health, and highlights the importance of considering the indirect pathway of social connection in the relationship between stigma and health. The findings support previous research on the detrimental effects of stigma on health and suggest that increasing social connectedness and decreasing stigma may have positive effects on health outcomes. Although the study has some limitations, including its correlational design and self-report measures, it provides a foundation for future longitudinal and experimental research to establish causality and further examine the mechanisms underlying the relationships between social connection, stigma, and health. Ultimately, the findings of this study have important implications for the development of interventions aimed at improving the health outcomes of those living with chronic illnesses.

References

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Brener, L., Broady, T., Cama, E., Hopwood, M., de Wit, J. B. F., & Treloar, C. (2020). The role of social support in moderating the relationship between HIV centrality, internalised stigma and psychological distress for people living with HIV. *AIDS Care*, *32*(7), 850–857. <https://doi.org/10.1080/09540121.2019.1659914>
- Buttorff, C., Ruder, T., & Bauman, M. (2017). *Multiple Chronic Conditions in the United States*. RAND Corporation. <https://doi.org/10.7249/TL221>
- Cacioppo, J. T., & Hawkey, L. C. (2003). Social Isolation and Health, with an Emphasis on Underlying Mechanisms. *Perspectives in Biology and Medicine*, *46*(3), S39–S52. <https://doi.org/10.1353/pbm.2003.0063>
- Chapple, A., Ziebland, S., & McPherson, A. (2004). Stigma, shame, and blame experienced by patients with lung cancer: Qualitative study. *BMJ*, *328*(7454), 1470. <https://doi.org/10.1136/bmj.38111.639734.7C>
- Christiansen, J., Qualter, P., Friis, K., Pedersen, S., Lund, R., Andersen, C., Bekker-Jeppesen, M., & Lasgaard, M. (2021). Associations of loneliness and social isolation with physical and mental health among adolescents and young adults. *Perspectives in Public Health*, *141*(4), 226–236. <https://doi.org/10.1177/17579139211016077>

Chronic Diseases in America / CDC. (2022, January 27).

<https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm>

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis.

Psychological Bulletin, 98(2), 310–357. <https://doi.org/10.1037/0033-2909.98.2.310>

De Ruddere, L., & Craig, K. D. (2016). Understanding stigma and chronic pain: A-state-of-the-art review. *PAIN*, 157(8), 1607–1610. <https://doi.org/10.1097/j.pain.0000000000000512>

Dischinger, M. I., Lange, L., & Vehling, S. (2019). Loss of resources and demoralization in the chronically ill. *General Hospital Psychiatry*, 61, 10–15.

<https://doi.org/10.1016/j.genhosppsy.2019.08.002>

Duru E. & Poyrazli S. (2011) Perceived discrimination, social connectedness, and other predictors of adjustment difficulties among Turkish international students. *International Journal of Psychology* 46(6). John Wiley & Sons, Inc.: 446–454. DOI:

Earnshaw, V. A., & Quinn, D. M. (2012). The Impact of Stigma in Healthcare on People Living with Chronic Illnesses. *Journal of Health Psychology*, 17(2), 157–168.

<https://doi.org/10.1177/1359105311414952>

Earnshaw, V. A., Quinn, D. M., & Park, C. L. (2012). Anticipated stigma and quality of life among people living with chronic illnesses. *Chronic Illness*, 8(2), 79–88.

<https://doi.org/10.1177/1742395311429393>

Fife, B. L., & Wright, E. R. (2000). The Dimensionality of Stigma: A Comparison of Its Impact on the Self of Persons with HIV/AIDS and Cancer. *Journal of Health and Social Behavior*, 41(1), 50–67. <https://doi.org/10.2307/2676360>

Hajat, C., & Stein, E. (2018). The global burden of multiple chronic conditions: A narrative review. *Preventive Medicine Reports*, *12*, 284–293.

<https://doi.org/10.1016/j.pmedr.2018.10.008>

Harandi, T. F., Taghinasab, M. M., & Nayeri, T. D. (2017). The correlation of social support with mental health: A meta-analysis. *Electronic Physician*, *9*(9), 5212–5222.

<https://doi.org/10.19082/5212>

Helliwell, J., Layard, R., Sachs, J., Neve, J.-E., Aknin, L., & Wang, S. (2021). *World Happiness Report 2021*.

Hobson, J. M., Gilstrap, S. R., Owens, M. A., Gloston, G. F., Ho, M. D., Gathright, J. M., Dotson, H. F., White, D. M., Cody, S. L., Justin Thomas, S., & Goodin, B. R. (2022). Intersectional HIV and Chronic Pain Stigma: Implications for Mood, Sleep, and Pain Severity. *Journal of the International Association of Providers of AIDS Care (JIAPAC)*, *21*, 23259582221077940. <https://doi.org/10.1177/23259582221077941>

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social Relationships and Mortality Risk: A Meta-analytic Review. *PLOS Medicine*, *7*(7), e1000316.

<https://doi.org/10.1371/journal.pmed.1000316>

Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health*, *78*(3), 458–467. <https://doi.org/10.1093/jurban/78.3.458>

Kawachi, I., Subramanian, S. V., & Kim, D. (2008). Social Capital and Health. In I. Kawachi, S. V. Subramanian, & D. Kim (Eds.), *Social Capital and Health* (pp. 1–26). Springer.

https://doi.org/10.1007/978-0-387-71311-3_1

- Kintzle, S., Barr, N., Corletto, G., & Castro, C. A. (2018). PTSD in U.S. Veterans: The Role of Social Connectedness, Combat Experience and Discharge. *Healthcare*, 6(3), Article 3. <https://doi.org/10.3390/healthcare6030102>
- Lange, L. J. & Crawford, A. B. (2023) Social Connectedness Identity and Physical Health: A Multi-Study Investigation, 05 April 2023, PREPRINT (Version 1) available at Research Square [<https://doi.org/10.21203/rs.3.rs-2729312/v1>]
- Lauckner, H., & Hutchinson, S. L. (2016, March 5). *Peer support for people with chronic conditions in rural areas: A scoping review*. <https://doi.org/10.22605/RRH3601>
- Lee, R. M., & Robbins, S. B. (1995). Measuring belongingness: The Social Connectedness and the Social Assurance scales. *Journal of Counseling Psychology*, 42(2), 232–241. <https://doi.org/10.1037/0022-0167.42.2.232>
- Lee R.M., Draper M. and Lee S. (2001) Social Connectedness, Dysfunctional Interpersonal Behaviors, and Psychological Distress: Testing a Mediator Model.: 9.
- Lee R.M., Keough K.A. and Sexton J.D. (2002) Social Connectedness, Social Appraisal, and Perceived Stress in College Women and Men. *Journal of Counseling & Development* 80(3). Wiley-Blackwell: 355. DOI: [10.1002/j.1556-6678.2002.tb00200.x](https://doi.org/10.1002/j.1556-6678.2002.tb00200.x).
- Lee R.M., Dean B.L. and Jung K.R. (2008) Social connectedness, extraversion, and subjective well-being: Testing a mediation model. *Personality and Individual Differences* 45(5): 414–419. DOI: [10.1016/j.paid.2008.05.017](https://doi.org/10.1016/j.paid.2008.05.017).
- Link, B. G., & Phelan, J. C. (2001). Conceptualizing Stigma. *Annual Review of Sociology*, 27(1), 363. <https://doi.org/10.1146/annurev.soc.27.1.363>

- Martin, A. B., Hartman, M., Lassman, D., & Catlin, A. (2021). National Health Care Spending In 2019: Steady Growth For The Fourth Consecutive Year. *Health Affairs*, *40*(1), 14–24. <https://doi.org/10.1377/hlthaff.2020.02022>
- Maslow A.H. (1943) A Theory of Human Motivation. *Psychological Review* *50*(4): 430–437.
- McInnis, O. A., McQuaid, R. J., Bombay, A., Matheson, K., & Anisman, H. (2015). Finding benefit in stressful uncertain circumstances: Relations to social support and stigma among women with unexplained illnesses. *Stress: The International Journal on the Biology of Stress*, *18*(2), 169–177. <https://doi.org/10.3109/10253890.2014.1001975>
- Morton, K., Ainsworth, B., Miller, S., Rice, C., Bostock, J., Denison-Day, J., Towler, L., Groot, J., Moore, M., Willcox, M., Chadborn, T., Amlot, R., Gold, N., Little, P., & Yardley, L. (2021). Adapting Behavioral Interventions for a Changing Public Health Context: A Worked Example of Implementing a Digital Intervention During a Global Pandemic Using Rapid Optimisation Methods. *Frontiers in Public Health*, *9*. <https://www.frontiersin.org/article/10.3389/fpubh.2021.668197>
- Nitschke, J. P., Forbes, P. A. G., Ali, N., Cutler, J., Apps, M. A. J., Lockwood, P. L., & Lamm, C. (2021). Resilience during uncertainty? Greater social connectedness during COVID-19 lockdown is associated with reduced distress and fatigue. *British Journal of Health Psychology*, *26*(2), 553–569. <https://doi.org/10.1111/bjhp.12485>
- Pan, A.-W., Chung, L., Fife, B. L., & Hsiung, P.-C. (2007). Evaluation of the psychometrics of the Social Impact Scale: A measure of stigmatization. *International Journal of Rehabilitation Research*, *30*(3), 235–238. <https://doi.org/10.1097/MRR.0b013e32829fb3db>

- Pantell, M., Rehkopf, D., Jutte, D., Syme, S. L., Balmes, J., & Adler, N. (2013). Social Isolation: A Predictor of Mortality Comparable to Traditional Clinical Risk Factors. *American Journal of Public Health, 103*(11), 2056–2062.
- R Core Team (2022). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Raghupathi, W., & Raghupathi, V. (2018). An Empirical Study of Chronic Diseases in the United States: A Visual Analytics Approach to Public Health. *International Journal of Environmental Research and Public Health, 15*(3), 431.
<https://doi.org/10.3390/ijerph15030431>
- Rusli, B. N., Edimansyah, B. A., & Naing, L. (2008). Working conditions, self-perceived stress, anxiety, depression and quality of life: A structural equation modelling approach. *BMC Public Health, 8*(1), 48. <https://doi.org/10.1186/1471-2458-8-48>
- Smith, A., & Lange, L. J. (2023). Do labels matter? Implications of ongoing symptomatic chronic illnesses labeled as conventional diagnoses vs. functional somatic syndromes. *Chronic Illness, 17*423953231174926. <https://doi.org/10.1177/17423953231174926>
- The jamovi project (2022). jamovi (Version 2.3.21) [Computer Software]. Retrieved from <https://www.jamovi.org>
- Valtorta, N. K., Kanaan, M., Gilbody, S., Ronzi, S., & Hanratty, B. (2016). Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies. *Heart, 102*(13), 1009–1016.
<https://doi.org/10.1136/heartjnl-2015-308790>

Wadley, A. L., Pincus, T., & Evangeli, M. (2019). A preliminary analysis of the association between perceived stigma and HIV-related pain in South Africans living with HIV. *African Journal of Primary Health Care & Family Medicine*, *11*(1), 1–5.
<https://doi.org/10.4102/phcfm.v11i1.1647>

Illness Stigma, Social Connectedness, and Health in People living with Chronic Illness: A Structural Equation Model

Chronic illness is the leading cause of death and disability, and related medical care makes up 90% of the United States' annual health care cost (CDC, 2022; Buttorff et al., 2017; Martin et al. 2021). Estimates show that between 16-58% of people around the world have multiple chronic health conditions, and this number is anticipated to continue increasing (Hajat & Stein, 2018). Unfortunately, because chronic illnesses often lack a straightforward pathology and treatment which deviates from the standard biomedical model, many individuals with chronic illness experience stigma related to their condition (De Ruddere & Craig, 2016).

Stigma is defined by Link and Phelan as the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination (2001). Research indicates that social connections are effective at reducing the negative impacts of stressors, while loneliness and isolation have been

linked to numerous psychological and physical issues such as depression and coronary heart disease (Cohen & Wills, 1985; Christiansen et al., 2021; Valtorta et al., 2016). Public health efforts have focused on behavioral and educational interventions for preventing or treating chronic illness, yet incidence of chronic illness and mortality rates continue to rise (Raghupathi & Raghupathi, 2018; Morton et al., 2021). Altering societal views about chronic illness as well as strengthening social ties may have a more powerful effect on improving health outcomes for people suffering from chronic conditions.

Stigma and Health

Research on illness stigma is limited, typically focusing on HIV and lung cancer patients. Illness stigma has been associated with higher pain intensity and depressive symptoms,