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Loneliness and Mental Health: Recommendations for Primary Care Intakes

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Abstract

Introduction/Objectives: The healthcare intake process plays a significant role in informing medical personnel about patients' demographic information, subjective health status, and health complaints. Intake forms can help providers personalize care to assist patients in getting proper referrals and treatment. Previous studies examined factors that could be included in intake forms independently, but this study analyzed loneliness, religiousness, household income, and social integration together to see how the combined effect influences mental and physical health status. This study aims to determine which of those 4 variables better inform patients' mental versus physical health status. **Methods:** One hundred and seventy-nine participants completed surveys, including the SF-12® Health Survey, measuring perceived physical and mental health, UCLA 3-item Loneliness Scale, and a demographics questionnaire with questions about household income and time spent dedicated to religious practice, if applicable. Additionally, individuals answered social integration questions about how often they contact close family and friends or volunteer in the community. Using loneliness, household income, religiousness, social integration as independent variables, and controlling for demographic variables such as age, gender, and race, 2 regression models were built with Mental and Physical Health Composite Scores from the the SF-12® Health Survey as dependent variables. **Results:** Loneliness was associated with mental health measures ($b = -2.190$, $P < .001$), while household income was associated with physical health measures ($b = 0.604$, $P = .019$) above and beyond other variables in the regression models. **Conclusions:** Integrating the 3 loneliness questions into intake forms can help approximate an individual's mental health status. This would allow the provider to be able to assess mental health problems more effectively and provide needed resources.

Keywords

physical health, mental health, loneliness, primary care, screening

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Introduction

Healthcare workers are instructed to treat patients as holistic individuals, meaning that they care for the mind, body, and spirit. Mental and physical health are affected by various risk factors, such as loneliness, social integration, religiousness, and household income can greatly affect one's health.[1,2] Previous studies have examined the importance of these risk factors in relation to mental and physical health separately, but no study had analyzed the synergistic effect that these risk factors can have on one's physical and mental health status.[1-5] Religion, household income, and social integration can serve as protective factors for one's health status.[3-5] Will one's mental or physical health suffer in presence of loneliness despite these protective factors? This study aims to explore the varying effect these risk and protective factors can have on one's mental health versus one's physical health.

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Loneliness is defined as a distressing feeling where one's desired and actual social relationships are not matching. It is different from social isolation, and happens when one perceives shortcoming from the relationships that they maintain.[6] Loneliness often affects human health, indicating unsatisfying social relationships lead to adverse consequences. Being lonely can contribute to changes in one's behavior and physiology, leading to serious adverse health implications and mortality.[7] Those who reported to be lonely are more likely to suffer from mental illnesses, such as depression and anxiety.[1] One study found that loneliness predicted increased depressive symptoms, decreased self-rated health, and additional functional limitations.[8]

Social integration refers to one's interaction with their friends, family, and community, and can include the frequency that one visits and communicates with others. Individuals who experience social isolation are more likely to have more depressive symptoms. They are also more likely to report poor physical and mental health.[9] A previous study found that individuals who engage in organizations and are involved in their community are less likely to report depressed and anxious symptoms, more likely to report higher physical functioning, and more likely to report a higher self-rated health level.[10] Integrating oneself into the community often gives individuals a purpose in life which leads to better mental and physical health.[10] Another study showed that social integration can be seen as a protective factor against health consequences such as a higher mortality rate and decreasing mental health, suggesting that emotional support from social interactions might contribute to why social integration predicts better mental and physical health.[5]

Many individuals have religious beliefs or spiritual views that they prefer to be incorporated into their care because they are important to some individuals when coping with illnesses.[11] Religious beliefs can give an individual a greater satisfaction with life, positive affect, and greater morale which ultimately leads to a greater state of well-being. Spiritual affiliation can also decrease anxiety and suicide risks.[12] Participating in religious activities has also been demonstrated as a protective factor for mental health and improves treatment outcomes.[4] Attendance at church services is often seen to provide physical health benefits, and spiritual affiliation can serve as a protective resource that prevents the development of disease in healthy people.[13]

Health is also correlated to people's income, likely because lower income creates a gap in healthcare access to receive routine medical care. Individuals with lower income are often at a greater risk for comorbidities, as they are less likely to seek and receive needed treatment.[14] They have also been noted to not get similar medical advice that others with high socioeconomic status (SES) receive, such as weight-loss advice.[15] One study found that SES has a significant impact on physical health. Low SES exposes individuals to more health risks at work, which contribute to psychological distress, depression, and anxiety leading to worsening mental health than those who have high SES.[16] Low income also negatively correlates to self-reported health, and these individuals are at a higher risk to experience stressors which can decrease mental and physical health status.[4]

While many studies demonstrated these variables' effects on mental and physical health independently, the combination of these variables has not been investigated.[1-5] It is unlikely that these variables exist in one's life without the presence of others, so examining the combined effect to understand how these variables together can hinder or protect one's health status is important, especially when it comes to treating patients in a primary care setting. Identifying the stronger variables correlated with mental and physical health for screening during the healthcare intake process can be a quick and easy way to understand how the stronger variable plays a role on one's health status. Based on previous studies, it is evident that these 4 variables will independently assess mental and physical health.[1-5] However, by choosing the variable with the strongest association to mental and physical health, we can better conduct screening in an efficient and reliable manner during the healthcare intake process. This study examined the synergetic effects of loneliness, social integration, religious affiliation, and household income on mental health versus physical health, when all these variables are accounted for. The goal of this study is to determine the most significant variables for mental and physical health and how to best incorporate them into the healthcare intake process.

Methods

This is a cross-sectional survey study that included in-person questionnaires and interviews with a lifespan sample of adults, who volunteered for the study and could provide valid consent, from 2 study sites.

Measurements

Physical health and mental health. The SF-12® Health Survey[17] consisted of twelve questions on personal perception of physical health (Physical Health Composite Scores, or PCS, that is, Does your breath limit you in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or play golf?) and mental health (Mental Health Composite Scores, or MCS, that is, How much of the time during the past 4 weeks have you felt calm and peaceful?) related to their quality of life.

Loneliness. UCLA's 3-item Loneliness Scale[18]: "How often do you feel that you lack companionship?" "How often do you feel left out?," and "How often do you feel isolated from others?" was answered on a 3-point scale, including "hardly ever" coded as 1, "some of the time" coded as 2, and "often"

Table 1. Demographics.

Demographic variables	Total sample (N = 179)	Indiana (n = 90)	California (n = 89)
Mean age	44.85	49.50	40.16
Gender			
Male	56 (31.3%)	32 (35.6%)	24 (26.9%)
Female	123 (68.7%)	58 (64.4%)	65 (73.0%)
Race			
White (not Hispanic)	144 (80.4%)	86 (95.6%)	58 (65.2%)
Hispanic or Latino	6 (3.4%)	1 (1.1%)	5 (5.6%)
Black or African American	0	0	0
Asian	17 (9.5%)	2 (2.2%)	15 (16.9%)
Pacific Islander or Native American	0	0	0
American Indian or Alaskan Native	0	0	0
Mixed ethnicity	10 (5.6%)	1 (1.1%)	9 (10.1%)
Other	2 (1.1%)	0	2 (2.2%)
Education			
High school/GED	23 (12.8%)	5 (5.6%)	18 (20.2%)
Vocational certificate	3 (1.7%)	2 (2.2%)	1 (1.1%)
Some college	61 (34.1%)	17 (18.9%)	44 (49.4%)
Associate degree	12 (6.7%)	7 (7.8%)	5 (5.6%)
Bachelor's degree	38 (21.2%)	32 (35.6%)	6 (6.7%)
Master's degree	30 (16.8)%	20 (22.2%)	10 (11.2%)
Doctoral degree	8 (4.5%)	6 (6.7%)	2 (2.2%)
Professional doctorate (MD, JD, etc.)	4 (2.2%)	1 (1.1%)	3 (3.4%)
Marital status			
Single (never married)	82 (45.9%)	24 (26.7%)	58 (65.2%)
Married	62 (34.6%)	46 (51.1%)	16 (17.9%)
Cohabitating	2 (1.1%)	2 (2.2%)	0
Separated/divorced	17 (9.5%)	10 (11.1%)	7 (7.9%)
Widowed	16 (8.9%)	8 (8.9%)	8 (8.9%)
Standard of living			
Below average	8 (4.5%)	4 (4.4%)	4 (4.5%)
Average	83 (46.4%)	47 (52.2%)	36 (40.4%)
Above average	88 (49.2%)	39 (43.3%)	49 (55.1%)

coded as 3. A summed score of the 3 items was calculated to reflect participant's level of loneliness, ranging from 3 to 9.

Social integration. Four questions were used to gather information about if time is spent volunteering, and if contact is kept with any of the participant's parents, offspring, neighbors or friends. The answer "yes" for each question was coded as 1, and a summed score ranging from 0 to 4 reflected participants' level of social integration.

Religiousness. As part of the demographics questionnaire, participants were asked if they have a religious preference and how often they practice that religion, if applicable. "No religious preference" was coded as 0, "do not practice" was coded as 1, "rarely" was coded as 2, "occasionally" was coded as 3, and "regularly" was coded as 4.

Household income. Lastly, participants were asked to estimate their annual household income (all sources before taxes) from 1 of the 7 categories, from "$0 to $15 000" to "over $100 000", with $15 000 increment between each category, except the last 2 categories which were "$75 000 to $100 000" and "over $100 000".

Participants

Participants included 179 individuals whose ages ranged from 18 to 89. Ninety participants were invited to Purdue University in Indiana for the study, and 89 participants were invited to Scripps College in California for the study. All participants volunteered for this study as explained in the next section. See Table 1 for full demographic information.

Procedures

This study was part of a funded study that included more measurements than the ones used in this study.

Table 2. Correlations between predictors and dependent variables (N = 179).

	Loneliness (1)	Religiousness (2)	Social integration (3)	Household income (4)	Physical health (5)	Mental health (6)
1	—	−.053	−.251***	.021	.037	−.593***
2		—	.353***	−.121	−.151*	.206**
3			—	.113	.024	.174*
4				—	.137	−.035
5					—	−.117
6						—

*$P < .05$. **$P < .01$. ***$P < .001$.

a. Participants were a convenience sample across the lifespan recruited through flyers posted in communities, word-of-mouth, and local senior centers. Participants contacted a designated research assistant (RA) in Indiana or California to schedule a meeting on campus. A trained RA was assigned to meet the participant and conduct the study, which consisted of a series of surveys and cognitive interviews. Once arriving to campus, the RA explained the project, and the participant reviewed and signed an informed consent after all questions were clarified. The RA emphasized that participants could leave anytime or skip questions they did not want to answer.
b. The Mini-Mental State Examination (MMSE[19]) was administered before other tasks to ensure consent given by each participant was valid. No one scored below the MMSE cutoff of 26 out of 30.
c. Next, participants were administered the measures above individually. These measures were completed using paper and pencil. Completion of the study took about an hour, with additional measures implemented to satisfy the funded study.
d. At the end of the project, the RA debriefed the participant, compensated them for their time ($20/per hour), and thanked them for participating in the project. The study was approved by Purdue University and Scripps College's Institutional Review Boards.

Analysis Plan

Bivariate correlations were conducted to examine relationships between independent variables (loneliness, household income, religiousness, social integration) and dependent variables (physical health versus mental health). Hierarchical regression models were built to examine the impact of the independent variables on physical health and mental health, respectively. Demographic variables served as control variables. The regression models were designed to discover unique effects of independent variables in the presence of other demographics. Measures of effect size include Pearson's *r,* R^2, ΔR^2, and unstandardized coefficients.

Results

Bivariate Correlations (see Table 2)

Mental health was found to be significantly correlated with 3 of the 4 independent variables of interest. Higher levels of religiousness ($r(179) = 0.206$, $P = .006$), social integration ($r(179) = 0.174$, $P = .020$), and lower levels of loneliness ($r(179) = -0.593$, $P < .001$) were correlated with better MCS.

Physical health was found to be significantly correlated with only 1 of the 4 independent variables of interest. Lower levels of religiousness ($r(179) = -0.151$, $P = .044$) was correlated with better PCS. At a lower significance level, higher levels of household income ($r(179) = 0.137$, $P = .067$) was also correlated with better PCS.

It should be noted that there was some significant correlation between the independent variables of interest. Specifically, higher levels of social integration is significantly correlated with higher levels of religiousness ($r(179) = 0.353$, $P < .001$) and lower levels of loneliness ($r(179) = -0.251$, $P < .001$).

Hierarchical Regression (see Table 3)

Multicollinearity was checked using the variance inflation factor (VIF) values of each variable in the full models. A value larger than 5 or 10 is often used as the cutoff to indicate multicollinearity. Since the highest overall VIF value is 4.723 in the models, multicollinearity was not a concern in this study.

Two separate 2-stage hierarchical multiple regression models were conducted with mental health and physical health as the dependent variables, respectively. Demographic variables (marital status, race, gender, education, and age) were entered at step 1 to control for background information. At step 2, the independent variables of interest were added, including loneliness, religiousness, household income, and social integration.

Mental health. At step 1, demographics contributed significantly to the regression model ($F(11,167) = 3.872$, $P < .001$) and accounted for about 20.3% ($R^2 = 0.203$, $\Delta R^2 = 0.151$) of

Table 3. Final models of regression analysis (N = 179).

Predictor variables	Mental health	Physical health
Constant	59.704***	54.129***
Age	0.031	−0.118***
Gender[a]	−0.431	−1.134
Race		
White (not Hispanic): reference group		
Hispanic of Latino	−1.714	5.099*
Asian	−0.869	0.537
Mixed ethnicity	3.169*	−1.445
Other	−3.724	8.878*
Marriage status		
Single (never married): reference group		
Married	0.786	2.797
Cohabitating	3.014	4.213
Separated/divorced	0.099	4.189*
Widowed	−0.077	1.732
Education	0.426	0.157
Loneliness	−2.190***	−0.108
Religiousness	0.435	−0.263
Social integration	−0.755	0.182
Household income	0.027	0.604*

[a]Male is coded as 1; Female is coded as 2.
*$P < .05$. **$P < .01$. ***$P < .001$.

the variation of MCS. At this step, the age variable is a significant independent variable ($b = 0.105$, $P = .002$) such that older adults had better MCS.

At step 2, the 4 independent variables of interest were added to the model ($F(15,163) = 9.887$, $P < .001$). The full model has an increase of about 27% more variability in MCS being explained, with a total of 47.64% ($R^2 = 0.476$, $\Delta R^2 = 0.428$). The addition of independent variables significantly increased the effectiveness of the model to describe the data ($F(167, 163) = 21.262$, $p < .001$). At this step, out of the independent variables of interest, loneliness is the only significant independent variable ($b = -2.190$, $P < .001$) such that participants who reported to be lonely also reported worse MCS.

Physical health. At step 1, demographics contributed significantly to the regression model ($F(11,167) = 2.904$, $P = .002$) and accounted for about 16.1% ($R^2 = 0.161$, $\Delta R^2 = 0.105$) of the variation of PCS. At this step, the age variable is a significant independent variable ($b = -0.115$, $P < .001$) such that younger adults had better PCS. The marital status group "married" is also a significant independent variable ($b = 2.967$, $P = .048$) such that married participants had better PCS health than singled participants.

At step 2, the 4 independent variables of interest were added to the model ($F(15,163) = 2.641$, $P = .001$). The full model has an increase of about 3.4% more variability in PCS being explained, with a total of 19.55% ($R^2 = 0.196$, $\Delta R^2 = 0.122$). The addition of independent variables did not increase the effectiveness of the model to describe the data ($F(167, 163) = 1.771$, $P = .137$). At this step, out of the independent variables of interest, household income is the only significant independent variable ($b = 0.604$, $P = .019$) such that participants who reported higher household income also reported better PCS.

Discussion

In this study, we examined the effects of loneliness, social integration, religiousness, and household income on individuals' mental versus physical health. Mental health was found to be correlated with religiousness, social integration, and loneliness, but only loneliness remained a significant independent variable of mental health in the regression model when other independent variables were present. Physical health was found to be correlated with religiousness only, but with the presence of all other independent variables of interest, household income was the only significant independent variable of physical health in the regression model.

When examining the independent variables' effects on mental health, results showed that when all variables of interest were entered into the regression model, the variance explained was increased by 27% beyond what was explained by the demographics. It is evident that inclusion of measurements of loneliness, social integration, and household income significantly increased prediction of mental health. Since loneliness was the only significant variable out of the 3, incorporating the 3-item Loneliness Scale[18] would best provide us information on one's mental health status effectively during healthcare intake processes. By doing this, health care providers would be able to determine if the patients are at risk for experiencing mental health problems and tackle the issues, if any. Most individuals with common mental illnesses go to primary care clinics, but few actually end up receiving specialized care for their mental health,[20] though mental health screenings in primary care settings are recommended.[21] When individuals are screened with specific mental health tools, such as the Patient Health Questionnaire-9, it is clear that the questions are about depression, anxiety, or suicidal tendencies. Patients might decline to respond if they did not visit primary care for mental health. The inclusion of more concise and broad questions, such as the 3-item Loneliness Scale,[18] during the intake process will allow the assessment of mental health status, and individuals might be less reluctant to respond since the intention to assess mental health status is not as obvious. Integrating the loneliness screening into the intake process allows for a concise analysis of one's mental health status. Then, if needed, providers can further analyze one's mental health if the results from the intake form are indicative of declining status.

Annual household income and the other 3 independent variables only increased variances explained for physical health by 3.4% when added to the regression model, which is much lower than the variances explained for in the mental health model. Although the addition of these variables did not significantly increase the usefulness of the model, comparing the significance of the independent variables can still be useful in identifying the variable that is most useful in predicting physical health. Household income was the only significant variable in the physical health model, so capturing one's income at annual physical check-ups or during primary care intake processes may allow us to analyze one's physical health status before seeing the patient. Implementing a patient care navigator may assist those who are less confident regarding the knowledge of health care systems and could be beneficial for patients.[22]

These findings bear implications that asking about loneliness and household income can serve as reliable indicators for one's mental and physical health, respectively. Considering the significant portion of variances explained for mental health, integrating the 3-item Loneliness Scale[18] into the primary care intake process allows providers to be clued into one's mental health status before even coming into contact with the patient. Most mental health screening tools have more than 3 items. By using a loneliness screening to estimate mental health, one's care can be tailored to their individual needs if the overall mental health seems to suffer, and those at risk for declining mental health status can be treated accordingly. Although the study was conducted before the coronavirus pandemic, loneliness has become a signature concern for mental health issues during the pandemic, suggesting potential use of the 3-item Loneliness Scale would be especially valuable.[23]

Limitations and Future Directions

The sample for this study lacked ethnic diversity, especially in Indiana, with over 95% being Caucasian individuals. Additionally, since this study took place in 2 separate college towns, participants were highly educated, with 85% having completed at least some college. Not only did all participants pass the MMSE, but they also had to drive to the college campus to take part in the study or had someone drive them. Therefore, the most physically and cognitively vulnerable were underrepresented in our study. Future research should expand the study to include individuals of diverse race and education backgrounds to generalize the results to all individuals.

Conclusion

Overall, this study highlights the importance of caring for all aspects of a patient, physically and mentally. This study also brings to light to how one's perceived loneliness is associated with their mental health, so we can use loneliness to better detect mental health issues. Healthcare should be provided to individuals in a holistic manner that cares for both the mental and the physical aspects of the person. As most individuals make appointments to see healthcare providers for physical illnesses, this study demonstrated the importance and effectiveness of screenings that can inform us of the individual's mental health. By integrating a short loneliness screening into individuals' healthcare visits, providers would be able to decide if more mental health questions should be asked. Finally, this study provided us information on how to better predict patients' health status through the healthcare intake process in order to be able to tailor our care towards one's individual needs.

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