Associations Between Social Disconnectedness and Possible Depression Across Age Groups

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Abstract

Rates of social disconnectedness and depression have intensified in recent years. Yet, little is known about how they relate to one another across different age groups. This study assessed the relationship between social disconnectedness and depressive symptoms among U.S. adults of varying ages using an internet-delivered survey data collected between November 2021 and January 2022 from a national sample of 2,496 employed adults aged 18-89 years. Participants completed Upstream Social Interaction Risk Scale (U-SIRS-13) and the Patient Health Questionnaire short version (PHQ-2). Within each of five age groups (18-29, 30-39, 40-49, 50-59, 60+), descriptive statistics and Pearson's r correlations were calculated for U-SIRS-13 and PHQ-2. Subsequently, logistic regression models were fitted to assess the relationship between the U-SIRS-13 and PHQ-2 (a score of 3 or greater indicated possible depression, requiring further screening), controlling for sociodemographic covariates. The prevalence of possible depression among participants was 31.6%, which ranged from 46.8% (ages 18-29) to 10.5% (ages 60+). PHQ-2 and U-SIRS-13 had significant correlations in all age groups (Pearson's r range: 0.283-0.275, P<0.001). Holding sociodemographic covariates constant, higher U-SIRS-13 scores were consistently associated with increased odds of possible depression across age groups (Odds Ratio range: 1.24-1.50, P<0.001). While possible depression was more prevalent among younger age groups (18-29 and 30-39), the relationship between social disconnectedness and possible depression was stronger among older age groups (40-49, 50-59, and 60+). Given this association, coordinated efforts are needed to simultaneously treat depressive symptomology and facilitate meaningful interactions with others.

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ABSTRACT

Rates of social disconnectedness and depression have intensified in recent years. Yet, little is known about how they relate to one another across different age groups. This study assessed the relationship between social disconnectedness and depressive symptoms among U.S. adults of varying ages using an internet-delivered survey data collected between November 2021 and January 2022 from a national sample of 2,496 employed adults aged 18-89 years. Participants completed Upstream Social Interaction Risk Scale (U-SIRS-13) and the Patient Health Questionnaire short version (PHQ-2). Within each of five age groups (18-29, 30-39, 40-49, 50-59, 60+), descriptive statistics and Pearson's *r* correlations were calculated for U-SIRS-13 and PHQ-2. Subsequently, logistic regression models were fitted to assess the relationship between the U-SIRS-13 and PHQ-2 (a score of 3 or greater indicated possible depression, requiring further screening), controlling for sociodemographic covariates. The prevalence of possible depression among participants was 31.6%, which ranged from 46.8% (ages 18-29) to 10.5% (ages 60+). PHQ-2 and U-SIRS-13 had significant correlations in all age groups (Pearson's *r* range: 0.283-0.275, $P<0.001$). Holding sociodemographic covariates constant, higher U-SIRS-13 scores were consistently associated with increased odds of possible depression across age groups (Odds Ratio range: 1.24-1.50, $P<0.001$). While possible depression was more prevalent among younger age groups (18-29 and 30-39), the relationship between social disconnectedness and possible depression was stronger among older age groups (40-49, 50-59, and 60+). Given this association, coordinated efforts are needed to simultaneously treat depressive symptomology and facilitate meaningful interactions with others.

Keywords: social disconnectedness; depressive symptoms; young adults; midlife; older adults

INTRODUCTION

Depression is a pervasive mental health condition that affects millions of people globally across all ages, contributing significantly to the burden of disease.[1] The onset of major depression occurs in early or late life. Nearly 40% of individuals experience their first episode of depression before the age of 20, with prevalence peaking during the second and third decades of life.[1] Over half of major depression cases occur in older age (age 60 or older), also known as the late onset depression.[2] Depression affects well-being and physical health and also increases risky health behaviors including alcohol and substance use.[3] Concurrently, social disconnectedness, an umbrella term that encompasses the concepts of social isolation and loneliness,[4] has emerged as a critical determinant of health.[5] The interplay between social disconnectedness and depressive symptoms is complex and may be bidirectional.[6] Existing evidence about the association between social disconnectedness and depressive symptoms suggests that people who are socially disconnected (i.e., feel lonely or isolated, report low social support, and experience strain in their relationships) are more likely to develop symptoms of depression.[7,8]

Recent years have seen a notable increase in the prevalence of both social disconnectedness and depression in various age groups.[9,10] Factors such as the replacement of personal communication channels with technology-mediated ones, the advent of technology communication, changes in family dynamics and structure, and the impact of the COVID-19 pandemic have been implicated in these rising trends.[11,12] Despite the evidence demonstrating a significant relationship between social disconnectedness and depressive symptoms in specific age groups (i.e., adolescents or older adults), there is a paucity of research examining how this association varies across different age cohorts (18-89 years). Closing the research gap regarding the age-specific dynamics of social disconnectedness and depressive symptoms may contribute to the broader understanding of social and mental health across the life course. As such, the purpose of this study was to assess the association between social disconnectedness and possible depression across five distinct age groups (i.e., 18-29, 30-39, 40-49, 50-59, 60+). We hypothesized that, while the prevalence rates of social disconnectedness and depressive symptoms would vary by age, their association would be significant across all age groups even after controlling for sociodemographic covariates.

METHODS

Data were analyzed from a national cross-sectional sample of employed adults collected using an internet-delivered questionnaire. Participants were recruited through Qualtrics Panel Services between November 2021 and January 2022. The overall purpose of the study was to identify the wellness of working Americans following the COVID-19 pandemic and identify perceptions about work culture. Given the study focus, eligibility criteria required all participants to be age 18 years or older, a full-time employee, and a resident of the United States. After eligible participants were identified by Qualtrics, they were presented with a link to the online questionnaire, which required acknowledgment of an Institutional Review Board (IRB)-approved information sheet. Participation in the study was voluntary, and participants could choose to stop taking the survey at any time. Initial data quality checks were performed by Qualtrics to ensure participants met eligibility criteria, completed all questionnaire items, and thoughtfully completed the instrument (e.g., time taken to complete, pattern responding). An unknown number of potential participants were recruited by Qualtrics to complete the online questionnaire; however, a total of 2,932 participants initiated the questionnaire, of which 2,508 completed the questionnaire (85.6%). Of those, 12 participants were omitted from analyses for missing data on specific variables of interest, resulting in an analytic sample of 2,496 employed adults. The Texas A&M University IRB reviewed and approved all components of this study (#IRB2021-1127M).

Measures

Depressive Symptoms. The Patient Health Questionnaire-2 (PHQ-2) was used to identify depressive symptoms among participants.[13,14] This two-item scale contains the first two items of the PHQ-9, a validated screening measure for depression,[15] which measures the two cardinal symptoms of depression: depressed mood and anhedonia. The PHQ-2 asked participants to report the frequency they “felt down, sad, or hopeless” and “had little interest or pleasure in doing things” in the past two weeks. Response choices were on a 4-point Likert scale and ranged from “not at all” (scored 0) to “nearly every day” (scored 3). These items were summed, with a total score ranging from 0 to 6. The scores were dichotomized using the recommended cutoff of ≥3, indicating those with possible depression

Social Disconnectedness. The Upstream Social Interaction Risk Scale (U-SIRS-13) was used to

identify the risk of social disconnectedness among participants.[16,17] This 13-item scale asked participants to report the frequency of feeling disconnected in terms of physical opportunities to interact with others and the emotional fulfillment of such interactions (or lack thereof). Response choices were on a 3-point Likert scale and ranged from "none of the time" (scored 1) to "often" (scored 3). Each item was then dichotomized based on the directionality of the wording to create items scored as "no risk" (scored 0) and "risk" (scored 1). Items were then summed to generate a continuous score from 0 to 13, with higher scores indicating higher risk for social disconnectedness. Cronbach's alpha for the U-SIRS-13 in the sample was 0.78, which aligns with reliability coefficients identified in other studies.[17]

Sociodemographic Covariates. Analyses were performed across five participant age groups (i.e., ages 18-29 years, 30-39 years, 40-49 years, 50-59 years, 60+ years). Age was also analyzed continuously within each age group, respectively. Other sociodemographic characteristics included in analyses were sex (i.e., male, female), ethnicity (i.e., non-Hispanic, Hispanic), and race (i.e., White, Black, Asian, Other/Multiple Races).

Data analysis

All analyses were performed using the IBM SPSS version 29. Descriptive statistics were calculated for all variables of interest, which were initially compared by participant age group and PHQ-2 score ≥3. When comparing across age groups, chi-square tests were used for categorical variables and one-way ANOVA were used for continuous variables. When comparing across PHQ-2 score ≥3, chi-square tests were used for categorical variables and two-tailed independent sample t-tests were used for continuous variables. Cronbach's alpha coefficients were calculated to identify the reliability of the U-SIRS-13 for the total sample and each age group. Point-biserial correlation coefficients were calculated to identify the strength and direction of relationships between U-SIRS-13 (continuous) and PHQ-2 score ≥3 (dichotomous) for the total sample and each age group. Then, a series of logistic regression models were fitted to assess the associations of U-SIRS-13 and covariates (i.e., age, sex, ethnicity, and race) on PHQ-2 score ≥3 for all participants, then separately within each age group. For each model, PHQ-2 score <3 served as the referent category with statistical significance set at $P<0.05$. To account for multiple analyses and reduce risks for Type I errors, a Benjamini Hochberg False Detection Rate of 95% was used.[18] All significant findings met these criteria.

RESULTS

Table 1 reports sample characteristics stratified by age group and possible depression (PHQ-2 score ≥3). Ages ranged from 18 to 89 years. On average (±SD), participants were aged 43.30 (±14.21) years, with 16.9% being ages 18-29 years, 31.2% ages 30-39 years, 16.2% ages 40-49 years, 19.0% ages 50-59 years, and 16.9% ages 60 years and older. About half of the sample (50.3%) was female, and 81.1% identified as non-Hispanic. About 77.4% of participants identified as White, 14.1% were Black, 3.4% were Asian, and 5.2% another race or multiple races. A total of 31.6% participants had possible depression. On average, participants reported a U-SIRS-13 score of 6.92 (±3.40) on a scale from 0 to 13.

When comparing sample characteristics by age groups, significantly smaller proportions of participants ages 30-39 years and 60 years and older were female. A significantly larger proportion of participants ages 18-29 years identified as Hispanic. In terms of race, a significantly larger proportion of participants ages 18-29 years identified as Black or another or multiple races, whereas a larger proportion of participants ages 60 years and older identified as White. Significantly larger proportions of participants ages 18-29 years and 30-39 years had possible depression. On average, participants of younger age groups reported significantly higher U-SIRS-13 scores.

When comparing sample characteristics by possible depression, participants reporting possible depression were significantly younger than those without depression. Significantly larger proportions of men and participants who identified as Hispanic had possible depression. Relative to those without possible depression, a significantly larger proportion of participants who reported being Black or another or multiple races reported possible depression. On average, participants reporting possible depression had significantly higher U-SIRS-13 scores than those without possible depression.

Table 2 reports the Cronbach's alpha reliability coefficients for the U-SIRS-13 as well as the point-biserial r coefficients between the U-SIRS-13 and PHQ-2, for all participants and within each age group. For the total sample, the Cronbach's alpha coefficient for the U-SIRS-13 data was 0.78, and the point-biserial *r* revealed a significantly positive association between the U-SIRS-13 and PHQ-2 (r_{pb}=0.36, P<0.001). The Cronbach's alpha coefficients for the U-SIRS-13 data increased across older age groups. The correlation between the U-SIRS-13 and PHQ-2 remained significantly positive across age groups and increased across older age groups.

Table 3 reports the binary logistic regression models examining the factors associated with possible depression (PHQ-2 score ≥3) by age groups, controlling for age (continuous), sex, ethnicity, and race. In the model with all participants, each additional unit increase of the U-SIRS-13 increased the odds of possible depression. In this model, each additional year of age decreased the odds of possible depression. Relative to male participants, female participants were less likely to have possible depression. Relative to non-Hispanic participants, Hispanic participants were more likely to have possible depression. Across regression models for each age group, each additional unit increase of the U-SIRS-13 increased the odds of possible depression, with odds ratios increasing across older age groups. For participants ages 18-29 years, Hispanic participants were more likely to have possible depression compared to their non-Hispanic counterparts. In the model for participants ages 30-39 years, each additional year of age decreased the odds of possible depression. In the models for participants ages 30-39 years and 40-49 years, female participants were less likely to have possible depression compared to male participants.

DISCUSSION

This study assessed the risk prevalence for social disconnectedness and possible depression, and the association between them, across adults in different age ranges. Results provide robust evidence of a positive relationship between social disconnectedness and possible depression across all age groups. While the relationship between social disconnectedness and possible depression was significant for all age groups, the effect was stronger among midlife and older adults relative to young adults.

Aligned with prior studies,[19-21] we found that the prevalence of social disconnectedness and possible depression were significantly higher among young adults aged 18-39 years. Their respective prevalence rates gradually decreased across age groups, reaching their lowest points among individuals aged 60 years and older. This pattern suggests that older adults may possess a more developed set of coping mechanisms or resilience strategies for managing social and mental health challenges compared to younger adults. This finding suggests the presence of age-related disparities in mental health and social well-being, with younger adults having higher risk for both social disconnectedness and possible depression. A recent report demonstrates that the health and wellbeing of younger people is largely impacted by the pervasiveness of digital communication and smart devices on daily lives.[22] For example, while technology has provided

opportunities for consistent communication and connection with others, its ubiquitous nature may generate the need for ongoing stimulation and the feelings of incompleteness without its presence.[23] Thus, the higher rates of social disconnectedness and possible depression observed among younger adults in the current study could be attributed to their higher level of technology use;[24,25] however, future studies are needed to examine how technology utilization influences these outcomes across age ranges.

The association between social disconnectedness and possible depression was significant across all age groups, confirming our study hypothesis. This finding supports that regardless of age, individuals who experience higher levels of social disconnectedness are more likely to have possible depression, or vice versa.[6,26,27] Interestingly, the strength of the positive correlation coefficients between these two factors gradually increased with increasing age (40-49, 50-59, and 60+) and was notably stronger in older age groups. This may be driven by more substantial life challenges in older age, such as reduced social networks due to loss of loved ones,[28,29] health challenges, and functional limitations.[30] Socioemotional selectivity theory posits that as one grows older, they view the time left in life as more limited and, as such, selectively choose to narrow and focus their social relationships that bring meaning and purpose, rather than broadening their social ties.[31] It might be that as one grows older, the need for meaningful relationships increases, and when this expectation is not reached (i.e., more socially disconnected), individuals may be more likely to experience mental distress (i.e., depressive symptoms).

The association between social disconnectedness and depression across all age groups underscores the need for intervention strategies targeting to reduce social disconnectedness tailored for specific age groups. Prior literature suggests a range of risk factors for social disconnectedness that may differ in magnitude at specific age groups.[20,21] For example, interventions for young adults may focus on skills to enhance relationship-building with friends and coworkers in educational and workplace settings as frequent contact with friends and relationship in workplace mattered more for loneliness in this age group compared to older age groups.[32] The current study's findings suggest that addressing social disconnectedness could be a key component of treatment and management plans for depression. Healthcare providers should consider assessing social connectedness as part of routine depression screenings and offering interventions that foster social interaction alongside traditional treatments for depression. Similarly, employers should offer

opportunities for more social interaction and approaches to enhance mental health in the workplace.

Our findings revealed a novel result that male participants were more likely to report possible depression compared to female participants, with this significant association driven by younger age groups (ages 30-49). This result contrasts with prior studies that demonstrate that women are more likely to report depression than men, a phenomenon known as the "female preponderance in depression."[33,34] Traditionally, men were far less likely to report depression or mental health symptoms due to societal expectations and mental health stigma that may provoke masculinity.[35] In fact, our oldest age group that was predominantly comprised of White men, reported the lowest rates of possible depression, which aligns with previous research showing that men tend to underreport depressive symptoms.[33] As such, the discrepancy in our findings may reflect a generational shift, with younger men becoming more expressive about their mental health as societal stigma surrounding mental health issues for males have decreased with an increase in awareness of its importance.[27,36] Further studies are needed to explore these gendered and age-varying patterns on mental health outcomes across different generations in a greater detail.

Consistent with previous studies,[37,38] participants in the current study who identified as racial and ethnic minorities had higher rates of probable depression. These findings likely reflect a complex interplay of social, structural, and health-related factors. One explanation is that race often serves as a proxy for exposure to systemic racism,[39] which has been consistently linked to poorer mental health outcomes.[40,41] These stressors may exacerbate the feelings of hopelessness and emotional distress, further compounding the risk of depression. In addition, structural barriers, such as limited availability of culturally competent clinicians, financial constraints, and systemic inequalities in healthcare access, may contribute to the underutilization of mental health services by these minoritized groups.[42] Studies indicate that individuals from these communities are less likely to receive accurate diagnoses and adequate treatment for depression, which may result in unmet mental health needs.[43,44] Stigma surrounding mental health, compounded by historical and ongoing medical mistrust, may further limit health-seeking behaviors for these minoritized groups. Black and Hispanic individuals often face dual stigmatization—both for experiencing mental health issues and for seeking treatment—which may serve as barriers to timely intervention and can lead to misdiagnosis or under-diagnosis of depression.[42-44] Stigma, coupled with the historical medial distrust, underscores the need for

culturally sensitive approaches to mental health care that directly address the unique challenges faced by these populations. Addressing these systemic factors is warranted for reducing the observed disparities in depression risk and improving mental health outcomes in these marginalized communities across all ages.

There are several limitations to consider when interpreting the study's findings. The cross-sectional study design precludes inferences about causality. Future studies should consider examination of longitudinal, between- and within-person differences that are reflective of the true developmental and life course changes in the relationship found in this study. Generalizability may be limited because data were collected from a Qualtrics panel was employed and had access to technology. Thus, study findings may not be representative of those who are unemployed or have barriers to technology. Additionally, all data were self-reported, which may have introduced social desirability or recall biases. The 2-item PHQ questionnaire was used to screen participants for possible depression, rather than the use of the full scale or confirming clinical diagnosis, further introducing response bias. Future studies should use the full PHQ-9 to test the reliability of these findings with clinical depression. Lastly, race, ethnicity, sex, and age were assessed as discrete categories rather than its intersectional factors in relation to risk for depression.[45] Further research assessing the interplay between these various identities on mental health outcomes is needed to gauge more nuanced understanding of the associations to reduce health inequalities.[46]

Despite these limitations, this study's findings show that there is a significant relationship between social disconnectedness and possible depression across different age ranges. Efforts are warranted to address social disconnectedness and depressive symptoms in all ages. These results underscore the importance of fostering social connectedness and managing depression.

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Table 1. Sample characteristics by age group and possible depression

		Age Groups							Possible Depression (*PHQ-2 = 3+*)			
	Total (n=2496)	**18-29 Years (n=421)**	**30-39 Years (n=779)**	**40-49 Years (n=404)**	**50-59 Years (n=473)**	**60+ Years (n=419)**	**χ^2 or f**	**P**	**No (n=1708)**	**Yes (n=788)**	**χ^2 or t**	**P**
Age	43.30 (±14.21)	24.91 (±3.11)	33.85 (±2.91)	44.08 (±2.88)	55.31 (±2.68)	65.04 (±4.44)			46.36 (±14.29)	36.66 (±11.55)	18.06	***
Sex							89.16	***			7.37	**
Male	49.7%	43.0%	56.9%	39.4%	40.4%	63.5%			47.8%	53.7%		
Female	50.3%	57.0%	43.1%	60.6%	59.6%	36.5%			52.2%	46.3%		
Ethnicity							16.29	**			14.80	***
Non-Hispanic	81.1%	74.1%	82.3%	83.2%	82.7%	82.1%			83.1%	76.6%		
Hispanic	18.9%	25.9%	17.7%	16.8%	17.3%	17.9%			16.9%	23.4%		
Race							120.51	***			15.54	***
White	77.4%	61.5%	77.9%	78.5%	79.1%	89.3%			79.4%	72.8%		
Black	14.1%	26.6%	13.1%	10.4%	13.3%	7.6%			12.7%	17.0%		
Asian	3.4%	2.9%	4.4%	4.2%	3.8%	1.0%			3.4%	3.4%		
Other Races	5.2%	9.0%	4.6%	6.9%	3.8%	2.1%			4.4%	6.7%		
U-SIRS-13 (range: 0 to 13)	6.92 (±3.40)	7.74 (±2.93)	7.43 (±3.24)	7.01 (±3.35)	6.48 (±3.51)	5.58 (±3.59)	30.17	***	6.09 (±3.48)	8.72 (±2.38)	-21.95	***
Possible depression							241.77	***				
No	68.4%	53.2%	55.1%	71.5%	82.7%	89.5%						
Yes	31.6%	46.8%	44.9%	28.5%	17.3%	10.5%						

*p<0.05, **p<0.01, ***p<0.001; PHQ, Patient Health Questionnaire, U-SIRS, Upstream Social Interaction Risk Scale

Table 2. U-SIRS-13 internal reliability and correlations between social disconnectedness and possible depression

	Total (n=2496)	**Ages 18-29 (n=421)**	**Ages 30-39 (n=779)**	**Ages 40-49 (n=404)**	**Ages 50-59 (n=473)**	**Ages 60+ (n=419)**
U-SIRS-13 Cronbach's Alpha	0.78	0.70	0.76	0.78	0.80	0.83
Correlation: Point-Biserial r_{pb} (P-value) [U-SIRS-13 **&** PHQ-2]	0.36 (***)	0.28 (***)	0.31 (***)	0.35 (***)	0.34 (***)	0.38 (***)

*p<0.05, **p<0.01, ***p<0.001; PHQ, Patient Health Questionnaire, U-SIRS, Upstream Social Interaction Risk Scale

Table 3. Factors associated with possible depression by age group

	All Ages			Ages 18-29 Years			Ages 30-39 Years			Ages 40-49 Years			Ages 50-59 Years			Ages 60+ Years		
		95% CI			95% CI			95% CI			95% CI			95% CI			95% CI	
	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper
U-SIRS-13	1.29***	1.25	1.34	1.23***	1.14	1.33	1.25***	1.19	1.32	1.33***	1.22	1.45	1.37***	1.25	1.50	1.51***	1.33	1.72
Age	0.95***	0.94	0.96	0.95	0.89	1.02	0.92**	0.87	0.97	0.97	0.90	1.06	0.95	0.86	1.04	0.92	0.83	1.03
Male	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--
Female	0.69***	0.57	0.84	1.14	0.75	1.72	0.54***	0.39	0.75	0.52**	0.32	0.84	0.94	0.55	1.59	1.20	0.59	2.45
Non-Hispanic	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--
Hispanic	1.30*	1.02	1.65	1.8*1	1.10	2.99	1.36	0.90	2.04	0.93	0.49	1.77	1.30	0.67	2.51	1.05	0.44	2.49
White	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--	1.00	--	--
Black	1.12	0.85	1.46	1.14	0.71	1.83	1.26	0.80	1.99	1.01	0.44	2.34	1.70	0.83	3.48	0.93	0.25	3.49
Asian	0.85	0.51	1.42	0.57	0.16	2.01	1.36	0.65	2.84	1.08	0.34	3.46	0.21	0.03	1.70	--	--	--
Other Races	0.99	0.65	1.50	0.68	0.32	1.48	0.92	0.43	1.96	1.59	0.66	3.82	1.72	0.54	5.46	--	--	--
Nagelkerke R Square		0.284			0.137			0.179			0.213			0.224			0.312	

Referent Group: PHQ<3, *p<0.05, **p<0.01, ***p<0.001; PHQ, Patient Health Questionnaire, U-SIRS, Upstream Social Interaction Risk Scale