Associations Between Internet-Based Professional Social Networking and Emotional Distress

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Abstract

Professional social networking websites are commonly used among young professionals. In light of emerging concerns regarding social networking use and emotional distress, the purpose of this study was to investigate the association between frequency of use of LinkedIn, the most commonly used professional social networking website, and depression and anxiety among young adults. In October 2014, we assessed a nationally representative sample of 1,780 U.S. young adults between the ages of 19–32 regarding frequency of LinkedIn use, depression and anxiety, and sociodemographic covariates. We measured depression and anxiety using validated Patient-Reported Outcomes Measurement Information System measures. We used bivariable and multivariable logistic regression to assess the association between LinkedIn use and depression and anxiety, while controlling for age, sex, race, relationship status, living situation, household income, education level, and overall social media use. In weighted analyses, 72% of participants did not report use of LinkedIn, 16% reported at least some use, but less than once each week, and 12% reported use at least once per week. In multivariable analyses controlling for all covariates, compared with those who did not use LinkedIn, participants using LinkedIn at least once per week had significantly greater odds of increased depression (adjusted odds ratio [AOR] = 2.10, 95% confidence interval [CI] = 1.31–3.38) and increased anxiety (AOR = 2.79, 95% CI = 1.72–4.53). LinkedIn use was significantly related to both outcomes in a dose–response manner. Future research should investigate directionality of this association and possible reasons for it.

Keywords: social media, Internet, depression, anxiety, LinkedIn, networking

Introduction

ABOUT THREE-FOURTHS of online adults participate in online social networking.[1] Recent estimates indicate that the average user spends 1.72 hours per day on social networking platforms, representing about 28% of all online activity.[2]

Professional social networking sites also have been increasing in popularity. LinkedIn—the most commonly used professional social networking website—aims "to connect the world's professionals to make them more productive and successful."[3] Between 2014 and 2015, the percentage of daily LinkedIn users increased from 13% to 22%.[4,5] LinkedIn plays an important role in career development, with many individuals reporting it to be valuable in the process of seeking employment,[6] advancing their careers,[7] and succeeding in their current positions.[8]

However, to our knowledge, associations between use of professional networking websites such as LinkedIn and emotional health outcomes have not been previously assessed in the literature. This is an important gap because there are conceptual reasons why use of professional social networking sites such as LinkedIn may be either positively or negatively associated with depression and/or anxiety.[9] For example, it may be that individuals who use sites such as LinkedIn frequently may seek gratification,[10] feel more connected,[11] more self-assured, and feel less anxious about work-related issues. However, it is also possible that people who use LinkedIn frequently may also feel increased depression and/or anxiety for a number of reasons, including

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feeling guilty for the time "wasted"[12] and feeling unable to measure up to others' accomplishments.[13–15] It may also be that increase in use of LinkedIn results in similar outcomes as Internet and Facebook addiction resulting in lower self-esteem and overall life satisfaction.[16] Alternatively, use of LinkedIn may be unrelated to an individual's mental health.[17] Therefore, we considered this an ideal topic for an empiric study.

Prior research has focused on social networking websites used primarily for nonprofessional social interactions, which may differ from professional social networking websites that are primarily used for business interactions. Although individuals experience social gratification and social connection from sharing news and personal information on other social media platforms,[10,11] this may not transfer to professional social networking websites, because sharing of general news and personal information is less common. In addition, the time spent on primarily nonprofessional social networking websites can be viewed as valuable time wasted.[12] However, time spent on professional social networking websites may be viewed as time well spent, because it could increase career opportunities and business connections.

Alternatively, social comparisons and distorted perceptions about peers' lives experienced on nonprofessional social networking websites may or may not transfer to professional social networking websites.[14,18] A LinkedIn member may receive notifications suggesting to congratulate a peer on her recent job promotion or educational accomplishment, which may result in social comparison and a decline in mood. However, it may also lead to positive feelings upon connecting with that colleague through a message of congratulations. In addition to the potential negative affects from social comparisons, LinkedIn users may be susceptible to emotional distress as they try to search for new job offers, make connections with new employers, wait for employee responses, and build their virtual curriculum vitae in the form of a personal profile. Given this, it is unclear if professional social networking use will result in similar findings as those focused on nonprofessional social networking Web sites.

The purpose of our study was to determine the association between frequency of use of LinkedIn and depression and anxiety among a nationally representative sample of young adults. Our study is unique in its examination of the association between professional social networking website use and emotional distress. This will contribute to the growing body of literature around social networking websites and emotional health outcomes by addressing the gap in the literature resulting from prior studies focusing on primarily nonprofessional social networking Web sites such as Facebook.

Although by definition a cross-sectional study cannot help determine causality, we considered such a study an ideal way to begin exploring this new area. Because of the relative preponderance of evidence described above, linking heavy social networking use with negative mood states, we hypothesized that an increased frequency of use of LinkedIn would be associated with increases in depression and anxiety.

Methods

Participants and setting

We recruited our sample with the assistance of Growth From Knowledge (GfK), a large-scale Web-based research company.[19] GfK uses random digit dialing and address-based sampling to recruit participants representing over 97% of the U.S. population,[20] and provides all participants with Internet access and computer hardware if needed. This process combines the validity of random sampling with the convenience and feasibility of Web-based data collection.

In October and November of 2014, we emailed our survey to a random sample of 3,048 noninstitutionalized adults between the ages of 19–32 who had responded to a prior survey on a different topic (tobacco use). All participants provided Web-based consent to participate in the research study and 1,780 participants responded with complete data during this period. Compared with nonrespondents, respondents were no different in terms of age, sex, or race/ethnicity. Each participant received a $15 cash equivalent for his or her participation in the study, which required a median completion time of 15 minutes. The University of Pittsburgh Institutional Review Board approved the study.

Measures

Online surveys completed by participants assessed the use of LinkedIn (independent variable), depression and anxiety (dependent variables), and covariates.

Use of LinkedIn. We measured use of LinkedIn by asking participants how often they visited or used LinkedIn on a weekly basis. We adapted this item and its response categories from those suggested by the Pew Internet Research study.[21] Because of the natural distribution of the data and to improve interpretability of results, we collapsed the independent variable based on the distribution of data. Categories represented included "None," "Less than once a week," and "1 or more times per week." However, to ensure robustness of our results, we also conducted all analyses with this independent variable as continuous.

Emotional distress. We measured both depression and anxiety using the respective Patient-Reported Outcomes Measurement Information System (PROMIS) 4-item short forms. PROMIS is a National Institute of Health Roadmap initiative that aims to provide precise, valid, reliable, and standardized questionnaires that measure patient-reported outcomes (PROs) across the domains of physical, mental, and social health.[22,23] To improve precision and decrease respondent burden, the Item Response Theory was used to develop these scales.[24] Each scale used Likert-type items to assess the frequency of symptoms during the previous 7 days. Response choices were "Never," "Rarely," "Sometimes," "Often," and "Always" (1–5). Thus, the total possible points ranged from 4 to 20 for each scale.

Depression. The PROMIS depression scale has been validated against the Center for Epidemiological Studies and Depression Scale (CES-D),[23,25] the Beck Depression Inventory (BDI-II),[23,25] and Patient Health Questionnaire (PHQ-9).[23,25] The depressive symptoms measured included negative mood, views of self-worthlessness, and social cognition (i.e., loneliness).[26] Because PROMIS measures the severity of depressive symptoms across a continuum of severity, rather than providing a dichotomous cut-off for clinical depression, we collapsed raw scores into tertiles of

"Low," "Medium," and "High" for primary analysis. Using this measure as continuous was not possible because the sample distribution of scores was nonnormal with a floor effect: 45% of respondents had the lowest possible score on this measure.

Anxiety. The PROMIS anxiety scale has been validated against the Mood and Anxiety Symptoms Questionnaire (MASQ), Generalized Anxiety Disorder Scale (GAD-7), and the Positive and Negative Affective Schedule (PANAS).[27] Symptoms assessed included feeling fearful, anxious misery, and hyperarousal.[24] For similar reasons to those described above regarding the depression scale, raw scores were categorized into tertiles of "Low," "Medium," and "High" for primary analysis. Approximately 38.3% of respondents had the lowest possible score on this measure.

Covariates. We assessed 7 sociodemographic variables that may be associated with both social networking and emotional health outcomes. For analysis, we divided age into three groups (19–23; 24–26; 27 and above) and race/ethnicity into four categories (White, non-Hispanic; Black, non-Hispanic; Hispanic; Biracial/Multiracial/Other, non-Hispanic). We also assessed other demographic factors, including living situation (with a parent or guardian; with significant other; or other), relationship status (single or in a committed relationship), household income (under $30,000; $30,000-$74,999; or $75,000 or more), and educational level (high school or less; some college; Bachelor's degree or higher). We also included self-reported average minutes per day spent on social media (0–30; 31–60; 61–120; 120 or more) as a covariate. We did this to isolate the association between LinkedIn use and depression and anxiety beyond any contribution of overall social media use.

Analysis

All participants who completed the PROMIS depression and anxiety scale questionnaire were included in analyses. Since <1% had missing data for these variables, this did not affect our results. In addition, to take advantage of the nationally representative nature of the data, study-specific survey weights were used for all analyses. These weights were computed to adjust for nonresponse, noncoverage, and under- or oversampling resulting from the sample design.

We first summarized the independent variable, the two dependent variables, and the eight covariates to describe the population.

Second, we used bivariable and multivariable ordered logistic regression to assess associations between our independent variable (LinkedIn use) and each of the dependent variables (depression and anxiety). Primary multivariable analyses controlled for all covariates. The presence of an overall linear trend between each ordered categorical independent variable and the dependent variables was tested using an established method. Ordered logistic regression was appropriate because each of the outcomes was ordered categorical. The proportional odds assumption was satisfied.

We conducted three sets of sensitivity analyses to assess the robustness of our results. First, while primary analyses collapsed LinkedIn use into three categories to improve interpretability of results, we also conducted all analyses using LinkedIn use as a continuous variable. Second, while primary analyses controlled for all covariates, confirmatory analyses included a more parsimonious set of covariates (only covariates with an association of $p < 0.15$ with the outcome). Third, while primary analyses used sampling weights, we also conducted all analyses without sampling weights. Because results for all sensitivity analyses were similar to primary results in terms of both magnitude of findings and significance, only primary results are presented here.

Statistical analyses were performed with Stata 12.1 (Stata Corp, College Station, TX), and two-tailed p-values <0.05 were considered to be significant.

Results

Participants

The weighted sample was 50.2% female, 57.6% white, 13.0% African American, 20.5% Hispanic, and 8.9% of other race/ethnicity. Just over half (55.5%) were in a committed relationship, and about one-third (35.6%) reported living with a significant other. Those in the low household income category (under $30,000) accounted for 22.8%, while those in the medium (between $30,000 and $74,000) and high ($75,000 and above) categories accounted for 38.5% and 38.7%, respectfully. Approximately, one-third of participants (35.9%) did not attend college, and 25.8% had a Bachelor's degree or higher (Table 1).

LinkedIn use, depression, and anxiety

Of the 1,780 participants, 1,282 stated that they used LinkedIn, "none," while using less than once a week and using at least once per week were reported by 292 and 206 individuals, respectively. After applying sampling weights, 72.0% of the sample reported not using LinkedIn, while 16.4% reported using it less than once a week. The remaining 11.6% reported using LinkedIn one or more times per week. Nearly half (44.5%) reported no depressive symptoms in the past week and were placed in the low-risk group. About one-fourth (26.2%) were classified as high risk, and the remaining 29.3% of participants were in the medium group. Just over one-third (38.3%) reported no anxious symptoms in the past week and were placed in the low-risk group. High risk represented 28.4%, and medium risk represented 33.3%.

Bivariable associations

Depression. Participants who used LinkedIn at least once per week had significantly greater odds of having increased depression (Odds Ratio [OR] = 1.90, 95% CI = 1.22–2.97) compared to those who did not use LinkedIn. An overall linear association was found between LinkedIn use and depression ($p = 0.01$) (Table 2). Covariates that had bivariable associations with depression were minutes per day on social media, sex, race, household income, and education level (Table 2).

Anxiety. Participants who used LinkedIn at least once per week had significantly greater odds of having increased anxiety (OR = 2.58, 95% CI = 1.64–4.05) (Table 3) compared to those who did not use LinkedIn. A linear association was found between LinkedIn use and anxiety ($p < 0.001$) (Table 3). Other variables associated with anxiety in bivariable analyses included minutes per day on social media, sex, race, living situation, household income, and education level (Table 3).

TABLE 1. CLINICAL, SOCIAL MEDIA USE,
AND DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Characteristics	All participants (n = 1780), n (Column%)[a]
Clinical characteristics	
Anxiety symptoms (raw score)	
Low (4)	682 (38.3)
Medium (5–8)	593 (33.3)
High (9–20)	505 (28.4)
Depressive symptoms (raw score)	
Low (4)	793 (44.5)
Medium (5–8)	521 (29.3)
High (9–20)	466 (26.2)
Social media use characteristics	
Checks per week on LinkedIn	
None	1,282 (72.04)
Less than once a week	292 (16.4)
1 or more times per week	206 (11.6)
Minutes per day on social media	
0–30	530 (29.8)
31–60	370 (20.8)
61–120	427 (24.0)
121+	453 (25.5)
Sociodemographic characteristics	
Age, y	
19–23	598 (33.6)
24–26	442 (24.8)
27 and above	740 (41.6)
Sex	
Female	893 (50.2)
Male	887 (49.9)
Race	
White, non-Hispanic	1,026 (57.6)
Black, non-Hispanic	231 (13.0)
Hispanic	366 (20.5)
Biracial/multiracial/other, non-Hispanic	157 (8.9)
Relationship status	
Single	792 (44.5)
In a committed relationship	988 (55.5)
Living situation	
Parent/guardian	606 (34.1)
Significant other	633 (35.6)
By myself/with friends/other	540 (30.4)
Household income	
Low	406 (22.8)
Medium	685 (38.5)
High	689 (38.7)
Education level	
High school or less	640 (35.9)
Some college	682 (38.3)
Bachelor's degree or higher	458 (25.8)

Please note that percentages for each variable may not total to 100 due to rounding. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under $30,000 per year, medium as $30,000-$74,999, and high as $75,000 and above.

Multivariable associations

Depression. In multivariable analyses, compared with participants who did not use LinkedIn, those who used LinkedIn at least once each week had significantly greater odds of having increased depression (Adjusted Odds Ratio [AOR] = 2.10, 95% CI = 1.31–3.38) (Table 2). We also found an overall linear association between LinkedIn use and depression ($p < 0.002$). Other covariates that had an independent association with depression included minutes per day on social media, age, race, household income, and education level. For example, those who spend over 121 minutes per day on social media had greater odds of having increased depression (AOR = 1.50, 95% CI = 1.02–2.19). Compared with those aged 19–23, participants between the ages of 24 and 26 had greater adjusted odds of having increased depression (AOR = 1.80, 95% CI = 1.23–2.64), but those aged 27 and above did not have significantly increased odds of increased depression. Compared with White participants, Black participants had lower adjusted odds for depression, but biracial/multiracial individuals had higher odds for depression. Higher income and higher education were each independently associated with reduced odds for depression (Table 2).

Anxiety. Compared with participants who did not use LinkedIn, those who checked LinkedIn at least once each week had significantly greater odds of increased anxiety (AOR = 2.79, 95% CI = 1.72–4.53) (Table 3). In addition, there was a linear association between LinkedIn use and anxiety ($p < 0.001$) (Table 3). Covariates that had an independent association with anxiety included minutes per day on social media, sex, race, household income, and education level. For example, compared to those in the lowest quartile of social media use, participants who spent 121 minutes or more per day on social media had greater odds of having increased anxiety (AOR = 1.64, 95% CI = 1.14–2.38) (Table 3). Also, biracial/multiracial participants were found to have greater odds of having increased anxiety (AOR = 1.68, 95% CI = 1.05–2.70) compared to White participants (Table 3). Increased household income and education level were each associated with reduced odds of anxiety (Table 3).

Discussion

In this cross-sectional nationally representative study of young adults, we found strong, independent linear associations between LinkedIn use and both depression and anxiety. This was true even when we controlled for total social media use, suggesting that our main finding was not simply an artifact of overall increased social media use. Therefore, our hypothesis that increased frequency of use of LinkedIn would be associated with increases in depression and anxiety was supported.

These findings are consistent with prior work suggesting that overall social media use is associated with depression and a decline in mood.[12,13,28,29] Our results mirror those of prior studies in both design and overall outcomes. For example, Steers used the Center for Epidemiological Studies Depression Scale to measure depressive symptomology and an online self-report survey for collecting overall time spent (minutes per day) on Facebook.[18] In addition, Sagioglou used the 20-item Positive and Negative Affect Schedule (PANAS) to assess participant's moods, while collecting time spent on Facebook using online self-report surveys.[12] Our study uses similar self-report measures for collecting LinkedIn use as well as tools validated against both previous assessment measures to collect depressive and anxious symptoms. However, both studies were limited to fewer than 200 participants and had strict geographical settings. Our study further expands upon previous research by examining

TABLE 2. BIVARIABLE AND MULTIVARIABLE ASSOCIATIONS BETWEEN LINKEDIN USE AND DEPRESSION

Characteristics	Bivariable, OR (95% CI)	p-value	Multivariable, AOR (95% CI)	p-value
Social media use				
Frequency of LinkedIn use		0.01		0.002
None	1 [Reference]		1 [Reference]	
<1 check per week	1.01 (0.73–1.39)		1.35 (0.95–1.91)	
1 or more checks per week	1.90 (1.22–2.97)		2.10 (1.31–3.38)	
Minutes per day		<0.001		0.02
0–30	1 [Reference]		1 [Reference]	
31–60	1.19 (0.81–1.74)		1.18 (0.79–1.75)	
61–120	1.90 (1.29–2.80)		1.69 (1.14–2.49)	
121+	1.75 (1.22–2.52)		1.50 (1.02–2.19)	
Sociodemographic				
Age, y		0.76		0.57
19–23	1 [Reference]		1 [Reference]	
24–26	1.58 (1.12–2.22)		1.80 (1.23–2.64)	
27 and above	0.97 (0.71–1.33)		1.16 (0.79–1.70)	
Sex				
Female	1 [Reference]		1 [Reference]	
Male	0.72 (0.55–0.95)		0.76 (0.58–1.00)	
Race				
White, non-Hispanic	1 [Reference]		1 [Reference]	
Black, non-Hispanic	0.74 (0.46–1.19)		0.53 (0.33–0.86)	
Hispanic	1.23 (0.86–1.78)		0.96 (0.66–1.40)	
Biracial/multiracial/other	1.74 (1.19–2.55)		1.66 (1.10–2.48)	
Relationship status				
Single	1 [Reference]		1 [Reference]	
In a committed relationship	0.75 (0.57–0.98)		0.82 (0.57–1.17)	
Living situation				
Parent/guardian	1 [Reference]		1 [Reference]	
Significant other	0.77 (0.54–1.08)		0.88 (0.56–1.37)	
By myself/with friends/other	0.94 (0.67–1.31)		0.91 (0.64–1.30)	
Household income		0.001		0.004
Low	1 [Reference]		1 [Reference]	
Medium	0.65 (0.46–0.93)		0.67 (0.47–0.96)	
High	0.53 (0.38–0.75)		0.59 (0.40–0.88)	
Education level		0.001		0.004
High school or less	1 [Reference]		1 [Reference]	
Some college	0.77 (0.54–1.08)		0.76 (0.53–1.10)	
Bachelor's degree or higher	0.56 (0.40–0.78)		0.49 (0.32–0.75)	

Please note that p-values represent linearity for overall associations between ordered categorical variables and the outcome. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under $30,000 per year, medium as $30,000–$74,999, and high as $75,000 and above.

AOR, adjusted odds ratio; CI, confidence interval.

a large, nationally representative population. In addition, this study extends previous findings of other studies in two ways. First, these prior studies have focused only on depression, while this study suggests that there is an association between social media use and anxiety as well. Second, prior studies focused on Facebook[12,13,28] or multiple social media platforms,[29] while this study examines use of LinkedIn. To our knowledge, this is the first study to focus on a professional social networking platform.

It is important to acknowledge immediately that, because our data were cross-sectional, it is not possible to determine directionality of findings. For example, it may be that individuals who already feel depressed and/or anxious tend to turn to LinkedIn in an attempt to improve their personal life by exploring career options. Similarly, it is possible that individuals who are experiencing job dissatisfaction and work-related stress, in particular, use LinkedIn more often to explore

alternative job options. Furthermore, depressed people with anhedonia or social anxiety may find it easier to access an electronic platform rather than to try to engage with others in personal, social, and/or professional interactions.

Alternatively, it may be that those who spend more time on platforms such as LinkedIn may experience envy and/or the distorted belief that all others lead happier and more successful lives.[14,18] While profiles are of course highly constructed, individuals who explore these sites—especially those who already may have a measure of anxiety and/or depression—may incorrectly get the sense that these idealized representations seen represent reality.[14,18] This explanation is consistent with previous findings that suggest envy and social comparison are important mediators of social media use and emotional distress.[18,30]

Whether the use of LinkedIn is a consequence of or a contributor to depression and anxiety, its continued use may further exacerbate these conditions for three reasons. First, there is some

TABLE 3. BIVARIABLE AND MULTIVARIABLE ASSOCIATIONS BETWEEN LINKEDIN USE AND ANXIETY

Characteristic	Bivariable, OR (95% CI)	p-value	Multivariable, AOR (95% CI)	p-value
Social media use				
Frequency of LinkedIn use		<0.001		<0.001
None	1 [Reference]		1 [Reference]	
Less than once a week	1.15 (0.84–1.58)		1.42 (1.02–1.98)	
1 or more times per week	2.58 (1.64–4.05)		2.79 (1.72–4.53)	
Minutes per day		<0.001		0.006
0–30	1 [Reference]		1 [Reference]	
31–60	1.20 (0.80–1.81)		1.13 (0.77–1.68)	
61–120	1.69 (1.18–2.44)		1.41 (0.97–2.06)	
121+	2.08 (1.46–2.98)		1.64 (1.14–2.38)	
Sociodemographic				
Age, y		0.47		0.97
19–23	1 [Reference]		1 [Reference]	
24–26	1.09 (0.79–1.51)		1.19 (0.83–1.71)	
27 and above	0.89 (0.65–1.21)		0.99 (0.68–1.46)	
Sex				
Female	1 [Reference]		1 [Reference]	
Male	0.63 (0.48–0.82)		0.63 (0.48–0.83)	
Race				
White, non-Hispanic	1 [Reference]		1 [Reference]	
Black, non-Hispanic	0.92 (0.59–1.43)		0.71 (0.45–1.12)	
Hispanic	1.28 (0.87–1.87)		1.03 (0.70–1.50)	
Biracial/multiracial/other	2.18 (1.37–3.46)		1.68 (1.05–2.70)	
Relationship status				
Single	1 [Reference]		1 [Reference]	
In a committed relationship	0.73 (0.55–0.95)		0.85 (0.59–1.18)	
Living situation				
Parent/guardian	1 [Reference]		1 [Reference]	
Significant other	0.70 (0.50–0.98)		0.75 (0.48–1.16)	
By myself/with friends/other	0.94 (0.67–1.31)		0.84 (0.59–1.18)	
Household income		0.008		0.02
Low	1 [Reference]		1 [Reference]	
Medium	0.74 (0.53–1.05)		0.81 (0.57–1.14)	
High	0.62 (0.44–0.87)		0.65 (0.44–0.97)	
Education level		0.04		0.03
High school or less	1 [Reference]		1 [Reference]	
Some college	0.80 (0.57–1.13)		0.75 (0.52–1.07)	
Bachelor's degree or higher	0.71 (0.51–0.99)		0.64 (0.42–0.97)	

Please note that p-values represent linearity for overall associations between ordered categorical variables and the outcome. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under $30,000 per year, medium as $30,000–$74,999, and high as $75,000 and above.

suggestion that individuals who spend a good deal of time online may feel regret and a sense of time wasted, exacerbating negative self-appraisal.[12] Second, increasing use of Internet portals such as LinkedIn can engender a type of addiction that is now recognized by the most recent Diagnostic and Statistical Manual of psychiatric conditions as an established condition related to both depression and anxiety.[31,32] Third, some individuals who spend more time on social network platforms have an increased risk of experiencing negative interactions that may influence mood.[33] While LinkedIn is not often considered a fertile ground for displays of anger and disagreement, future qualitative research may be valuable in determining whether there are examples of such problematic interactions on this platform.

While our findings suggest overall patterns indicating associations between LinkedIn use and depression and anxiety, the situation is almost certainly more complex and nuanced in reality. For example, there are likely subsets of individuals who may experience improved mood as a consequence of using

LinkedIn and sharing their successes with friends and colleagues. Indeed, some studies suggest that social networking may improve mood by facilitating positive social connection and improving social capital.[34–38] Similarly, it may be that individuals experience negative emotions initially upon job searching with LinkedIn, but that ultimately they make improved professional connections leading to improved mood.

Therefore, it will be valuable for future research to examine a more nuanced set of variables assessing contextual factors related to LinkedIn use. For example, it may be interesting for future assessments to more specifically assess the reason for using LinkedIn, such as whether it is for networking, job searching, or gathering information and business ideas. Examining reasons for use in conjunction with time spent on social networking platforms may contribute to identifying particularly high-risk situations. It may also be valuable to study user experiences in greater depth to identify particularly positive or negative experiences. Some individuals may find

difficulty navigating specific platforms, which may inhibit optimal use leading to negative experiences. However, others may receive praise and endorsements from their peers, resulting in positive experiences. Identifying and understanding these diverse experiences through qualitative assessments may potentially help developers create a more manageable and positive experience for users.

It also may be useful to gather, in future research, more information about users' "type" of use. For example, some users tend to only observe others' interactions (these users are sometimes called "lurkers"), while others tend to participate in discussions more actively. By more carefully typing users, future researchers may be able to determine whether risk of depression and/or anxiety may be higher with certain types of use. It may also be beneficial for future work to include qualitative methods to capture users' experiences, common uses, and user types. The addition of qualitative work will enrich the quantitative findings and provide insight to identifying at-risk individuals.

Regardless of directionality, the suggestion that LinkedIn use and emotional health concerns are associated may open the door to interventions. For example, others have found potential benefit for leveraging Facebook to alleviate mental health concerns.[39,40] While our findings are early, it may still be useful to begin to consider the particular character and type of interventions appropriate for this medium.

Limitations

Because we surveyed a large national group of individuals, we were not able to use gold standard assessments of LinkedIn use, such as applications that confirm time logged onto this platform. Therefore, we had to rely on self-report. It may be valuable for future work to validate self-report using intensive methodologies such as ecological momentary assessment. Similarly, our measures of depression and anxiety, while validated against other measures, were not gold standard assessments, which would have required professional interviews by mental health professionals. It should also be noted that we focused on LinkedIn as opposed to other work-related social media sites such as BranchOut, Zerply, AngelList, PartnerUp, VisualCV, and Opportunity. While we focused on LinkedIn because it is the most commonly used social media site of its type, our findings do not necessarily transfer onto other social media sources.

It is also worth noting that because our sample was ages 19–32, these results do not generalize to other age groups. We selected young adults these ages to capture a variety of young professionals who tend to use these Web sites.[4] One alternative may have been to focus more squarely on "emerging adults" who are generally considered those between the ages of 18–25.[41] Another possibility would be to assess an older population, who also use networking sites such as LinkedIn.[4] These would be valuable directions for future research.

Finally, because our findings are specific to the U.S. population, our results are not generalizable to the rest of the world.

Conclusion

In conclusion, our hypothesis that increased frequency of use of LinkedIn would be associated with an increase in depression and anxiety was supported. While these findings are consistent with prior research, our results extend previous research studies in that, to our knowledge, this is the first study to focus on a professional social networking platform. Because of the cross-sectional design of the study, we were not able to determine directionality. There are conceptual reasons why people with emotional concerns may turn to social networking sites such as LinkedIn, but there are also potential reasons why individuals who frequent these sites may develop depressive or anxious cognitions. Therefore, an important avenue for future research will be to begin to assess directionality; this may be achieved, for example, with longitudinal research and/or qualitative assessments. Because many individuals, especially young adults, are beginning to use platforms such as LinkedIn on a regular basis, it will also be valuable for future work to explore contextual factors—such as specific types of use—that may moderate these associations. Ultimately, this may facilitate development of best practices for using these potentially important tools, while minimizing risk of emotional health concerns.

Author Disclosure Statement

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