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Association Between Social Media Use, Sleep Disturbances, Psychological Symptoms, and Overweight/Obesity Among Older Adults: A Cross-Sectional Study

Mohammad Younes Alsmadi[1], Muamar Odeh Aldalaeen[2], Sabah Abbas Ahmed[3], Muhanad Fakree Ibraheem[4], Aon Moh'd Ali Almauhawesh[5], Khaldoun Ismail[6]

[1]Psychiatry Department, Ministry of Health, Amman, Jordan.
Email: Msmadi1991@gmail.com, ORCID: 0009-0004-5102-6670
[2]Medical Surgical Nursing Department, Faculty of Nursing, Northern Border University, Arar, Saudi Arabia.
Email: muamar.aldalaeen@nbu.edu.sa, ORCID: 0000-0002-3328-2062
[3]Professor, Department of Adult Nursing, College of Nursing, Al-Bayan University, Baghdad, Iraq.
Email: sabah.a@albayan.edu.iq, ORCID: 0000-0003-4225-9339
[4]Consultant Neurosurgeon, Lecturer, College of Medicine, Ibn Sina University, Baghdad, Iraq.
Email: muhanadfakree@ibnsina.edu.iq, ORCID: 0009-0003-3099-9345
[5]Faculty of Medicine, The University of Jordan, Amman, Jordan.
Email: aonalmauhawesh@gmail.com, ORCID: 0009-0001-3537-5561
[6]College of Nursing, Northern Border University, Arar, Saudi Arabia.
Email: khuldonwidyan@yahoo.com, ORCID: 0000-0001-7984-6073

ABSTRACT:

Background: Social media is increasingly used in later life, but its relationships with sleep, psychological health, and body weight among older adults remain uncertain.

Aim: To examine associations between social-media-use frequency and sleep disturbance, depressive symptoms, BMI, and overweight/obesity among adults aged 65 years or older.

Methods: A cross-sectional analysis used 2022 Health and Retirement Study data from adults aged 65 years or older. Social-media exposure was classified as non-use, occasional use, or frequent use from three frequency items. Outcomes were a sleep-disturbance score, CES-D-8 depressive symptoms, body mass index (BMI), and overweight/obesity (BMI ≥25 kg/m²). Multivariable linear, Poisson, and logistic regression models adjusted for age, sex, education, marital status, smoking, alcohol use, physical activity, and self-rated health, with standard errors clustered by household.

Results: Of 8,975 adults aged 65 years or older, 2,748 had usable social-media data. Adjusted sleep disturbance did not differ for occasional users (mean difference [MD] = 0.05, 95% CI -0.23 to 0.34) or frequent users (MD = 0.00, 95% CI -0.20 to 0.20) relative to non-users. CES-D-8 symptom counts were also not independently associated with social-media frequency. BMI was higher among occasional users (MD = 0.81 kg/m², 95% CI 0.03 to 1.58) and frequent users (MD = 1.18 kg/m², 95% CI 0.61 to 1.74), with

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a positive dose-response trend (0.58 kg/m² per category; $p < .001$). The adjusted overweight/obesity outcome was not significant.

Conclusion: Social-media use was not independently associated with sleep disturbance or depressive symptoms, but more frequent use was associated with higher BMI. Longitudinal, survey-weighted research is needed to clarify temporality and mechanisms underlying this association.

Recommendations: Future longitudinal, survey-weighted studies should measure the timing, duration, purpose, and active or passive nature of social-media use and examine behavioral pathways linking digital engagement with BMI.

INTRODUCTION

Digital communication has become an important part of later-life social participation, helping older adults maintain family and friendship ties despite distance, mobility limitations, retirement, or shrinking social networks. HRS-based studies have associated social technology or social-media communication with less loneliness, greater perceived support, and better well-being, although these findings do not establish causality (Chopik, 2016; Zhang et al., 2021; Zhang et al., 2024). Longitudinal HRS evidence has also linked Internet use with a lower probability of depression among retired adults, particularly those living alone (Cotten et al., 2014). However, reviews have found that favorable psychosocial associations are more common in cross-sectional than longitudinal or intervention research and that methodological heterogeneity limits firm conclusions (Lei et al., 2024; Wiwatkunupakarn et al., 2022).

Sleep is one outcome for which the evidence remains inconsistent. Across the adult lifespan, greater social-media use has been associated with poorer sleep quality and shorter sleep duration, whereas a study of late-middle-aged and older adults reported better sleep quality with more frequent use and identified psychological distress as a mediator (Perez et al., 2021; Shiraly et al., 2024). Bedtime use may be particularly relevant: a nationally representative study of younger adults found that checking social media during the 30 minutes before bed was independently associated with greater sleep disturbance, although that age group differs from the present sample (Levenson et al., 2017). HRS evidence further shows that patterns of social and cognitive activity are related to insomnia symptoms in later life (Kim et al., 2021).

Psychological outcomes may depend on how and why older adults use digital platforms. Social-media communication can support contact and perceived support, but frequency alone may not capture interaction quality or vulnerability. In California survey data, frequent social-media use was associated with severe psychological distress and did not remove the mental-health disadvantage associated with loneliness (Siddiq et al., 2024). Conversely, among U.S. older adults with multimorbidity, social-media use was related to better self-care efficacy, which in turn was associated with better mental health (Nie et al., 2024). Broader Internet-use studies have reported fewer depressive symptoms among users, yet longitudinal evidence also suggests bidirectional relationships involving physical activity (Cotten et al., 2014; Liu et al., 2024; Wen et al., 2023). These mixed findings support direct assessment of depressive-symptom burden without assuming that social-media use is uniformly protective or harmful (Guzman et al., 2023).

Body weight is a less frequently studied correlate of digital engagement in older adults. A meta-analysis of cross-sectional studies found higher odds of overweight and obesity with greater Internet use, although Internet use is broader than social-media use and the included age ranges varied (Aghasi et al., 2020). The behavioral direction is not necessarily adverse: Internet use has been associated with sufficient moderate-to-vigorous physical activity among community-dwelling older adults, and structured social-media interventions have produced small improvements in weight-related outcomes (Loh et al., 2023; Sasaki et al., 2022). Interpretation in later life nevertheless requires caution because BMI does not distinguish adiposity from age-related changes in muscle mass and fat distribution (Prado et al., 2024).

Taken together, prior studies rarely assess sleep disturbance, depressive symptoms, and weight status within one older population using a common exposure definition and adjustment set. The 2022 HRS provides a useful opportunity to examine whether associations with social-media-use frequency differ across these outcomes. Because exposure and outcomes were measured in the same wave, all estimates were interpreted as associations rather than causal effects (Sonnega et al., 2014).

Study Rationale and Significance

Clarifying these outcome-specific associations is important because older adults are increasingly exposed to digital communication while also experiencing high burdens of sleep problems, depressive symptoms, and excess weight; depression and obesity may also coexist in later life (Yu et al., 2022). Examining the outcomes together can distinguish a general pattern from associations that are specific to psychological, behavioral, or physical health and can guide more precise longitudinal research and intervention design.

Aim and Objectives

The aim was to examine the association between social-media-use frequency and selected health outcomes among adults aged 65 years or older. The objectives were to: (1) compare sleep-disturbance scores across non-users, occasional users, and frequent users; (2) examine CES-D-8 depressive-symptom counts and elevated symptom status across the same categories; (3) evaluate continuous BMI and overweight/obesity; and (4) test ordered trends after adjustment for prespecified sociodemographic, behavioral, and health covariates.

Research Questions

1. Is social-media-use frequency associated with sleep-disturbance burden? 2. Is it associated with depressive-symptom burden or elevated depressive symptoms? 3. Is it associated with BMI or overweight/obesity? 4. Do these outcomes show monotonic trends across increasing social-media-use categories?

METHODOLOGY

Study Design

This cross-sectional analysis used exposure and outcome data measured in the same 2022 HRS wave.

Data Source

The Health and Retirement Study (HRS) is a nationally representative longitudinal study of U.S. adults older than 50 years and their spouses. It collects information on health, functioning, employment, economic circumstances, family relationships, and psychosocial factors (Sonnega et al., 2014). The 2022 HRS Core Final Release Version 2.0 contained 15,787 respondent records and included the Core health interview and Psychosocial and Lifestyle Questionnaire data required for this analysis (Health and Retirement Study, 2026).

Data from the 2022 Core interview were linked to the 2022 Psychosocial and Lifestyle Questionnaire (Leave-Behind questionnaire). Because the psychosocial questionnaire is administered to a rotating subsample, missing Leave-Behind responses were not coded as social-media non-use (Health and Retirement Study, 2023). The 2022 Leave-Behind respondent sampling weight is not included in the Core archive but is available in the separate HRS Cross-Wave Tracker archive (Health and Retirement Study, 2025). That weight was not included in the analytic data files used here; therefore, models were unweighted and used household-clustered robust standard errors.

Study Population

Adults aged 65 years or older with social-media information and the outcome required for each model were eligible for the analytic population. Of 15,787 Core respondents, 8,975 were aged 65 years or older, and 2,748 had usable data for at least one of the three social-media items. Outcome-specific analyses included individuals with complete exposure, outcome, and covariate information and did not require one common complete-case sample across all models.

Study Instruments and Measures

Social Media Use

Use of social media was the most common exposure and was based on three items from the Psychosocial and Lifestyle Questionnaire from 2022. The respondents were asked the frequency of social-networking site usage (Facebook, WhatsApp, Twitter, etc.) (Q38b14), social media use to network with others (excluding Facebook) (Q38b15), and social media use to network with others (using WhatsApp, Snapchat, etc.) (Q38b16) (Health and Retirement Study, 2023). Responses included

daily, several times a week, at least once a month, at least once a year, and never/not relevant (Health and Retirement Study, 2023).

The top frequency across the three social-media items was taken for analysis; thus, not using or never was considered non-user, at least once a year or at least a month was considered occasional-user, and several times a week/daily was considered frequent-user. The ordered 3-tiered exposure was also coded (0-2) for dose-response trend tests. Adjusted models used the non-users as the reference group.

Sleep Disturbances

Sleep disturbance was evaluated with four HRS Core items covering difficulty initiating sleep, nocturnal awakenings, early awakening with difficulty returning to sleep, and feeling rested on waking. These items have been used to characterize insomnia symptoms in older HRS participants (Kim et al., 2021). The first three items were coded so that higher values indicated greater difficulty, the rested item was reverse-coded in the adverse direction, and all four were summed to create a score from 4 to 12, with higher scores indicating greater disturbance. Internal consistency was evaluated with Cronbach's alpha.

Psychological Symptoms

Psychological symptoms were operationalized as depressive-symptom burden using the HRS 8-item Center for Epidemiologic Studies Depression Scale (CES-D-8). Scores ranged from 0 to 8, with higher values indicating more symptoms (Dang et al., 2020). A secondary indicator defined CES-D-8 scores of 3 or higher as elevated symptoms, not a clinical diagnosis. A sensitivity analysis repeated the count model after excluding the restless-sleep item, producing a seven-item score. The original CES-D is a public-domain instrument, so separate author permission was not required; the abbreviated items were analyzed as released within the registered HRS public-use data (Radloff, 1977).

Overweight and Obesity

BMI was calculated from HRS self-reported weight and height as 703 × weight in pounds divided by height in inches squared. BMI was analyzed continuously, and a secondary binary outcome defined overweight/obesity as BMI ≥25.0 kg/m². These variables were derived from the HRS public-release questionnaire rather than from a proprietary instrument. Because ageing alters the relationship among adiposity, muscle mass, and body weight, BMI was not interpreted as a complete measure of body composition (Prado et al., 2024).

Covariates

Covariates were selected a priori rather than by automated significance testing. The adjustment set included age, sex, years of education, marital status, current smoking, current alcohol use, weekly moderate and vigorous physical activity, and self-rated health. These are standard HRS demographic, behavioral, and health items rather than a single psychometric questionnaire and were selected because they may be associated with both digital engagement and the sleep, psychological, or weight-related outcomes (Guzman et al., 2023; Lei et al., 2024; Sonnega et al., 2014).

Measurement Quality, Reliability, and Permissions

The three social-media questions assess related but distinct forms of digital communication; therefore, they were combined by maximum reported frequency as an exposure classification rather than treated as a reflective scale, and internal-consistency reliability was not applicable. Their content and response options came directly from the standardized 2022 HRS Psychosocial and Lifestyle Questionnaire (Health and Retirement Study, 2023). The CES-D-8 has demonstrated usefulness for depressive-symptom assessment in later-life research, although it is a screening measure and not a diagnostic interview (Dang et al., 2020). In the present data, internal consistency was acceptable for the CES-D-8 ($\alpha = .80$) and modest for the four-item sleep score ($\alpha = .67$). All items were used under the HRS public-data registration and Conditions of Use; no copyrighted instrument was reproduced or newly administered to participants.

Statistical Analysis

The participant characteristics were presented by means and standard deviations for continuous data and counts and percentages for categorical data across categories of social-media-use. Continuous variables were compared for crude difference using Kruskal-Wallis tests and categorical variables were compared using chi-square test. All adjusted regression

models are in fact using standard errors clustered at the HRS household level because members of a household may not be statistically independent.

Multivariable linear regression was used to model sleep disturbance and BMI. For the CES-D-8 symptom count, Poisson regression was used to model and incidence-rate ratios (IRRs) were reported and for elevated depressive symptoms and combined overweight/obesity, the logistic regression model was used and odds ratios (ORs) were reported. All models used non-users as the reference group; they were adjusted for the prespecified covariates. Estimates are reported as 95% confidence intervals and a two-sided p value of less than .05 was deemed statistically significant, although the focus was on effect size and precision.

In the ordered social-media variable, a single 0-to-2 term was used in otherwise similar adjusted models as dose-response trend tests. A sensitivity analysis was conducted to repeat the CES-D count model without the restless-sleep item, which has a high overlap with the sleep outcome. Outcome specific complete case analysis was used to address missing exposure and outcome variables, and adjustment variables. All exposure and outcome data came from the same wave of the HRS and therefore temporal and causal assumptions were not made (Sonnega et al., 2014).

Ethical Considerations

The parent HRS operates under University of Michigan institutional review procedures and obtains informed consent from participants; the public files are de-identified before release (Health and Retirement Study Staff & Weir, 2024; Sonnega et al., 2014). This study used only registered-access HRS public-release data and involved no direct participant contact, new data collection, or attempt to identify respondents. Additional participant consent was therefore not required for this secondary analysis. In accordance with HRS Conditions of Use, analytic files were kept in an access-controlled project location, were not redistributed, and were used only for the stated research purpose.

RESULTS

Participant Flow and Sample Characteristics

The 2022 HRS Core Final V2.0 contained 15,787 respondents. Of these, 8,975 were aged 65 years or older, and 2,748 had usable information for at least one of the three social-media items. Outcome data were available for 2,720 participants for sleep disturbance, 2,722 for CES-D-8 symptoms, and 2,697 for BMI; 2,650 participants had valid social-media exposure and all three principal outcomes. Among the 2,748 respondents with valid exposure information, 1,001 (36.4%) were non-users, 389 (14.2%) were occasional users, and 1,358 (49.4%) were frequent users (Figure 1).

The social-media groups differed descriptively in several baseline characteristics (Table 1). Non-users were older on average than occasional and frequent users (77.34, 74.62, and 73.18 years, respectively). Frequent users were more often women (66.3%) and reported more weekly moderate or vigorous activity (60.9%) than non-users (52.5%). Non-users also had fewer years of education on average and poorer self-rated health than the two user groups.

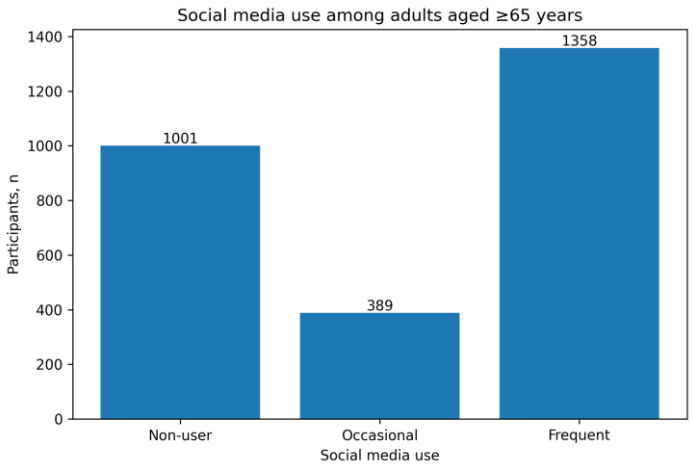

Figure 1. Distribution of social media use among adults aged 65 years or older in the analytic exposure sample.

The distribution in Figure 1 provides the exposure context for the demographic and health characteristics summarized across the same three groups in Table 1.

Table 1 Participant characteristics according to social media use

Characteristic	Non-user	Occasional	Frequent	Overall
Age, years	77.34 (7.76)	74.62 (7.07)	73.18 (6.47)	74.90 (7.30)
Female	526 (52.5%)	180 (46.3%)	900 (66.3%)	1606 (58.4%)
Education, years	12.81 (3.14)	14.02 (2.93)	13.59 (2.83)	13.36 (2.99)
Married	527 (52.7%)	235 (60.4%)	774 (57.0%)	1536 (55.9%)
Current smoker	37 (5.2%)	15 (5.9%)	37 (3.8%)	89 (4.6%)
Current alcohol use	527 (52.6%)	249 (64.0%)	837 (61.6%)	1613 (58.7%)
Weekly moderate/vigorous activity	523 (52.2%)	227 (58.4%)	827 (60.9%)	1577 (57.4%)
Self-rated health (1 excellent–5 poor)	2.95 (1.03)	2.77 (0.89)	2.81 (0.96)	2.86 (0.98)
Sleep disturbance score	6.86 (2.08)	6.65 (1.97)	6.74 (2.09)	6.77 (2.07)
CES-D-8 score	1.34 (1.91)	1.28 (1.84)	1.15 (1.80)	1.24 (1.84)
Elevated depressive symptoms	189 (19.1%)	73 (18.8%)	215 (16.0%)	477 (17.5%)
BMI, kg/m²	27.70 (5.56)	28.48 (5.59)	28.99 (6.01)	28.45 (5.82)
Overweight/obesity	658 (67.0%)	274 (72.9%)	982 (73.3%)	1914 (71.0%)

Note. Values are mean (SD) or n (%). Percentages are based on available observations for each characteristic.

Crude Outcome Patterns

Mean sleep-disturbance scores were similar across non-users, occasional users, and frequent users (6.86, 6.65, and 6.74, respectively; Kruskal-Wallis p = .187). CES-D-8 scores were modestly lower with increasing social-media frequency (1.34, 1.28, and 1.15; p = .011), whereas mean BMI increased across the same categories (27.70, 28.48, and 28.99 kg/m²; p < .001). The prevalence of elevated depressive symptoms did not differ significantly across groups (19.1%, 18.8%, and 16.0%; p = .112), while overweight/obesity was more common among occasional and frequent users than non-users in crude comparisons (72.9%, 73.3%, and 67.0%; p = .003).

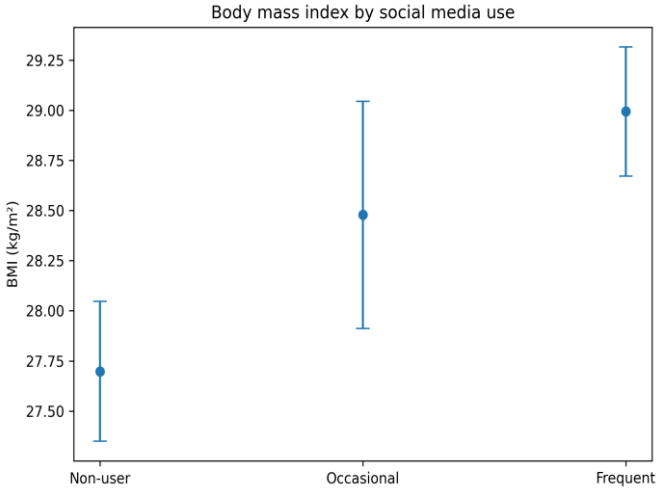

Figure 2. Mean body mass index by social media use category. Error bars show 95% confidence intervals.

Adjusted Associations

After adjustment for age, sex, education, marital status, smoking, alcohol use, weekly moderate or vigorous physical activity, and self-rated health, social-media frequency was not associated with the sleep-disturbance score (Table 2). Compared with non-users, the adjusted mean difference was 0.05 points for occasional users (95% CI -0.23 to 0.34; p = .716) and 0.00 points for frequent users (95% CI -0.20 to 0.20; p = .991). The ordered trend was also null (p for trend = .992).

Adjusted associations with depressive symptoms were similarly imprecise. The CES-D-8 incidence-rate ratio was 1.14 for occasional users relative to non-users (95% CI 0.95 to 1.37; p = .156) and 0.92 for frequent users (95% CI 0.80 to 1.07; p = .279). For elevated depressive symptoms (CES-D-8 ≥3), the adjusted odds ratios were 1.48 (95% CI 0.98 to 2.22; p = .061) for occasional users and 0.90 (95% CI 0.66 to 1.22; p = .496) for frequent users. The ordered trend tests provided no evidence of a monotonic association for either CES-D-8 symptom counts or elevated symptom status.

BMI showed the clearest adjusted association with social-media frequency. Relative to non-users, occasional users had a mean BMI that was 0.81 kg/m² higher (95% CI 0.03 to 1.58; p = .041), while frequent users had a mean BMI that was 1.18 kg/m² higher (95% CI 0.61 to 1.74; p < .001). The ordered trend corresponded to an increase of 0.58 kg/m² per higher social-media-use category (95% CI 0.30 to 0.87; p for trend < .001). However, the binary overweight/obesity outcome did not remain statistically significant after covariate adjustment: the OR was 1.16 for occasional users (95% CI 0.83 to 1.61; p = .393) and 1.21 for frequent users (95% CI 0.96 to 1.52; p = .112).

Table 2 Adjusted associations between social media use and study outcomes

Outcome	Comparison	N	Adjusted estimate (95% CI)	p
Sleep disturbance score	Occasional vs non-user	1847	MD 0.05 (-0.23, 0.34)	.716
Sleep disturbance score	Frequent vs non-user	1847	MD 0.00 (-0.20, 0.20)	.991
CES-D-8 score	Occasional vs non-user	1846	IRR 1.14 (0.95, 1.37)	.156
CES-D-8 score	Frequent vs non-user	1846	IRR 0.92 (0.80, 1.07)	.279
BMI	Occasional vs non-user	1830	MD 0.81 (0.03, 1.58)	.041
BMI	Frequent vs non-user	1830	MD 1.18 (0.61, 1.74)	<.001
Elevated depressive symptoms	Occasional vs non-user	1846	OR 1.48 (0.98, 2.22)	.061
Elevated depressive symptoms	Frequent vs non-user	1846	OR 0.90 (0.66, 1.22)	.496
Overweight/obesity (BMI ≥25)	Occasional vs non-user	1830	OR 1.16 (0.83, 1.61)	.393
Overweight/obesity (BMI ≥25)	Frequent vs non-user	1830	OR 1.21 (0.96, 1.52)	.112

Note. All models adjusted for age, sex, education, marital status, current smoking, current alcohol use, weekly moderate/vigorous activity, and self-rated health; standard errors were clustered by household. MD = mean difference; IRR = incidence-rate ratio; OR = odds ratio; CI = confidence interval.

The adjusted estimates in Table 2 show that the principal contrast across outcomes was concentrated in BMI; Figure 3 therefore displays the continuous sleep and BMI estimates with their confidence intervals for direct visual comparison.

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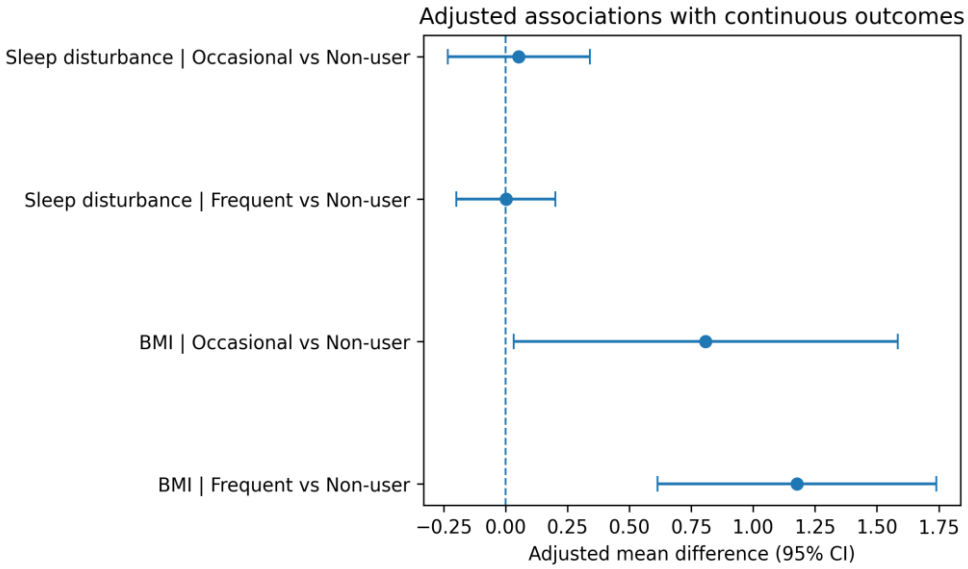

Figure 3. Adjusted mean differences for continuous sleep-disturbance and BMI outcomes.

Note. The vertical reference line at 0 indicates no adjusted mean difference relative to non-users.

Because the category-specific BMI estimates suggested a graded pattern, ordered trend models were examined next; these dose-response results are summarized in Table 3.

Table 3 Adjusted dose-response trend tests across social media use categories

Outcome	N	Trend effect (95% CI)	p for trend
Sleep disturbance score	1847	-0.00 (-0.10, 0.10)	.992
CES-D-8 score	1846	0.96 (0.90, 1.03)	.253
BMI	1830	0.58 (0.30, 0.87)	<.001
Elevated depressive symptoms	1846	0.94 (0.81, 1.09)	.442
Overweight/obesity	1830	1.10 (0.98, 1.23)	.116

Note. The ordered exposure was coded 0 = non-user, 1 = occasional user, and 2 = frequent user. Continuous outcomes are shown as adjusted mean change per category; CES-D-8 is shown as an IRR and binary outcomes as ORs.

Sensitivity Analysis

Internal consistency was acceptable for the CES-D-8 (Cronbach's alpha = .80) and modest for the four-item sleep-disturbance score (alpha = .67). Excluding the restless-sleep item from the CES-D score did not materially change the psychological findings. Relative to non-users, the adjusted IRR for the seven-item symptom count was 1.17 for occasional users (95% CI 0.95 to 1.44; p = .134) and 0.91 for frequent users (95% CI 0.78 to 1.07; p = .268), supporting the conclusion that overlap between the sleep and depressive-symptom measures did not explain the primary psychological results.

DISCUSSION

This study examined associations of social-media use with sleep disturbance, depressive symptoms, and weight status among adults aged 65 years or older in the 2022 HRS. Three findings were salient. First, neither occasional nor frequent use was independently associated with the four-item sleep-disturbance score after adjustment for demographic, behavioral, and health characteristics. Second, there was no clear association with depressive-symptom burden, including when the restless-sleep item was excluded from the CES-D score. Third, BMI showed a different pattern: occasional and frequent users had higher adjusted BMI than non-users, and the ordered analysis indicated a positive trend, although the adjusted binary

overweight/obesity outcome was not statistically significant. The associations therefore varied by outcome rather than indicating a uniformly beneficial or harmful pattern.

Sleep Disturbance

The null adjusted sleep results are interesting as previous research apparently has suggested different conclusions. Perez et al. (2021) found that higher amount of daily social media use was linked to a lower sleep quality and shorter sleep duration across an adult lifespan, but this relationship was stronger at older ages. However, other research by Shiraly et al. (2024) observed the positive association between social media use and sleep quality for older middle-aged people, where psychological distress significantly mediated that association. Multivariable adjustment did not replicate either direction in the effects in the present study. This discrepancy could be partly accounted for by differences in how exposure was measured: Perez et al. quantified the time spent using social media, Shiraly et al. assessed frequency of use (visits) per week, and the HRS items used here measured how often the person used a number of social-media or networking channels. There is also variation in the sleep outcomes reported and the HRS score focuses on insomnia-type symptoms and not an overall sleep quality or duration measure (Kim et al., 2021). The current results thus suggest that perhaps this relationship is not as straightforward as one would think: the mere use of social media may be a poor independent sign of sleep disturbance in U.S. adults aged 65 years and older. The lack of information on bedtime use is important because pre-sleep social-media checking has been associated with sleep disturbance in younger adults; whether that mechanism operates similarly in older adults remains uncertain (Levenson et al., 2017).

Psychological Symptoms

The psychological results also need to be differentiated from the psychosocial outcomes that are much more commonly highlighted in much of the older adult literature. Frequent communication via social media was found to be associated with reduced loneliness among HRS participants and social support and social contact partially mediated the association between frequent social-media communication and reduced loneliness (Zhang et al., 2021). Zhang et al. (2024) used the HRS to find an inverse association between social-media communication and loneliness, which involved social relations as important pathways. These studies do not necessarily mean that frequency of social media should also be correlated with decreased CES-D depressive symptomology since loneliness, social support, and depressive symptomology are related, yet mutually distinct. In line with this distinction, Guzman et al. (2023) characterized the evidence between social media and depression in older adults as nuanced and identified differences in the ways in which social-media exposure, quality of social media interaction, health status, and older adult age cohorts have been measured. Similarly, cross-sectional psychosocial research conducted by Lei et al. (2024) showed beneficial associations in general, with significantly less consistent evidence of such associations over time. This current null CES-D results aligns with this heterogeneous literature and indicates that perhaps it is not the mere amount of social media use but the quality, purpose and social context of that use that is more important with respect to depressive symptomology. This interpretation is supported by divergent primary studies: frequent use was associated with severe psychological distress in a California older-adult sample, whereas social-media use among older adults with multimorbidity was linked to better self-care efficacy and indirectly to better mental health (Nie et al., 2024; Siddiq et al., 2024). Longitudinal studies of broader Internet use have likewise reported either reduced depression risk or reciprocal relationships among Internet use, physical activity, and depressive symptoms (Cotten et al., 2014; Liu et al., 2024).

Body Mass Index and Weight Status

BMI was the most obvious relationship found in this study. The adjusted BMI of frequent users was nearly 1.18 kg/m2 higher than that of non-users; and the trend was ordered by an increase of about 0.58 kg/m2 per higher social-media-use category, while occasional users had an adjusted BMI nearly 0.81 kg/m2 higher. This is in general agreement with Aghasi et al. (2020) who confirmed increased overweight and obesity risk with increased Internet use and a dose-response relationship for each additional hour of Internet use per day. However, weight status was dichotomized as BMI ≥25 kg/m2 and no statistically significant adjusted association was found in the present study. A possible statistical reason is that a continuous BMI model retains the variation present in the data which is lost if those with BMI above and below a single threshold are clubbed together. Older adults should also be interpreted with care as BMI fails to differentiate adiposity from ageing and decrease in lean mass and body composition (Prado et al., 2024). Thus, the BMI gradient observed is a signal of an association of social media use with weight and not an indication of causality. The direction of this association should not be attributed

automatically to inactivity, because Internet use has also been associated with greater moderate-to-vigorous physical activity among community-dwelling older adults (Sasaki et al., 2022).

The weight finding should not be taken as proof of the harmfulness of social media in general for weight management. Structured social media-based interventions resulted in small to moderate effects in RCTs on weight, BMI, waist circumference, body fat, and daily steps, with moderate to low certainty of evidence. The difference is that that intervention literature is about a different sort of exposure than what most people experience when using social media every day. Purpose-designed programs offer the opportunity to deliver goal setting, feedback, health information and social support; routine use can involve extensive amounts of time spent idle, or activities not associated with health. This comparison between today's observational association and intervention results, thus, further emphasizes the need to differentiate between the platform exposure and the content and use behavior of older adults. The HRS frequency items do not allow for differentiating activities that were passedively viewed, actively communicated, used to look for health information, and used at times that might have replaced physical activity. This contrast illustrates why platform frequency, sedentary time, health-information seeking, and participation in structured behavior-change programs should be treated as distinct exposures.

Interpretation and Potential Mechanisms

Overall, the results do not warrant one positive or one negative description of social media use in later life. This sample revealed that frequent users were younger, more educated, more physically active and had better self-rated health than non-users, demonstrating the significant social and health selection that may be present with digital engagement. Crude differences in sleep and depressive symptoms were somewhat reduced with multivariable adjustment, part of which may be explained by the type of individual who adapts to and regularly uses social media. In the meantime, the BMI gradient remained after accounting for the available covariates, suggesting that this relationship was not fully accounted for by age, sex, education, marital status, smoking, alcohol use, moderate or vigorous activity done on a weekly basis or self-rated health. Residual confounding and reverse causation are still plausible, however; and the cross-sectional nature of the study design does not allow for determining if increased social-media use came before increased BMI or if other factors affected both behaviors.

Strengths and Limitations

The study has a number of features that enhance it. The analysis included the entire 2022 HRS Core release, and was limited to adults 65 years and older, for whom the HRS has linked psychosocial and health information (Health and Retirement Study, 2026; Sonnega et al., 2014). The exposure to social media was measured using three frequency categories instead of a dichotomous variable (user/non-user), which enabled both testing of categories and of an ordered trend. Sleep, depressive symptoms, continuous BMI and binary weight status were explored in a single analytic framework, permitting the study to demonstrate that relationships were outcome-specific. The sensitivity analysis using CES-D excluding restless sleep along with the prespecified covariate adjustment and the household-clustered robust standard errors further decreased the model dependence and measurement overlap.

However, there are also significant limitations to this study. No temporal or causal inference are possible due to its cross-sectional design and all the exposure and outcome data was collected in the same wave of the HRS. Social-media use was categorized based on frequency, and the quality of social-media interactions, emotional tone, content, active versus passive use, and duration of use were not captured, as these may be important dimensions of social-media use related to sleep and psychological health (Guzman et al., 2023; Lei et al., 2024). For the main BMI calculation, heights and weights were self-reported, which may have created some error in measurements, and BMI is a less reliable measure of adiposity in older age (Prado et al., 2024). There was modest internal consistency in the sleep scale which could have dampened the associations. There may also be selection bias when there is missingness that is related to the outcomes as well as social-media use in outcome-specific complete-case analysis. Furthermore, the Leave-Behind respondent sampling weights are available in the separate HRS Cross-Wave Tracker but were not included in the analytic files used for this study (Health and Retirement Study, 2025). The regression estimates were thus unweighted; the present effect estimates cannot be said to be nationally representative of all older adults in the U.S. despite the use of household clustering. Unmeasured factors, including more detailed sedentary time, diet, digital literacy, socioeconomic resources, functional limitations, and social-network characteristics also can be a residual confounding factor.

RECOMMENDATIONS AND FUTURE RESEARCH

Future research should incorporate the HRS psychosocial sampling weights and use longitudinal designs to establish temporal ordering and improve population-level inference. Social-media exposure should distinguish active from passive use, duration and timing of use, communication from content consumption, and health-related from non-health-related purposes. Studies should test sedentary behavior, diet, physical activity, loneliness, perceived support, and self-care efficacy as potential mediators, while incorporating waist circumference or body-composition measures when available (Liu et al., 2024; Nie et al., 2024; Sasaki et al., 2022). These extensions would help explain why the BMI gradient observed here was not accompanied by parallel sleep or depressive-symptom associations.

CONCLUSION

Frequency of social-media use was not independently associated with sleep disturbance or the burden of depressive symptoms after accounting for demographic, behavioral, and health characteristics in this cross-sectional analysis of adults aged 65 years or older in the 2022 HRS. BMI, however, rose in all social-media-use groups; occasional and frequent users had higher adjusted BMI than those who never used social media and a significant positive dose-response trend was found. The binary overweight/obesity estimates did not suggest that there was a clear signal in weight, as the results were not statistically significant. This is consistent with an inconsistent literature which suggests that the relationship between social-media use and physical and psychosocial outcomes could be different later in life. The findings should be viewed as associations since the study was cross-sectional, used frequency-based social-media measure, and the separate HRS Leave-Behind sampling weight was not applied. More detailed measures of digital behaviors with longitudinal, survey-weighted studies are required to investigate the mechanisms that underlie the observed BMI gradient and to elucidate whether specific behaviors related to social-media use are linked to sleep or psychological well-being in older adults.

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