



A Scoping Review and Conceptual Framework Examining the Role of Sleep Disturbance in Financial Exploitation in Older Adults

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Abstract

Sleep disturbances and financial exploitation have both been linked to impaired cognitive ability, loneliness, and depressed mood in older adults, suggesting a potential role of sleep disturbances in increasing vulnerability to financial exploitation. We sought to identify evidence linking sleep disturbances to financial exploitation. We conducted a systematic search of MEDLINE, PubMed Central, and National Center for Biotechnology Information Bookshelf for relevant published articles on sleep and financial exploitation. Three studies examining both sleep and financial exploitation were identified. None of the studies explored sleep disturbances as a cause of financial exploitation. More work needs to be done to examine the role of sleep disturbances in financial exploitation. We propose a conceptual framework for identifying possible associations among sleep disturbance, biopsychosocial, and decision-related situational factors to guide further exploration of relationships between sleep and financial exploitation.

Keywords

sleep health, abuse, aging, social determinants of health

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Introduction

Up to 40% of older adults in the United States (US) report sleep disturbance (Grandner et al., 2012), such as difficulties with the duration, continuity, or timing of the sleep period, excessive daytime sleepiness, or overall sleep quality (Buysse, 2014). Sleep disorders such as obstructive sleep apnea and chronic insomnia disorder are also prevalent in older adults (Bixler et al., 1998; Ohayon, 2002). Sleep is affected by the complex interplay among medical, psychiatric, and psychosocial factors (Miner & Kryger, 2017). For example, major depressive disorder, which is more common in individuals with chronic medical conditions such as heart failure, has a bidirectional relationship with insomnia symptoms (Plante, 2021). These conditions are exacerbated by psychosocial factors such as ongoing financial strain and over-indebtedness, which are also associated with disrupted sleep in older adults (Arber et al., 2014; Dregan & Armstrong, 2009; Hall et al., 2008; Lallukka et al., 2012; Warth et al., 2019).

Financial exploitation—the “illegal or improper use, control over, or withholding” of funds or resources by others for profit or advantage (US Department of Justice, 2020)—is a particularly troubling cause of financial

strain. Examples of financial exploitation include investments schemes, romance scams, sham sweepstakes or technology support, and timeshare scams, and perpetrators can include ill-willed family/friends, business or government impostors, or purveyors of online shopping hoaxes (National Adult Protective Services Association, 2022; Rohde, 2021). Nearly three billion dollars annually in financial loss is attributed to fraud in older adults (MetLife, 2009). Rates of financial exploitation continue to soar among U.S. older adults. Financial abuse, a type of exploitation, has a prevalence of 7% (Yon et al., 2017), and compared to other forms of elder abuse, it has one of the highest mortality rates (Burnett et al., 2016). Financial exploitation occurs more frequently in individuals who are more vulnerable. Factors that occur

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more frequently with advanced age such as limited financial means, poor cognition, impaired social support, and depression increase risk of financial exploitation in older adults (Weissberger, Mosqueda, Nguyen, Axelrod, et al., 2020). Interestingly, these same factors are also strongly associated with sleep disturbance (Bloom et al., 2009; Hall et al., 2008). Disruptions in sleep may decrease decision making capacity and social cognition, putting older adults with sleep disturbance at greater risk for financial exploitation (Weissberger, Mosqueda, Nguyen, Axelrod, et al., 2020). Because sleep is a modifiable risk factor, research linking poor sleep to financial exploitation could have important implications for developing interventions to decrease financial exploitation and improve the overall health and financial well-being of older adults.

We sought to summarize through a scoping review the current body of evidence examining the potential role of sleep disturbance in financial exploitation in older adults. The main goal was to find and summarize peer-reviewed publications reporting results from scientific studies that have investigated associations between sleep and financial exploitation in this population. A secondary goal was to identify whether prior studies have examined how biopsychosocial factors influence the relationship between these variables in the older adult population.

Methods

As described by Arksey and O'Malley's methodological framework for conducting a scoping study (Levac et al., 2010), we began with identifying our research question. Then, we developed a plan for identifying relevant studies. The choice of methodology, a scoping review that used a systematic approach, was primarily motivated by the desire to see what literature exists when examining the correlation between sleep and the construct of financial exploitation. In this unregistered protocol, we sought to identify empirical research that assessed sleep disturbance (i.e., sleep disorder, insomnia, sleep deprivation, etc.) and financial exploitation (e.g., financial fraud, theft, unauthorized real estate changes, mortgage scams, contractor fraud, investment and lottery scams, electronic scams, and insurance sale scams; National Adult Protective Services Association, 2022). We also sought to identify the ways in which mental health or social factors have been addressed in such studies. We opted to use the PubMed search engine. The searches included combined terms and phrases related to sleep and finances as described in the section, "search strategies." Other theoretical concepts that denote brain considerations and sleep (such as neuropathology, brain health, cortical structure of sleep, etc.) were not included in the search. As described in step 3 of the Arksey and O'Malley framework (Levac et al., 2010), we refined inclusion and exclusion criteria post hoc and selected the studies.

Search Strategies

A list of keywords and MeSH terms were compiled and combined into a search string (see Supplemental Material 1). MEDLINE, PubMed Central, and National Center for Biotechnology Information Bookshelf and other resources accessible through PubMed were searched. The literature search was initially conducted in December 2021 and was updated in June 2022. It included all articles published since the inception of MEDLINE. An initial selection of relevant publications was made by screening the titles and abstracts for the found literature. Publications that summarized the results of primary data collection, used quantitative (e.g., cross-sectional, cohort, and randomized trial) or qualitative (e.g., interview) designs, and examined the relationship between sleep and overt financial exploitation were eligible. Data were charted independently by JRA in an electronic spreadsheet developed and refined by the team for this project. Three researchers (JRA, SDH, and CHF) were involved in the screening of relevant literature and in reviewing the full text of the publications that were included. Summaries of the data/publications were documented in tabular format and reviewed by the three researchers.

Results

A flow diagram for the search is presented in Figure 1. Table 1 summarizes the results of the scoping review. A total of three references (Weissberger, Mosqueda, Nguyen, Samek, et al., 2020; Yunus et al., 2017; Zunzunegui et al., 2017) were identified. Weissberger, Mosqueda, Nguyen, Samek, et al. (2020) found that among older adults living in Los Angeles, United States, those who endorsed financial exploitation had worse scores on the Medical Health Checklist, an effect that in follow-up analyses was found to be attributed to the sleep item in the Medical Health Checklist. Yunus et al. (2017) found that among older adults surveyed in Kuala Pilah, Malaysia, a dose-response relationship was observed between abuse and poor sleep quality, although when the authors examined the financial abuse subtype, they found no significant relationship between financial abuse and sleep quality. Zunzunegui et al. (2017) explored whether fraudulent behaviors by financial institutions during the economic crisis (2007–2014) in Spain were associated with health problems, including sleep quality. The authors found that those who had not received financial compensation for financial fraudulent activity had worse sleep quality.

There was no uniformity in the ways in which the constructs, "sleep" and "financial exploitation," were measured or analyzed. Weissberger, Mosqueda, Nguyen, Samek, et al. (2020) examined aspects of financial exploitation with a two-item questionnaire, but did not isolate sleep in its measurements; rather sleep was a single item within an instrument focused on measuring

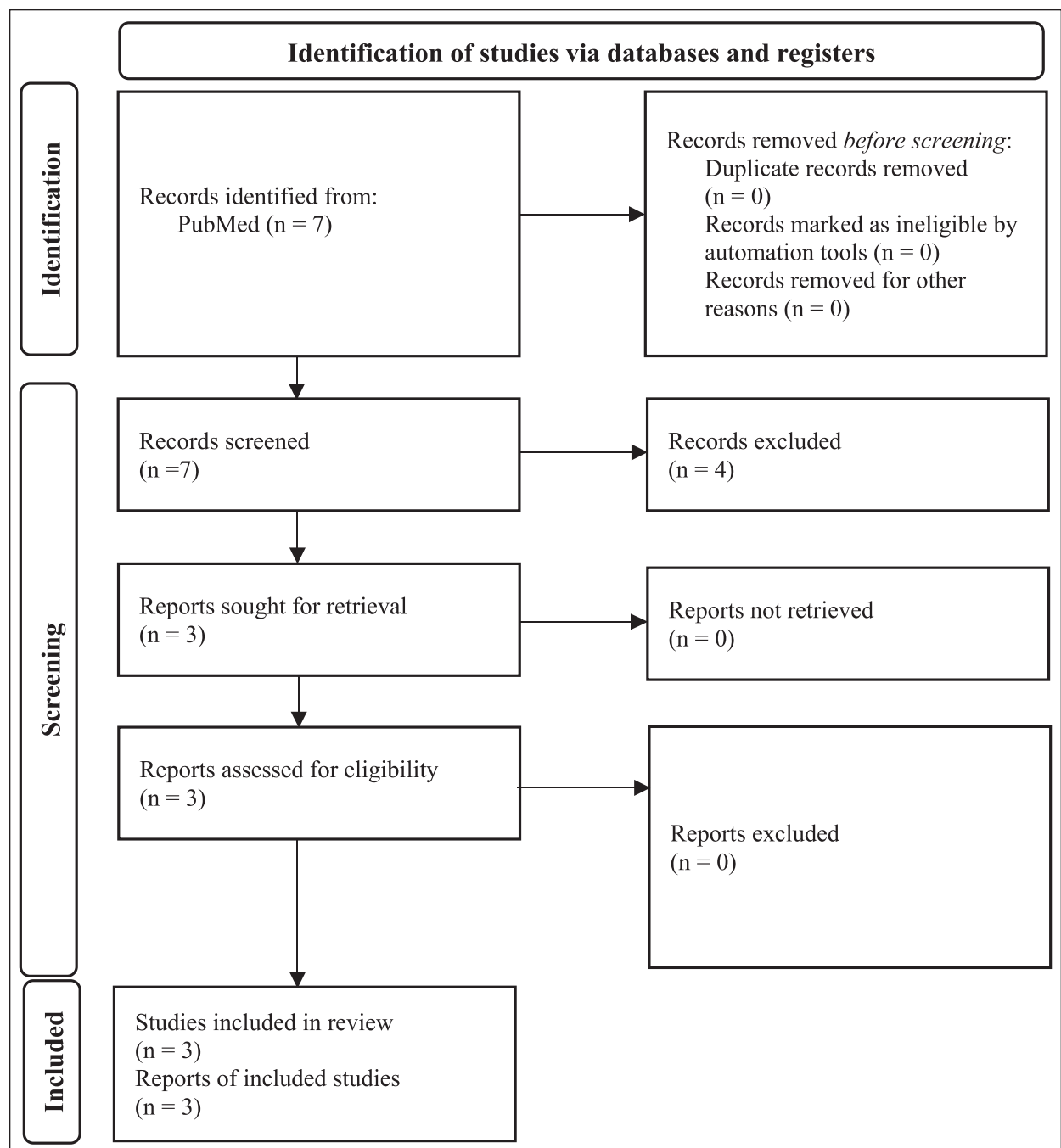


Figure 1. Flow diagram of search for articles on sleep disturbance and financial exploitation.

medical symptoms. The association between financial fraud and sleep was measured in Zunzunwgui et al. (Zunzunegui et al., 2017) with a widely used instrument, the Pittsburgh Sleep Quality Index (PSQI), and a 4-item measure of financial fraud. Finally, Yunus et al. (2017) also used the PSQI but studied different aspects of abuse (including financial) using a questionnaire adapted from the Conflict Tactic Scales. Yunus et al. (2017) discussed the importance of recognizing sleep problems among older individuals who have experienced abuse or neglect.

The studies used a cross-sectional design, which limits interpretation of the direction of effect between sleep

and financial exploitation. Studies attempted to adjust for other variables, but none of the studies used designs that could establish a causal relationship (only associations) between sleep and financial exploitation.

Discussion

In this scoping review, we found few studies that examined the relationship between sleep and financial exploitation in older adults and no studies that examined whether sleep disturbance (or sleep disorders) cause financial exploitation or increase vulnerability to

Table 1. Articles Describing Sleep and Financial Exploitation.

First author, year	Country of origin	Study design	Study question	Measures
Weissberger, Mosqueda, Nguyen, Samek, et al. (2020)	United States	Cross-sectional	Examines associations among financial exploitation, cognition, and health	PHQ-9 9 (including item about sleep), GAD-7, MHC, MoCA, Aging Questionnaire, FE-2 item questionnaire
Zunzunegui et al. (2017)	Spain	Cross-sectional	Examines if financial fraud is associated to sleep (duration, efficiency, and quality) and quality of life	PSQI validated for Spain; GHQ-28; Financial Fraud Questionnaire
Yunus et al. (2017)	Malaysia	Cross-sectional	Is abuse (neglect, physical, psychological, and financial) associated with poor sleep (subjective sleep quality, sleep latency, and sleep disturbance).	Malay version of PSQI, Abuse Questionnaire

Note. PHQ-9=9-Item Patient Health Questionnaire; GAD-7=7-ITEM Generalized Anxiety Questionnaire; MHC=Medical History Checklist subscale of the Multi-Assessment Instrument; MoCA=Montreal Cognitive Assessment Screening Instrument; FE=Financial Exploitation Questionnaire; PSQI=Pittsburgh Sleep Quality Index; GHQ-28=General Health Questionnaire.

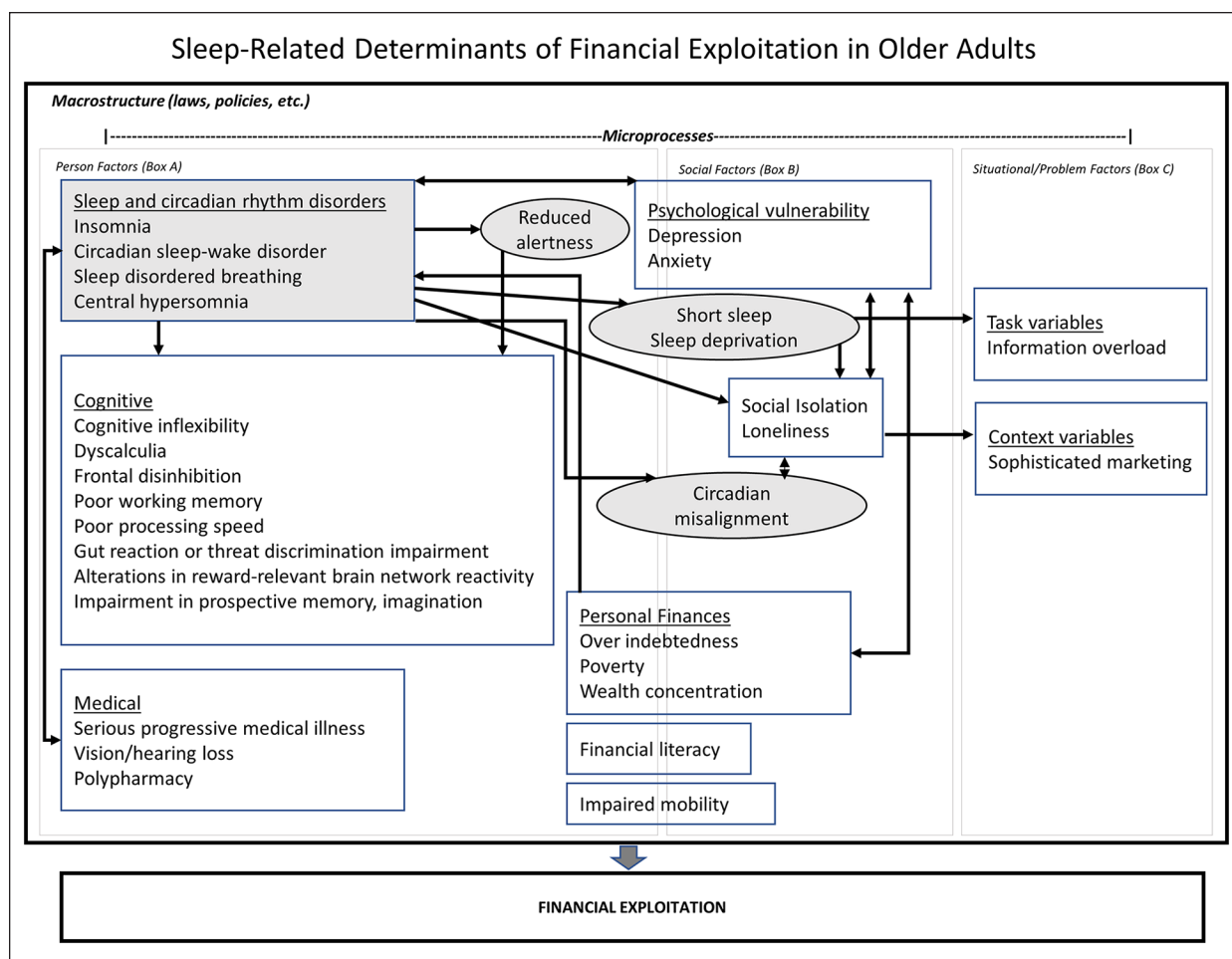


Figure 2. Sleep-related determinants of financial exploitation in older adults. Oval shapes represent types of sleep disturbance that may or may not have reached the threshold of a sleep/circadian rhythm disorder. Microprocesses that affect risk of financial exploitation are divided into three groups (person, social, and situational/problem) factors. Sleep and circadian rhythm disturbances (shaded shapes) are considered person factors, although circadian misalignment and short sleep or sleep deprivation are also a function of social factors. Other factors that increase vulnerability to exploitation are included in the unshaded figures.

exploitation. This review, to our knowledge, is the first to summarize the current body of evidence on this subject. While financial strain has been shown to be a contributor to poor sleep in numerous studies (Arber et al., 2014; Dregan & Armstrong, 2009; Hall et al., 2008; Lallukka et al., 2012; Warth et al., 2019), the effects of poor sleep (e.g., sleep fragmentation, short sleep duration, repetitive hypoxia during sleep, and circadian misalignment) on financial decisions and other contributors to financial exploitation have not been examined, even though these factors have been studied in the context of decision-making, for example. Numerous studies have demonstrated significant associations between sleep and circadian rhythms and cognitive (e.g., executive function), psychological (e.g., depression), social (e.g., isolation and occupation), and situational (e.g., information overload) dysfunction (Goel et al., 2009; Goldstein-Piekarski et al., 2015; Gujar et al., 2011; Olaithe et al., 2018; Park et al., 2016; Zhang et al., 2021). A growing body of evidence implicates these same areas in financial exploitation (Boyle et al., 2019; DeLiema et al., 2020; Nguyen et al., 2021; Weissberger, Mosqueda, Nguyen, Axelrod, et al., 2020). Given the potential overlap in pathways and mechanisms between sleep/circadian rhythm changes and financial exploitation, a framework describing the areas of overlap is warranted.

We propose a framework (Figure 2) that is based on existing models of financial exploitation (Lachs & Han, 2015; Lichtenberg et al., 2018; Rabiner et al., 2004), but that focuses on the potential role of sleep and circadian rhythm disorders (rectangle shapes) and sleep disturbance (oval shapes) in increasing risk of financial exploitation in older adults. The framework acknowledges the macrostructure (e.g., laws and policies) that influences microprocesses (Rabiner et al., 2004), which are the main focus of this particular framework. The microprocesses include person factors (Box A), social factors (Box B), and situational/problem factors (Box C). Person factors (Box A) include sleep/circadian disorders, cognitive ability, and other factors that have previously been described such as serious medical illness, sensory impairment, and polypharmacy. Social factors (Box B) include social isolation as well as a number of factors that overlap with person factors, including psychosocial vulnerability due to depression or anxiety, short sleep duration/deprivation (e.g., multiple jobs and caregiving), social isolation/loneliness, circadian misalignment (e.g., shift work), personal finances (e.g., over-indebtedness), financial literacy, and impaired mobility. Situational or problem factors (Box C) are those involving the complexity of a decision task and include task variables (e.g., excessive volume of information presented in complex manner) and context variables (e.g., sophisticated marketing). Factors within each of three boxes interact with each other and in aggregate, person, social, and situation/problem factors within the context of the macrostructure lead to financial exploitation. The connections highlighted in the framework focus on potential relationships involving sleep/circadian rhythm

disorders, types of sleep disturbance, and financial exploitation.

Person factors (Box A) that are particularly relevant to the potential role of sleep problems in increasing vulnerability to financial exploitation include specific types of sleep and circadian rhythm disorders. As listed in the International Classification of Sleep Disorders-3rd edition (American Academy of Sleep Medicine, 2014), these include insomnia (e.g., chronic insomnia disorder), circadian sleep-wake disorders (e.g., delayed sleep wake phase disorder), sleep disordered breathing (e.g., obstructive sleep apnea), and central hypersomnia (e.g., due to a medical condition) conditions. A growing number of studies demonstrate relationships between these conditions and aspects of cognition that are also implicated in financial exploitation, including impaired executive function (e.g., inflexibility, poor working memory, and impaired inhibitory control), reduced perceptual and psychomotor speed, and altered reward-relevant brain reactivity (Goel et al., 2009; Goldstein-Piekarski et al., 2015; Gujar et al., 2011; Olaithe et al., 2018; Park et al., 2016; Zhang et al., 2021). For example, obstructive sleep apnea is associated with poor working memory and diminished ability to initiate new mental processes (Naëgelé et al., 1995), which in theory could reduce an individual's ability to quickly incorporate critical details and ask important questions to assess risk of a situation. Treatment with positive airway pressure therapy has demonstrated improvement in executive function (Dzierzewski et al., 2018). Sleep deprivation causes deficits in attention and memory, and insomnia is associated with poor working memory (Olaithe et al., 2018). Insomnia treatment has had mixed results on cognition, with one study showing improvement in reaction times for complex vigilance tasks while another showing no difference in working memory or abstract reasoning (Dzierzewski et al., 2018). Whether impaired gut reaction/threat discrimination and reduction in prospective memory, which may increase vulnerability to financial exploitation, are also caused by sleep disorders or sleep disturbance is unknown.

Social factors (Box B) involving sleep disturbance and sleep disorders may contribute to financial exploitation through a variety of pathways. Depression and sleep disorders such as chronic insomnia disorder are closely interconnected, such that insomnia may be a result of depression, and conversely, insomnia increases the risk of older adults developing depression (Miner & Kryger, 2017). One of the consequences of depression is a tendency to isolate. Furthermore, 28% of adults 65 years and older tend to live alone, which also increases the rates of social isolation (Surks et al., 2004). Evidence indicates that social isolation has a negative impact on sleep quality in older adults (Yu et al., 2018). For socially-isolated older adults, sleep hygiene and an inadequate exposure to zeitgebers, could lead to irregular sleep-wake patterns (Miner & Kryger, 2017) and short sleep duration. Social isolation has been established as

one of the most robust risk factors for elder abuse and financial exploitation (Lachs & Pillemer, 2015). Older adults who are socially isolated may be more at-risk for scams, especially when sleep deprived, because brain regions associated with executive functioning and reasoning may be affected by lack of sleep. Inadequate amounts of sleep could lead to lower levels cognitive functioning (not thinking clearly), risky behavior (overspending on lottery tickets or engaging in other forms of debt) or being overly generous to caregivers in exchange for social connection. Moreover, the desire to remain connected and perhaps appease the person on the other line of the phone or persons who are taking care of them, may increase an older adult's vulnerability to fraud and exploitation. An older adult that is socially isolated from family or close friends does not have the benefit of certain protective factors, such as people in their lives who can check-in on their safety, well-being, and financial health.

Situational (problem) factors (Box C) have been previously described in conceptual frameworks of financial exploitation in older adults (Lachs & Han, 2015). These include context variables such as sophisticated marketing aimed at scamming individuals and information overload with complicated offerings (Lachs & Han, 2015). The relationship between sleep disturbance and sleep disorders and these situational factors, however, has not been examined in the context of financial exploitation. Sleep disorders such as obstructive sleep apnea impair working memory and other conditions reduce alertness, which may decrease an individual's capacity to handle the volume of information presented. In addition, obstructive sleep apnea contributes to impairment in cognitive flexibility, which is needed when switching among different choice sets and comparing attributes of choices in decision-making. As described above, social isolation and loneliness related to depression or to circadian rhythm sleep-wake disorders may increase susceptibility to sophisticated marketing ploys.

Our study has several limitations. As a scoping review, we did not conduct a comprehensive search of all databases and may have omitted studies. Our review was limited to publications written in the English language. Financial exploitation encompasses several different constructs, and the key words we selected to operationalize the constructs may have resulted in omitted citations.

In conclusion, we found few studies examining the relationship between sleep disturbance and financial exploitation. The studies suggest that individuals who have experienced financial exploitation have worse sleep. Future studies should consider the effects of sleep disturbance on vulnerability to financial exploitation because sleep disturbance is known to affect cognition and other factors that increase risk of exploitation. Our conceptual framework could guide future research aimed at examining the role of sleep and circadian rhythm disturbance in

increasing vulnerability of older adults to financial exploitation, especially since safe and effective treatments for sleep disorders are available such as cognitive behavioral therapy for insomnia and positive airway pressure for obstructive sleep apnea. Elucidating and investigating pathways between sleep/circadian problems and financial exploitation could lead to improvements in the financial well-being and health of older adults.

Author Note

Poster presented at GSWEV VAGLAHS event on April 27, 2022.

Author Contributions

JRA, SDH, and CHF contributed to study concept and design, analysis and interpretation of data, and preparation of manuscript. JRA collected the data.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Supplemental Material

Supplemental material for this article is available online.

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