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24-Hour Care: Work and Sleep Conditions of Migrant Filipino Live-In Caregivers in Los Angeles

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Introduction *Live-in formal caregivers spend consecutive days in patients' homes, raising questions about their ability to secure adequate sleep while on duty. Few studies have examined sleeping conditions and outcomes for this growing workforce.*
Methods *We collected weeklong sleep logs and interview data from 32 Filipino caregivers in Los Angeles who provide live-in services at least 3 consecutive days per week.*
Results *Respondents recorded a total average of 6.4 sleep hours during workdays divided over 2.4 sleep periods. Caregivers rated sleep quality as lower while at work; over 40% indicated excessive daytime sleepiness. Female caregivers reported worse sleep outcomes than their male counterparts. Some variations in sleep outcomes were found by employment arrangements.*
Conclusion *Live-in caregivers experience frequent sleep interruptions at all hours of the day and night to attend to patients' needs. The resulting impacts on sleep quality pose risks for both work-related injury and errors in patient care.* Am. J. Ind. Med. 59:1120–1129, 2016.

KEY WORDS: formal caregiving; sleep; work organization; immigrant workers; healthcare and social services

INTRODUCTION

In-home care work is one of the fastest growing occupations in the United States, with an estimated 3 million in-home formal care workers nationwide [Paraprofessional Healthcare Institute, 2012].[1] "Formal" care work refers to care carried out by workers who are paid for their services, distinguishing it from non-paid care work provided by family members or friends. A steadily aging general population and rising costs for institutional care coupled with diminished family size, and rising employment rates for women have contributed to the growth of the formal caregiving sector [Boris and Klein, 2012; Redfoot et al., 2013; Poo, 2015]. Formal care workers providing in-home services for elderly or disabled patients typically help with a wide range of activities of daily living such as bathing, grooming, toileting, laundry, feeding, cooking, ambulation assistance, housecleaning, sanctioned medical care, patient lifting, and basic companionship [Domestic Workers United, 2006; Burnham and Theodore, 2012; Poo, 2015].

Live-in caregivers constitute a distinctive sector of the in-home formal care workforce. Their work schedules typically involve multiple consecutive days at patients' homes providing round the clock care, returning home only after having completed their extended shifts; in some cases, caregivers may live-in fulltime. In all cases, private homes constitute caregivers' primary workplace, and the wide range of support services they provide mirror those available in nursing homes and board and care facilities [Poo, 2015].

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[1] The term "formal care work" does not necessarily imply formal recognition under federal labor law, since much of the workforce is exempted from protections under the Fair Labor Standards Act (see below).

While official estimates are difficult to come by, one recent survey of domestic workers in 14 metropolitan areas found that 11% of respondents performed some form of live-in work [Burnham and Theodore, 2012]. Live-in caregivers may be employed through home care agencies, caregiver referral websites, or hired directly by patients or family members. Many of these workers are immigrant and racial/ethnic minority women [Romero, 1992; Glenn, 1997; Hondagneu-Sotelo, 2001; Momsen, 2003; Misra et al., 2006; Duffy, 2007; Guevarra, 2009; Rodriguez, 2010; Parreñas, 2015].

The nature of live-in care raises questions about the impact of work environment and job demands on caregivers' ability to secure adequate sleep [Stacey, 2005; Markkanen et al., 2007]. Live-in workers rarely have control over their time while on duty and are typically on-call for the duration of their shifts—including during nighttime hours [Burnham and Theodore, 2012]. A live-in caregiver may effectively work up to 24 hr per day depending on the patient's health status and care needs. Such conditions may be further exacerbated by legal considerations. Most live-in caregivers and other domestic workers are exempted from wage and hour protections under the Fair Labor Standards Act [Gaydos et al., 2011; Solis, 2011; Guevarra and Lledo, 2013; Parreñas, 2015]. Many work arrangements do not include explicit provisions regarding meal and rest breaks or sleep time [Poo, 2015].

While a sizable body of scholarship recognizes the impacts of extended shifts and other nonstandard shift schedules on sleep duration and quality among healthcare workers in general [Leonard et al., 1998; Baldwin and Daugherty, 2004; Trinkoff et al., 2006; Gershon et al., 2009; de Castro et al., 2010; Anderson et al., 2012; Bae and Fabry, 2014; Caruso, 2014], research on the sleep experiences of live-in caregivers is limited. The multi-city survey of domestic workers referenced above found that 25% of live-in workers had responsibilities that prevented them from obtaining at least 5 hr of uninterrupted sleep [Burnham and Theodore, 2012]. The issue is consequential for both caregivers and patients. Extended work hours are associated with more frequent sleep disturbances and greater need for recovery [Jansen et al., 2003; Merkus et al., 2015]. Chronic work-related fatigue and sleeplessness may in turn increase risk for gastro-intestinal problems, Type 2 diabetes, cancer, and cardiovascular disease [Bannai and Tamakoshi, 2014]. Occupational injury and illness rates are also often higher for nonstandard shift schedules as compared to conventional day shifts [Trinkoff et al., 2006; Dembe et al., 2009; Geiger-Brown et al., 2012]. In the case of direct care providers, fatigue can result in errors that adversely affect the health and well-being of patients as well [Gander et al., 2000; Estabrooks et al., 2009; Arimura et al., 2010; Olds and Clarke, 2010; Geiger-Brown et al., 2012; Caruso, 2014].

The goal of this exploratory study, therefore, was to document the sleep patterns and outcomes for this under-examined workforce—to better understand how live-in caregivers' sleep is typically structured during extended shifts, how patient care responsibilities interact with sleep schedules, and the resulting impacts on sleep quantity and quality.

Our research was conducted in Los Angeles as a collaboration between the UCLA Labor Occupational Safety and Health Program and the Pilipino Worker Center (PWC), a community-based organization advocating for the health and well-being of migrant Filipino workers and their families in Southern California. California has the largest and fastest growing formal care workforce in the country, the majority of whom are foreign-born women of color [Gaydos et al., 2011],[2] and the live-in caregiver workforce in Los Angeles is comprised of a large proportion of migrant Filipino women [Tung, 2000; Guevarra and Lledo, 2013; Nazareno et al., 2014]. This ethnic niche is the consequence of long historical ties between the United States and the Philippines—the development of Americanized nursing and education programs in the Philippines in the early 20th century laid the foundation for a gendered, professionalized, and exportable labor force, while the Philippine government and state officials played an active role in positioning the Philippines as one of the largest global distributors of domestic and care labor [Choy, 2003; Guevarra, 2009; Rodriguez, 2010]. Research on this workforce in Los Angeles has found many Filipino caregivers to be above the age of 50 and undocumented [Nazareno et al., 2014]; many likely came to the United States on temporary tourist visas and stayed longer than the period of authorized visit in order to work and provide remittances to their families [Ramakrishnan and Espenshade, 2006; Ocampo, 2016].

PWC has grown increasingly concerned about sleep problems among live-in caregivers as a result of their efforts to promote the California Domestic Workers' Bill of Rights. Signed into law in 2014, the legislation extends minimum wage and overtime protections to domestic workers.[3] But the legislation does not include provisions to ensure adequate breaks or time for uninterrupted sleep or specify maximum consecutive days of work, issues of continuing concern for many caregivers. Questions have also arisen regarding the impacts of employment arrangements on opportunities for sleep; that is, whether caregivers hired through agencies have better or worse sleep outcomes than those hired directly by patients and guardians.

[2] http://www.thescanfoundation.org/sites/thescanfoundation.org/files/ca_who_provides_ltc_in_ca_oct_2012_fs.pdf. Last accessed February 8, 2015.

[3] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB241. Last accessed March 12, 2016.

METHODS

In 2014 and 2015, we conducted exploratory research on the sleep conditions of Filipino live-in caregivers in Los Angeles. Five graduate student interns were recruited over an 18-month period to help develop the research tools and materials, collect study data, and summarize the results. Three interns spoke Tagalog (the national language of the Philippines along with English, and one of the most commonly spoken languages among Filipino migrants to the United States); all received training on interviewing techniques prior to participating in the project. PWC played a central role in recruiting participants for this research. The project was conducted with approval from the university Institutional Review Board, and all study participants signed consent forms detailing project goals and expectations.

Adults who worked as live-in caregivers at least 3 days per week were eligible to participate in the study. To gather data on the quantity and quality of sleep that caregivers receive, we developed a sleep log tool and interview guide. The sleep log was adapted from the **Consensus Sleep Diary** [Carney et al., 2012] and modified to capture the specific sleep patterns of live-in workers. The log allowed caregivers to record their sleep and waking hours in 30-min intervals over a 7-day period, including both workdays and non-workdays. Respondents also recorded time they spent on meal and rest breaks while on duty. The log included questions about whether the respondent had trouble falling asleep or waking up each day, as well as items for respondents to rate the quality of their sleep and feelings of restfulness on five-point scales from 1 ("very bad") to 5 ("very good"). Each page of the log also included space for comments, such as where sleep took place and factors that facilitated or interrupted sleep.[4]

The interview guide included a combination of closed- and open-ended questions about respondents' employment arrangements, typical work schedules and working conditions, and common caregiver duties. The guide also included questions from the **Epworth Sleepiness Scale (ESS)** to measure daytime sleep propensity [Johns, 1991]. The scale asks respondents to rate the likelihood of falling asleep in eight common daytime situations (watching TV, sitting and reading, talking with someone, etc.) from 0 (no probability) to 3 (high probability), and the results provide a score between 0 and 24. An ESS score above 10 is regarded as an indicator of excessive daytime sleepiness [Johns, 1991]. The ESS has been validated and used successfully in research with other worker populations [e.g., Johns and Hocking, 1997; Garbarino et al., 2002; Neylan et al., 2002; Waage et al., 2009]. Finally, the interview guide captured gender, age, immigrant status, length of time in the United States, and length of time working as a caregiver, as well as questions about other chronic health conditions and the use of medications to assist with sleep.

A combination of convenience and snowball sampling methods were used to recruit live-in caregivers to participate in the study. The student interns worked closely with staff and organizers at the Pilipino Worker Center to identify eligible participants through the PWC network; in addition, caregivers who completed the sleep log, and questionnaire were asked to identify others who might be eligible and willing to participate. The student interns distributed the sleep logs to study participants, provided check-in phone calls and text messages to participants throughout the week to encourage them to complete the logs, and followed up at the end of the week to collect the log forms and administer the interview questionnaire. Each respondent received a $25 gift card for participation.

RESULTS

Sample Characteristics

A total of 32 live-in caregivers were recruited for this study. Table I summarizes respondents' demographic and work characteristics. Four out of five respondents were women, and their mean age was 51 years. All respondents identified as Filipino. The majority of respondents were college educated with career histories in non-health related fields; only a small number had worked in health-related field such as nursing in the Philippines or the Middle East prior to immigrating to the United States.

Two-thirds of respondents reported working for home care agencies, while the remainder were hired directly by patients or guardians. More than half of respondents working for agencies reported having a written contract with their employers; none of the respondents who were hired by patients or guardians reported having written contracts for their work.[5] A total of 56% of respondents indicated they typically take public transportation to work, while 31% indicated they typically drive. The average wage earned by participants in this study was $133.75 per day.

The majority of respondents cared for patients living in private homes; other worksites included apartments/condominiums and board and care facilities. Respondents generally worked 3–5 consecutive days during the weeklong sleep log period performing continuous day and night shifts. All respondents reported the task of administering medications to patients. Other common job tasks included

[4] We used sleep diaries coupled with daily sleep-quality scales to capture more detailed data on sleep patterns and variations across work and non-workdays; this level of detail is not possible with common tools such as the Pittsburgh Sleep Quality Index [Buysse et al., 1989].

[5] Written contracts may or may not have included provisions regarding sleep and/or breaks.

TABLE I. Demographic and Work Characteristics of Study Sample (n = 32)

Characteristics	%
Sex	
Female	78
Male	22
Age	
16–39	12
40–59	66
60–69	22
Employer	
Agency	66
Patient/guardian	34
Written contract for work?	
Yes	44
No	56
Worksite	
Private home	75
Apartment/condominium	19
Board and care facility	6
Job tasks	
Administer medications	100
Assist with bathing and grooming	97
Assist with walking/ambulation	91
Assist patient with bathroom visits	91
Change patient's diapers	75
Rotate patients to avoid bedsores	63
Mode of transportation to work	
Public transportation	56
Car	31
Other (carpool, share car service, etc.)	13

assisting with bathing and grooming, assisting with walking and bathroom visits, changing patients' diapers, and rotating patients to prevent bed sores, as well as cooking and feeding, housekeeping, driving patients to appointments, helping patients with exercises, and taking vitals.

Overall Measures of Sleep Quantity and Quality

Weeklong sleep logs from the 32 participants in this study yielded information for a total of 223 days, including 143 workdays (64%), 46 non-workdays (21%), and 34 days that included a mix of both work and non-work hours (15%). Respondents reported an overall average daily sleep duration of 6.6 hr during the weeklong sleep log period, including both workdays and non-workdays. A total of 38% of respondents reported overall average sleep duration of 6 hr or less, a common measure of short sleep duration [Luckhauptet al., 2010; Centers for Disease Control and Prevention, 2012]. Respondents recorded an average of 1.2 hr for meal breaks and 0.9 hr for other breaks during workdays. Taken together, respondents' logs indicated an average combined total of 8.5 hr of sleep and break time during each 24-hr in-home work period.

Based on sleep log reports, respondents' average overall rating for both sleep quality and restfulness was 3.3 out of 5. Additional data on quality of sleep and restfulness was derived from respondents' scores on the Epworth Sleep Scale. The mean ESS score among the 32 respondents in this sample was 8.1, and more than 40% had an ESS score higher than 10, an indicator of excessive daytime sleepiness.

Comparison of Sleep Outcomes by Type of Day

Table II compares respondents' reported average sleep and break duration by type of day. (All *P* values are derived from two-tailed *t*-tests comparing the results for mixed and non-workdays vs. workdays.) Average total sleep duration was shorter on workdays (6.4 hr) than on non-workdays (7.3 hr)—a difference of nearly 1 hr. Respondents also indicated their sleep was significantly more fragmented during workdays than on mixed or non-workdays; sleep log data indicated that sleep time on workdays was typically divided into an average of 2.4 sleep periods. The average duration of sleep periods was significantly longer on non-workdays (5.2 hr) versus workdays (4.2 hr).

Table III shows results of respondents' self-reported quality of sleep and restfulness, and the percent of days in which respondents reported trouble sleeping and waking; in both cases, results are divided by type of day. Respondents generally rated the *quality of their sleep* and their *feelings of restfulness* as lower on workdays than on non-workdays. Yet, respondents were more likely to report *trouble sleeping* and *trouble waking* on non-workdays—about one half indicated trouble sleeping and two-thirds indicated trouble waking on workdays versus three quarters or more on non-workdays.

Written comments provided by caregivers on sleep logs illustrate the ways in which work demands contribute to short sleep duration and frequent sleep interruptions:

> *Woke up to patient's call for a diaper change. Cleaned him up and changed into his day clothes.*

> *4:00am Pt. [patient] woke-up screaming from having a nightmare.*

> *At 1:30AM my patient called me. She fell off the bed while trying to use her bedside commode but thankfully she didn't break any bone or hurt herself*

TABLE II. Quantity of Sleep and Breaks, by Type of Day

	Work (n = 143)	Mixed work and non-work (n = 34)	*P*-value	Non-work (n = 46)	*P*-value
Average daily sleep duration (hr)	6.4	6.5	0.75	7.3	<0.05
No. sleep periods	2.4	2.0	0.07	1.8	<0.05
Longest sleep duration (hr)	4.2	4.9	0.11	5.2	<0.05
Total daily meal break duration (hr)	1.1	0.7	<0.05	–	–
Total daily other break duration (hr)	0.9	0.3	<0.05	–	–

P values indicate comparison with workdays as the reference category.

badly. Changed her bedsheet and nightgown. I had a hard time going back to sleep after that.

10:20PM went to bed. About to fall asleep—patient called, assisted to toilet at 10:50PM. At 12:55AM patient called, attended for toilet visit. At 3:20AM patient called, attended for toilet visit.

Work @ 5:30pm Sunday. Patient sleep @ 12:00 midnight. Woke me up to pee then back to bed @ 4:00am. Not rested because you are watching the patient.

The sleep environments many caregivers face while serving in patients' homes are also not necessarily amenable to adequate rest. A total of 47% of respondents indicated they slept on couches, recliner chairs, or cots near their patients while working (data not shown in tables). In follow-up interviews, a number of respondents indicated there are no dedicated beds in patient homes for sleeping or they are prohibited from using guest bedrooms; some reported that employers expect them to regularly sleep on the floor beside the patient's bed. Only four respondents indicated they used medicine to help them sleep, and only one indicated using medicine three or more times a week.

TABLE III. Quality of Sleep, by Type of Day

	Work (n = 143)	Mixed work and non-work (n = 34)	*P*-value	Non-work (n = 46)	*P*-value
Rate sleep (five-point scale from 1 "very bad" to 5 "very good")	3.2	3.4	0.17	3.8	<0.05
Rate restfulness (five-point scale from 1 "very bad" to 5 "very good")	3.1	3.3	0.17	3.8	<0.05
Trouble sleeping (% of days)	51	71	<0.05	72	<0.05
Trouble waking (% of days)	65	88	<0.05	80	<0.05

P values indicate comparison with workdays as the reference category.

Role of Gender and Employment Arrangements in Sleep Outcomes

Table IV compares sleep quantity and quality outcomes by the gender of the caregiver and based on whether respondents were hired by an agency or directly by the patient or guardian. On the whole, female caregivers in this sample fared worse than their male counterparts. They reported significantly more sleep interruptions on workdays and rated the quality of their sleep and restfulness as lower. They also tended to report fewer overall hours of sleep on workdays and shorter sleep periods. There were no statistical differences in the amount of time female and male caregivers recorded for meal and rest breaks while working.

While none of the differences in sleep measures between caregivers' employment arrangements was statistically significant, the overall trends suggest that live-in caregivers hired directly by patients or guardians had better sleep outcomes than those hired by agencies. These caregivers received more total hours of sleep while at work in fewer sleep periods, received longer daily meal and other breaks, and reported higher ratings on measures of quality of sleep and restfulness.

DISCUSSION

The findings from this exploratory study indicate a number of adverse sleep outcomes among Filipino live-in caregivers and suggest ways in which work conditions and employment arrangements shape caregivers' opportunities for sleep. Respondents' total average sleep duration of 6.4 hr during workdays is slightly below averages reported in other studies of United States healthcare workers [Ertel et al., 2011], while the proportion of respondents reporting 6 or fewer sleep hours on workdays (38%) exceeds existing prevalence estimates of short sleep duration in the healthcare and social service sectors [Luckhaupt et al., 2010]. Perhaps even more notable, sleep log data reveal frequent nocturnal interruptions while on duty. Total workday sleep hours were often obtained over multiple sleep periods, many of which lasted 4 hr or less. Such sleep fragmentation may trigger activation of the body's physiological systems, which in turn may lead to difficulty returning to sleep and subsequent sleep loss [Merkus et al., 2015].

TABLE IV. Quantity and Quality of Sleep and Breaks, by Gender of Caregiver and Type of Employment

	Gender			Hired by		
	Female	Male	*P*-value	Agency	Patient/ guardian	*P*-value
Average total sleep on workdays (hr)	6.1	7.2	0.132	6.0	6.9	0.175
Average sleep periods on workdays (no.)	2.6	1.9	0.019	2.6	2.2	0.145
Average longest sleep block on workdays (hr)	3.8	5.2	0.118	3.9	4.5	0.385
Average meal breaks on workdays (hr)	1.1	1.2	0.567	1.1	1.3	0.381
Average other breaks on workdays (hr)	0.6	1.0	0.659	0.6	1.0	0.458
Average sleep rating on workdays (five-point scale from 1 "very bad" to 5 "very good")	2.9	3.8	0.019	2.9	3.4	0.169
Average restfulness rating on workdays (five-point scale from 1 "very bad" to 5 "very good")	2.8	3.8	0.021	2.8	3.4	0.144

P values indicate comparisons between female and male caregivers, and between those employed by agencies and those employed directly by patients or guardians.

Qualitative data provided by respondents reveal just how conditions of work for live-in caregivers shape the structuring and duration of their sleep. Frequent sleep interruptions at all hours of day and night to attend to patients' needs demonstrate that these caregivers are effectively on-call throughout both their waking and sleeping hours. As one respondent noted when asked about breaks at work during the interview: "*I don't call it breaks because I'm there 24 hours. If I sleep, maybe it is a break. When my diabetic patient sleeps, maybe that's when I take a break. But I don't have a specific time when I take a break.*" A comment from another respondent suggests the way caregivers' own sense of responsibility to their patients undermines restful sleep: "*What if something happened to the patient? I would be responsible since I'm there at night...even though I'm not supposed to be working.*"

Employer expectations also play a role in shaping the opportunities live-in caregivers have to secure adequate rest. Many respondents indicated they had no dedicated place to sleep in the patient's home, instead relying on couches, recliner chairs, or cots; some were expected to regularly sleep on the floor beside the patient's bed. Many employers expect caregivers to be available anytime, including at night and during days off [Burnham and Theodore, 2012]. In one case, a respondent explained that her patient kept a bell next to the bed and would ring it for her to come; if she did not hear the bell or did not come promptly at the time of the ring, the patient would become angry. In another case, a respondent lived in the patient's home full time, and the distinction between workdays and non-workdays was blurred as a result. She indicated on her sleep log: "*I'm off today supposedly but my patient has low-grade fever. The daughter and I took [the patient] to a clinic to see the doctor and examine her urine. They paid me for doing extra work for her mom. We spent an hour and a half in the clinic. I put her to bed tonight at 9pm.*"

Respondents rated the quality of their sleep and restfulness lower on workdays compared to non-workdays. This can be explained by several factors. With less total sleep time on working days, in a range commonly defined as short sleep duration, sleep deprivation is more likely. Second, increased sleep fragmentation on workdays likely altered participants' sleep architecture, resulting in less time in restorative sleep (slow wave sleep and REM) than if the same total sleep time was obtained during one continuous sleep period (or in relatively fewer sleep periods as was frequently reported on non-workdays). Also, physically suboptimal sleeping conditions described by some participants, as well as the necessity of being able to quickly awaken or remain alert for caregiving needs, can impair sleep quality and eventually result in environmental sleep disorder [American Academy of Sleep Medicine, 2014].

More than 40% of respondents had an ESS score higher than 10, an indicator of excessive daytime sleepiness (EDS). This proportion exceeds rates found among academic physicians [Ozder and Eker, 2015], police officers [Rajaratnam et al., 2011], oil rig workers [Waage et al., 2009], and public train and bus drivers [Asaoka et al., 2010]. Prolonged exposure to these sleeping conditions may lead to chronic fatigue and increase the risk of both work-related injuries and errors in patient care [Estabrooks et al., 2009; Arimura et al., 2010; Caruso, 2014]. Caregivers in this sample regularly engaged in tasks such as patient lifting, assistance with walking/ambulation, and administering medication where such risks are present. Additionally, a number of caregivers reported their responsibilities included driving patients to doctor appointments or on errands, and 31% indicated they typically drive to and from work—potential concerns given that EDS may increase the likelihood of motor vehicle accidents [Gold et al., 1992; Pack et al., 1995; Dalziel and Job, 1997; Swanson et al., 2012].

Perhaps surprisingly, caregivers reported more trouble sleeping and waking on non-workdays than on workdays. This could be a chronic effect of sleep fragmentation induced by work shift-related nocturnal awakenings. Such awakenings on the job disrupt normative physiologic processes, which usually act to maintain an entrained circadian rhythm. Such sleep fragmentation during nights at work result in circadian rhythm disruption well beyond the work shift night, which can manifest as insomnia, sleep fragmentation, and daytime sleepiness even on non-work shift nights [Belenky et al., 2003; Dongen et al., 2003].

Gender appeared to impact sleep outcomes in our study, with female caregivers reporting significantly more sleep interruptions and lower sleep quality than their male counterparts. These results may reflect gendered care labor expectations and inequalities between women and men that can directly shape caregivers' ability to negotiate sleep arrangements with employers [Choy, 2003; Guevarra, 2009; Parreñas, 2015]. (One male respondent indicated that, "*If I get woken up in the middle of the night, I will ask [the family] to pay me more*.") Employment arrangements also appeared to influence opportunities for sleep—caregivers hired through home care agencies reported fewer sleep hours and lower sleep quality scores than those hired directly by patients or guardians, although the results were not statistically significant. These findings clearly require further research to substantiate and fully understand. While none of those hired by patients or guardians reported having written contracts for their work, many indicated during follow-up interviews that they had more flexibility to negotiate their work schedules and working conditions. Those hired by home care agencies, on the other hand, were often at the whim of agency demands and faced threats of reduced work hours or other consequences if they complained about work conditions. Even non-punitive agreements regarding sleep hours and conditions may have the unintended consequence of negatively impacting caregivers' earning potential. One respondent explained the agreement she maintained with her agency employer: "*If the patient keeps on bothering me in the middle of the night, they will change from 24-hour to 12-hour agreement and someone will come to replace me*." We hope to explore these issues in more depth in subsequent research.

Strengths and Limitations of Study

This exploratory study offers a valuable window into the sleep experiences of live-in caregivers, a topic that has been largely unexamined to date. The findings serve as a basis for subsequent research into this growing workforce, the demands they face, and the safety and health implications of caregiving work. In addition, the use of a sleep log to record respondents' sleep and wake patterns hour-by-hour over a 7-day period allowed us to capture a level of detail unavailable in the commonly used Pittsburgh Sleep Quality Index [Buysse et al., 1989] or standard sleep diaries that record only time to bed, number of sleep interruptions, and final awakening [Carney et al., 2012]. Our tool may ultimately be more applicable for examining sleep patterns in occupational environments where workers perform extended or nonstandard shifts, such as security guards, police and firefighters, or those in other healthcare settings.

Our research also has some limitations, some of which result from the exploratory nature of the project. The small sample size means our statistical comparisons may not be conclusive and may not reflect sleep outcomes in the overall caregiver population. Although Filipino immigrants make up a large proportion of the caregiving workforce in Los Angeles, our focus on this demographic means the findings may not extend to other caregivers from different backgrounds or with different types of work experience. In addition, the economic and social vulnerability many undocumented immigrant workers face may have influenced study participation as well as respondents' willingness to report adverse work and sleep conditions to our interviewers. (Our collaboration with the Pilipino Worker Center, a trusted community-based resource, was intended to minimize respondents' fears about talking openly about working conditions.) Finally, self-reports of sleep tend to overestimate sleep duration [Lauderdale et al., 2008], suggesting that caregivers' total sleep may be even shorter than reported here. Subsequent research using more objective tools such as actigraphy or personal sleep monitors would be valuable for confirming our sleep log findings.

CONCLUSION

The nature of live-in care work raises important questions about caregivers' opportunity to obtain adequate sleep. This exploratory study with Filipino live-in caregivers in Los Angeles is one of the few to investigate sleep outcomes for this workforce. Our findings indicate that live-in caregivers often experience short sleep duration and frequent sleep interruptions while on duty, a consequence of round-the-clock care responsibilities. Subjective sleep quality and restfulness ratings seem to be significantly impacted as a result. Over 40% of participants reported ESS values consistent with excessive daytime sleepiness. These patterns increase the risk of chronic fatigue and may affect psychomotor performances in ways that could have consequences for the safety, and well-being of both caregivers and patients. The results of this investigation of caregivers performing extended multiday work shifts is relevant to discussions of changing work organization and sleep outcomes more generally [e.g., Johnson and Lipscomb, 2006], and enhances our understanding of potential reasons for diminished job satisfaction among live-in formal caregivers found in other studies [Delp et al., 2010].

Our findings underscore the tenuous nature of private residences serving as a formal work environment for live-in caregivers. The prolonged periods of time caregivers spend in patients' homes mean they are essentially on-call throughout their shifts and do not enjoy the limits to work that exist in more traditional work settings [Burnham and Theodore, 2012]. A lack of formal labor protections in many states contributes to workers' vulnerability. While states such as California, Hawaii, New York, and Massachusetts have passed Domestic Workers' Bill of Rights legislation in recent years, these laws vary in the types of provisions they include that are likely to impact live-in caregivers' opportunities for adequate rest. Subsequent legislation would do well to require written employer–employee contracts that include provisions for rest and meal breaks, standard hours of uninterrupted sleep when possible, dedicated beds for caregivers, and assurance of paid rest and sick days. Such policies would provide an added level of protection for those working extended shifts in private homes and serve as a tool for workers to negotiate with employers—whether home care agencies or patients and guardians—over adequate time for rest.

Lastly, the potentially detrimental patterns of sleep within this workforce may indicate the need for a reexamination of the unregulated, multiday, round-the-clock work shift schedules that often fall on just one caregiver. Home care agencies explicitly advertise their ability to provide 24-hr care services, yet, no policies exist to mandate that these care services be provided by separate workers or divided into different shift work schedules similar to other care institutions (i.e., hospitals and nursing homes). Such policy interventions would alleviate the time and work pressures on individual caregivers and in turn promote the health and well-being of both themselves and the patients they serve.

AUTHORS' CONTRIBUTIONS

Kevin Riley and Jennifer Nazareno conceived of this research and oversaw the design and implementation of the study, including coordination with staff at the Pilipino Worker Center and supervision of the student interviewers. Sterling Malish advised on the use of sleep-related measurement tools and interpretation of the results. Kevin Riley took the lead on analyzing the data and drafting the manuscript for publication. All three authors contributed to manuscript revisions, provided final approval of the version to be published, and agree to be accountable for the accuracy and integrity of this work.

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DISCLOSURE (AUTHORS)

The authors declare no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Steven Markowitz declares that he has no competing or conflicts of interest in the review and publication decision regarding this article.

DISCLAIMER

None.

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