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A Mixed Method Examination of Sleep Patterns and Barriers to Sleep in Hispanic Women

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Abstract
Research on Hispanic sleep (1) remains far behind research on non-Hispanic White sleep, and (2) seldom focuses solely on Hispanic women. A convergent parallel mixed-methods study design was used to examine (1) sleep quantity, quality, and habits; (2) the association of sleep and health; and (3) perceived barriers to healthy sleep in middle-aged Hispanic women living in [a large Midwest city]. A total of 78 Hispanic women were surveyed, and 27 of these Hispanic women participated in focus groups. Participants had: poor sleep quantity, quality, and sleep hygiene. In focus groups, participants identified three barriers to healthy sleep: poor sleep hygiene, responsibilities and related stress, and additional mental health concerns. While poor sleep quantity and quality have serious health consequences for Hispanic women, sleep disorders in Hispanic women have been understudied. This study underscores barriers to healthy sleep and the associations between sleep and health in Hispanic women.

Keywords Hispanic women sleep · Hispanic women health · Latina health · Latina sleep · Sleep disparities · Sleep promotion

Sleep disturbances are a major contributing factor in the overall physical and mental health disparities experienced by Hispanic women, vs. non-Hispanic White (NHW) women [1]. Disturbances in sleep quantity and quality increase the burden of chronic conditions such as high blood pressure (BP), obesity, diabetes, cardiovascular disease, depression, and anxiety—health issues that are prevalent among Hispanic women [1–3].

Exact rates of sleep disturbances in Hispanic women are unclear as sleep disturbances in Hispanic women, when compared with NHWs, are understudied [1, 4]. Hispanic women tend to be very short and/or very long sleepers [5–9]. Hispanic women are significantly more likely to sleep less than 6 h/night than NHWs [10]. Besides sleeping few hours, Hispanic women also have poor sleep quality [5, 11].

Research on Hispanic sleep has grown considerably in the last decade, but (1) it is far behind research on NHW sleep, and (2) almost all existing studies still examine Hispanics together rather than isolating by self-reported gender. Aggregated sleep information may obscure the identification of significant sleep disturbances in Hispanic women [12].

Hispanic women's sleep patterns are not the same as Hispanic men's and their reasons for poor sleep may also be distinct. Hispanic men are more likely to report sleep disordered breathing and snoring, and less likely to report daytime sleepiness than Hispanic women [11]. Some of the predictors of sleep complaints are also different in men than women. Among men, lowest educational attainment predicts highest sleep complaints [13]. Conversely, Hispanic women who have not finished high school are less likely to report sleep complaints [13].

In addition, in the general population (i.e., not just in Hispanics), women experience different barriers to healthy sleep than men due to a combination of biological, social, and cultural disparities that aggregated data may be masking [14, 15]. Research on the broader population (i.e., not exclusive to Latinas) shows that psychosocial issues have a bigger impact on women's health than men's (Mallampalli & Carter [14]). More midlife women (66%) than men are

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caregivers and more likely to report stress, depression, and sleep disturbances [16]. In addition, secondary data analyses have shown that acculturation in Latinx (not isolated by gender) immigrants has been linked to sleep disturbances [17]. Further, Latinas are vulnerable to discriminatory policies and practices involving racial segregation, disproportionate material deprivation, limited access to health care, or greater exposure to detrimental features of the physical/built environment such as light, noise, and air pollution, all of which are known to also affect sleep in racial/ethnic minorities [18]. Yet, barriers to healthy sleep are poorly understood for Hispanic women.

Purpose of this Study

This study is cross-sectional and combines quantitative and qualitative methods to understand the sleep experiences of a group of adult Hispanic women living in [a large city in the Midwest]. This study aimed to understand (1) participating Hispanic women's current sleep quantity and quality; (2) the association of sleep patterns and health; and (3) participants' sleep habits and perceived barriers to healthy sleep. Given that middle age is one period of life when distinct hormonal and physical changes happen that may interfere with sleep, this study has a sample consisting of mostly middle-aged women.

Methods

Participants

Participants ($N = 78$) were female Hispanic community members involved in existing [Overarching Community Health Program] at the time of the study. As part of [Program], participants in the study were involved in programs to reduce risk of heart problems and diabetes. Criteria for participation were being: (a) older than 18 years of age, (b) able to understand English or Spanish at a 5th grade reading level and at a conversational level, and (d) able to consent to participate. Of the 78 participants, 51 participants completed a survey only, and 27 participants took the survey and a focus group that explored their sleep habits and perceived barriers to healthy sleep. Of the 27 participants who completed the survey and focus groups, 6 participants were community health workers (CHWs) who are currently engaged in health promotion in the Hispanic women community, leading the [Overarching Program] where the rest of the participants in the study were enrolled.

Nearly all of the participants ($N = 70$) were born in Mexico; 4 participants were from the U.S.; and 4 participants were from 'other' Latin American countries (Table 1). About half (51.3%) of the participants reported being White, and 46.2% reported being 'Other'. While completing the survey, many participants voiced that they understood themselves as "Hispanic women," and that was not a possible response to the 'race' question. Thus, they shared they would select 'Other.' Two participants had missing race data.

Participants were between the ages of 21 and 72 ($M = 49.6$, $SD = 9.0$). Of the participants, 60.3% were between the ages of 46 and 60 years. The majority of participants (66.7%) had up to a high school degree and were generally low-income, with 50.1% reporting less than \$39,999 as their annual household income and 28.2% living under the federal poverty line. Several participants ($N = 12$) left blank the income question and all stated during data collection that their husbands were in charge of their home finances, so they reportedly did not know what their income was. The majority of participants said they spoke Spanish at home (75.6%). Under half (44%) of the participants reported having poor/fair health.

Procedure

After receiving approval by the [University] Institutional Review Board, participants were recruited for the study at the start of six [Overarching Program] sessions by the PI and a graduate research assistant, both Latina and bilingual Spanish–English. The study was designed in collaboration with the CHWs leading the [Overarching Program]. Community members who agreed to participate completed the informed consent form and assessment battery [AB], which were administered by the research team. While the AB was available in English and Spanish, all participants opted to complete it in Spanish. The AB took about 15 min to complete.

In two of the [Program] sessions, participants joined focus groups after completing the survey. The sessions where focus groups were conducted ($N = 14, 7$, and 6) where selected based solely on scheduling (i.e., earlier sessions where participants could stay over for a group). For the sessions where groups were conducted, program leaders explained to participants the week prior to the session that this (i.e., survey plus focus group) would be the format of the following session. Participants could opt out of attending the session without repercussions on their participation in the rest of the program. Additionally, a focus group with some of the CHWs who normally lead [Overarching Program] ($N = 6$) was conducted. All focus groups were in Spanish, lasted 1 h each, and were audio recorded.

Participants were not paid for completing the survey. However, in sessions where participants only completed the survey (and not a focus group), after administration of the survey, the research team delivered to community participants a stress management and sleep workshop. No

Table 1 Demographic data

	n	%
Country of origin		
United States	4	5.1
Mexico	70	89.7
Other	4	5.1
Race		
Native American or Alaska Native	0	0
Asian/Asian American	0	0
Black/African American	0	0
White	36	51.3
Hawaiian Native/Pacific Islander	0	0
Other race/ethnicity	35	46.2
Missing	2	2.6
Age		
21–35 years	3	3.9
36–45 years	18	23.4
46–60 years	47	60.3
> 60 years	9	11.7
Highest level of education		
Elementary school (up to 5th grade)	12	16.7
Middle school	24	32.1
High school or GED	11	17.9
Some college/technical school	4	5.1
2-year college	6	7.7
4-year college	16	20.5
Annual income		
< $14,999	9	11.5
$15,000–$19,999	7	9
$20,000–$29,999	11	14.1
$30,000–$39,999	13	16.7
$40,000–$49,999	5	6.4
$50,000–$59,999	3	3.8
$60,000 or more	6	7.7
I prefer not to respond	12	15.4
Need support with securing housing		
Yes	4	5.1
No	67	85.9
Prefer not to respond	4	5.1
Missing	3	3.8
Need support with securing food daily		
Yes	1	1.3
No	69	88.5
Prefer not to respond	6	7.7
Missing	2	2.6
Language spoken at home		
English	3	3.8
Spanish	59	75.6
English and Spanish	16	20.5
Health status		
Excellent	0	0
Very good	8	11

Table 1 (continued)

	n	%
Good	33	45.2
Fair	28	38.4
Poor	4	5.5
Relationship status		
I don't have a partner	4	5.1
I live with my partner	71	91
I don't live with my partner	1	1.3
I prefer not to respond	2	2.6

workshop was administered during the survey plus focus group sessions. Participants received handouts with tips for stress management and sleep after the groups were finished. Focus group participants received refreshments and a $20 gift card as compensation. Childcare was offered during both the survey + workshop and the focus group sessions.

Measures

Demographic Data Questionnaire (DDQ)

The DDQ is a researcher-created questionnaire. It gathered demographic information such as race, country of origin, etc.

Activity, Health, and Sleep Questionnaire

Activity and Health This questionnaire was created by the PI and asked participants to rate their health status on a 5-point Likert scale from *Poor* to *Excellent*. For physical activity, participants were asked to reflect on how much time they exercise regularly and how much they had exercised in the past week (both excluding time at work). They were also asked to list their preferred physical activity.

Sleep To assess sleep quality, participants answered a restorative sleep question adapted from the Berlin Questionnaire [19] ("How often do you feel rested when you wake up in the morning?") and 3 questions related to initiating and maintaining sleep that were adapted from the Insomnia Severity Index ("How often do you have trouble falling asleep?" "How often do you wake up during the night?," and "How often do you wake up too early and are not able to fall asleep again?") [20]. Participants also responded to the statement "My sleep is restless," from the Center for Epidemiologic Studies Depression Scale. Response categories for all five questions/statements were: never (= 1), rarely (= 2), sometimes (= 3), and most of the time (= 4).

To assess sleep quantity, participants reported the time when they go to bed and wake up, and how many hours they sleep at night. For the purpose of the present study, and in line with prior sleep research, reported hours of sleep duration were recoded as a categorical variable with 3 groups: less than 7 h of sleep, 7–9 h of sleep, and more than 9 h of sleep [21]. Participants were asked to rank (*1* = never to *5* = all the time) how often they engaged in the following healthy sleep habits recommended by the National Sleep Foundation: (1) stick to a sleep schedule, even on weekends; (2) practice a relaxing bedtime ritual; (3) exercise daily; (4) evaluate your bedroom to ensure ideal temperature, sound, and light; (5) sleep on a comfortable mattress and pillows; (6) beware of hidden sleep stealers, like alcohol and caffeine; (7) turn off electronics before bed [22].

Focus Groups

Participants for the focus groups were sampled purposively to obtain a cross section of participants and staff typical of the [Overarching Program]. Groups were facilitated in a semi-structured fashion. Focus group discussions continued until saturation was reached for key topics. Full transcripts were recorded, translated into English by a bilingual research assistant, and reviewed for accuracy by the PI.

Focus group data were analyzed using a phenomenological and constructivist approach to inquiry. These approaches were selected to highlight the sleep experiences of Hispanic women without preconceived notions of how respondents may answer. The analysis process began with inductive coding of the raw qualitative data. Emergent themes were then categorized into larger overarching themes. Following these inductive processes, data were recoded deductively using emergent overarching themes.

Results

Sleep Quantity and Quality

Analyses were conducted using SPSS v25. The mean sleep duration was 6.8 h (SD = 1.3). Close to 40% of participants slept under the 7 h recommended by the National Sleep Foundation (Table 2). Only a third reported feeling rested most of the time (28.2%). The majority of participants reported having restless sleep (67.9%) and trouble falling asleep (71%) sometimes or most of the time. Of the participants, 34.6% reported waking up at night most of the time, and 23.1% of participants reported waking up too early and not being able to fall back asleep most of the time.

Table 2 Descriptive statistics for sleep variables

Measure	N	%
Hours of sleep		
Under 7 h	30	38.5
Between 7 and 9 h	45	57.7
More than 9 h	1	1.3
Missing	2	2.6
Rested in the morning		
Never	2	2.6
Rarely	16	20.5
Sometimes	38	48.7
Most of the time	22	28.2
Restless sleep		
Never	8	10.3
Rarely	17	21.8
Some of the time	32	41
Most of the time	21	26.9
Trouble falling asleep		
Never/rarely	21	26.9
Sometimes	39	50.5
Most of the time	16	20.5
Missing	2	2.6
Wake up at night		
Never/rarely	16	20.5
Sometimes	35	44.9
Most of the time	27	34.6
Wake up too early and cannot fall back asleep		
Never/rarely	28	35.9
Sometimes	32	41
Most of the time	18	23.1

Sleep Properties and Health

Of the participants, 43.9% reported having poor or fair health. Analyses of variance (ANOVAs) showed that participants who slept 7–9 h per night had significantly better self-reported health (M = 1.9, SD = 0.7) than participants who slept under 7 h/night (M = 1.4, SD = 0.5), F = 8.64, p < 0.05. Restless sleep was also significantly associated with health status, F = 5.04, p = 0.009. Participants who reported restless sleep most of the time (M = 1.3, SD = 0.5) had significantly worse self-reported health status than participants who never/rarely had restless sleep (M = 1.9, SD = 0.5). Feeling rested in the morning was not significantly associated with self-reported health status.

Sleep Habits and Barriers to Sleep

Survey Results

Participants reported some habits that likely interfered with sleep. Close to 40% of participants reported rarely or never

keeping a consistent bedtime (Table 3). Most participants (75.5%) said they rarely or never engage in a relaxing activity before bedtime. Of the participants, 20.3% of participants said they never or rarely paid attention to hidden sleep stealers like alcohol and caffeine. More than a third of participants (38.2%) never or rarely turned off electronics before bed. In terms of physical activity, 62% of participants exercised at least 150 min per week ($M = 245$ min per week, $SD = 292$ min), and 59% walked at least 150 min per week ($M = 417$ min per week, $SD = 678$ min). Many participants were able to at least sometimes ensure ideal temperature, sound, and light in their bedrooms (60.3%) and most participants (81.2%) reported sleeping on a comfortable mattress and pillow frequently or always. See Table 3 for more information on participants' sleep habits.

Focus Group Results

Participants were asked to identify barriers to obtaining enough high-quality sleep. Responses were inductively coded into the following broad categories: poor sleep hygiene, responsibilities and related stress, and additional mental health concerns.

Participants in the focus groups identified poor sleep hygiene (i.e., limited sleep habits) as a barrier to healthy sleep. Generally, participants spoke to the need for more leisure physical activity and nutritious food (i.e., less sugar and processed foods). As an example of the types of leisure physical activities participants are seeking, one participant explained, "I like swimming a lot, it tires me a lot and relaxes me more." Conversely, another participant mentioned that it would be helpful to "make teams like a club for walking, a women's team…something that makes us do physical activities." Finally, participants mentioned the effect of unhealthy food on sleep, making comments such as, "…if we eat junk food, that tires us, and the body does not work well then," and "…food also has an influence on our sleep patterns. For example, if we consume more sugars, perhaps our body has a different reaction."

Participants also discussed limited ability to prioritize sleep that may relate to gender expectations. One participant stated, "I think it [sleep hygiene] is also a habit…. having a set schedule where you don't wash, iron, leave it [chores] there…" Implicit in this statement is the long list of household duties for which Hispanic women often feel responsible. This sense of household responsibility may relate to cultural norms for Hispanic women. Participants also discussed the use of technology, including TV, social media, and phones prior to bedtime as a way to decompress after a long day. A participant pointed out, "Sometimes you are watching too much television because you say, 'I deserve this. I worked all day and my only chance to rest is watching television' (…) And of course the one who

pays for it is your sleep…" In addition, participants also identified cultural norms that often conflict with pace of life in the U.S. For example, as one participant explained, "…it is a custom in Mexico that you eat dinner very late and very heavy," which is a problem if work is early the next morning.

The notion of having too many responsibilities ('pendientes'), and associated stress, which may further complicate efforts to practice good sleep hygiene, emerged consistently across focus groups. Participants pointed out that many Hispanic women work long hours to fulfill their familial gender role, being expected to take care of their children and other family members and to maintain their households. For example, one participant commented, "I can't sleep because…I didn't finish doing this, the other, and another." The stress of juggling these responsibilities and the related anxiety may also prevent quality sleep. Another participant explained, "[it is difficult to sleep] because of the stress you accumulate…you arrive at the moment when you can no longer sleep or you wake up in the middle of the night because…the brain continues working…and looking for solutions. But sometimes it is difficult because the day isn't enough…" The implications of a collectivistic cultural orientation also weigh on Hispanic women's sleep. One participant said, "… if someone needs a favor, you put it on your list; and then at work they ask you for an extra thing and you put it on your list. [Lack of sleep happens] because we don't know how to say 'no' to certain things or set limits." In addition, participants spoke to not having extended family support in the US like they did in Mexico. For instance, a participant said, "Here, there is no collaboration from the extended family like there is in other countries." Stress, and consequent lack of sleep, are also attributed to poor financial conditions. Participants pointed to needing to take jobs that are undesirable in terms of scheduling (e.g., night shifts or rotating schedules) and pay due to a lack of skills, such as fluency in English, or immigration status.

Separate from juggling responsibilities and the resultant stress, participants also mentioned additional factors that cause them depression and anxiety. Depression and anxiety present a common challenge to healthy sleep. Per one participant, adaptation and acculturation are difficult: "…the way of life in Mexico to the way of life here in the United States is very different. And that makes one have to adjust to new things in a culture and that creates anxiety." Anxiety related to political rhetoric related to immigration and fear of being deported and separated from their families were also brought up by several participants as anxiety-producing. One participant said, "Fear, anxiety, all of these things are in the air. We sometimes believe that we are not thinking about them consciously, but they are in our subconscious."

Table 3 Sleep and exercise habits

Recommendation	N	%
Stick to a sleep schedule, even on weekends		
Never	18	23.1
Rarely	11	14.1
Sometimes	15	19.2
Often	20	25.6
All the time	12	15.4
Missing	2	2.6
Practice a relaxing bedtime ritual		
Never	46	59.0
Rarely	10	12.8
Sometimes	11	14.1
Often	6	7.7
All the time	1	1.3
Missing	4	5.1
Beware of hidden sleep stealers, like alcohol and caffeine		
Never	10	12.8
Rarely	5	6.4
Sometimes	12	15.4
Often	15	19.2
All the time	32	41.0
Missing	4	5.1
Turn off electronics before bed		
Never	20	25.6
Rarely	9	11.5
Sometimes	15	19.2
Often	7	9.0
All the time	25	32.1
Missing	2	2.6
Exercise daily		
Never	4	5.1
Rarely	9	11.5
Sometimes	35	44.9
Often	18	23.1
All the time	9	11.5
Missing	3	3.8
Evaluate your bedroom to ensure ideal temperature, sound, and light		
Never	24	30.8
Rarely	5	6.4
Sometimes	13	16.7
Often	17	21.8
All the time	17	21.8
Missing	2	2.6
Sleep on a comfortable mattress and pillows		
Never	4	5.1
Rarely	1	1.3
Sometimes	6	7.7
Often	23	29.5
All the time	41	52.6
Missing	3	3.8

Discussion

This study is novel in that it employed a convergent parallel mixed-methods approach to explore sleep patterns, barriers, and associations to health in Hispanic women alone (and not Hispanics, in general). This study showed that, generally, participants had poor sleep quantity, poor sleep quality, and poor sleep hygiene. These poor sleep patterns and habits were associated with poor health outcomes.

Prior research has shown that individuals of Mexican heritage have longer and more consolidated sleep than other Hispanic subgroups [23–26]. Yet, this study, with a sample that was primarily of Mexican origin or descent, showed that sleep quantity and quality in participating Hispanic women is still fairly poor. In addition, while the percentage of short sleepers in this study is lower than in other community studies with Hispanics (between 55 and 70%, depending on the Hispanic subgroup), which could possibly be attributed to participants being enrolled in a community health promotion program, the high prevalence of short sleep among Hispanic women participants is still concerning, especially in the context of short sleep being associated with poor health outcomes [7, 27–30].

Most participants also reported not feeling rested in the morning, experiencing restless sleep, and having trouble falling asleep sometimes or most of the time. These results are concordant with existing research, which shows that restless sleep is high in Hispanics and more common than in NHWs [31]. Restless sleep is more common in low-SES Hispanics [32], such as those participating in this study. Literature strictly on Hispanic women (vs. Hispanics) is very limited; thus, this study contributes to a more nuanced understanding of the Hispanic population.

This study showed that, in Hispanic women, hours of sleep and restless sleep were significantly associated with self-reported health status, with participants who slept less hours or experienced restless sleep reporting poorer health. This is in line with other studies showing that, in Hispanic women, sleep is associated with health outcomes [1, 3, 7, 9, 29, 33–35].

The three main barriers to sleep that participants identified were: poor sleep hygiene, responsibilities and related stress, and additional mental health concerns. These results coincide with literature showing that, in Hispanics, a high allostatic load leads to sleep disturbances [32]. In addition, these results support literature showing that, in Hispanic women, significant barriers to health promoting behaviors such as physical activity are lack of time related to family obligations, being tired, and "lack of self-discipline" [36–39]. Participants also noted in the focus groups often having to work at undesirable times. Per the existing literature, in Latinx, full-time employment

may be an independent predictor of short sleep [4]. In a secondary analysis of the data from 542 Latinas, Im et al. [40] showed that employment status is significantly positively correlated with total number and total severity of sleep-related symptoms. In addition, Reid et al. [41] showed that, among Hispanic/Latinx, shift work schedules are linked to delayed sleep timing; additionally, night and irregular schedules are associated with shorter sleep duration, more and longer naps, and greater variability of sleep. While details retrieved in this study regarding participants' work schedules and their potential association with sleep are minimal, they warrant further exploration.

Implications

This study centers the role of ethnicity and gender in determining sleep disparities as experienced by Hispanic women. Hierarchies of race, gender, and class intersect to create structures of oppression and meaning, and consequently produce health inequities [42, 43]. Future research must continue to explore how ethnicity and gender intersect and relate to social determinants of sleep and health outcomes in Hispanics. Future research would also benefit from including a larger sample of Hispanic women from diverse countries. This study also presents some of the barriers that Hispanic women experience when aiming to sleep enough and well. Clinicians can engage in patient-centered care that promotes sleep and consequently physical and mental health in Hispanic women by addressing some of the barriers to sleep introduced in this study. Because barriers to health disparities are not just influenced by race/ethnicity but also by other health and sociodemographic variables, and therefore vary by individual, a thorough assessment must be conducted by clinicians and researchers aiming to reduce Latina sleep disturbances. For instance, mental health concerns could be met with cultural appropriateness and empowerment in clinical interactions, in addition to inclusive practices at the staff and clinic environment level. Providers and staff working with Latina patients could also participate in anti-racism trainings to reduce racism and bias [44].

Limitations

This study has some limitations that worth considering. First, in this study, participants reported their hours of sleep and health status. Self-report measures of sleep and health are commonly used because they are low-cost and can be easily administered [45]; however, future research should include both subjective and objective sleep measures and health. Second, this study is also limited in that it is cross-sectional and causal inferences cannot be made. A final

limitation of this study is that participants were a small sample of self-selected, and coming from a shared geographical area and community health promotion program, which may limit the generalizability of results.

Declarations

Conflict of interest Authors have no conflict of interest to declare.

Informed Consent All participants in this study consented to participating in the study and to their data being published, in a de-identified manner.

Research Involving Human and/or Animal Participants This research was conducted in accordance with the principles of research ethics of the American Psychological Association regarding research with human subjects and with approval from the University of Denver Institutional Review Board. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

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