NATIONAL SLEEP FOUNDATION

2015 *Sleep in America*® Poll
Sleep and Pain

Summary of Findings

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Objectives

The National Sleep Foundation commissioned Mokrzycki Survey Research Services to conduct a national survey of adults in the U.S. to ask about sleep patterns, practices and attitudes and their relationship to the experience of pain.

The objectives were to address the following questions:

1. How is sleep related to measures of health and well-being and are these relationships similar for those with and without pain?
2. How does pain vary by health status and by sleep duration and quality?
3. What are common attitudes about sleep and its impact on life and are they related to pain or sleep patterns?
4. How does the sleep environment affect sleep in those with and without pain?
5. Is there a relationship between medication use, pain & sleep?

Background, Purpose and Methodology

- Sample:: 1,029 non-institutionalized adults aged 18 years or older residing in the United States
    - Sampling error for estimates from full sample: +/-3.3 percentage points, including adjustment for design effects.

    - The GfK Group (GfK, formerly Knowledge Networks) conducted the 2015 Sleep in America Survey on behalf of Mokrzycki Survey Research Services; field work conducted Dec. 5-12, 2014.

    - Sample drawn randomly from GfK's probability-based online KnowledgePanel®, which is designed to be representative of the U.S. population.
    - Panel recruited randomly using Address-Based Sampling, which is based on the U.S. Postal Service's Delivery Sequence File.
    - If necessary, GfK provides a laptop and Internet connection at no cost to panel recruits

- Web survey instrument; median completion time 11 minutes
    - English and Spanish versions
    - The final survey with topline results can be found in the appendix:

- Response Rate: 1,740 panel members from GfK's KnowledgePanel® were assigned to this survey and 1,044 completed the survey. The study completion rate was 60%. The recruitment rate reported by GfK was 13.8% and the cumulative response rate was 5.1%. The complete Response Rate Report is available upon request.

- Of the 1,044 respondents who completed the main survey, 15 were excluded either due to "speeding" (e.g., completing the survey in less than 4 minutes) or for refusing to answer more than one-third of the questions for which they were eligible.

- Survey results were weighted in two stages:

    - Before the sample for this study was drawn, the overall KnowledgePanel® is adjusted to demographic distributions from the most recent Current Population Survey. Weighting variables include gender, age, race/ethnicity, education, household income, geographic

Background, Purpose and Methodology (Continued)

Sample Description

- The focus of the 2015 Sleep in America poll was to explore sleep practices and beliefs and their relationship to pain in adults.
    - Average age was 47 years and ranged from 18 to 91 years.
    - Approximately 52% of respondents were women.
    - The distribution of racial/ethnic groups was: 65.5% was White, non-Hispanic, 11.6% was Black, non-Hispanic, 6.5% was Other race/ethnicity, non-Hispanic, 15.2% was Hispanic, and 1.3% was more than one race/ethnicity.
        - Results weighted by race/ethnicity to the Current Population Survey

The 2015 Sleep in America® Poll was sponsored and funded by the National Sleep Foundation. The National Sleep Foundation does not solicit or accept corporate support for its annual Sleep in America® Poll; its polls are developed by an independent task force of sleep scientists who provide guidance and expertise in developing the poll questionnaire as well as providing the analysis of the data. Information about the National Sleep Foundation, the current and former polls and a database of sleep professionals and sleep centers can be found online at www.sleepfoundation.org.

The National Sleep Foundation recommends that researchers and writers citing the Sleep in America® poll use the National Library of Medicine Recommended Formats for Bibliographic Citation as follows:

National Sleep Foundation. 2015 Sleep in America Poll: Sleep and Pain.
Washington (DC): The Foundation; 2015 Mar. DOI- in process

When referring to this poll in an article or story, please refer to it as the "National Sleep Foundation 2015 poll" and link it to http://sleepfoundation.org/sleep-polls-data/2015-sleep-and-pain

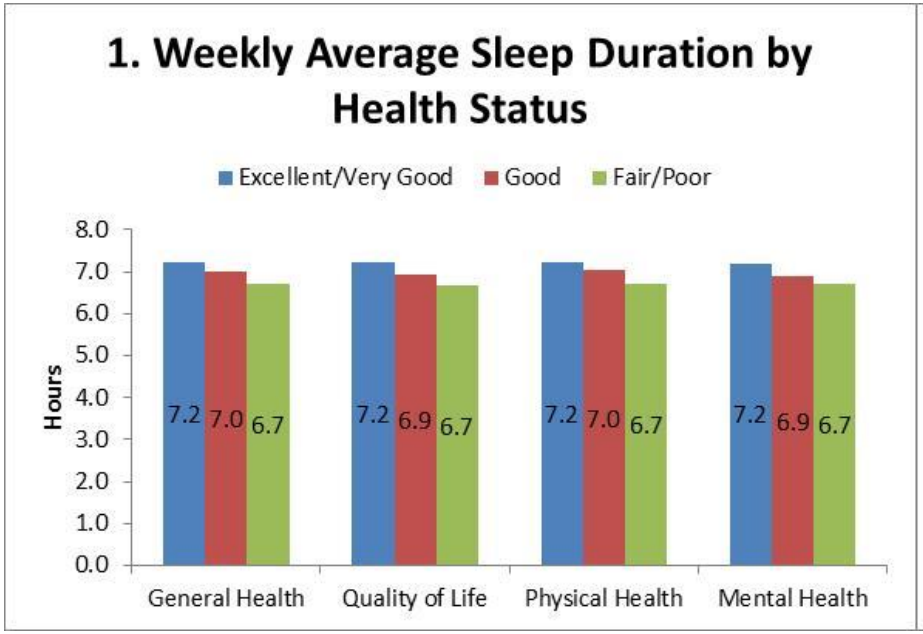
2015 *SLEEP IN AMERICA*® POLL

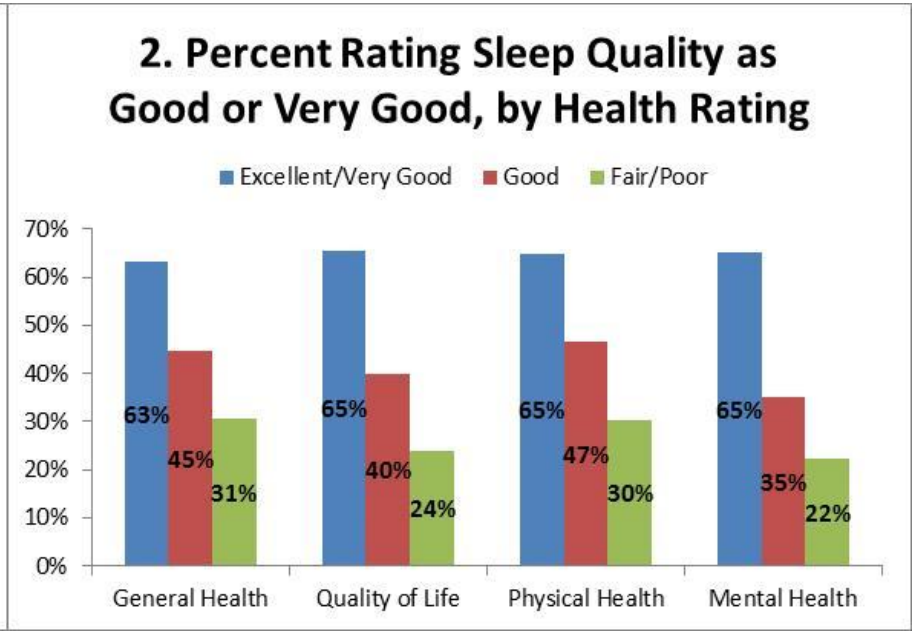
KEY FINDINGS

Key Findings: *Good health was related to good sleep*

Americans were asked to rate their general health, quality of life, physical health and mental health. Almost half (48%) rated their general health highly, as very good or excellent, and just over half (54%) also rated their quality of life highly. In addition, 44% rated their physical health highly and 60% rated their mental health highly.

As seen in Figure 1, those who rated their health or quality of life more highly (very good or excellent) reported getting approximately 30 minutes more sleep on average in the past 7 days than those who rated their health or quality of life as poor or fair. Those who rate their general health more highly were approximately twice as likely to rate their sleep quality as very good or excellent (63% vs. 31% in Figure 2).





Key Findings: *Good health was related to good sleep (continued)*

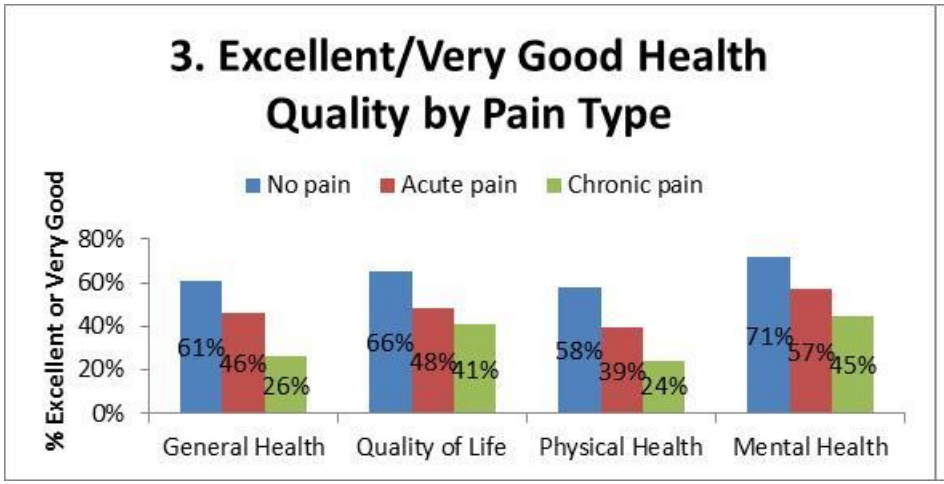
Likewise, greater stress was associated with less sleep and worse sleep quality. Approximately 1 in 10 people (12%) had severe or very severe stress in the previous 7 days and another 31% reported moderate levels of stress. People with severe or very severe stress were getting less sleep than they felt they need (their "sleep debt") -- 49 minutes less sleep per night on average. In contrast those with no or only mild stress got only 2 minutes shy of their sleep need per night on average. Those with severe or very severe stress were more than twice as likely to report poorer sleep quality (very poor, poor or fair) compared with those with mild or no stress (83% vs 35%). Also, 67% of those with severe or very severe stress reported difficulty sleeping in the past 7 days compared with only 25% of those with no or mild stress.

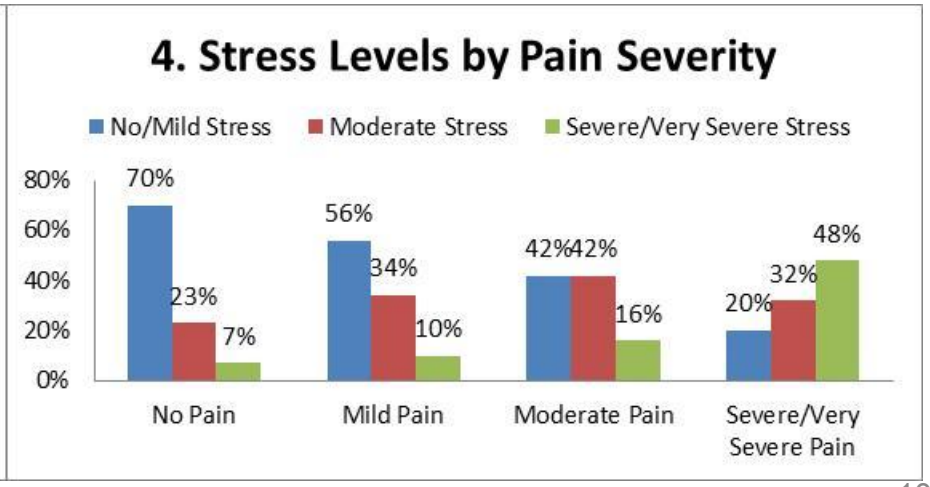
Key Findings: *Pain was associated with worse health and more stress*

When asked about any physical pain experienced in the past 7 days, the majority of Americans (57%) indicated they had experienced at least mild pain. Those experiencing pain were asked if the pain was chronic and long-lasting or only fleeting and minor, which we have termed "acute" pain. Both chronic pain and acute pain were associated with worse health and greater stress. As seen in Figure 3, those with either chronic or acute pain were less likely to report excellent or very good general health, quality of life, physical health and mental health compared with those with no pain in the previous 7 days. People with pain were more likely to report severe to very severe stress levels. Among those with chronic pain, 23% reported severe/very severe stress levels in the previous 7 days compared with 12% of those with acute pain and 7% of those with no pain.

Average pain severity was described as severe/very severe for 5% of people, moderate for 24% of people and mild for 30% of people. Pain severity is also associated with higher stress levels (Figure 4). Among those with no pain in the past 7 days, 70% had mild or no stress and just 7% were severely stressed. In contrast, among those with severe or very severe average pain in the past 7 days, only 20% reported mild or no stress and 48% reported their stress levels as severe or very severe.

Not surprisingly, those with chronic pain experienced greater pain severity in the last week. 40% of those with acute pain reported at least moderate pain compared to 69% of those with chronic pain.



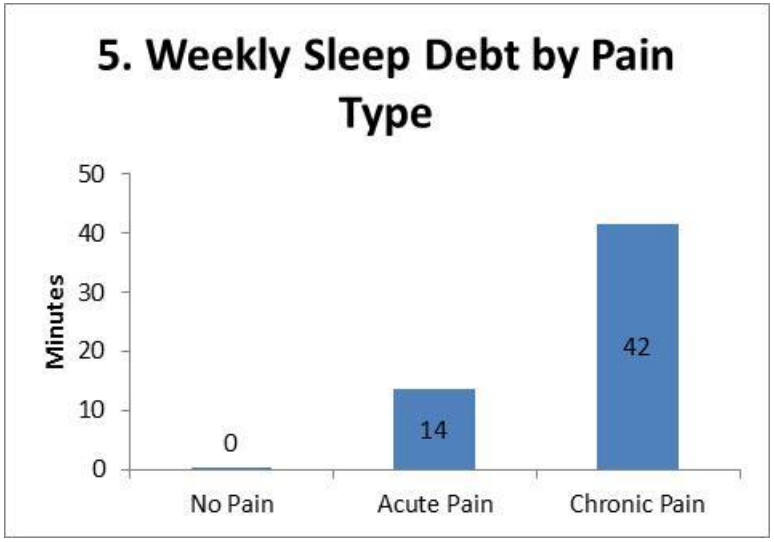


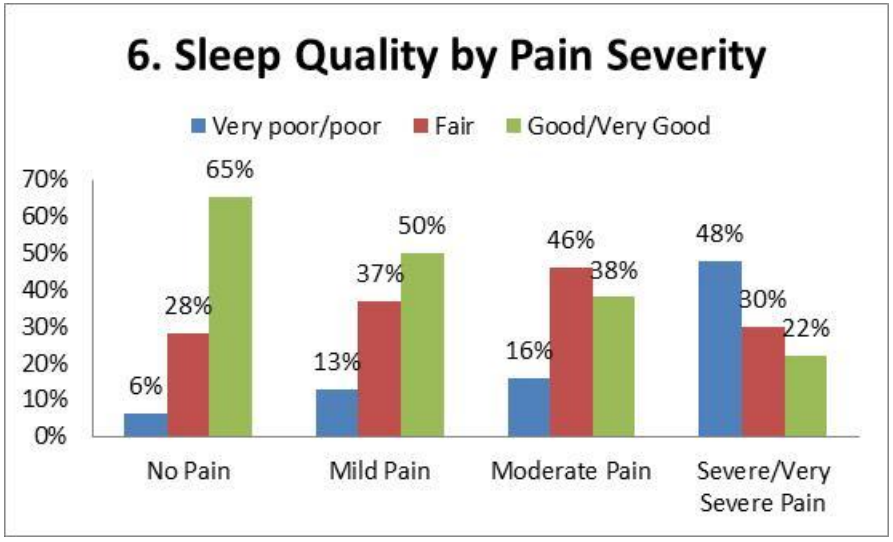
Key Findings: *Pain was also associated with lower sleep quality, more sleep problems, and greater sleep debt*

Those experiencing pain in the past 7 days slept less and had worse sleep quality than those without pain. On average, those with no pain slept 7.3 hours in the past week, while those with acute pain slept 7.0 hours and those with chronic pain slept 6.7 hours. Those with an average pain severity that was mild got an average of 7.0 hours of sleep, compared to 6.5 hours for those with severe or very severe pain (and 6.9 hours for those with moderate pain).

More important, pain was related to greater sleep debt – the gap between how much people say they need and the amount they're actually getting. The sleep debt averaged 42-minute for those with chronic pain and 14 minutes for those who've suffered from acute pain in the past week (see Figure 5). There was no gap for those who did not have pain in the last week. Likewise, those who reported greater average pain severity in the past week also experienced greater sleep debt. The sleep debt for those with mild pain was 15 minutes, 24 minutes for those with moderate pain, and 60 minutes for those with severe pain.

Pain is also associated with sleep quality. While 65% of those with no pain reported good or very good sleep quality, just 45% of those with acute pain did the same. Just 37% of those with chronic pain reported good or very good sleep, 25% reported poor or very poor sleep quality, and 38% reported fair sleep quality. Average pain severity is also related to sleep quality, as seen in Figure 6. 50% of those with mild pain in the past 7 days reported good or very good sleep, compared to just 22% of those with severe pain.





Key Findings: *Pain was also associated with lower sleep quality, more sleep problems, and greater sleep debt (continued)*

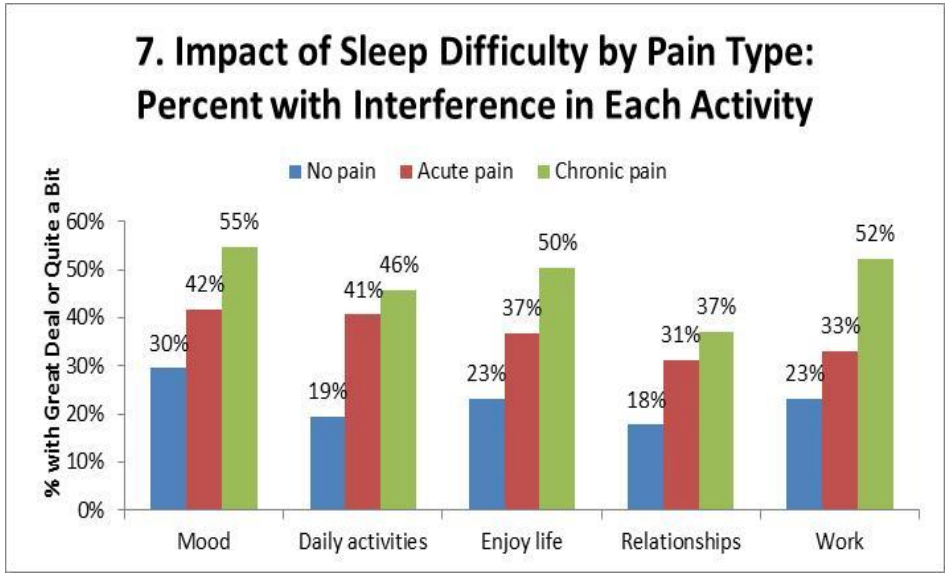
Likewise, when asked how often they get a good night's sleep, 68% of Americans with no pain said often or always in the past 7 days, compared to 47% of those with acute pain and only 39% of those with chronic pain. Among those with mild pain, 53% report always/often getting a good night's sleep, compared to only 39% of those with moderate pain and 27% of those with severe or very severe pain.

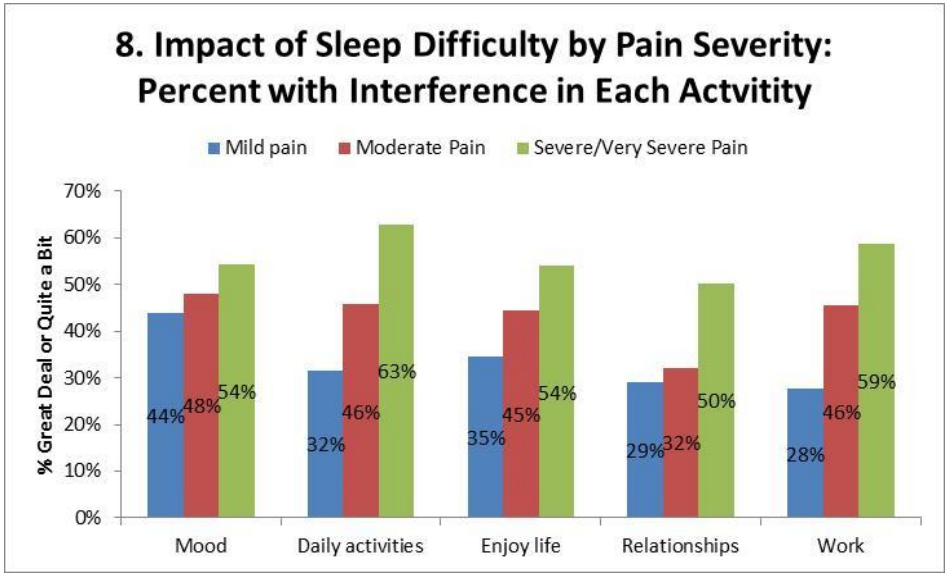
Those with chronic pain were 3 times more likely to have been diagnosed with a sleep disorder than those with no pain or acute pain. Specifically, 23% of those with chronic pain were diagnosed with sleep disorder compared with 6% of everyone else.

People in pain felt less in control of their sleep and they reported worrying more about the effects of poor sleep on their health. The proportion of Americans who said they often or always have control over when and how much they sleep was 63% in the group without pain, 45% in the acute pain group and 47% in the chronic pain group. The percentage who indicated that they were very or extremely concerned that poor sleep may have serious consequences for their physical health was 24% among those with no pain, 32% among those with acute pain and 39% among those with chronic pain.

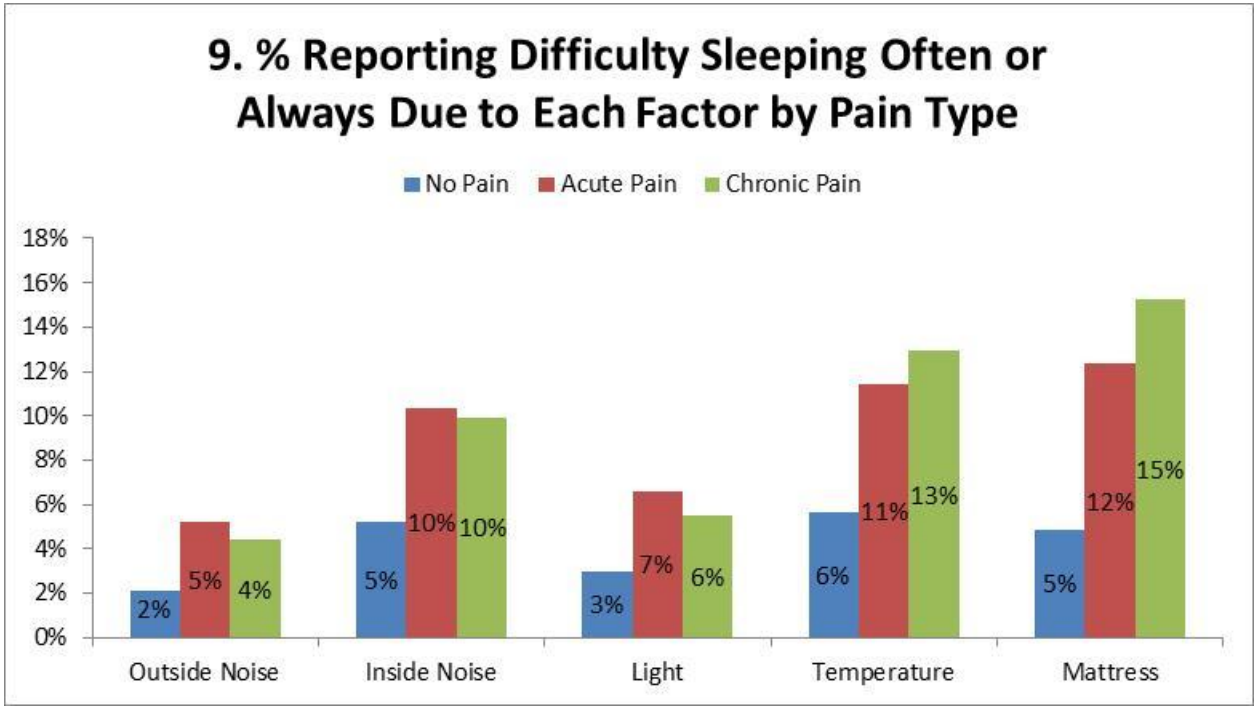
Key Findings: *Difficulty sleeping interferes with life more among people with either acute or chronic pain*

48% reported sleep problems in the last week according to the NIH PROMIS scale (see appendix for details: URL). They people were asked how the sleeping difficulties interfered with 5 domains of life: their mood, daily activities, enjoyment of life, relationships with other people and ability to do work, chores, child care, or other duties. As seen below, people who have chronic or acute pain are more likely to have sleeping difficulties interfere with their life. For example, 52% of those with chronic pain indicate that sleeping difficulties interfere with their work, compared to 23% of those without pain. Thus, sleep difficulties appear to have a greater impact on the lives of those in pain.





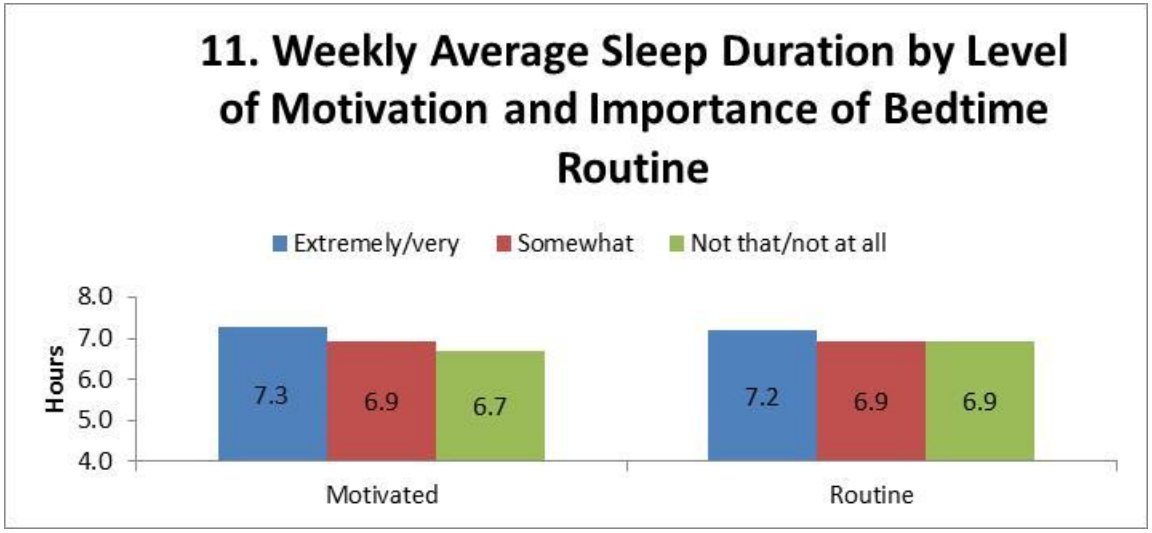
Key Findings: *Environmental factors disturb sleep more among those with either acute or chronic pain*



Everyone was asked the degree to which specific environmental factors made it more difficult to get a good night's sleep. People with pain, either acute or chronic, were significantly more likely to have environmental factors such as noise, light, temperature and their mattresses interfere with their sleep. After adjustment for sociodemographic factors, people with acute and chronic pain were still more likely to have sleep difficulties due to inside noise, light, temperature and their mattresses. Similar associations were observed for average pain intensity: those with severe pain were more likely to report that their sleep was disturbed by these environmental factors. For example, 21% of those with the most severe pain report having sleep disturbed by inside noise, compared to 8% of those with mild pain.

Key Findings: *Sleep attitudes associated with better sleep*

We asked everyone about their motivation to make sure they have enough time to sleep and we also asked them how important going to bed at a suitable time was as part of their routine. As seen in Figure 11, these sleep attitudes were associated with longer sleep durations and better sleep quality. People who said they were very or extremely motivated to get enough sleep reported sleeping 36 more minutes per night across the week compared to those were not that motivated or not motivated at all (7.3 vs. 6.7 hours). Those who were more motivated also said they needed more sleep to feel their best. Those who were very or extremely motivated said they wanted 7.4 hours of sleep per night compared to 7.0 hours for those who were not motivated. Sleep quality was also higher among those more motivated to get enough sleep: 62% reported good or very good sleep quality compared with 41% of those who were not that motivated or not at all motivated. People who were very or extremely motivated were less likely to report difficulty sleeping in the past 7 days compared with those not that motivated or not motivated at all (29% vs 39%).



Key Findings: *Sleep attitudes associated with better sleep (continued)*

People who felt that going to bed at a suitable time was a very or extremely important part of their routine reported getting more sleep across the week than those who said it was not that important or not at all important: 7.2 vs 6.9 hours. Sleep quality was also higher among those who felt that going to bed at a suitable time was very or extremely important: 60% reported good or very good sleep quality compared with 45% of those who said it was not that important or not at all important. People who felt that going to bed at a suitable time was a very or extremely important part of their routine were less likely to report difficulty sleeping in the previous 7 days compared with those who did not feel it was important (30% vs 40%).

When we examined these associations within each pain group (no pain, acute pain and chronic pain), the association between motivation to sleep and sleep duration was significant for all pain groups. Even among those with chronic pain, those who were more motivated to make sure they had enough time for sleep did indeed sleep more. Likewise, being motivated and having a bedtime routine was associated with more sleep and higher sleep quality even among those with more severe pain. Thus, everyone, even those in pain, could benefit from making sleep a priority.

2015 *SLEEP IN AMERICA*® POLL

DETAILED FINDINGS

Detailed Findings: *Overall Sleep Patterns*

Americans were asked to report the time they typically go to bed and wake up on work days (or weekdays if unemployed) and free days (or weekends). They were also asked to estimate how much actual sleep they obtain on work days and free days. Finally, they were asked how much sleep they thought they needed, at a minimum, to be at their best during the day, which we call "preferred" sleep duration.

- On average people went to bed at 11:02PM and woke at 7:05AM on workdays and went to bed at 11:24PM and woke at 8:13AM on free days.
- They spent 7.9 hours in bed on work days and 8.6 hours on free days.
- They reported sleeping 6.9 hours on work days and 7.6 hours on free days resulting in an average of 7.1 hours across the week.
- *Sleep efficiency*, a commonly-used marker of sleep quality, was calculated by dividing sleep duration by time spent in bed. The average sleep efficiency was 88% on work days and 89% on free days.
- Americans indicated that they would prefer to sleep 7.3 hours per night on average. Comparing the preferred sleep amount to actual time spent sleeping gives us an estimate of *sleep debt*. The average sleep debt on work days was approximately 26 minutes, indicating that on average Americans would prefer to sleep 26 minutes more than they do on work days. On free days, however, the average was -17 minutes, indicating that on average on free days Americans were getting 17 minutes more sleep than they felt they needed.

Detailed Findings: *Overall Sleep Patterns (continued)*

Several questions probed sleep quality and sleep problems.

- The NIH PROMIS Sleep Disturbance scale (short Form 8b) asked about sleeping difficulties in the past 7 days across 8 individual items. These items were used to calculate an additive "Sleep Disturbance Score" (see Appendix). Scores range from 8 to 40 (average of 20), where higher values indicate greater sleep disturbance. 34% of Americans reported at least sleep problem in the past 7 days.

- When asked about sleep quality in the past 7 days, 52% reported very good or good sleep quality, 36% reported fair sleep quality, and 13% reported poor or very poor sleep quality.

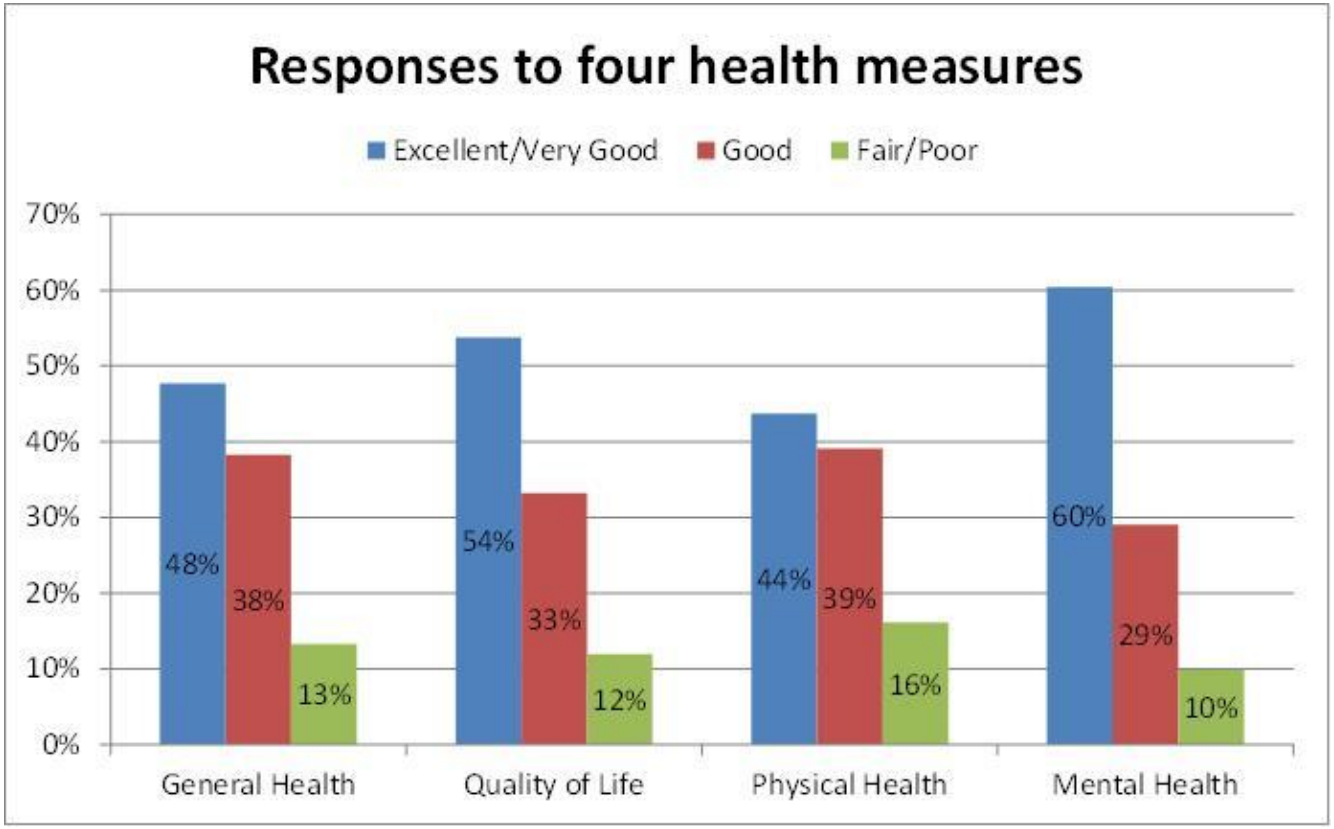
- When asked about how often they get a good night's sleep in general, 13% of Americans reported rarely or never, 32% reported sometimes and 54% said often or always.

- When asked how often health problems make it difficult to get a good night's sleep, only 29% said Never. 40% said rarely, 20% said sometimes, and 10% reported Often or Always.

- 9% of Americans report they had been diagnosed with a sleep disorder by a doctor or medical professional. Of them, 71% were diagnosed with apnea and 24% with insomnia.

Detailed Findings: *Sleep and Health*

Americans were asked to rate their general health, quality of life, physical health, mental health, level of stress and level of fatigue. As reported in the figure below, approximately half of respondents rated their general health, quality of life, physical health and mental health very good or excellent.



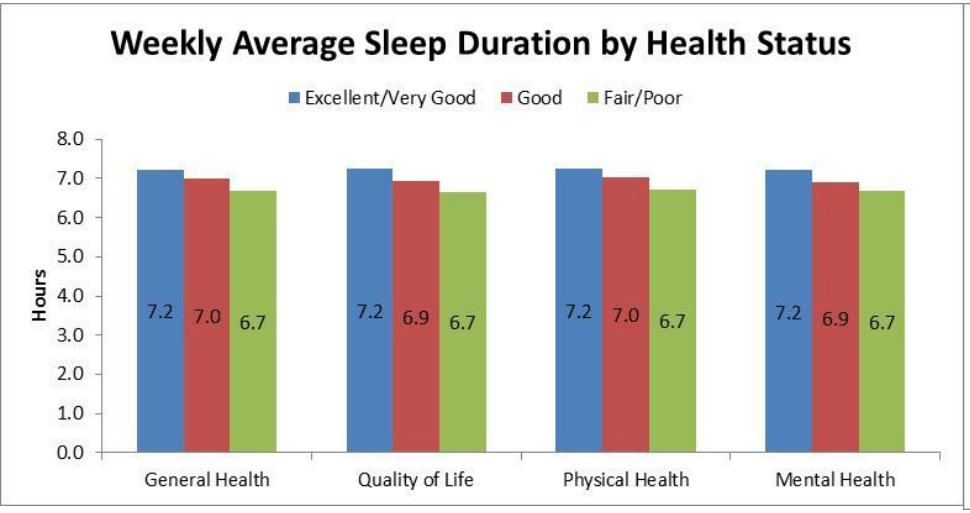
Detailed Findings: *Sleep and Health (continued)*

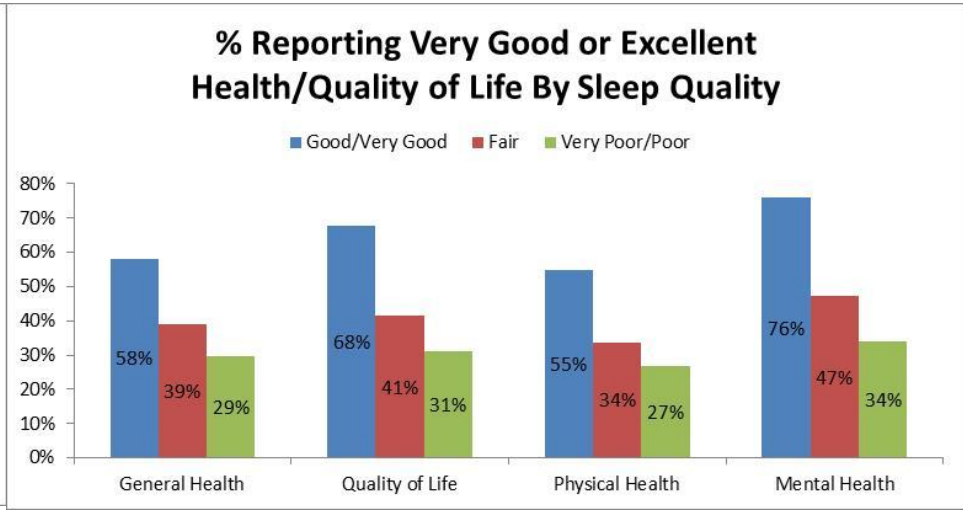
Longer sleep duration and better sleep quality were associated with better health:

- As seen in graph below, those who rate their sleep quality more highly were also more likely to rate their health and quality of life as very good or excellent, while those who indicated they had difficulty sleeping in the previous 7 days were less likely to rate their health and quality of life as very good or excellent (all p<0001). Similarly, those with better health had lower scores on the sleep disturbance scale.

- Likewise, those who rated their health and quality of life highly (very good or excellent) reported getting more sleep -- getting approximately 30-34 minutes more sleep (depending on which health/quality of life question is used) across the week on average than those who reported their health as fair or poor (all p<.001).

- In the overall relationship between health and sleep, pain plays a prominent role – a point explored in the next section.

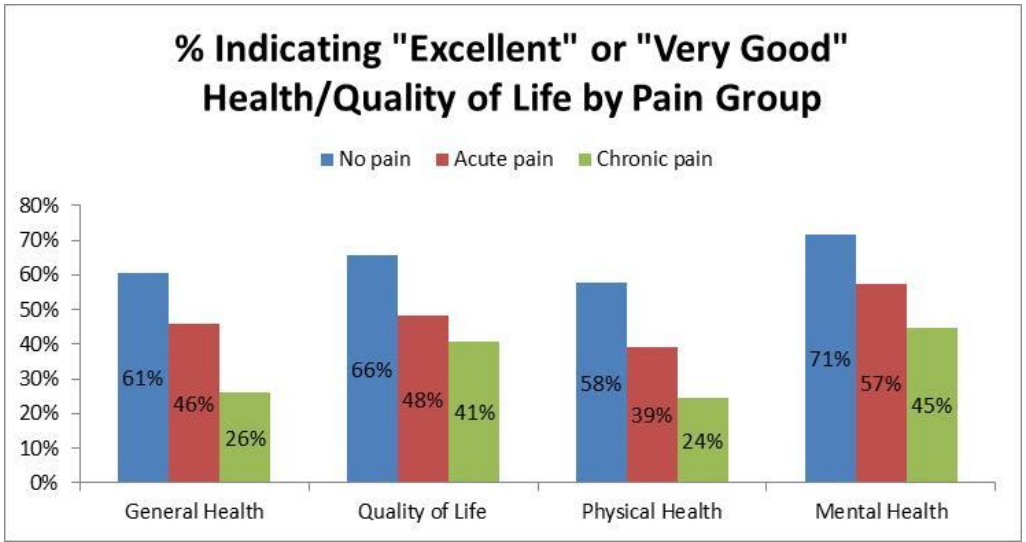




Detailed Findings: *Pain, Health, and Sleep*

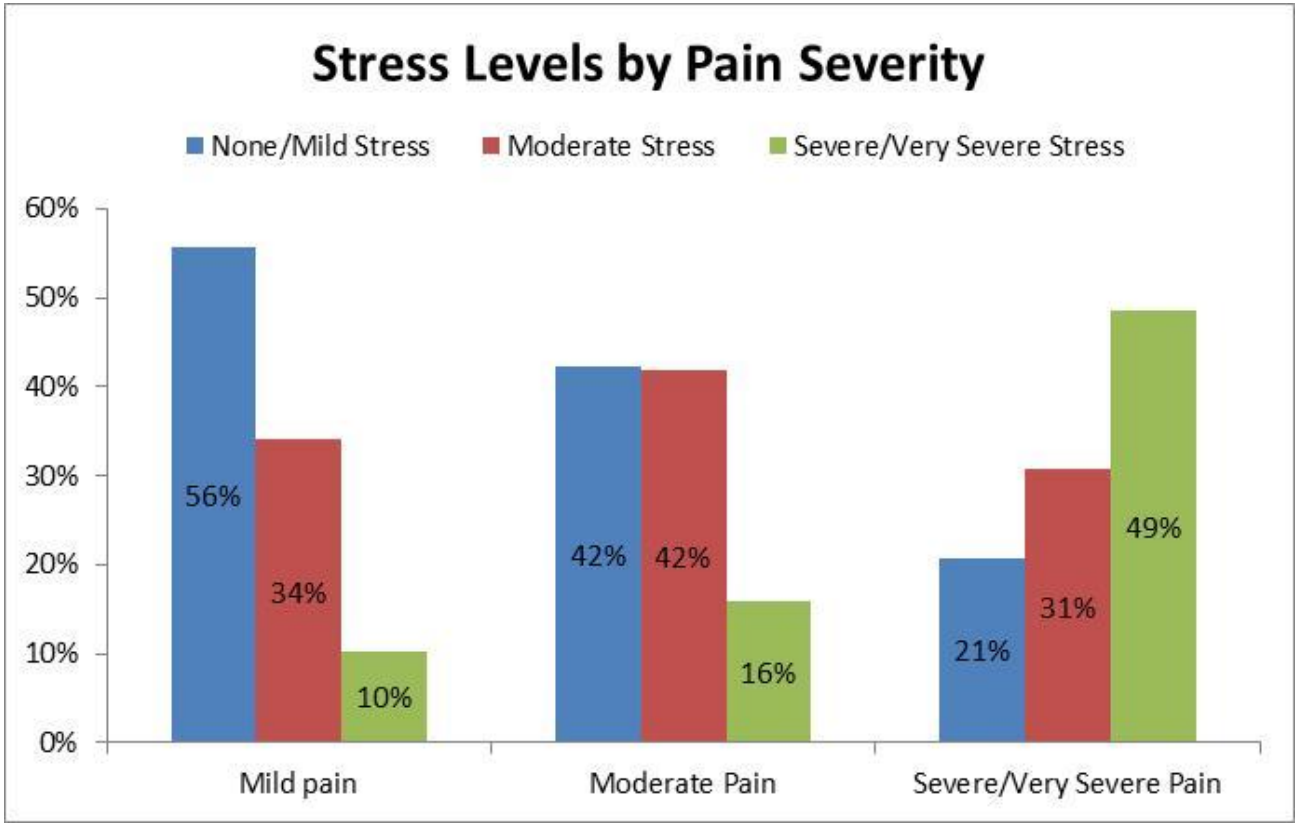
Everyone was asked about any physical pain experienced in the past 7 days. The majority of Americans had experienced at least mild pain in the past 7 days—30% reported mild pain, 24% moderate pain, and 5% severe or very severe pain when asked about their average pain severity. Those experiencing pain were also asked if the pain was chronic and long-lasting or only fleeting and minor, which we have termed "acute" pain.

- 43% did not have pain in the previous 7 days, 36% reported acute pain in the previous 7 days and 21% reported having chronic pain. Women were more likely to be in the chronic pain group than men (26% vs 16%, p=.003)
- People with chronic pain were more likely to older (mean age 53 years) vs mean age of 45 years in the no pain and 46 years in the acute pain groups.
- People with either acute or chronic pain were asked to rate their worst pain on a scale of 0 to 10, with 10 being the worst pain they could imagine. The average "pain intensity" score was 5.8 for both groups combined, but was 5.1 for the acute pain group and 7.1 for the chronic pain group (p<.0001).
- As seen in the Figure below, people with chronic pain were less likely to report excellent or very good general, physical and mental health and quality of life than either those with acute pain or no pain. Those with acute pain were less likely to report excellent or very good health and quality of life than those with no pain. These differences remained significant even after adjusting for demographics (all p≤.01).



Detailed Findings: *Pain, Health, and Sleep (continued)*

People with pain were more likely to report severe or very severe stress levels. Among those with chronic pain, 23% reported higher stress levels and 12% of those with acute pain as compared with 7% of those with no pain (p<.0001). As seen in the graph below, greater pain severity was also associated with more severe stress levels: 49% of those with severe/very severe pain reported severe/very severe stress compared with 10% of those with mild pain (p<.0001).

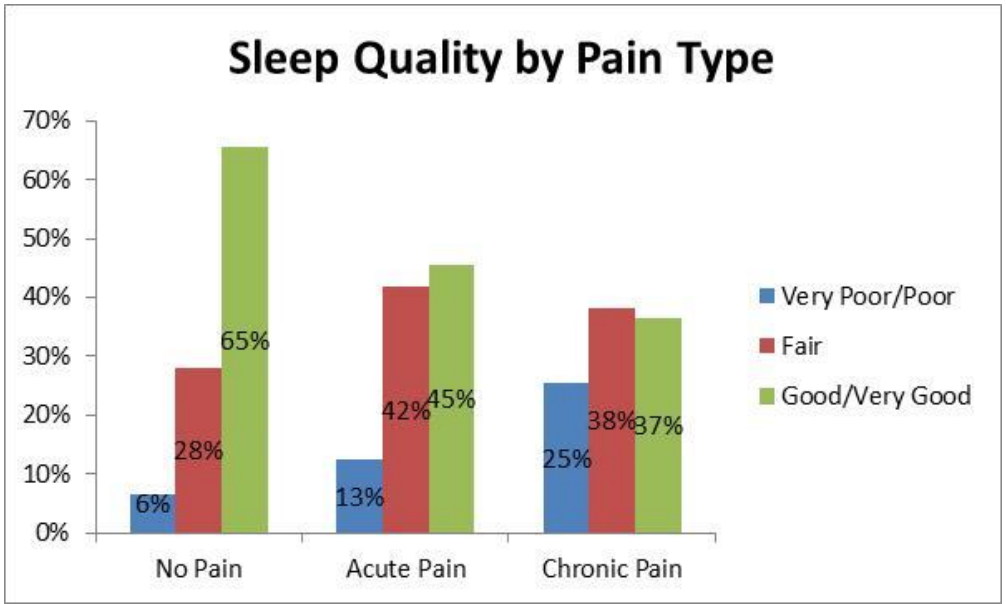


Detailed Findings: *Pain, Health, and Sleep*

Pain and Sleep

Those experiencing pain in the last week got less sleep, greater sleep debt, lower sleep quality, and more sleep problems.

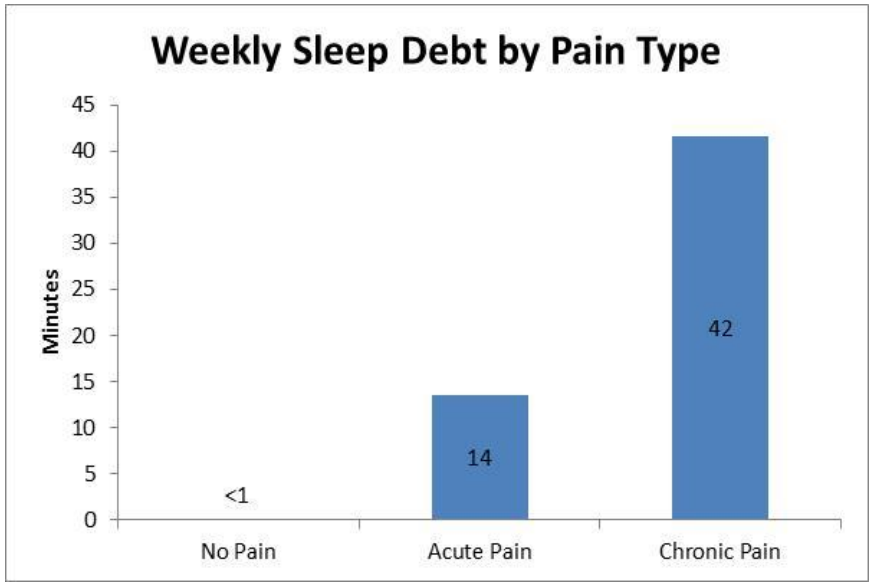
- On average, those with no pain slept 7.3 hours in the past week, while those with acute pain slept 7.0 hours and those with chronic pain slept 6.7 hours. Those with an average pain severity that was mild got an average of 7.0 hours of sleep, compared to 6.5 hours for those with severe or very severe pain (and 6.9 hours for those with moderate pain). Sleep efficiency was highest in the group with no pain (91%), lowest in the group with chronic pain (86%) and intermediate for those with acute pain (88%).
- Those experiencing pain also reported lower sleep quality in the past 7 days. As seen in figure below, while 65% of those with no pain reported good or very good sleep quality, just 45% of those with acute pain and 37% of those with chronic pain did the same. Likewise, average pain severity is also related to sleep quality. 50% of those with mild pain in the past 7 days reported good or very good sleep, compared to just 22% of those with severe or very severe pain.
- When asked, in general, how often they get a good night's sleep, 68% of Americans with no pain indicated they got a good night's sleep often or always while 47% of those with acute pain and 39% of those with chronic pain said they got a good night's sleep often or always (p<.0001). Similarly, 64% of those with no pain said they got enough sleep to feel their best often or always while only 46% of those with acute pain and 36% of those with chronic pain also said they got enough sleep often or always (p<.0001).



Detailed Findings: *Pain, Health, and Sleep*

Pain and Sleep (continued)

- Pain was also related to greater sleep debt, the difference between preferred sleep and actual sleep. As seen in figure below, the sleep debt averaged 42 minutes for those with chronic pain and 14 minutes for those with acute pain in the past week while those with no pain did not report a sleep debt. Those with more severe pain in the past week also experienced greater sleep debt. The sleep debt for those with mild pain was 15 minutes, 24 minutes for those with moderate pain, and 60 minutes for those with severe or very severe pain.
- People with chronic pain were more likely to have been diagnosed with sleep disorder (23%) compared with those with no pain (5%) and acute pain (6%).
- The presence of pain was associated with greater concern that poor sleep may have serious consequences for physical health. The proportion who indicated that they were very or extremely concerned was 24% among those with no pain, 32% among those with acute pain and 39% among those with chronic pain (p=.0001).
- People with chronic pain also worry about getting a good night's sleep more often; 24% of those with chronic pain indicated they often or always worried while only 12% of those with acute pain worried and 11% of those with no pain worried (p<.0001).
- The presence of pain was also associated with feeling less in control of sleep. The proportion who said they often or always have control over when and how much they sleep was 63% in the group without pain and 45% in the acute pain group and 47% in the chronic pain group (p=.0001).
- People with pain more often reported being overwhelmed by thoughts when trying to sleep. 27% of those with chronic pain, 17% of those with acute pain and 14% of those with no pain indicated they were often or always overwhelmed by thoughts (p<.0001).



Detailed Findings: *Pain, Health, and Sleep*

Overall Pain Intensity

Everyone completed the NIH PROMIS Pain Intensity scale, which uses 3 questions to calculate an overall pain intensity score for the past 7 days (see appendix URL). Greater pain intensity was associated with less sleep and worse sleep quality.

- Longer average sleep durations were associated with lower pain intensity scores. For example, those with the lowest pain intensity (bottom third) averaged the most sleep across the week (7.3 hours per night) and those with the highest pain intensity (top third) reported the least (6.8 hours per night) while those in the middle third slept an average of 7 hours per night ($p<.0001$).

- Pain intensity was also associated with a greater sleep debt. The perceived sleep debt in those with the lowest pain intensity was only 12 minutes on work days while in the highest third it was 43 minutes and 28 minutes in the middle third ($p=.0001$). On free days, those in the lowest third would slept 29 minutes more than they needed and those in the middle third slept 21 minutes more, while those in the highest third would prefer to sleep 5 minutes more than they did.

- The negative associations between pain intensity and both sleep duration and sleep debt remained significant even after adjusting for age, sex, race, number of children under 6 years, and household income ($p<.0001$).

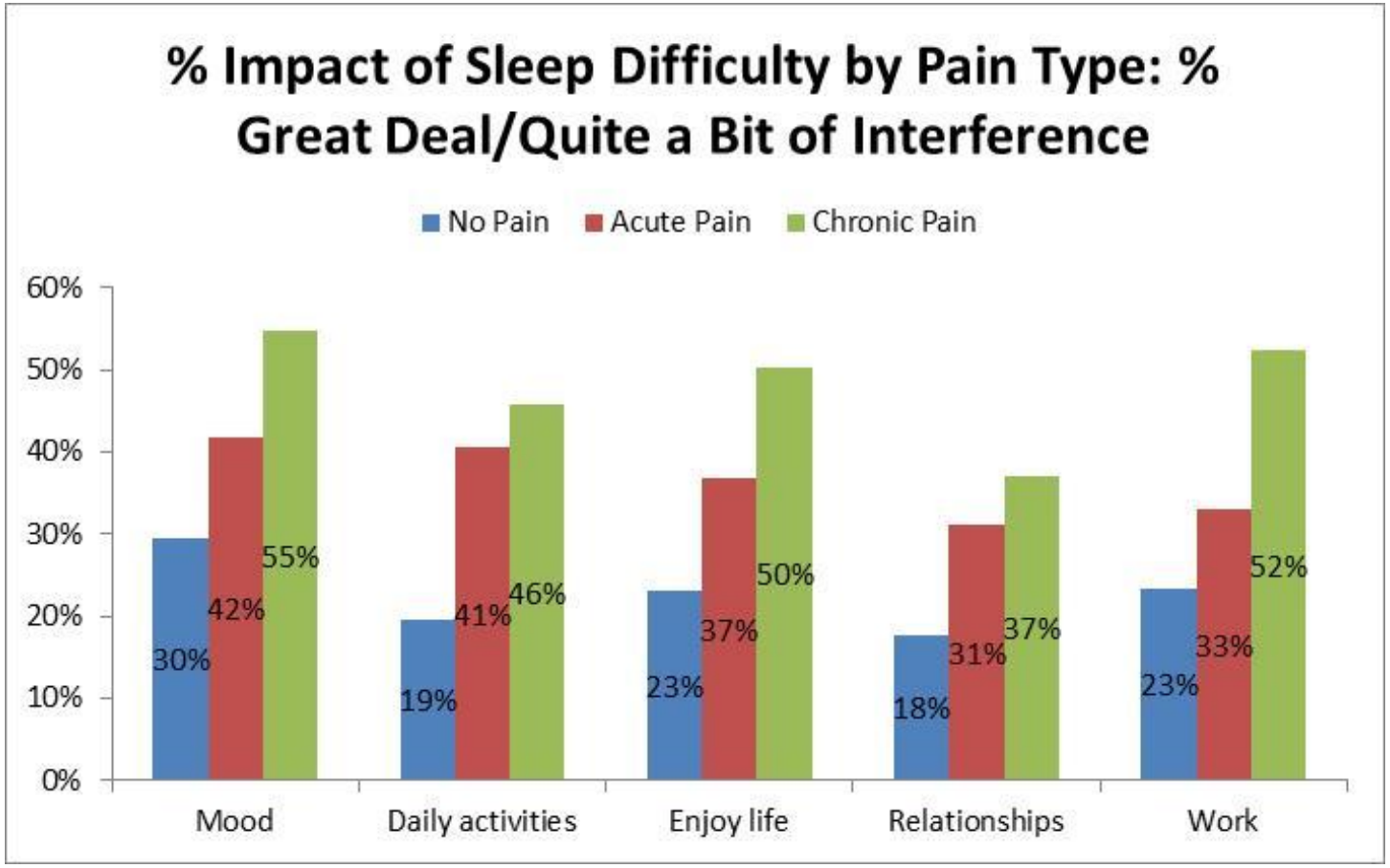
- Sleep quality was also worse with greater pain intensity. People who described their sleep quality as very poor, poor or fair had a higher pain intensity score than those who described their sleep quality as good or very good (6.5 vs 5.0, $p<.0001$). Similarly, those who reported difficulty sleeping in the previous 7 days had a higher mean pain intensity score than those who did not report difficulty sleeping (6.5 vs 4.9, $p<.0001$).

Detailed Findings: *Interference of Difficulty Sleeping*

Respondents who reported any sleep problems in the past 7 days according to the 8 NIH PROMIS items (see Appendix for details) were asked, in general, when they have difficulty sleeping, how much it interferes with their mood, their day-to-day activities, their enjoyment of life, their relationships with other people and their ability to do work, chores, child care, or other duties.

- The majority of respondents indicated that difficulty sleeping did not interfere (not that much or not at all) with each of the five different domains.
- Although men and women were similar in the degree to which sleep difficulties interfered with their lives, there were some differences by age. Specifically, adults who were 60 years old or older reported less interference compared with 18-29 year olds.
- Average weekly sleep duration did not differ between those who reported that difficulty sleeping interfered "quite a bit" or "a great deal' compared with those who reported it did not interfere for any of the life domains. Those reporting greater interference of difficulty sleeping on their mood and their ability to do work also reported worse sleep quality. Specifically, sleep quality was more likely to be "good" or "very good" among those who indicated that difficulty sleeping did not interfere with their mood (29% vs 18%, p=.01) and among those who indicated that difficulty sleeping did not interfere with their ability to do work (31% vs 14%, p=.0007).
- Average global health score was higher among those who reported that sleep did not interfere at all or that much with their mood, daily activities, enjoyment of life or ability to do work (all p<.01).
- As seen in the figure below, difficulty sleeping interferes with life more among people with either acute or chronic pain. People who have chronic or acute pain are more likely to have sleep difficulties interfere with their life. For example, 52% of those with chronic pain indicate that sleeping difficulties interfere with their work, compared to 23% of those without pain.

Detailed Findings: *Interference of Difficulty Sleeping (continued)*



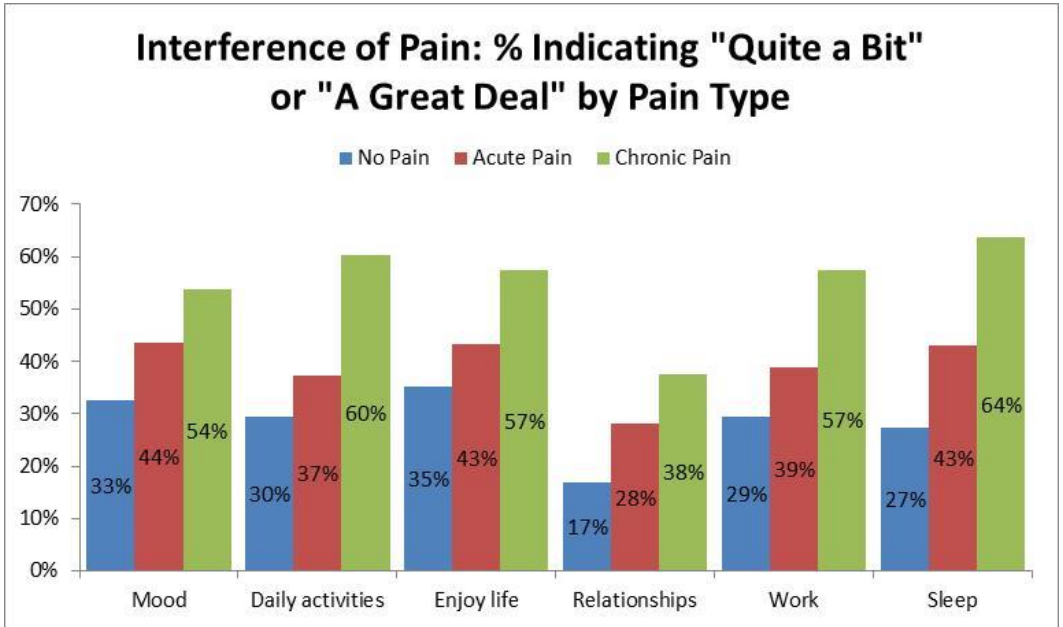
Detailed Findings: *Pain Interference*

Everyone was asked to indicate, in general when they have pain, to what degree the pain interferes with their mood, their daily activities, their enjoyment of life, their relationships with other people, and their ability to do work, chores, child care or other duties and sleep.

- The majority of respondents indicated that difficulty sleeping did not interfere (not that much or not at all) across each of the five different domains.

- Average global health score was higher among those who reported that sleep did not interfere at all or that much with their mood, daily activities, enjoyment of life or ability to work (all p<.01).

- As seen in the graph below, self-reported pain interference was higher among those experiencing pain in the past 7 days. Those with chronic pain reported greater interference of pain in their lives compared with the no pain group and those with acute pain were intermediate. For example, 57% of those with chronic pain interfered with work, compared to 39% of those with acute pain, and 29% of those who didn't experience pain in the past 7 dates. 64% of those with chronic pain report that pain interferes with sleep, compared to just 27% of those who have not experienced pain in the past 7 days.



Detailed Findings: *Pain Locations*

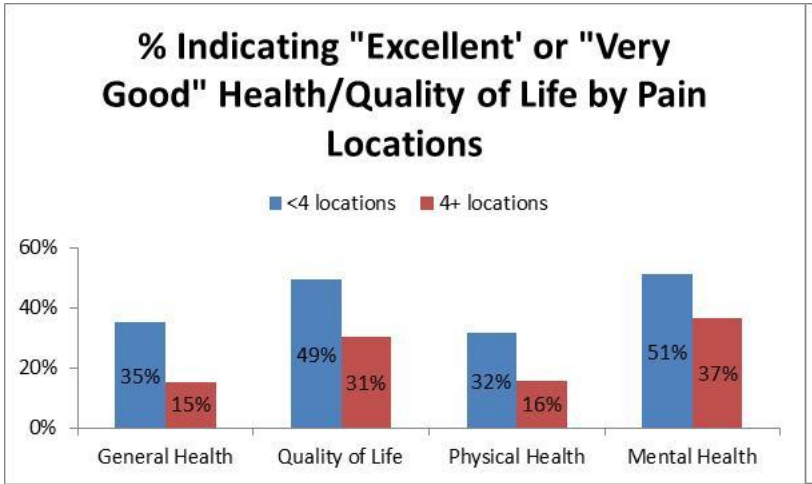
People who indicated they had chronic pain were asked to identify the location of the pain with 11 different options: head (including throat, jaw or mouth), shoulder or neck, back (upper or lower), left arm, hand or wrist, right arm, hand or wrist, left leg, knee, foot or ankle, right leg, knee, foot or ankle, hip/buttocks, chest/breast, stomach/abdomen, or other location. We summed the total number of locations and divided them into two groups: <4 locations and 4 or more locations.

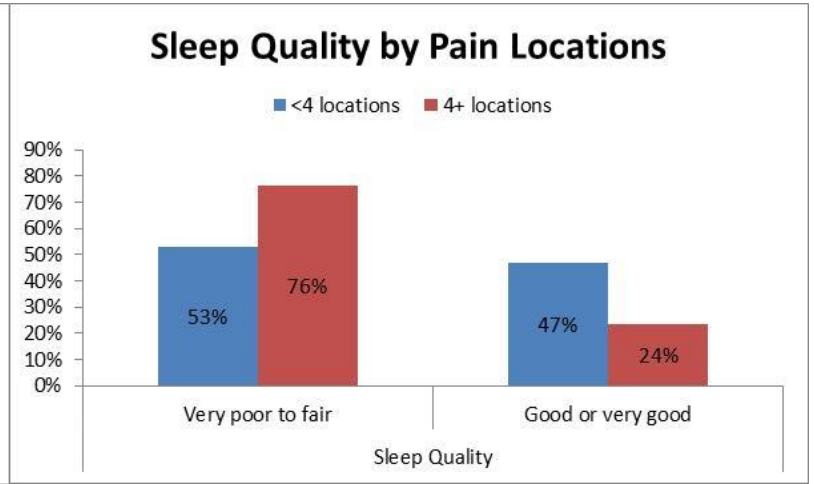
- Those with pain in 4 or more locations had greater average pain intensity scores (9.3 vs 8.0, p<.0001).
- Self-reported health and quality of life were lower in the group with more pain locations, although mental health did not differ significantly (see Figure X).
- Those with more pain locations reported greater levels of fatigue. Among those with <4 pain locations, 53% reported moderate to very severe fatigue while among those with 4 or more pain locations, 75% reported moderate to very severe fatigue (p=. 0009). There were no differences in the levels of stress reported.
- The proportion who used pain medication several days/every day during the past 7 days was higher in the group with the ≥4 pain locations (59%) compared with 36% for <4 locations (p=.002). The frequency of use of non-pain medication for sleep did not differ between the groups.

Detailed Findings: *Pain Locations (continued)*

Subjective sleep quality and sleep duration varied by the pain location groups as well.

- Only 24% of those reporting 4 or more pain locations rated their sleep quality as good or very good compared with 47% of those with pain in less than 4 locations (p<.001).
- Weekly sleep duration was approximately 36 minutes shorter among the group with the more pain locations (4+) compared with those with pain in less than 4 locations (p<.01).
- Perceived sleep debt on work days and across the week on average was also significantly higher in the group with the most pain locations: 87 minutes on work days compared with 45 minutes and 34 minutes for <3 locations and 3-4 locations respectively (p=.006). Sleep debt was 41 minutes on free days for the group with 5+ locations compared with -9 and -2 minutes for <3 locations and 3-4 locations respectively (p=.02). This resulted in an average weekly sleep debt of 74 minutes for 5+ locations compared with 22 and 31 minutes for <3 locations and 3-4 locations respectively (p=.004).
- A greater number of pain locations was significantly associated with worse global health score, greater perceived sleep debt and higher sleep disturbance score (all p≤.01) even after adjusting for demographics.





Detailed Findings: *Stress, Fatigue & Sleep*

Americans rated their levels of stress and fatigue in the previous 7 days. 12% had severe or very severe stress and 31% had moderate stress while 56% said they had only mild or no stress. Only 7% had severe or very severe fatigue in the previous 7 days, but 32% had moderate fatigue and 61% had only mild or no fatigue. Both stress and fatigue were associated with sleep duration and quality.

- Average sleep duration on work days was shorter in those who reported severe/very severe stress (6.4 hours) compared with those with moderate stress (6.9 hours) and mild or no stress (6.9 hours) (p=.01).

- Sleep quality was also worse among those reporting greater stress. 83% of those with severe to very severe stress reported poorer sleep quality (very poor, poor or fair) compared with 59% of those with moderate stress and 35% of those with mild or no stress (p<.0001). The average sleep disturbance score was higher for people with greater stress (27 vs 22 in moderate stress group and 18 in mild/no stress group, p<.0001). Those with severe/very severe stress were more likely to report at least one sleep problem in the previous 7 days, based on the NIH Promis items: 67% compared with 36% of those with moderate stress and 25% of those with mild or no stress (p<.0001).

- Sleep duration on work days was shorter among those with moderate to very severe fatigue (6.7 hours) compared with those with mild or no fatigue (7.0 hours) (p=.002). Weekly average sleep duration was also shorter (6.9 vs 7.2 hours, p=.002).

- Lower sleep quality was also associated with greater fatigue. Fatigue was associated with poorer sleep quality: 81% of those with severe/very severe fatigue and 70% of those with moderate fatigue reported poor to fair sleep quality compared with 33% of those with no/mild fatigue (p<.0001). A greater proportion of people with severe to very severe fatigue reported at least one sleep problem in the previous week (79%) compared with those with moderate (44%) or no/mild fatigue (23%).

Detailed Findings: *Stress, Fatigue & Sleep (continued)*

- Finally, the sleep disturbance score was higher among those with greater fatigue: 29 among those with severe/very severe fatigue, 23 among those with moderate fatigue and 18 among those with no/mild fatigue ($p<.0001$).

- Greater perceived sleep debt was associated with more stress and greater fatigue. Those who felt severe to very severe stress would prefer to sleep 69 minutes more on work days compared with 14 minutes more for those with mild or no stress during the last 7 days ($p<.0001$). On free days, those with severe/very severe stress reported sleeping about what they felt they needed (perceived debt is <1 minute) while those with mild to no stress reported sleeping 26 minutes more than they felt they needed ($p=.009$).

- Similarly, those who felt severe to very severe fatigue would prefer to sleep 100 minutes more on work days compared with 13 minutes more for those with little to no fatigue during the last 7 days ($p<.0001$). On free days, those with severe/very severe fatigue would like to sleep 39 minutes more while those with little to no fatigue slept about 29 minutes more than they felt they needed ($p<.0001$).

Detailed Findings: *Making Sleep a Priority*

The survey asked Americans about their motivation to make sure they have enough time to sleep and also asked them how important going to bed at a suitable time is as part of their routine.

- 48% were either extremely or very motivated to make time for sleep while 40% were somewhat motivated and 12% were either not that motivated or not motivated at all.

- 51% felt that going to bed at a suitable time was either an extremely or very important part of their routine, while 31% felt it was somewhat important and 16% felt it was not that important or not important at all.

- Motivation to make time for sleep was associated with more sleep compared with those not motivated (not at all or not that much). People who said they were very/extremely motivated to get enough sleep reported sleeping 7.1 hours on work days compared with 6.5 hours among those who were not that motivated or not at all motivated. On free days the difference was not statistically significant (7.7 vs 7.3 hours p=.02). The weekly average sleep duration was greater among those more motivated (7.3 vs. 6.7 hours, p<.0001). People who were more motivated also preferred to get more sleep: 7.4 hours per night compared with 7.0 hours among those who were not motivated (p=.003).

- Sleep quality was also higher among those more motivated to get enough sleep: 62% reported good or very good sleep quality compared with 41% of those not motivated (p<.0001).

- People who felt that going to bed at a suitable time was a very/extremely important part of their routine reported getting more sleep on average across the week: 7.2 hours compared with 6.9 hours among those who felt that bedtime was not an important part of their routine (not that much or not at all) (p=.01). Sleep quality was also higher among those who feel that going to bed at a suitable time was very/extremely important: 60% reported good or very good sleep quality compared with 45% of those who did not feel bed time was an important part of their routine (p<.0001). Perceived sleep debt did not differ.

Detailed Findings: *Making Sleep a Priority (continued)*

- As seen in the graph below, subjects who reported greater motivation for good sleep also reported better health: 56% of those who were highly motivated reported very good or excellent general health compared with 42% of those who were not that motivated or not at all motivated (p<.0001); 62% of the motivated respondents reported very good/excellent quality of life compared with 43% of those not motivated (p=.008); 54% of the motivated respondents reported very good/excellent physical health compared with 36% of those not motivated (p<.0001); and 67% of the motivated respondents reported very good/excellent mental health compared with 50% of those not motivated (p<.0001).

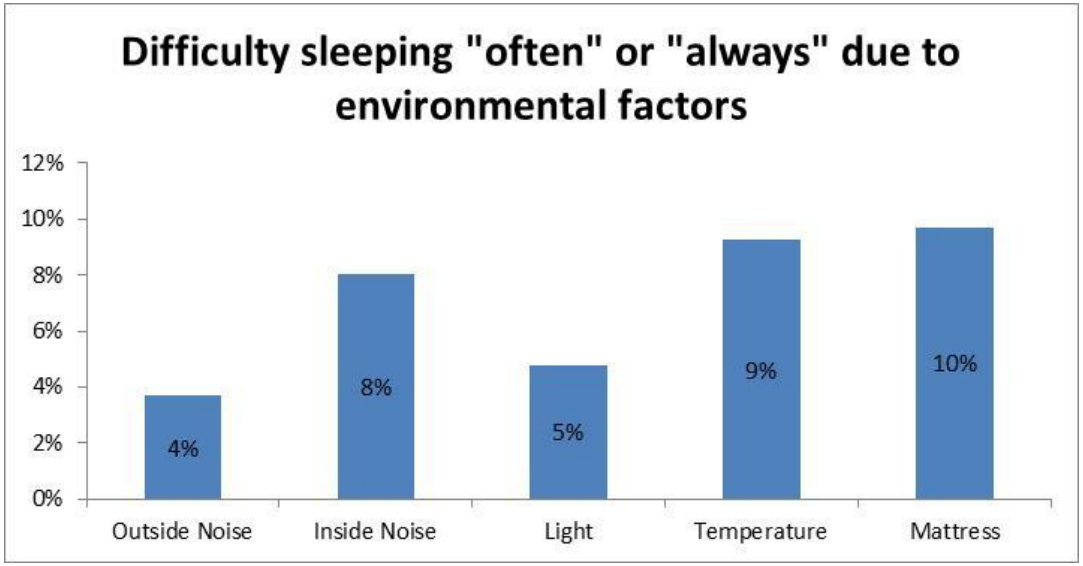
- Women were more motivated to get sleep and suitable bed times were a more important part of their routine. For example, 54% of women were extremely or very motivated compared with 42% of men (p=.0005). In addition, 57% of women felt a suitable bedtime was either an extremely important or a very important part of their routine compared with 45% of men (p=.004).

- Motivation to get a good night's sleep was significantly associated with longer sleep duration and lower sleep disturbance scores after adjusting for demographics.

- We examined each pain group separately and found that the significant association between greater motivation to sleep and better global health persisted within each pain group. The association between greater motivation to sleep and longer sleep duration was significant among those with chronic pain (p=.004) but not acute pain (p=.02) or no pain (p=.04). The association between greater motivation to lower sleep disturbance score was significant among those with acute pain (p<.001) but not chronic pain (p=.09) or no pain (p=.04).

Detailed Findings: *Environmental Factors Disturbing Sleep*

Of factors disturbing sleep often or always: an uncomfortable mattress was the most commonly reported problem (10% of people), followed by temperature (9%), inside noise (8%), light (5%) and outside noise (4%).



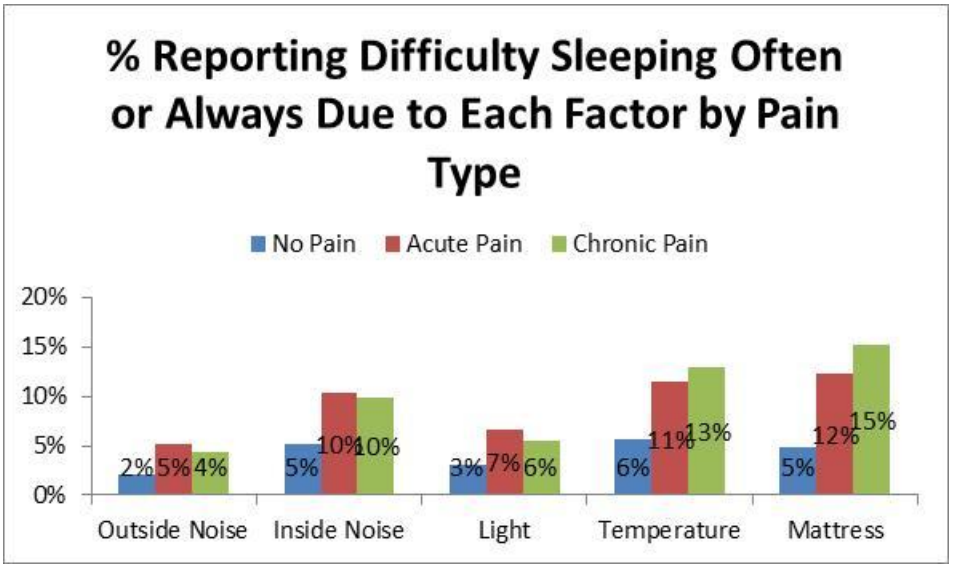
- Women's sleep was disturbed more often by inside noise (11% vs 4%) and temperature (11% vs 7%, p=.04) than men's sleep. There were no differences between men and women for the other environmental factors.
- There was no difference in sleep duration between those with 0 to 1 of these environmental factors frequently (sometimes, often or always) making sleep difficult and those with 2-5 of these factors frequently making sleep difficult. However, sleep quality was significantly lower in those with 2-5 perturbations: 64% of them reported poorer sleep quality (very poor, poor or fair) compared with 39% of those with 0-1 perturbations (p<.0001). A greater proportion of people with 2-5 perturbations reported difficulty sleeping in the past 7 days (60% compared with 41% of those with 0-1 perturbations, p<.0001). Mean sleep disturbance score was also higher (23 vs 19 points, p<.0001). Perceived sleep debt was higher among those with 2-5 perturbations: 40 vs 18 minutes on work days (p=.0003), -6 vs -24 on free days (p=.008) and 27 vs 5 minutes per night across the week on average (p=.0002).

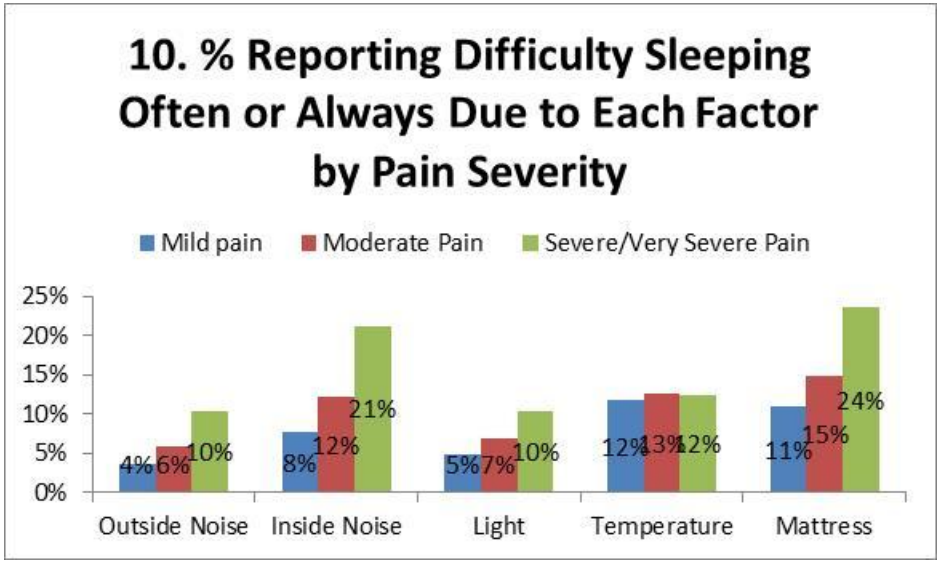
Detailed Findings: *Environmental Factors Disturbing Sleep*

Environmental Factors Disturb Sleep More Among Those With Pain (continued)

People with pain were more likely to have sleep difficulties due to environmental factors (all p<.001).

In linear regression predicting degree of disturbance by each environmental factor adjusting for demographic variables, both acute and chronic pain groups had sleep disturbed more often by these environmental factors than those with no pain. One exception is that the chronic pain group did not differ from the no pain group for disturbance by outside noise; however, those with acute pain reported their sleep was more often disturbed by outside noise than those with no pain (p<.001). Similar associations were observed for average pain intensity: those with severe/very severe pain were more likely to report sleep disturbed by these environmental factors.





Detailed Findings: *Medication Use and Sleep*

Pain Medication

- 60% did not take any pain medication in the past 7 days, while 21% took it once or twice, 11% took pain medication on several days and 8% took pain medication every day/night.

- Those who took pain medication at least once in the past week slept significantly less than those who never took pain medication: 6.7 vs 7.0 hours on work days (p=.001), 7.3 vs 7.8 on free days (p<.0001) and 6.8 vs. 7.2 hours averaged across the week (p=.0001). Perceived sleep debt was also longer among those who took pain medication. Those who took pain medication wanted to sleep about 29 minutes more per night on average than they did compared with 3 minutes per night on average for those who never took pain medication.

- Sleep quality was also worse among the group who took pain medication. Only 40% described their sleep as good or very good compared with 60% of those who never took pain medication. Similarly, 59% of those who took pain medication had at least one type of sleep difficulty in the past 7 days compared with 41% of those who never took pain medication (p<.0001).

- Because pain medication use is more common among those with chronic pain, we examined those with chronic pain separately from those who did not have chronic pain. Among those without chronic pain, average sleep duration on free days was shorter for those who took pain medication (7.4 vs 7.8 hours, p=.0009). Average sleep duration on work days was 7.0 hours for those who never took pain medication compared with 6.8 hours for those who did (p=.11). Average sleep duration across the week was therefore 7.2 hours in those who never took pain medications and 7.0 hours in those who did (p=.02). Fewer people who took pain medication described their sleep quality as good or very good compared with people who never took pain medication (45% vs 61%, p<.001).

- If we examine only those with chronic pain, average sleep duration and perceived sleep debt did not differ significantly between those who took pain medications and those who did not (all p>.01). Sleep quality was worse among those who took pain medication during the past 7 days: only 32% described their sleep as good or very good compared with 47% of those who never took pain mediation (p=.005).

Detailed Findings: *Medication Use and Sleep*

Sleep Medication

- Three-quarters (76%) never took non-pain medication for sleep in the previous 7 days, while 10% took it once or twice, 6% took sleep medication on several nights and 7% took sleep medication every night.

- Those with chronic pain were more likely to ever (once or twice, several nights, every night; 33%) use sleep medications in the past 7 days than those with no pain (13%) or acute pain (29%).

- Average sleep duration did not differ significantly between those who never took sleep medication and those who did at least once (all p>.01). Perceived sleep debt was greater on free days among those who took sleep medications. Specifically, those who took the medications were sleeping approximately the amount they felt they needed (debt<1 minute) while those who never took sleep medication were sleeping about 22 minutes more than they felt they needed (p=.006). Sleep debt on work days or averaged across the week was not significantly different (p>.01).

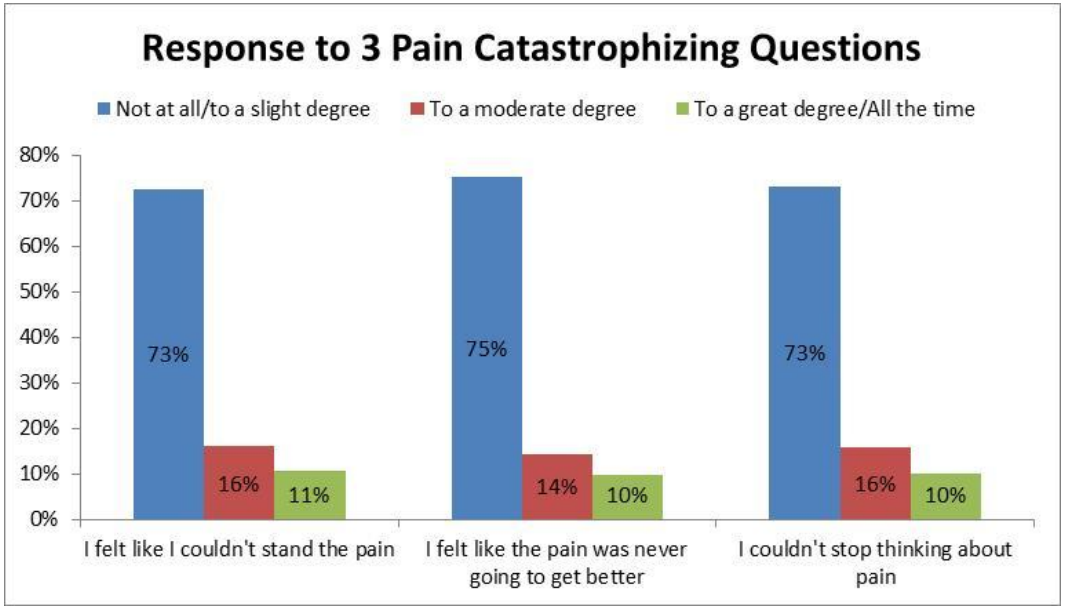
- Those who took sleep medication in the previous 7 days reported worse sleep quality and more sleep difficulties. Only 33% of them described their sleep as good or very good compared with 58% of those who never took sleep medication (p<.0001). Over half (66%) of those who took sleep medication had a sleep difficulty compared with 42% of those who never took sleep medication (p<.0001).

- Among the respondents who did not have chronic pain, those who took sleep medications reported less sleep on free days (7.3 vs 7.8 hours, p=.008), but sleep duration on work days did not differ. Perceived sleep debt on free days also differed significantly: those who took sleep medications were sleeping only 4 minutes more than what they felt they need compared with 30 minutes extra sleep in those who did not take sleep medications (p=.005). Those who took sleep medication also reported worse sleep quality and more sleep difficulties. Only 36% of those who took sleep medication described their sleep as good or very good compared with 61% of those who never took medication (p<.0001). 63% of those who took sleep medication had difficulty sleeping in the past 7 days compared with 39% of those who never took sleep medication (p=.0001).

- Among only the respondents with chronic pain, those who used a sleep medication in the past 7 days were less likely to report good or very good sleep quality than those with chronic pain who did not take sleep medication (23% vs 43%, p<.01). Sleep duration and perceived sleep debt did not differ between those with chronic pain who used sleep medication and those with chronic pain who did not (all p>.01).

Detailed Findings: Pain Catastrophizing

Respondents were also asked to think about the last time they were in physical pain and indicate the degree to which they had certain thoughts and feelings about the pain. 46-52% reported that the thoughts and feelings did not apply to them at all. These 3 questions were then summed to create a "pain catastrophizing" score which ranged from 3-15 and mean was 5.7.



- Those in the highest third of the pain catastrophizing score reported less sleep. Average sleep duration averaged across the week was 6.9 hours for the highest third, 7.0 hours for those in the middle third, and 7.2 hours for those in the lowest third (p=.01).

- Those in the highest third of the pain catastrophizing score also had lower sleep efficiency (86%) than those in the bottom third (91%) or middle third (89%) (p=.003) and they had a higher sleep disturbance score (22.8) compared with those in the bottom third (18.1) or middle third (20.4) (p<.0001).

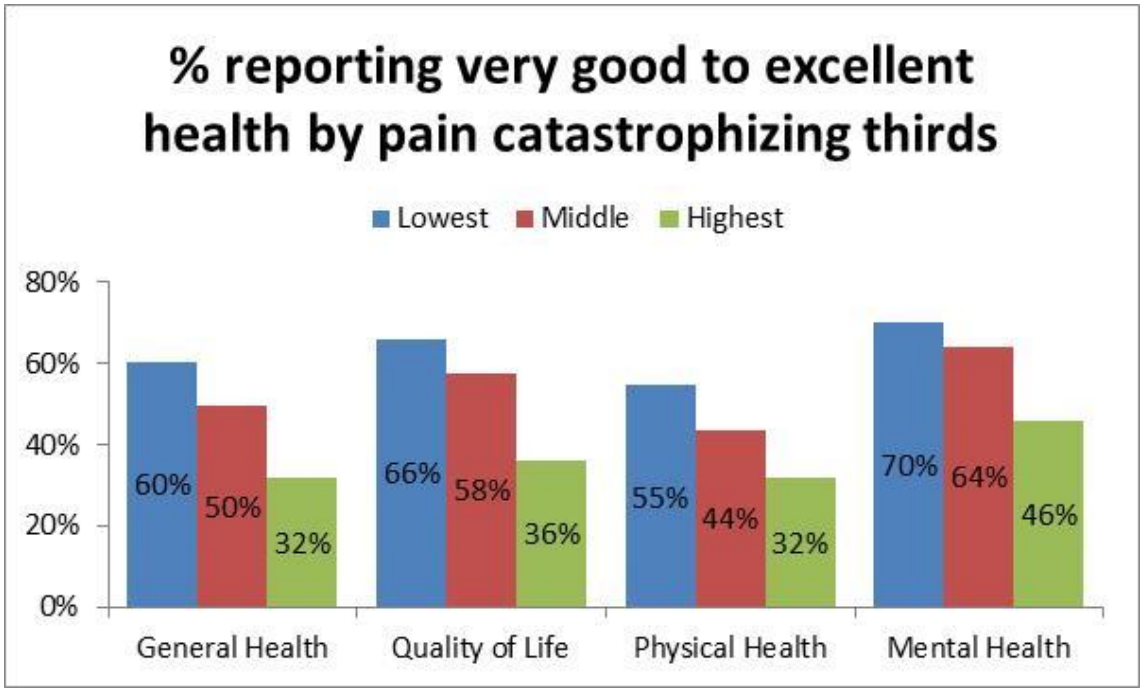
- Over half of those in the highest third (57%) and middle third (51%) of the pain catastrophizing score reported poor to fair sleep quality compared with 37% of those in the bottom third (p<.0001).

Detailed Findings: Pain Catastrophizing (continued)

- Perceived sleep debt was also greater among those in the highest third of the pain catastrophizing score (38 minutes on work days and 1 minute on free days) compared with 14 minutes on work days and -32 minutes on free days in the bottom third and 28 minutes on work days and -19 minutes on free days in the middle third ($p<.004$ for both work and free days).

- Health was lowest among those with the highest pain catastrophizing (Figure X). Global health scores were also lower: mean scores were 13 points for the highest third, 14 points for those in the middle third, and 15 points for those in the lowest third ($p<.0001$).

- Among only those with chronic pain, similar patterns were observed. Those with greater pain catastrophizing scores had shorter sleep durations, greater sleep debt and worse sleep quality.



2015 *Sleep in America*® Poll

Survey Instrument and Topline Data

Survey Instrument and Topline Data

NATIONAL SLEEP FOUNDATION SLEEP INDEX SURVEY
TOPLINE RESULTS
SLEEP TIMES NOT REPORTED
January 29, 2015

N=1,029 national adults age 18+
Margin of Error: plus or minus 3.3 percentage points
Design Effect: 1.1830
Interviewing dates: December 5-12, 2014
Interviewing: English and Spanish

NOTES: An asterisk indicates less than.05. Percentages are rounded and may not add to 100%

This survey for the National Sleep Foundation is about the health and well-being of the American public. We really appreciate your help because it's important to hear from all kinds of people in this survey.

Overall Health

Q1A. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor	Refused
10	37	38	11	3	1
	NET: 48			NET: 13	

Q1B. In general, would you say your quality of life is:

Excellent	Very good	Good	Fair	Poor	Refused
13	41	33	10	2	1
	NET: 54			NET: 12	

Q1C. In general, how would you rate your physical health?

Excellent	Very good	Good	Fair	Poor	Refused
9	35	39	13	3	1
	NET: 44			NET: 16	

Q1D. In general, how would you rate your mental health, including your mood and your ability to think?

Excellent	Very good	Good	Fair	Poor	Refused
23	37	29	8	1	1
	NET: 60			NET: 10	

Sleep Questions

Now we have several questions about your sleep behavior, including times you typically go to bed and wake up and how much actual sleep you think you get.

The following questions concern your typical behavior on work days or weekdays.

Please tell us what time you typically...

Q2A. **Go to bed** on work days or weekdays?
Mean (95% CI): 10:59 PM (10:49 PM, 11:08 PM)
Q2B. **Wake up** on work days or weekdays?
Mean (95% CI): 7:04 AM (6:52 AM, 7:16 AM)

The following questions concern your typical behavior on non-work days or weekends.

Please tell us what time you typically...

Q3A. **Go to bed** on non-work days or weekends?
Mean (95% CI): 11:16 PM (11:17 PM, 11:35 PM)
Q3B. **Wake up** on non-work days or weekends?
Mean (95% CI): 8:12 AM (8:03 AM, 8:21 AM)

Considering that someone may or may not fall asleep as soon as they go to bed or may wake up during the night, about how much actual sleep would you estimate you typically get...

Q6A. On work nights or weeknights?
Mean (95% CI): 6.9 (6.8, 7.0) hours
Q6B. On non-work nights or weekend nights:
Mean (95% CI): 7.6 (7.5, 7.7) hours

Q7. About how much sleep do you think you need, at a minimum, to be at your best during the day?
Mean (95% CI): 7.3 (7.2, 7.4) hours

Survey Instrument and Topline Data

Q8. Thinking now about your sleep in the past 7 days, would you say...

		Not at All	A little bit	Somewhat	Quite a bit	Very much	Refused
a.	I was satisfied with my sleep	10	14	34	27	15	0
		NET: 24			NET: 42		
b.	My sleep was refreshing	10	16	34	28	12	0
		NET: 26			NET: 40		
c.	My sleep was restless	24	32	26	12	6	0
		NET: 56			NET: 18		
d.	I had difficulty falling asleep	41	27	17	9	6	0
		NET: 69			NET: 15		

Q9. In the past 7 days, would you say...

		Never	Rarely	Sometimes	Often	Always	Refused
a.	I got enough sleep	5	12	35	33	14	0
		NET: 17			NET: 48		
b.	I had trouble sleeping	17	35	30	13	4	0
		NET: 52			NET: 17		
c.	I had trouble staying asleep	20	33	28	14	5	0
		NET: 53			NET: 20		

Q10. In the past 7 days, would you say...

		Very poor	Poor	Fair	Good	Very good	Refused
a.	My sleep quality was	3	10	36	38	14	0
		NET: 13			NET: 52		

Q11. [IF AT LEAST SOME SLEEP PROBLEMS IN ANY ITEM IN Q8 OR Q9 OR AT LEAST POOR SLEEP QUALITY IN Q10] You indicated that you've had difficulty with some aspect of your sleep in the past 7 days. For about how long have you had this difficulty?

Less than 1 month	At least 1 month but less than 3 months	At least 3 months but less than 6 months	At least 6 months but less than 1 year	1 year or more	Refused
29	8	10	9	43	1
NET: 37			NET: 52		

Q11a. [IF AT LEAST SOME SLEEP PROBLEMS IN ANY ITEM IN Q8 OR Q9 OR AT LEAST POOR SLEEP QUALITY IN Q10] In general when you have difficulty sleeping, how much does it interfere with your...

		A great deal	Quite a bit	Not that much	Not at all	Refused
a.	Mood	8	27	49	16	*
		NET: 34		NET: 65		
b.	Day-to-day activities	5	22	56	17	*
		NET: 27		NET: 73		
c.	Enjoyment of life	6	21	51	22	*
		NET: 28		NET: 72		
d.	Relationships with other people	6	17	53	24	0
		NET: 23		NET: 77		
e.	Ability to do work, chores, child care, or other duties	5	23	49	23	0
		NET: 28		NET: 72		

Survey Instrument and Topline Data

Q12. In the past 7 days, how often did you...

		Never	Once or twice	Several days/nights	Every night	Refused
a.	Take medication for pain (including prescription, over the counter, or herbal remedies)?	60	21	11	8	*
				NET: 40		
b.	Take non-pain medication for sleep (including prescription, over the counter, herbal remedies or melatonin)?	76	10	6	7	*
				NET: 23		

Q13. In the past 7 days, how would you rate ...

		None	Mild	Moderate	Severe	Very severe	Refused
a.	Your fatigue on average?	20	42	32	5	1	*
		NET: 61			NET: 7		
b.	Your stress level on average?	17	39	31	9	3	*
		NET: 56			NET: 12		

Q14. For the following questions, please indicate how often these things happen to you in general. How often do you...

		Never	Rarely	Sometimes	Often	Always	Refused
a.	Get a good night's sleep?	3	10	32	44	10	*
		NET: 13			NET: 54		
b.	Get enough sleep to feel your best the next day?	2	13	34	42	10	0
		NET: 15			NET: 51		
c.	Have control over when and how much you sleep?	6	15	27	34	19	*
		NET: 20			NET: 53		
d.	Worry about getting a good night's sleep?	24	37	24	9	5	*
		NET: 61			NET: 14		
e.	Get overwhelmed by your thoughts when trying to sleep at night?	17	33	32	13	5	0
		NET: 50			NET: 18		

Q14a. How often do health problems make it difficult for you to get a good night's sleep?

Never	Rarely	Sometimes	Often	Always	Refused
29	40	20	7	3	*
NET : 69			NET: 10		

Q15. In general, how often does each of the following make it more difficult for you to get a good night's sleep?

		Never	Rarely	Sometimes	Often	Always	Refused
a.	Outside noise (ex: street noise, sirens)	44	36	16	2	1	*
		NET: 80			NET: 4		
b.	Inside noise (ex: television, other people, snoring)	41	33	18	6	2	*
		NET: 73			NET: 8		
c.	Light (from either inside or outside)	48	32	15	3	2	*
		NET: 80			NET: 5		
d.	Temperature (too hot or too cold)	23	35	33	6	3	*
		NET: 58			NET: 9		
e.	Uncomfortable mattress	44	29	17	6	4	*
		NET: 73			NET: 10		

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Q16. In general, how motivated are you to make sure you have enough time to sleep?

Extremely motivated	Very motivated	Somewhat Motivated	Not that motivated	Not motivated at all	Refused
12	36	40	10	2	1
NET: 48			NET: 12		

Q17. In general, how important a part of your routine is going to bed at a suitable time?

Extremely important	Very important	Somewhat important	Not that important	Not important at all	Refused
11	40	31	13	3	1
NET: 51			NET: 16		

Q18. In general, are you able to tell when you are sleepy?

Extremely able	Very able	Somewhat able	Not that able	Not able at all	Refused
28	55	14	1	1	1
NET: 83			NET: 3		

Q19. How concerned are you that poor sleep may have serious consequences for your physical health?

Extremely concerned	Very concerned	Somewhat concerned	Not that concerned	Not concerned at all	Refused
8	22	37	24	9	1
NET: 30			NET: 33		

Q20. How often would you say you have seen information about sleep problems on TV or the Internet in the past year?

Frequently	Occasionally	Rarely	Never	Refused
15	42	27	15	1
Net: 57		Net: 42		

Q21. How often would you say you have discussed your sleep with a doctor or medical professional in the past year?

Frequently	Occasionally	Rarely	Never	Refused
3	12	16	69	1
Net: 15		Net: 85		

Q22. Have you ever been told by a doctor that you have a sleep disorder?

Yes	No	Refused
9	90	*

Q23. [IF EVER DIAGNOSED WITH A SLEEP DISORDER] Have you been diagnosed with...

		Yes	No	Refused
a.	Sleep apnea	71	28	1
b.	Insomnia	24	72	4
c.	Other sleep disorder	12	84	4

Pain Questions

At some point in their lives, everyone experiences physically painful situations, such as headaches, tooth pain, joint or muscle pain. People might have illnesses, injuries, dental procedures or surgeries. Some experience chronic, recurrent or long-lasting pain.

Q24. In general when you have pain, how much does it interfere with your...

		A great deal	Quite a bit	Not that much	Not at all	Refused
a.	Mood	9	32	45	14	1
		NET: 41		NET: 59		
b.	Day-to-day activities	8	30	47	13	1

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		NET: 39		NET: 60			
c.	Enjoyment of life	10	33	41	15	1	
		NET: 43		NET: 57			
d.	Relationships with other people	6	19	54	21	1	
		NET: 25		NET: 74			
e.	Ability to do work, chores, child care, or other duties	9	30	45	16	1	
		NET: 39		NET: 61			
f.	Sleep	10	31	45	14	1	
		NET: 41		NET: 59			

Q25. Now, in thinking about any physical pain you have experienced in the past seven days...

		No pain	Mild	Moderate	Severe	Very severe	Refused
a.	How intense was your pain at its worst?	39	23	23	10	4	1
		NET: 62			NET: 14		1
b.	How intense was your average pain?	40	30	24	4	1	1
		NET: 70			NET: 5		1
c.	What is your level of pain right now?	64	20	13	3	1	1
		NET: 83			NET: 3		1

Q25_A2. [IF NOT "NO PAIN" in Q25 a and b] Still thinking about the physical pain you experienced in the past 7 days. At its WORST, how would you rate it on a scale of 0 to 10, with 0 being no pain and 10 being the worst pain you can imagine?

0	1	2	3	4	5	6	7	8	9	10	Refused
1	9	12	13	9	14	13	13	9	3	4	1

Q26. [IF NOT "NO PAIN" in Q25 a and b] Would you consider the pain you've experienced in the past 7 days to be chronic, recurrent or long-lasting pain, or only aches and pains that are fleeting and minor?

Chronic pain	Only fleeting and minor pain	Refused
36	62	1

Q27. [IF CHRONIC PAIN, Q26] How long have you experienced this chronic, recurrent or long-lasting pain?

Less than 1 month	At least 1 month but less than 3 months	At least 3 months but less than 6 months	At least 6 months but less than 1 year	1 year or more	Refused
4	2	8	8	78	0
NET: 6			NET: 86		

Q28. [IF CHRONIC PAIN, Q26] Please tell us all locations where you experience chronic pain. Do you experience this pain in your:

		Yes	No	Refused
a.	Head (including throat, jaw or mouth)	24	68	8
b.	Shoulder or neck	64	32	4
c.	Back (upper or lower)	70	26	4
d.	Left arm, hand or wrist	24	68	7
e.	Right arm, hand or wrist	28	64	8

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f.	Left leg, knee, foot or ankle	43	53	4
g.	Right leg, knee, foot or ankle	44	51	5
h.	Hip/buttocks	37	55	8
i.	Chest/breast	6	84	10
j.	Stomach/abdomen	20	74	7
k.	Other location	8	78	14

Q29. [IF CHRONIC PAIN Q26 AND AT LEAST SOME SLEEP PROBLEMS IN ANY ITEM IN Q8 OR Q9 OR POOR SLEEP QUALITY IN Q10] Your answers suggest that you have experienced problems with both sleep and physical pain. To the best of your recollection, did you start to experience sleep problems before or after you started dealing with chronic, recurrent or long-lasting pain?

Sleep problems started before pain	Sleep problems started after pain	Both started about the same time	Don't recall	Refused
28	32	13	26	1

Catastrophizing Pain Instrument

Q30. Thinking about the last time you were in physical pain, use the following scale to indicate the degree to which you had these thoughts and feelings when you were experiencing the pain.

		Not at all	To a slight degree	To a moderate degree	To a great degree	All the time	Refused
a.	I felt like I couldn't stand the pain.	46	26	16	8	3	1
		NET: 73			11		
b.	I felt like the pain was never going to get any better.	52	23	14	7	2	1
		NET: 75			NET: 10		
c.	I couldn't stop thinking about how much it hurt.	46	27	16	7	3	1
		NET: 73			NET: 10		

Q31. Based on all the things you do to cope or deal with physical pain in general, how much control do you feel you have over pain:

A lot of control	Some control	Not much control	No control at all	Refused
26	54	14	4	1
NET: 80		NET: 19		

Demographic Questions

Please enter your date of birth. (Categorical)

18-34	35-54	55-64	65 or older
29	35	19	17

What is the highest level of school you have completed? (Categorical)

Less than high school	High school	Some college	Bachelor's degree or higher
12	30	29	29

Please check one or more categories below to indicate what race(s) you consider yourself to be. (Categorical)

White, Non-Hispanic	Black, Non-Hispanic	Other, Non-Hispanic	Hispanic	2+ Races, Non-Hispanic
65	12	6	15	1

What is your gender?

Male	Female
48	52

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Is your residence in...

Someone else's name only	Your name only or Your name with someone else's name
24	76

Including yourself, how many people currently live in your household at least 50% of the time?

1	2	3	4	5	6	7 or more
17	35	19	16	7	3	3

Which best describes the building where you live?

A one family house detached from any other house	A one family house attached to one or more houses	A building with 2 or more apartments	A mobile home	Boat, RV, van, etc.
70	8	17	5	0

We would like to get a better estimate of your total Household income in the past 12 months before taxes. Was it...

Less than $25,000	$25,000 to $49,999	$50,000 to $74,999	$75,000 or more
18	22	18	41

Are you now married, widowed, divorced, separated, never married, or living with a partner?

Married	Widowed	Divorced	Separated	Never married	Living with partner
55	5	9	1	22	8

Metro status (from ZIP code):

Non-Metro	Metro
16	84

In which state do you live? (Categorical)

Northeast	Midwest	South	West
18	21	37	23

Are your living quarters. . .

Owned or being bought by you or someone in your household	Rented for cash	Occupied without payment of cash rent
70	26	3

How many children currently live in your household at least 50% of the time?

0	1	2	3 or more
67	14	13	6

Which statement best describes your current employment status?

Working – as a paid employee	Working – self-employment	Not working – on temporary layoff from a job	Not working – looking for work	Not working – retired	Not working – disabled	Not working – other
50	6	1	9	19	6	10

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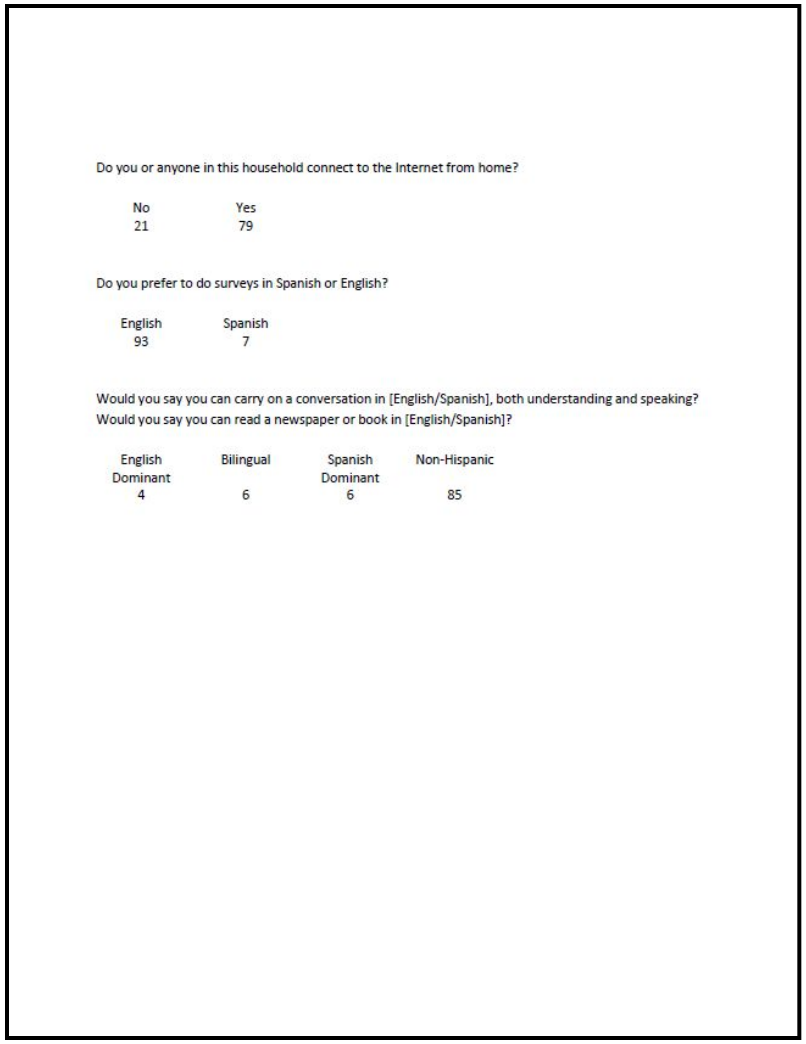

Do you or anyone in this household connect to the Internet from home?

No	Yes
21	79

Do you prefer to do surveys in Spanish or English?

English	Spanish
93	7

Would you say you can carry on a conversation in [English/Spanish], both understanding and speaking?
Would you say you can read a newspaper or book in [English/Spanish]?

English Dominant	Bilingual	Spanish Dominant	Non-Hispanic
4	6	6	85

Appendix – Derived Variables

The following variables were derived using the survey questions:

Global Health Score

- A global health score was calculated using the responses to four health questions:
  - Q1A. In general, would you say your health is:
  - Q1B. In general, would you say your quality of life is:
  - Q1C. In general, how would you rate your physical health?
  - Q1d. In general, how would you rate your mental health, including your mood and your ability to think?
- Response choices to these questions were "excellent" (=5), "very good" (=4), "good" (=3), "fair" (=2) and "poor" (=1). The global health score was a sum of all 4 questions.

Time in Bed

Time in bed was calculated using the interval between bedtime and wake time on workdays (Question 2) and free days (Question 3).

Sleep Efficiency

Sleep efficiency is a commonly-used marker of sleep quality. It is calculated by dividing the actual sleep duration by the time spent in bed. Separate sleep efficiency values were calculated for work days and free days. A weekly average was also calculated (see "weekly averages").

Appendix – Derived Variables (continued)

Weekly Averages of Sleep Variables

For many of the sleep questions, respondents were asked to report on work days (or weekdays if not working) and free days (or weekends) separately. To create a weekly average the following formula was used:

[(work day value X 5) + (free day value X 2)] / 7

Weekly averages were calculated for:

- Time in bed
- Sleep Duration
- Perceived Sleep Debt
- Sleep Efficiency

Perceived Sleep Debt

Perceived sleep debt was calculated using this formula: Preferred sleep duration – Actual sleep duration. Separate sleep debt values were calculated for work days and free days. A weekly average was also calculated (see "weekly averages").

Sleep Disturbance Scale

The NIH PROMIS Sleep Disturbance scale (short Form 8b) was used (available at http://www.nihpromis.org/). This scale includes 8 questions about sleep (Questions 8, 9 and 10 in the Sleep In America Poll, see below). Responses were coded 1 through 5. Positively-framed questions were reverse coded and then summed. Final scores can range from 8 to 40 and higher scores indicate greater sleep disturbance.

Appendix – Derived Variables (continued)

Sleep Difficulties

Sleep Difficulties was a dichotomous variable (yes or no) based on the NIH PROMIS Sleep Disturbance scale. A person was described as having a sleep difficulty if they indicated a problem on any one of the 8 questions below:

Question	Responses indicating difficulty/problem
Q8A: Thinking now about your sleep in the past 7 days, would you say... I was satisfied with my sleep	Not at all or A little bit
Q8B: Thinking now about your sleep in the past 7 days, would you say... My sleep was refreshing	Not at all or A little bit
Q8C: Thinking now about your sleep in the past 7 days, would you say... My sleep was restless	Quite a bit or Very much
Q8D:Thinking now about your sleep in the past 7 days, would you say... I had difficulty falling asleep	Quite a bit or Very much
Q9A: In the past 7 days, would you say… I got enough sleep	Never or Rarely
Q9B: In the past 7 days, would you say… I had trouble sleeping	Often or Always
Q9C: In the past 7 days, would you say… I had trouble staying asleep	Often or Always
Q10. In the past 7 days, would you say…My sleep quality was	Very poor or Poor

Appendix – Derived Variables (continued)

Pain Intensity Score

The NIH PROMIS Pain Intensity (Short Form 3a, available at http://www.nihpromis.org/) instrument was used (Question 25 in Sleep In America Poll):

- Q25A. How intense was your pain at its worst?
- Q25B. How intense was your average pain?
- Q25C. What is your level of pain right now?

The 3 questions had the following responses: No pain, Mild, Moderate, Severe, Very severe, which were coded 1 to 5. A final score was created by summing the 3 responses. Scores can range from 3 to 15 and higher scores indicate greater pain intensity.

Pain Catastrophizing

Question 30 asked respondents to think about the last time they were in physical pain and indicate the degree to which they had certain thoughts and feelings when they were experiencing the pain. The thoughts/feelings were:

- Q30A. I felt like I couldn't stand the pain.
- Q30B. I felt like the pain was never going to get any better.
- Q30C. I couldn't stop thinking about how much it hurt.

Responses were: Not at all, To a slight degree, To a moderate degree, To a great degree, All the time. Responses were coded 1 (not at all) to 5 (all the time). These 3 questions were then summed. Scores ranged from 3 to 15.