INTRODUCTION

Prior studies have found that 16% of the general population have reported difficulty returning to sleep after a nocturnal awakening at least three times per week.1 Despite the prevalence, it is unclear the extent to which those who experience this symptom of middle-of-the-night (MOTN) awakening consider it as a sleep condition and receive a diagnosis.

OBJECTIVE

To investigate the level of attribution of the impact of MOTN awakening to its general treatment patterns.

METHODS

Data source

The 2011 US National Health and Wellness Survey (NHWS) dataset was used for this study (N=75,000).

The NHWS is a cross-sectional, Internet survey given to a sample of adults (18 years and older) who were identified through a web-based panel. Invitations to participate in the NHWS were sent using a random stratified sampling framework to ensure the final sample of NHWS participants is representative of the adult population in the US.

Sample

Because of the potential for outliers, respondents who had been diagnosed with cancer or HIV/AIDS were excluded from all analyses (n=6,644) leaving a total analytical sample size of N=68,356.

Measures

MOTN awakening. Respondents who reported that they regularly experienced “waking during the night and not being able to get back to sleep” were considered to have MOTN awakening. All others were considered part of the control group.

• Respondents who reported they had experienced sleep apnea or had been diagnosed with sleep-disordered breathing were placed in the control group regardless of whether they reported MOTN awakening.
• The control group included those with other sleep symptoms such as difficulty initiating sleep but did not also endorse MOTN awakenings.
• Additional analyses focused on those with MOTN awakening as their only sleep symptom.

Attribution. Respondents were also asked whether they considered themselves to have insomnia or sleep difficulties (yes or no) and, if they responded yes, whether they were diagnosed by a physician.

• “Only Symptomatic” (OS) was used to refer to patients with insomnia/sleep symptoms but who did not report having insomnia/sleep difficulties.
• “Aware but Undiagnosed” (AU) was used to refer to respondents with symptoms who reported they had insomnia/sleep difficulties but reported not being diagnosed.

• “Diagnosed” was used to refer to respondents with symptoms who had been diagnosed with insomnia/sleep difficulties by a physician. The particular sleep problem associated with the diagnosis was not able to be determined by the survey methodology.

Other sleep symptoms. Besides MOTN awakening, other regularly experienced sleep symptoms were assessed including “difficulty falling asleep”, “poor quality of sleep”, “waking up several times during the night”, and “waking up too early”.

Treatment pattern. Among those who reported having either insomnia or sleep difficulties, current and prior use of a prescription medication, prior recommendation of a prescription medication by a physician, and current use of an over-the-counter [OTC] medication were assessed.

Sociodemographics and health history. Age, race/ethnicity, gender, marital status, education, annual household income, body mass index (BMI), alcohol consumption, exercise behavior, smoking status and the Charlson comorbidity index (CCI) were assessed.

Statistical analysis

Among those with different levels of attribution of their MOTN awakening representing a sleep condition (those diagnosed vs. AU vs. OS vs. those without MOTN awakening), comparisons were made with respect to sociodemographics and health history using chi-square and one-way ANOVA tests.

The analyses above were replicated for those respondents with MOTN awakening as their only sleep symptom.

RESULTS

Among those with MOTN awakening regardless of other sleep symptoms (n=14,021), 40.50% were Only Symptomatic, 29.99% were Aware but Undiagnosed, and 29.51% were diagnosed with a sleep disorder.

All MOTN awakening groups were more likely to be female (63.1% to 55.7%) and non-Hispanic white (72.6% to 75.1%) compared with non-MOTN awakening controls (48.7% and 70.1%, respectively; both p<.05; see Table 1). Those undiagnosed had the highest rates of being uninsured (22.5%). The comorbidity burden was highest among those who reported MOTN awakening (Mean = 0.53).

Table 1. Sociodemographic and health history differences among those of varying levels of attribution of their MOTN awakening as associated with a sleep condition.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No MOTN Awakening (n=43,462)</th>
<th>Only Symptomatic (OS) (n=4,603)</th>
<th>Aware but Undiagnosed (AU) (n=6,197)</th>
<th>Diagnosed (n=6,197)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>56.6 ± 17.9</td>
<td>57.8 ± 17.2</td>
<td>57.3 ± 17.5</td>
<td>57.3 ± 17.2</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>52.3%</td>
<td>52.1%</td>
<td>52.2%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Smoking behavior</td>
<td>Current smoker (%)</td>
<td>16.7%</td>
<td>13.4%</td>
<td>17.5%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>Do not drink (%)</td>
<td>96.6%</td>
<td>97.7%</td>
<td>98.6%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Charlson comorbidity index</td>
<td>Mean ± SD</td>
<td>0.53 ± 0.62</td>
<td>0.53 ± 0.62</td>
<td>0.53 ± 0.62</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

DISCLOSURE STATEMENT

Approximately 40% of those who experience MOTN awakening are neither diagnosed nor do they even consider themselves to have insomnia or sleep difficulties. Only 30% are diagnosed.

• Numbers are even larger when focusing on respondents with only MOTN awakening and no other sleep symptoms.
• Most respondents who endorse symptoms as problems were not currently using any form of treatment and, even among those who are diagnosed, a third remain untreated.

LIMITATIONS

Diagnosis of sleep condition was only assessed from a patient perspective and not confirmed through objective means.

The NHWS is broadly representative of the adult US population but the specific MOTN awakening subsample may differ in meaningful ways from the MOTN awakening population.

REFERENCES


DISCLOSURE STATEMENT

This study was funded by Purdue Pharma L.P.