

The Burden Myasthenia Gravis Patients Experience in Fatigue, Sleep, and Mental Health Compared to the General Population

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BACKGROUND

- Myasthenia Gravis (MG) a rare, chronic autoimmune disease marked by extensive muscular weakness.
- MG patients suffer from a variable combination of ocular, bulbar, respiratory, axial and limb muscle weakness.
- Besides physical impairments, a high prevalence of mood disorders such as anxiety and depression, has been found in MG.
- This analysis uncovers the problems MG patients experience regarding fatigue, sleep and mental health, and compare the extent and the severity of these problems with the general population.

METHODS

Study design & Data sets

- The study utilizes data from two digital, prospective, international, observational studies: MyRealWorld-MG (MRW) among MG patients and POPUP among the general population.

MyRealWorld-MG (MRW)

- The MRW study explored the impact of MG in the real world from the patient perspective.
- The study was conducted in the US, UK, Canada, Japan, France, Germany, Italy, Spain, and Denmark.
- MRW collected data on demographics, disease characteristics, the EQ-5D-5L, the Hospital Anxiety and Depression Survey (HADS), PROMIS-Sleep Disturbance Short Form 6a, and the FACIT-Fatigue Scale v4.

Comparator data

- Comparison with PROMIS sleep was based on US population norms data, and for FACIT Fatigue on German population norms¹. Comparison for the HADS was based on a digital observational study (POPUP):

General Population Norms (POPUP)

- POPUP established reference data in 8 countries: US, UK, Canada, Belgium, Netherlands, Germany, Italy and Spain.
- Participants were representative of age, gender, education and region in each country

Outcomes

- HADS** has 7 items on anxiety (e.g., “I feel tense or wound up”, “Worrying thoughts go through my mind”,...) and 7 on depression (e.g., “I feel as if I’m slowed down”, “I have lost interest in my appearance”). Sum Scores for each domain range from 0-21 and are interpreted as 0-7 Normal, 8-10 Mild, 11-15 Moderate, 16-21 Severe.
- The **FACIT-Fatigue** is a PROM with 13 items, in which respondents need to score items such as: “I feel weak all over”, “I need to sleep during the day”, “I am too tired to eat”, “I have to limit my social activities because I am too tired”, scored on a 5-point scale (“Not at all” to “Very much”). A total sum score can be calculated ranging 0-52.
- The **PROMIS Sleep Disturbance** has 6 items on characteristics of sleep, such as: “My sleep was refreshing”, “I had difficulty falling asleep”, “My sleep was restless”, all scored on a 5-point scale (“Not at all” to “Very much”). The total sum score can be rescaled to a T-Score and compare with population norms.

Sample sizes

- In MRW, sample sizes differed substantially between outcomes as participants filled in the PROMs on their smartphones as and when presented to them.
- US general population data on the PROMIS sleep disturbance survey were based on US Census population; German population data on FACIT Fatigue N=2426, and POPUP enrolled N=9000 respondents completing the HADS.

Demographic Characteristics

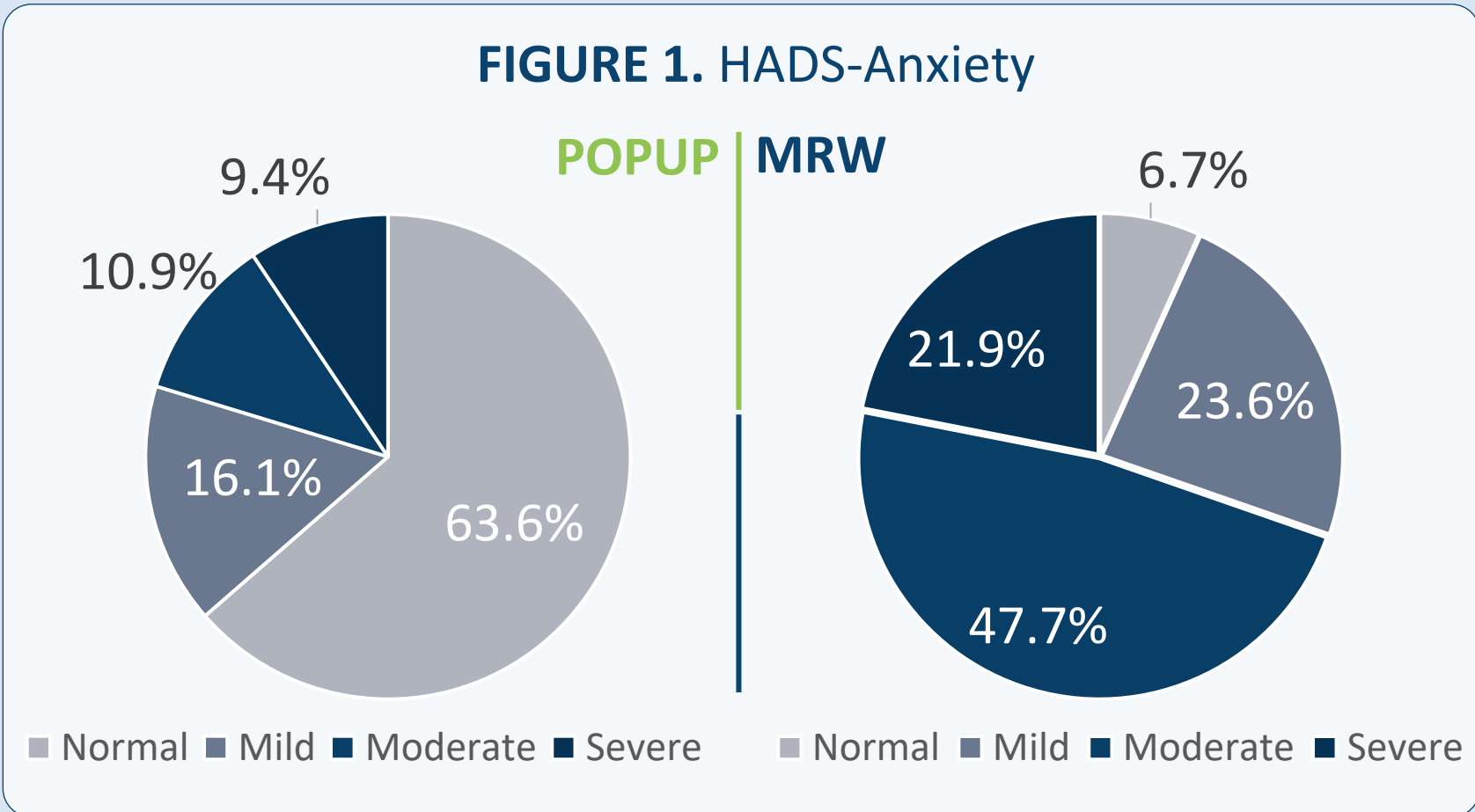
- MRW enrolled 2074 patients. 68.8% of them were female; 58.3% is suffering from moderate-to-severe MG (**Table 1**).

TABLE 1. MRW Patient characteristics	
	MRW
	N=2074
% Female	68.8%
Age Mean (SD)	49.9 (14.8)
Mild MG	41.7%
Moderate MG	39.6%
Severe MG	18.7%

RESULTS

Anxiety

- Ten times fewer respondents had **normal anxiety** levels (**Figure 1**) among MG patients compared to the general population from POPUP: **6.7% vs. 63.6%**.
- The proportion of respondents with **moderate anxiety** was over 4 times larger in MRW (47.7% vs. 10.9% and **severe anxiety** was twice as common (21.9% vs. 9.4%).
- Mean (SD) Anxiety score was 11.5 (2.4) vs. 6.4 (4.6) in POPUP.



Depression

- Over three times fewer respondents had **normal depression** levels (**Figure 1**) among MG patients compared to the general population from POPUP: **24.2%% vs. 84.0%**.
- The proportion of respondents with **moderate depression** was over 4 times larger in MRW.: 16.9% vs. 4.2%.
- Severe depression** was less common than severe anxiety, and less common in MRW compared to POPUP: 1.6% vs. 2.7%.
- Mean (SD) depression score was 8.9 (2.0) vs. 5.0 (4.1) in POPUP.

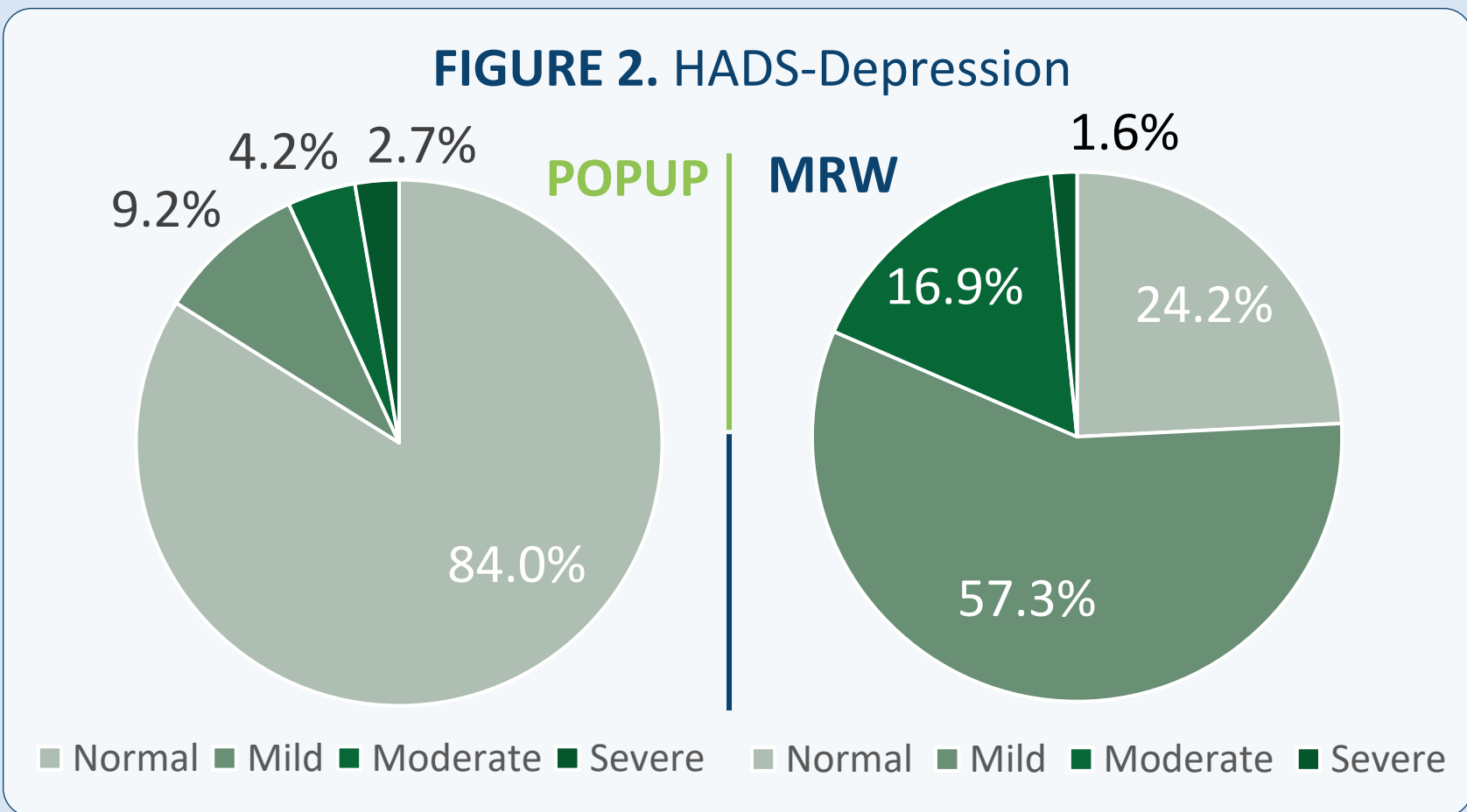


TABLE 2. PROMIS-10: Sleep disturbance		
	MRW	
	N=1159	
	My sleep was restless...	I had difficulty falling asleep...
Not at all	19%	30%
A little bit	30%	32%
Somewhat	27%	16%
Quite a bit	17%	15%
Very much	7%	8%

Sleep

- About a quarter of MG patients have a lot of difficulties falling asleep and have restless sleep (**Table 2**).
- MG patients had statistically (but not substantially) higher mean (SD) = 53.7 (8.1) PROMIS-Sleep Disturbance scores than the US population norms, for which mean (SD) = 50.0 (10.0)

TABLE 3. FACIT-Fatigue		
	Germany ¹	MRW
	N=2426	N=324
Mean (SD)	43.5 (8.3)	28.9 (11.5)

Fatigue

- In MRW, 40% of MG patients felt quite a bit or very much weak all over; and 59% needed quite a bit or very much sleep during the day. Furthermore, 57% felt very often too tired to eat. And 71% needed quite a bit or a lot of help carrying out usual activities.
- The FACIT-Fatigue total score was compared with a German population norms study with 2426 respondents. MG patients had substantially lower FACIT fatigue scores compared to the general population (**Table 3**), indicating that fatigue is problematic in this patient population.

KEY TAKEAWAYS



Many MG patients suffer from clinical anxiety and depression. Due to this high prevalence, screening for mental health issues among MG patients should be an important part of MG care.



Fatigue and sleep are distinct problems, and whilst MG patients do not have significantly more problems sleeping than the general population, fatigue is a real issue.

DISCUSSION

- Health care policy should consider the holistic impact of MG symptoms on patients' lives and address not only muscle weakness but also social, emotional, and mental health aspects.
- Screening for anxiety and depression is recommended to improve mental health issues in MG patients.
- Study limitations include potential selection bias in digital studies, over-representation of certain patient groups, and the use of compensation in the recruitment process.

CONCLUSIONS

- A significant burden was found among people suffering from MG in this HRQoL comparison with the general population.
- MG patients suffered particularly from anxiety, depression and fatigue. Sleeping problems were not markedly more common among MG patients than the general population.

ABBREVIATIONS

MG: Myasthenia Gravis, **MRW**: MyRealWorld-MG, **EQ-5D-5L**: EuroQoL 5-Dimension 5-Level, **HADS**: Hospital Anxiety and Depression Survey, **PROMIS**: Patient-Reported Outcomes Measurement Information System, **FACIT**-fatigue: Functional Assessment of Chronic Illness Therapy, **POPUP**: General Population Norms study **SD**: Standard deviation, **Q1/Q3**: First/Third quartile,

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