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# The Humanistic Burden of Rare Kidney Diseases: Understanding the Impact of Immunoglobulin A Nephropathy (IgAN) and Focal Segmental Glomerulosclerosis (FSGS) on Patients and Care-Partners Study (HONUS): Updated Results for IgAN in the United States (US)

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## BACKGROUND

- While immunoglobulin A nephropathy (IgAN) has been shown to be associated with clinical and economic burden, the humanistic burden is less understood.
- HONUS (**H**umanistic Burden **o**f Rare **N**ephrotic Diseases: **U**nderstanding the impact of FSGS and IgAN on Patients and Caregivers **S**tudy) is a multi-national, cross-sectional survey designed in consultation with IgAN and FSGS patients and clinical community members to quantify the humanistic burden of rare kidney diseases from both patient and caregiver (care-partner) perspectives.[1]
- The current analysis focused on a subset of IgAN adult patients and their care-partners in the United States (US) who participated in HONUS before May 1, 2023.

## OBJECTIVE

- To quantify the humanistic burden of IgAN adult patients in the US
- To understand the burden and impact of IgAN from the care-partner perspective

## METHODS

Adult patients and their care-partners were recruited from two patient advocacy groups (NephCure Kidney International and the IGA Nephropathy Foundation of America) and two medical centers (University of North Carolina Kidney Center and Kaiser Foundation Research Institute) in the US. The study and associated online survey was approved by the Pearl Institutional Review Board (IN, USA) and is Health Insurance Portability and Accountability Act (HIPPA) compliant.

### *Study Population*

Inclusion criteria

- Adult patients (i.e., ≥18 years old) and their paired adult care-partners in the US who had a self-reported physician-provided diagnosis of IgAN (with renal biopsy confirmation of the diagnosis), and were able to provide informed consent

Exclusion criteria

- IgAN secondary to another condition
- History of malignancy other than adequately treated basal cell or squamous cell skin cancer
- Co-existing glomerular disease (e.g., membranous nephropathy or lupus nephritis)
- Participation in a kidney disease clinical trial, and potentially have received active treatment as part of the trial at the time of recruitment

### *Study outcomes*

All patients and care-partners completed an online survey, with questions on demographic and clinical characteristics. The following data were also collected:

| Patient | Care-partner |
|---|---|
| ▪ KDQoL-36 (including SF-12) | ▪ SF-12 |
| ▪ GAD-7 | ▪ GAD-7 |
| ▪ PHQ-9 | ▪ PHQ-9 |
| ▪ Most burdensome symptoms | ▪ Fear and uncertainty for the future |
| ▪ Fear and uncertainty for the future | ▪ Productivity impairment: WPAI:SHP |
| ▪ Productivity impairment: WPAI:SHP | |

**Notes:** The Kidney Disease Quality of Life Instrument (KDQoL-36) is a short form questionnaire that includes the 12-Item Short Form Survey (SF-12) as generic core plus the burden of kidney disease, symptoms/problems of kidney disease, and effects of kidney disease scales from the KDQOL-SF™v1.3.[2] The SF-12 is a general health questionnaire that assesses the impact of health on everyday life.[3] The Generalized Anxiety Disorder Assessment (GAD-7) is a seven-item instrument that is used to measure or assess the severity of generalized anxiety disorder.[4] The Patient Health Questionnaire-9 (PHQ-9) is the 9-item depression module from the full PHQ and measures the severity of depression.[5] The Work Productivity and Activity Impairment Questionnaire: Specific Health Problem (WPAI:SHP).[6]

### *Analysis*

All outcomes were summarized descriptively. Continuous variables were summarized as mean, median, and standard deviation (SD); categorical variables were summarized as count and proportion.

## CONTACT INFORMATION

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## RESULTS

### *Demographics*

- 116 adult patients with IgAN and their care-partners in the US were included in this analysis (**Table 1**).
- The average age of patients was 37.8 (SD: 8.6) years and more than half were female (56.0%).
- The average age of the care-partners for IgAN patients was 40.1 (SD: 11.8) years, and more than half (56.0%) were male.
- Most of the care-partners were partners of the patients (87.9%), and the rest were friends (3.5%), parents (3.5%), other relatives (2.6%), siblings (1.7%), or children (0.9%) of the patients.

### *Patient Disease Characteristics*

- Patients had IgAN for an average of 6.3 (SD: 5.0) years (**Table 1**). The mean time from first symptoms to diagnosis was 2.7 (SD: 6.8) months, with a median of 0.3 months.
- Around one-third of patients were in CKD stage 1 or 2 (30.2%), 38.8% were in CKD stage 3, and 18.1% were in CKD stage 4. Eleven patients (9.5%) had progressed to renal failure and seven (6.0%) had received a kidney transplant. The most common comorbidities reported were hypertension (37.1%), anemia (26.7%) and depression (17.2%).

**Table 1. Demographics (patients and care-partners) and patient disease characteristics**

| | Patients (N=116) | Care-partners (N=116) |
|---|---|---|
| **Age** | | |
| Mean ± SD | 37.8 ± 8.6 | 40.1 ± 11.8 |
| Median | 36.0 | 38.0 |
| **Sex, n (%)** | | |
| Male | 50 (43.1%) | 65 (56.0%) |
| Female | 65 (56.0%) | 50 (43.1%) |
| Other/Unknown | 1 (0.9%) | 1 (0.9%) |
| **Race, n (%)** | | |
| Caucasian | 93 (80.2%) | 96 (82.8%) |
| African American | 8 (6.9%) | 9 (7.8%) |
| Hispanic | 5 (4.3%) | 5 (4.3%) |
| Asian and Pacific Islander | 9 (7.8%) | 8 (6.9%) |
| Native American | 1 (0.9%) | 0 (0.0%) |
| Other[1] | 1 (0.9%) | 2 (1.7%) |
| Prefer not to answer | 1 (0.9%) | 0 (0.0%) |
| **Time since diagnosis (years)** | | |
| Mean ± SD | 6.3 ± 5.0 | - |
| **Current CKD status** | | |
| Stage 1 | 9 (7.8) | - |
| Stage 2 | 26 (22.4) | - |
| Stage 3 | 45 (38.8) | - |
| Stage 4 | 21 (18.1) | - |
| Stage 5, dialysis | 3 (2.6) | - |
| Stage 5, no dialysis | 1 (0.9) | - |
| Transplant recipient | 7 (6.0%) | - |

**Note**: One patient indicated that they are 'Turkish' race. One caregiver indicated that they are 'multi-racial between White and Ashkenazi', and another caregiver indicated that they are 'Turkish' race.

**Table 2. HRQOL for patients and care-partners**

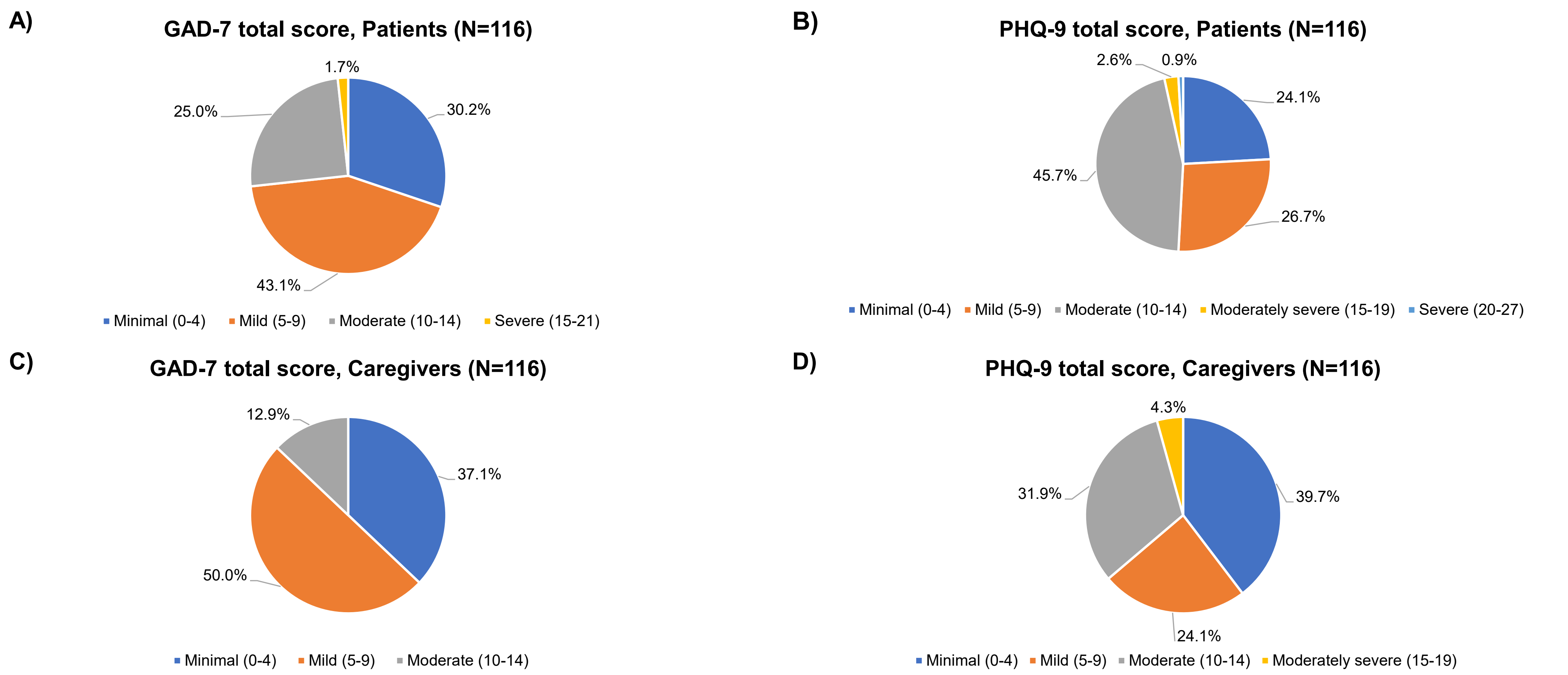
| | Patients (N = 116) | Care-partners (N=116) |
|---|---|---|
| **SF-12 PCS** | | |
| Mean ± SD | 46.8 ± 7.9 | 50.8 ± 7.1 |
| Median | 47.9 | 50.8 |
| **SF-12 MCS** | | |
| Mean ± SD | 41.9 ± 9.1 | 43.8 ± 10.2 |
| Median | 41.2 | 42.4 |

**Abbreviations**: HRQOL = Health-Related Quality of Life; MCS = mental component summary; PCS = physical component summary; SD = standard deviation; SF-12 = 12-item short form survey.

### *Health-Related Quality of Life*

- Mean (SD) SF-12 Physical and Mental Component Summary (PCS and MCS) scores for patients were 46.8 (7.9), 41.9 (9.1) and 50.8 (7.1), 43.8 (10.2) for care-partners, respectively **(Table 2)**, reflecting generally worse HRQoL (lower score) than previously published US general population mean scores (PCS and MCS of 50 [10]), with the exception of PCS for care-partners.[7]
- Moderate or severe anxiety was reported by 26.7% of patients (**Figure 1a**) and nearly half reported moderate to severe depression (49.2%) (**Figure 1b**). In care-partners, moderate anxiety was reported in 12.9% (**Figure 1c**) and more than a third (36.2%) reported moderate to moderately severe depression (**Figure 1d**).

**Figure 1: GAD-7 and PHQ-9 total scores**



**Abbreviations**: GAD-7 = general anxiety disorder-7; PHQ-9 = patient health questionnaire-9.

**Notes**: GAD-7 is calculated by assigning scores of 0, 1, 2, and 3 to the response categories, respectively, of "not at all," "several days," "more than half the days," and "nearly every day." GAD-7 total score for the seven items ranges from 0 to 21. 0–4 indicates minimal anxiety, 5–9 indicates mild anxiety, 10–14 indicates moderate anxiety and 15–21 indicates severe anxiety. The recall period is the past 2 weeks. PHQ-9 scores are calculated based on how frequently a person experiences these feelings. Each "not at all" response is scored as 0; each "several days" response is 1; each "more than half the days" response is 2; and each "nearly every day" response is 3. The sum value of these responses gives the total score. 0–4 indicates minimal depression, 5–9 indicates mild depression, 10–14 indicates moderate depression, 15–19 indicates moderately severe depression, and 20-27 indicates severe depression. The recall period is the past 2 weeks.

### *Most Burdensome Symptoms and Fear of the Future*

- The three most burdensome symptoms for patients overall were lower back pain, constipation, and bone or joint pain **(Figure 2)**.
- Most patients (96.6%) reported feeling fear and uncertainty for the future due to their disease, of which 49.1% reported the frequency of fear and uncertainty to be 'often'.
- Almost all care-partners (99.1%) reported feeling fear and uncertainty for the future due to the disease of their cared ones, of which 41.7% reported the frequency of this worry to be 'often' or 'always'.

### *Work Productivity*

- Approximately three quarters of patients (74%) and almost all care-partners (94%) were employed with similar levels of absenteeism, presenteeism, overall work impairment and activity impairment **(Table 3)**.

**Figure 2. Most burdensome symptoms**

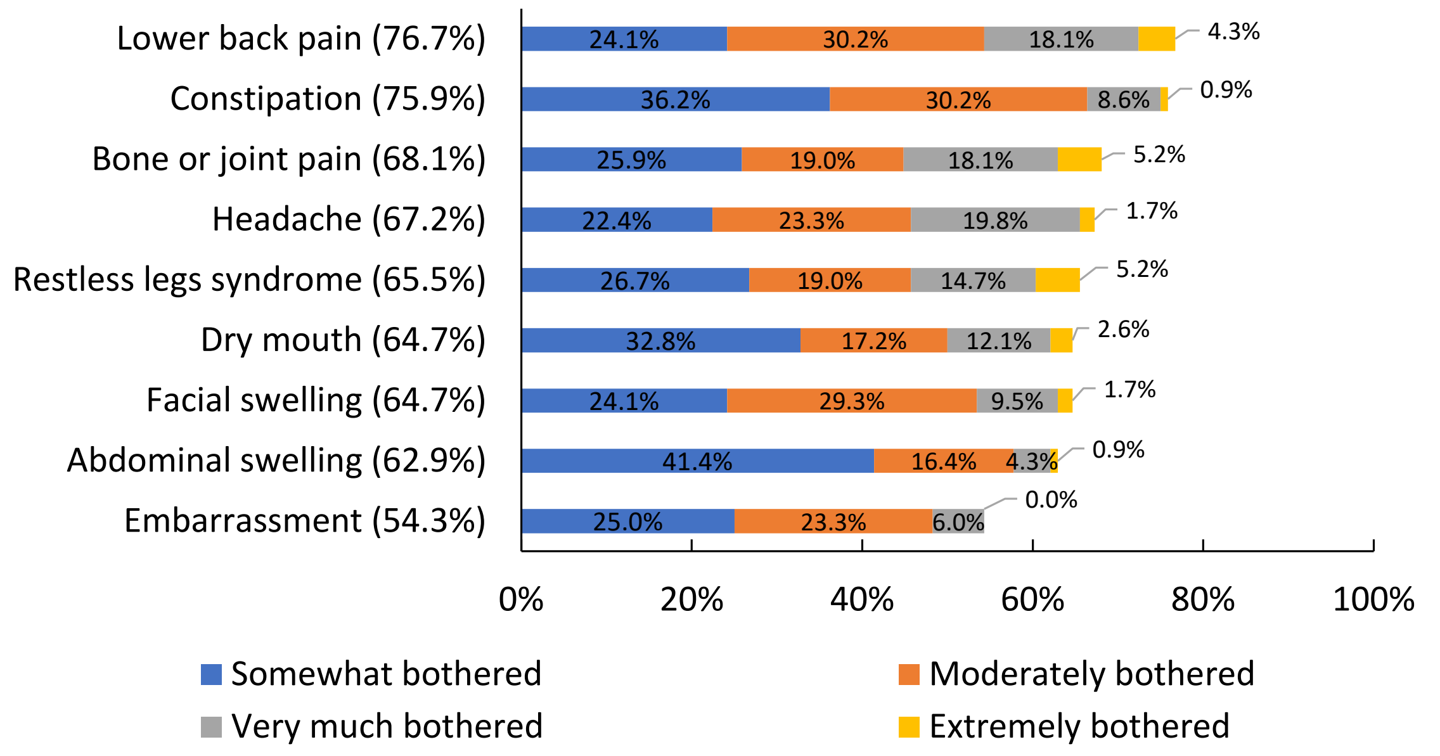


**Table 3. WPAI:SHP**

| | Patients (N = 116) | Care-partners (N = 116) |
|---|---|---|
| **Number of people working, N (%)** | 86 (74.1%) | 109 (94.0%) |
| **Percent absenteeism** | | |
| Mean ± SD | 8.2 ± 14.0 | 8.8 ± 14.9 |
| Median | 4.7 | 4.7 |
| **Percent presenteeism** | | |
| Mean ± SD | 25.4 ± 22.5 | 24.7 ± 23.1 |
| Median | 20.0 | 20.0 |
| **Percent overall work impairment** | | |
| Mean ± SD | 29.8 ± 24.6 | 29.9 ± 26.9 |
| Median | 30.0 | 25.9 |
| **Percent activity impairment** | | |
| Mean ± SD | 34.0 ± 24.2 | 28.8 ± 24.9 |
| Median | 30.0 | 30.0 |

**Abbreviations**: SD = standard deviation; WPAI:SHP = work productivity and activity impairment: specific health problem

**Notes**: Percent work time missed, impairment while working, and overall work impairment were assessed among respondents who were employed at the time of survey. Activity impairment was only assessed among respondents who were employed and worked >0 hrs in the past 7 days. The recall period is the past 7 days.

## LIMITATIONS

- Selection bias may exist as participants who voluntarily participated in the survey may differ from those who did not.
- The study relied on self-reported survey responses and could be subject to biases resulting from concerns common to all self-reported measures. Patients' self-reported diagnosis and disease history of IgAN may differ from a clinician's assessment.
- Lack of a control group and use of historical US general population estimates for reference.
- Participant responses may be confounded by the COVID-19 pandemic. This broader circumstance may impact socioeconomic status, accessibility of care, health outcomes, and HRQoL.

## CONCLUSIONS

- Adult patients with IgAN in the US experience impaired mental and physical health, depression, anxiety, and poor work productivity compared with the general US population. Care-partners for adult patients with IgAN are also affected in terms of their mental health and work productivity.
- Both patients with IgAN and their care-partners also report widespread fear and uncertainty for the future due to the disease.

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## DISCLOSURES

**JS, UF, DG, KG, KK-Z, KH, DR, BS, PS, KT:**

Received consultancy fees from Travere Therapeutics, Inc.

**BH:** Employee, Travere Therapeutics, Inc.

**MB:** Managing director of Benofit Consulting, which received consulting fees from Travere Therapeutics, Inc.

**NH, CX, JL, Z-YZ:** Employees of Analysis Group, which received consultancy fees from Travere Therapeutics, Inc.