Characterizing the Positive Experience Reported by Natalizumab-Treated Patients with Relapsing Multiple Sclerosis

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Discussion

- In this exploratory, qualitative interview study, concept elicitation identified improved energy as the characteristic most commonly associated with the natalizumab 'feel-good' experience. Improvements in emotional, social, and cognitive functioning were also commonly reported.
- Rankings of quality of life (QoL) characteristics and measures highlighted reduced fatigue and improved positive affect as most relevant to the feel-good experience.
  - These improvements may be associated with the improved ability to participate in social activities mentioned by the majority (56.5%) of patients.
- Further research is needed, as the study population was small and included only patients who received natalizumab and reported feeling good. In addition, as patients' characteristics at baseline were not evaluated, it is possible that those not reporting improvement may not have had a deficit at baseline.
- These results provide QoL characteristics to be considered when investigating components of the feel-good experience reported by some natalizumab-treated patients.

Introduction

- The efficacy of natalizumab in relapsing multiple sclerosis (RMS) has been demonstrated with traditional outcome measures, including relapse rates, disability worsening, and magnetic resonance imaging disease activity.[1]
- Treatment with natalizumab has also been associated with improvements in patient-centric outcomes, including cognition, fatigue, and health-related QoL.[2-6]
- Patients have also anecdotally reported a 'feel-good' experience on natalizumab. However, whether this feel-good experience is adequately captured by standard QoL surveys used in clinical research is not currently known.

Objectives

- To identify QoL concepts that may contribute to a natalizumab-associated feel-good experience.

Methods

- Participants were RMS patients recruited from clinical sites in the United States.
- Patients currently or previously on natalizumab for ≥6 months who told their clinician that they were 'feeling good' while on natalizumab were eligible.
- As detailed in Figure 1, patients were asked in a one-on-one, in-person, semi-structured interview to do the following:
  - Answer brief questions about their experience receiving natalizumab;
  - Select concepts or domains most related to their natalizumab experience from a list of 33 key factors assessed in commonly used QoL surveys; and
  - Rank RMS-validated QoL surveys based on the relevance of the questions to their natalizumab feel-good experience.
- Transcripts from the interview portion were evaluated using qualitative analysis software to identify concepts associated with the natalizumab experience.

Results

Patients
- In April and May 2019, investigators completed interviews with 23 patients, 21 of whom were currently receiving natalizumab.
  - Mean age was 44.7 years (Table 1).
  - At the time of the interview, patients had been receiving natalizumab for a median of 38 months.

Concept elicitation
- A mean of 13.2 concepts per patient were identified from the qualitative interview.
- Nearly all patients (91.3%) indicated improved physical functioning compared with pre-natalizumab (Figure 2).
  - Improved energy, identified in 73.9% of patients, was the most commonly reported metric of improved physical functioning (Figure 3).
  - Improvements in mobility (34.8%), vision (30.4%), and numbness/tingling (30.4%) were also commonly reported.
- Reported improvements in emotional functioning (78.3%; Figure 2) were most often related to feeling happier/less depressed (34.8%) and feeling 'normal/like [one]self' again (30.4%; Figure 3).
- Improved social functioning was reported by 69.6% of patients (Figure 2) and was most often characterized by the ability to do more/go out/participate in activities (56.5% of patients; Figure 3).
- Patients also reported improvements in cognitive function (43.5%; Figure 2), with improved thinking/focus mentioned most frequently (39.1%; Figure 3).

Concept list
- Of the factors from QoL surveys, patients identified energy/tiredness (88.2%) and hopefulness (82.4%) as the ones most often affected by natalizumab (Figure 4).

Survey rankings
- The QoL surveys identified as most relevant measured positive affect, fatigue, and cognition (Figure 5).
- The surveys focused on anxiety, sleep, and satisfaction with social roles/activities were generally ranked as least relevant (Figure 5).

Literature

- Concept elicitation through qualitative interviewing is an established step in ensuring content validity of a patient-reported outcome measure.[7]
- The findings of this research are consistent with previous studies in which natalizumab treatment was associated with reductions in fatigue and depression and with improved cognitive function.[2-4,8]

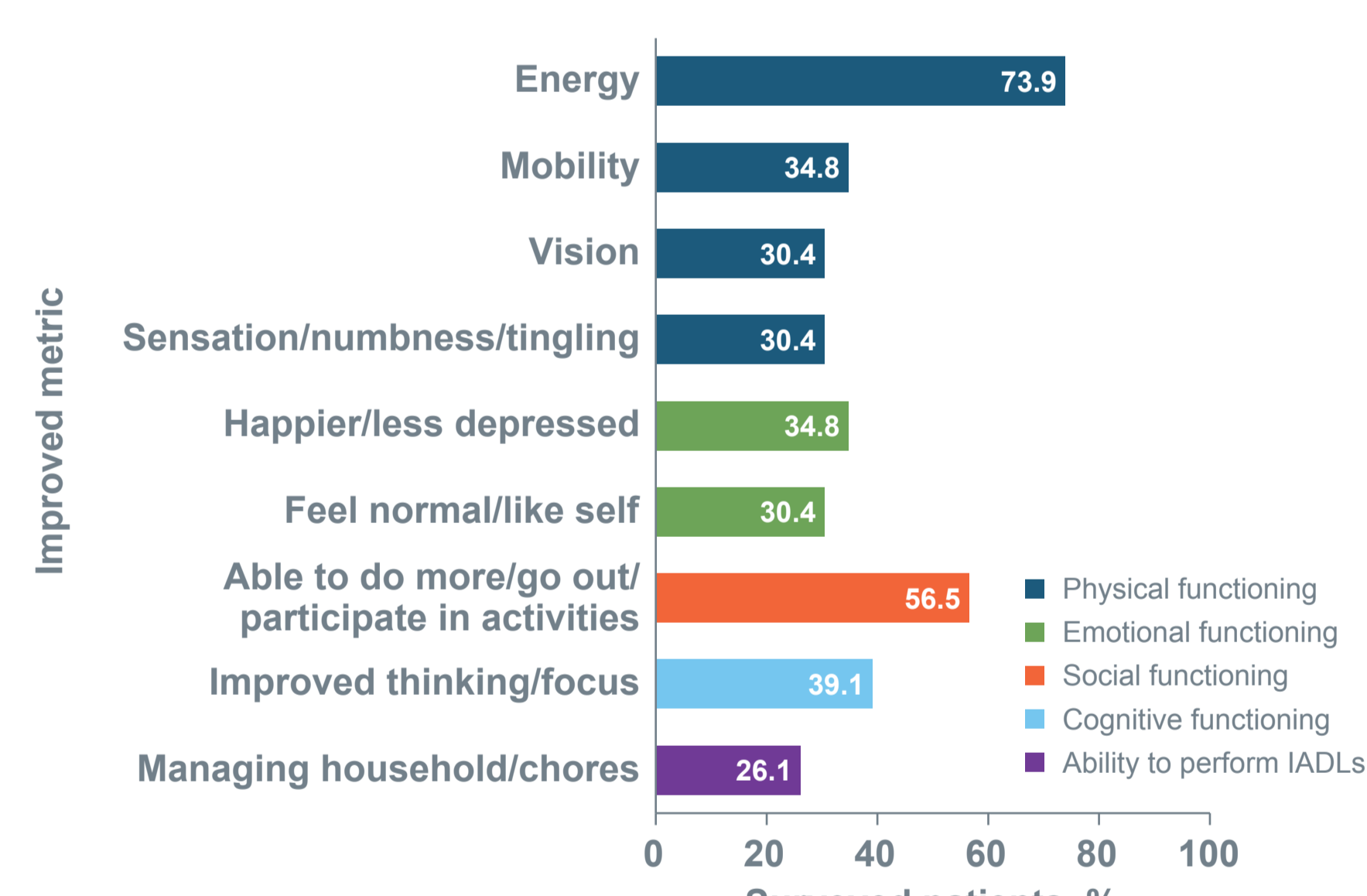**Figure 1.** Qualitative interview design
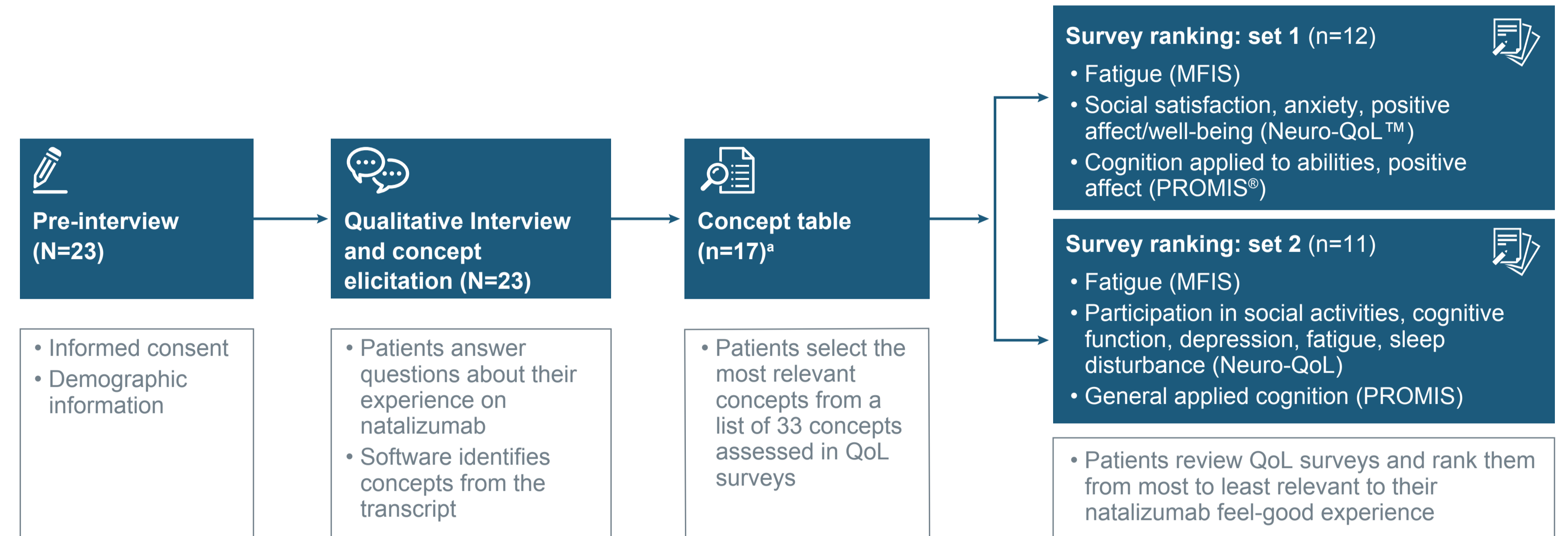
MFIS=Modified Fatigue Impact Scale; Neuro-QoL=Quality of Life in Neurological Disorders; PROMIS=Patient-Reported Outcomes Measurement Information System.
[a]The concept table was added to the interview process after the first 6 patients had completed the interview.

Figure 2. Areas of improvement identified through qualitative interviews about patients' experiences on natalizumab (N=23)
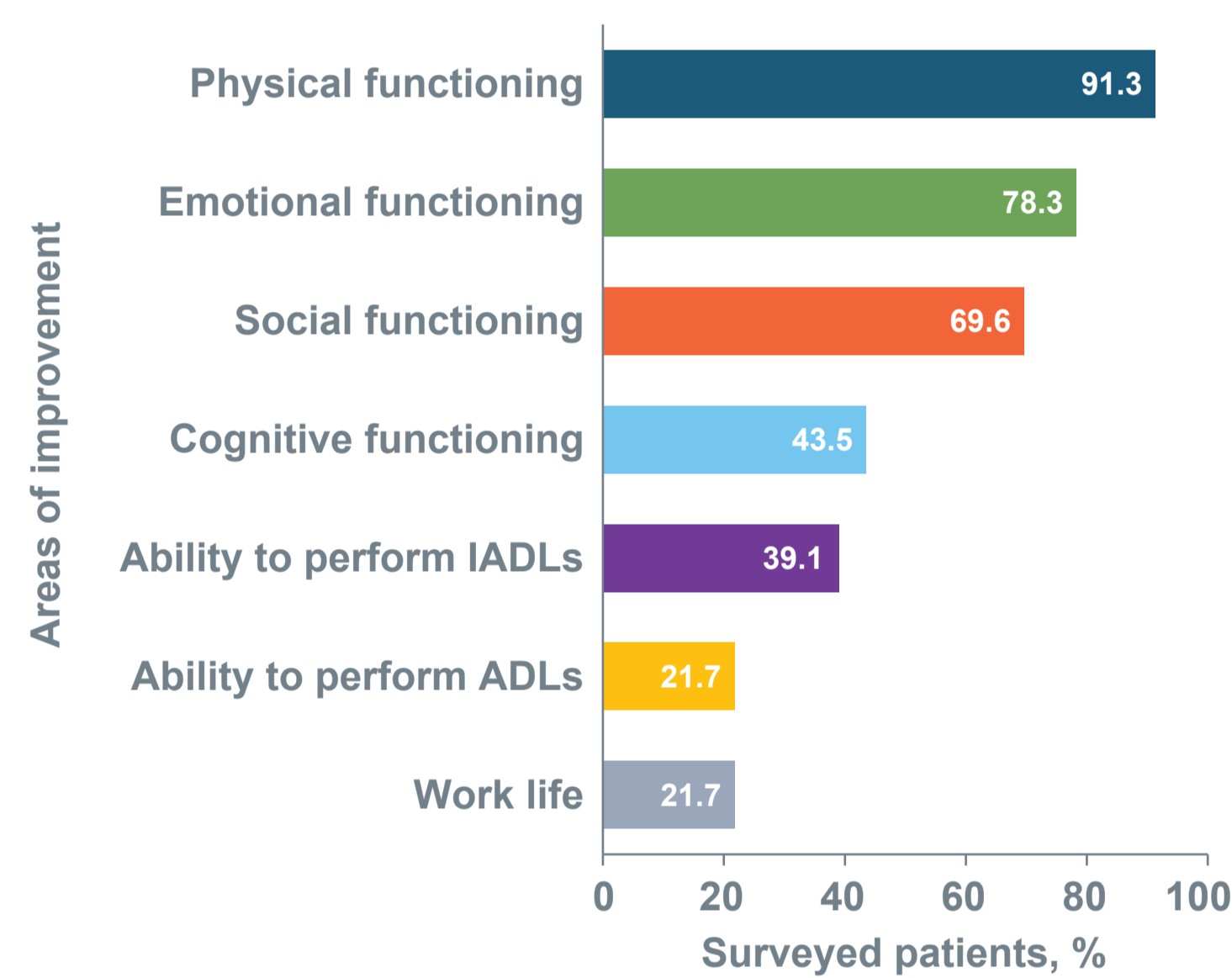
ADL=activities of daily living; IADL=instrumental activities of daily living.

Figure 3. Elements of the natalizumab experience identified in qualitative interviews with >5 patients (N=23)

CI=confidence interval; SD=standard deviation

Table 1. Baseline characteristics of interview participants

Baseline characteristic	Natalizumab-treated patients (N=23)
Age, mean (SD), years	44.7 (12.7)
Female, n (%)	17 (73.9)
Employment, n (%)	
Full time	9 (39.1)
Part time	3 (13.0)
Retired	3 (13.0)
Permanently disabled	4 (17.4)
Other	4 (17.4)
Anti-JCV antibody positive, n (%)[a]	12 (54.5)
Anti-JCV antibody index in anti-JCV antibody–positive patients, median (min, max)	2.39 (0.51, 4.46)
Patients with prior DMT use, n (%)	18 (78.3)
Prior DMT used, n (%)[b]	
Interferon beta-1a	14 (60.9)
Glatiramer acetate	12 (52.2)
Fingolimod	3 (13.0)
Dimethyl fumarate	6 (26.1)
Teriflunomide	2 (8.7)

DMT=disease-modifying therapy; JCV=JC virus.
[a]n=22. Interviewers were blinded to anti-JCV antibody data during interview process.
[b]Some patients had used more than 1 prior DMT.

Figure 4. Characteristics from QoL surveys identified by >50% of patients as related to their natalizumab experience (n=17)

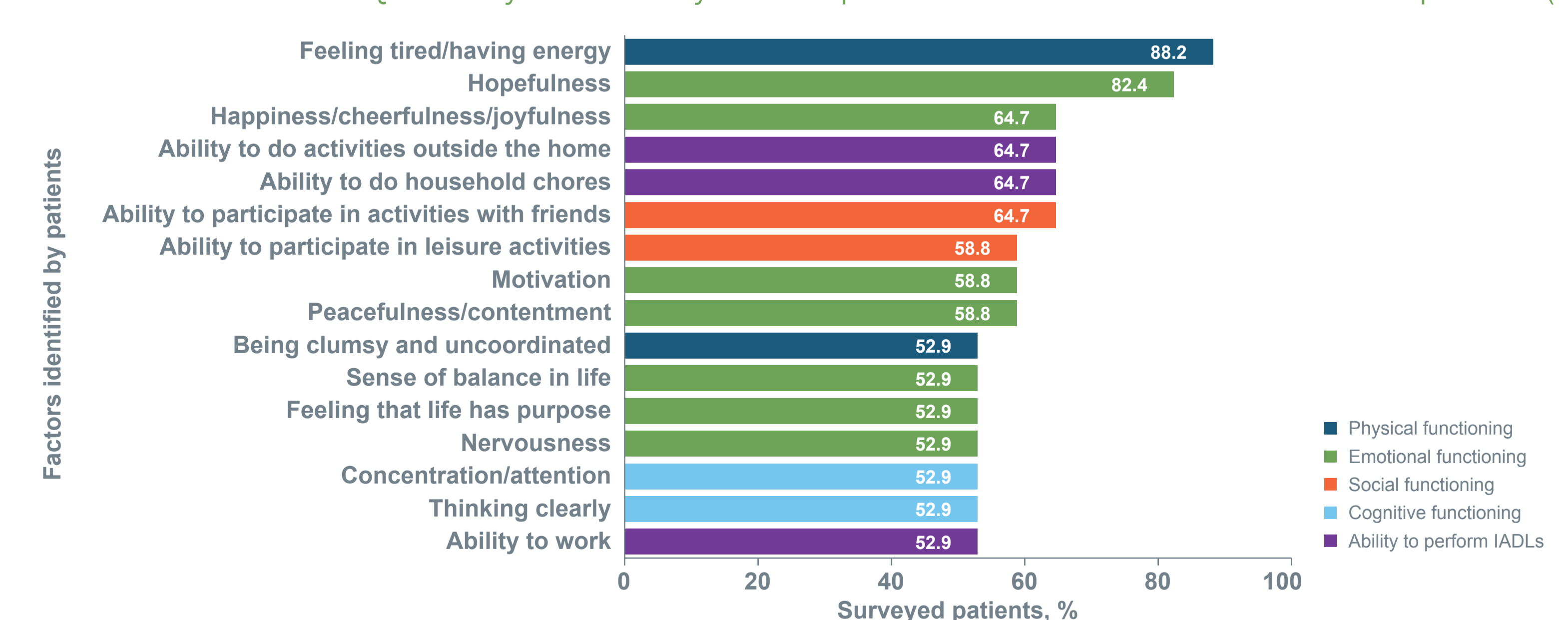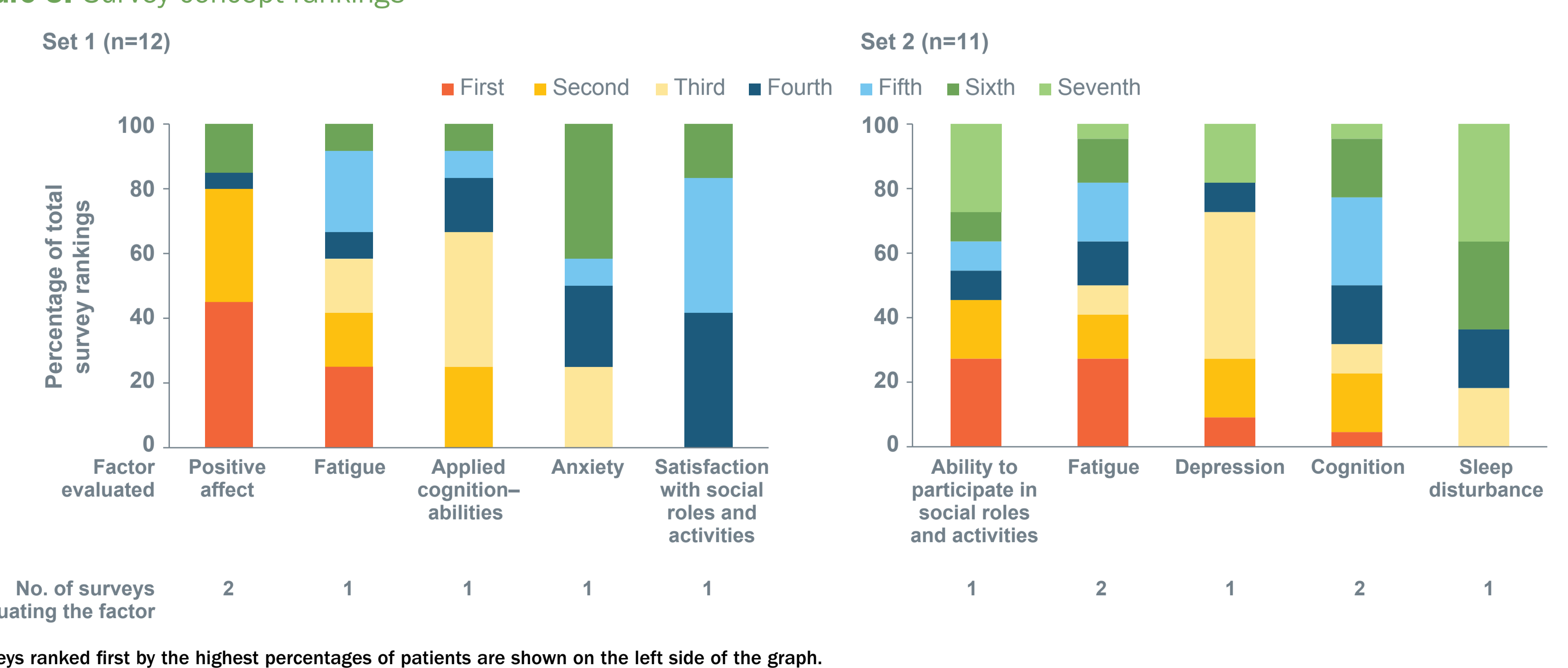**Figure 5.** Survey concept rankings

Surveys ranked first by the highest percentages of patients are shown on the left side of the graph.

References 1. Polman CH, et al. N Engl J Med. 2006;354:899-910; 2. Svenningsson A, et al. PLoS One. 2013;8:e58643; 3. Wilken J, et al. Int J MS Care. 2013;15:120-128; 4. Perumal J, et al. BMC Neurol. 2019;19:116; 5. Stephenson JJ, et al. Health Qual Life Outcomes. 2012;10:155; 6. Rudick RA, et al. Ann Neurol. 2007;62:335-346; 7. Patrick DL, et al. Value Health. 2011;14:967-977; 8. Kunkel A, et al. Front Neurol. 2015;6:97.