

Article

Demographic Patterns of MS Patients Using BRISA: An MS-Specific App in Germany

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Supplementary material

Table S1. Overview of study cohort in categories ‘age group’, ‘MS-type’, ‘time since diagnosis’ and ‘medication category’.

	Groups	Users	%
Age group	18–25	183	10.1
	26–35	567	31.3
	36–45	498	27.5
	46–55	421	23.3
	>55	162	7.8
	Total	1831	
MS-type	RRMS	1200	78.4
	PPMS	151	9.9
	SPMS	158	10.3
	Other	22	1.4
	Total	1531	
Time since diagnosis	0–1	247	13.0
	2–5	607	31.9
	6–10	354	18.6
	11–20	355	18.7
	21–30	339	17.8
	Total	1902	
Medication category	Category 1	581	44.2
	Category 2	232	17.7
	Category 3	501	38.1
	Total	1314	

Supplemental Methods: Detailed description of all PRO questionnaires used in BRISA app.

The questionnaires implemented in BRISA are:

- *Beck Depression Inventory - Fast Screen (BDI-FS)*
- *Bladder Control Scale (BLCS)*
- *Bowel Control Scale (BWCS)*
- *Patient-determined Disease Steps (PDDS)*
- *Modified Fatigue Impact Scale – 5-Item Version (MFIS-5)*
- *Impact of Visual Impairment Scale (IVIS)*
- *MOS Pain Effects Scale (PES)*
- *Perceived Deficits Questionnaire - 5-Item Version (PDQ-5)*
- *Sexual Satisfaction Scale (SSS)*

Except the “Beck Depression Inventory” and “Patient-determined Disease Steps” [47] all questionnaires used for this study are taken from the Multiple Sclerosis Quality of Life Inventory [48]. For a more detailed description of the used questionnaires check supplemental methods section.

Beck Depression Inventory - Fast Screen (BDI-FS)

The Beck Depression Inventory - Fast Screen is derived from Beck Depression Inventory II for measuring the severity level of depression in patients with possible physical limitations. The questionnaire consists of 7 groups of statements. For each statement there are four possible answers, which are ordered according to their intensity and assigned a score from 0–3. The individual scores are summed up and can result in a total score of 0–21, with a higher score indicating greater severity of depression.

Bladder Control Scale (BLCS)

The Bladder Control Scale (BLCS) was used to measure bladder problems that may occur in MS. The answering of the question refers to the last 4 weeks before answering the questionnaire. It is a set of 4 items to measure bladder control and the extent to which bladder problems have an impact on everyday activities. The first 3 items are rated on a scale of 0–4, where 0 indicates “not at all” and 4 indicates “daily”. The fourth

item is rated in a scale of 0–10, where 0 indicates “not at all” and 10 indicates “severely”. Each participant receives a total score between 0 and 22, with higher scores representing poorer bladder control and a greater impact of this on daily activities.

Bowel Control Scale (BWCS)

Bowl problems that may occur in MS and their impact on everyday activities was measured with the Bowel Control Scale (BWCS). It is a set of 5 items to measure bowl control and the extent to which bowl problems have an impact on daily activities. The first 4 items are rated on a scale of 0–4, where 0 indicates “not at all” and 4 indicates “daily”. The fifth item is rated in a scale of 0–10, where 0 indicates “not at all” and 10 indicates “severely”. Each participant receives a total score between 0 and 26, with higher scores indicating poorer bowel control and stronger impairment of daily activities.

Patient-determined Disease Steps (PDDS)

To visualize the progression of MS in patients, the Patient-determined Disease Steps questionnaire was used. This consists of a list of 9 categories describing disease severity with a special focus on the mobility of MS patients. Each of the 9 categories is assigned a score from 0–8. The patient selects the appropriate category and receives the corresponding score. A higher score describes a reduced mobility[47].

Modified Fatigue Impact Scale – 5-Item Version (MFIS-5)

The Modified Fatigue Impact Scale - 5-Item Version was used to measure how fatigue may affect patients. The answering of the question refers to the last 4 weeks before answering the questionnaire. It is a set of 5 items to measure fatigue and the extent to which fatigue has an impact on everyday activities. The 5 items are rated on a scale of 0–4, where 0 indicates “never” and 4 indicates “almost always”. Each participant receives a total score between 0 and 20, with higher scores representing greater severity of fatigue and greater impairment of daily activities.

Impact of Visual Impairment Scale (IVIS)

The Impact of Visual Impairment Scale was used to assess visual problems that can occur in MS and their impact on daily activities. It is a series of 5 questions about visual impairments and the extent to which they affect daily activities. The questions are scored on a scale of 0 to 3, with 0 being 'not at all difficult' and 3 being 'not possible due to visual problems'. Each participant is given a total score between 0 and 15, with higher scores indicating greater impairment of vision and therefore greater impairment of daily living.

MOS Pain Effects Scale (PES)

The MOS Pain Effects Scale was used to measure the experience of unpleasant sensory symptoms because of MS. The answering of the question refers to the last 4 weeks before answering the questionnaire. It is a set of 6 items to measure how much the sensory symptoms interfere with daily life. The 6 items are rated on a scale of 1–5, where 1 indicates “not at all” and 5 indicates “to an extreme degree”. Each participant receives a total score between 6 and 35, with higher scores representing greater interfering of the unpleasant sensory symptoms with everyday activities.

Perceived Deficits Questionnaire - 5-Item Version (PDQ-5)

The Perceived Deficits Questionnaire - 5-Item Version (PDQ-5) was used to assess cognitive dysfunction specific to MS. It is a series of 5 items scored on a scale of 0 to 4, with 0 representing “never” and 4 representing “almost always”, to measure different areas of cognitive function that are commonly impaired in MS. The total score ranges from 0 to 20, with higher scores representing more pronounced cognitive dysfunction.

Sexual Satisfaction Scale (SSS)

To assess the impairment of sexual function in patients with MS, we have used the Sexual Satisfaction Scale. The questionnaire consists of a total of 5 questions, whereby the first question can only be answered with yes/no with a corresponding score of 0–1. The other questions are scored from 1–6, where 1 stands for “very satisfied” and 6 for “very dissatisfied”. The total score can be between 0–25. A higher score indicates more pronounced sexual dissatisfaction.

Researchers/Research-Tools/Clinical-Study-Measures/Multiple-Sclerosis-Quality-of-Life-Inventory-(MSQL (accessed 2 May 2022).