



# The Migraine Prevention Questionnaire (MPQ): Development and Validation



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## BACKGROUND

Migraine is a debilitating disease that affects 12% of US adults. Prior American Migraine Prevalence and Prevention (AMPP) study research found that preventive medications may be indicated for up to 38% of migraine sufferers, however only 12% of migraine sufferers receive them.

A simple self-report tool for identifying migraine sufferers who are candidates for preventive therapy might help close this migraine treatment gap.

## OBJECTIVE

To develop and validate an instrument to screen migraineurs in need of preventive medication, for use in the primary care setting.

## METHODS

Following a review of existing instruments, current literature and group discussions with migraineurs from a headache clinic, we developed a pool of 18 candidate questions. Item format included categorical (some of the time, much of the time, etc.) and count (# of days) questions representing four domains: 1) headache frequency and severity; 2) acute medication use; 3) headache attack related impairment; 4) Inter-ictal headache burden. MIDAS and questions regarding headache impairment were included as well so that prevention need categories (from prior AMPP research) could be identified.

The candidate scale questions were included in three mail surveys: An item-reduction survey to identify the best scale items, a test-retest reliability survey, and a survey to assess external validity.

The validation survey included measures of disability (MIDAS), health-related quality of life (SF-12 and MSQ), and depression (PHQ-9).

Item-reduction and reliability study results are presented here. Validation study results will be the subject of a subsequent report.

### Item Reduction Phase

Surveys were mailed to a representative random sample of 2,500 pre-identified headache sufferers from the NFO/TNS household panel. Self-reported headache symptoms were used to identify migraine cases based on ICHD-2 criteria.

An initial instrument with both categorical and count variables was abandoned due to scoring complexity.

Eight count items were retained and Confirmatory Poisson Item Factor Analysis was conducted on these items using SAS Proc NL MIXED. Items were scaled in days.

### Test-Retest Reliability Phase

An additional short mail survey with all 18 candidate items was sent to a representative random sample of 2,250 AMPP study migraine cases.

Subjects who returned surveys were sent a second survey with a target response interval of two weeks.

### Instrument Cut Points

Marginal distributions for the eight MPQ count items were examined along with the correspondence between intervals of MPQ item scores with MIDAS severity categories. Expert headache clinicians reconciled the empirical distributions and disability associations with clinical experience to identify clinically relevant cut points for determination of prevention need.

## RESULTS

### Item Reduction

Valid returns were obtained from 1,691 (68%) subjects in the initial mailing, and of these 1,362 (81%) met ICHD-2 criteria for migraine.

Two meaningful factors were identified: a **Headache Severity Factor** and a **Headache Interference Factor**.

An 8-item version of the scale was retained as a research tool. The 4 MPQ items with the greatest clinical relevance and largest factor loadings were retained for use as a brief clinical assessment. Factor loadings and scoring cut points for prevention need groups are presented in Table 1.

### Test-Retest

A total of 1,807 surveys were returned and valid returns were obtained with two time points for 1,637 (91%) subjects.

While the test-retest target interval was 2 weeks, time interval variance allowed for an assessment of reliability across multiple intervals.

Test-retest reliability for all retest intervals was high (Table 2). Pooling across intervals yielded overall reliability for the MPQ of approximately 0.80.

### Scoring

Patients above the cut point on any of the four items should be evaluated for preventive therapy.

Table 1. Confirmatory Poisson Factor Loadings (Scaled as Rate Ratios) and Cut Points for Offering and Considering Preventive Therapy	Headache Severity Factor	Headache Interference Factor	Offer Prevention If response greater than	Consider Prevention If response greater than
On how many days in the last month did you have headaches that were moderate to severe?	1.98	0	4	3
On how many days in the last month did you use over the counter or prescription meds?	2.12	0	8	6
On how many days in the last three months did your headaches spoil or prevent activities?	0	1.92	4	3
How many days in the last month were you worried that headaches would spoil important activities?	0	3.38	8	6

Table 2. Test-Retest Correlations (Rho) and Intra-Class Correlations (ICC)

Time Interval	N	Rho	ICC
Overall	1637	.79	.79
<2 Weeks	59	.84	.84
2 Weeks	90	.77	.75
>2 Weeks but <3 Weeks	1145	.79	.79
3+ Weeks	343	.80	.80

## CONCLUSION

These results indicate that questions about headache frequency and severity, acute medication use, headache attack related impairment, inter-ictal burden can be scaled together. Our 4-item instrument has robust psychometric properties and may facilitate communication regarding the potential need for preventive treatment.

**8-item Research Version of The Migraine Prevention Questionnaire (MPQ)**

**Please think about all headaches that you have had in the last 3 months.  
Some questions will refer to the last month, and others to the last 3 months.**

- \*1. On how many days in the LAST MONTH did you have headaches that were moderate or severe?  
**(Write In)**

# of days: \_\_\_\_\_

- \*2. On how many days in the LAST MONTH did you use over-the-counter or prescription medications to treat your headaches? (Do not count medications that you use on a daily basis to prevent your headaches or medications you take for reasons other than headache.) **(Write In)**

# of days: \_\_\_\_\_

3. On how many days in the LAST MONTH did you need bed rest because of your headaches? **(Write In)**

# of days: \_\_\_\_\_

4. On how many days in the LAST THREE MONTHS did your headaches make it hard to work, study, or carry out household work? **(Write In)**

# of days: \_\_\_\_\_

- \*5. On how many days in the LAST THREE MONTHS did your headaches spoil or prevent family, social, or leisure activities? **(Write In)**

# of days: \_\_\_\_\_

6. What percent of your headache attacks are satisfactorily relieved with the medications you usually take? **(Write In)**

Around \_\_\_\_\_% of my attacks are relieved to my satisfaction with the medications I take.

7. What percent of your headache attacks are completely relieved with the medications you usually take? **(Write In)**

Around \_\_\_\_\_% of my attacks are completely relieved with the medications that I take.

- \*8. How many days in the LAST MONTH were you worried that your headaches would keep you from doing important activities? **(Write In)**

# of days: \_\_\_\_\_

**\* Four items that make up the MPQ Short Form**