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Original

Utility of a structured telephone interview for the assessment of patients with non-acute headache

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Abstract

Background and Objective
Non-acute headache is the most common reason for referral to neurology outpatient clinics, contributing substantially to healthcare burden. However, many patients may not require an in-person specialist consultation with a neurologist. This study aimed to assess if the structured interview could effectively identify patients with headache who present warning signs and guide the most appropriate consultation modality (telephone or face-to-face) and priority of care.

Patients and Methods
We conducted a prospective study including patients referred from primary care to the neurology department for headache consultation between 1 January and 31 October, 2021. Consenting patients underwent a structured telephone interview conducted by a trained nurse to systematically collect clinical information and assess the need for specialist evaluation.

Results
Out of 648 referred patients, 251 completed the structured interview. Based on the assessment, 215 patients (85%) were allocated to telephone consultation with a neurologist, while 36 patients (15%) were prioritized for face-to-face evaluation. Among those managed initially via telephone consultation, 53% were discharged following assessment, whereas 47% required follow-up, including 31% via telephone and 16% in person.

Conclusions
The structured telephone assessment can be an effective triage tool for patients referred for non-acute headache. It enables appropriate stratification of patients according to clinical need, optimizes the use of telemedicine, and supports efficient allocation of in-person consultations, thereby improving resource utilization and facilitating integrated care between primary and specialist services.

Keywords:
Telemedicine,
Headache,
Primary care,
Structured interviews,
Telephone interview

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Introduction

Headache is one of the most prevalent conditions and has a negative impact on quality of life. Headaches in general—and migraines in particular—can significantly limit daily activities and represent a considerable economic burden for both society and those affected (1–5).

Unsurprisingly, headache is a leading reason for referral to neurology outpatient clinics and constitutes a major healthcare burden, which was exacerbated during the pandemic due to reduced access to in-person care.

The COVID-19 pandemic fundamentally altered clinical practice and accelerated the adoption of telemedicine (6), which, according to some authors, reduces consultation time and waiting lists, thereby improving access to care and referral pathways from primary care (PC) (7).

However, telemedicine presents its own challenges, one of which is the accurate collection of clinical information. In this regard, structured assessment forms—an area in which nurses have extensive experience—support the standardized collection of data.

Our initial hypothesis was that not all patients referred from PC for non-acute headache require an in-person consultation with a neurologist. The primary aim of this study, therefore, was to demonstrate that structured interviews conducted by trained nurses are effective for detecting headache warning signs and assessing the degree of impact—information which in turn helps determine the most appropriate type of consultation for patients with non-acute headache, thereby optimizing the use of available resources.

Patients and methods

Patients referred for a first headache consultation to the neurology department of our hospital from PC between 1 January and 31 October 2021, who were willing to participate and gave oral informed consent, were included in our study. Once verbal consent was obtained, a sample of these patients underwent a structured telephone interview conducted by our trained nurse. The time required for each interview ranged from 7 to 10 minutes.

The structured interview was jointly developed by the nurse and neurologists specializing in headache medicine, and it collected key information based on the recommendations of the Headache Study Group of the Spanish Society of Neurology (8). The interview included structured questions addressing relevant clinical aspects such as the duration of the headache, previous diagnosis of migraine or other primary headache disorders, headache characteristics (location, quality, and intensity), associated symptoms, warning signs, triggers, frequency of attacks or headache days over a given period, and impact on personal, social, or professional life.

Patients were also asked about comorbidities and use of symptomatic or preventive treatments, and they were requested to give new verbal consent for a future telephone consultation with a neurologist (Supplement 1). Without this consent, the selected patients were scheduled for an in-person consultation in the neurology department.

During the study period of approximately 10 months, 648 patients were referred for a first headache consultation from PC. Our trained nurse conducted the structured interview with 264 selected patients using simple random sampling, none of whom declined participation. We identified 13 patients who had been incorrectly referred for other neurological issues. These patients were subsequently redirected to the appropriate in-person consultations.

Data from the remaining 251 patients—correctly referred for a first headache consultation—were analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA).

Results

The demographic data of the patients and the characteristics of their headaches are shown in Table 1.

Table 1. Demographic data and headache characteristics

Sex	**n (%)**
Male	67 (31)
Female	148 (69)
Average age	Years
Male	45.7
Female	38.2
Type of headache	n (%)
Migraine	162 (75)
TTH	53 (25)
TAC	12 (5)
Other	22 (9)
Headache duration	
<1 year	62 (25)
1–3 years	54 (21)
>3 years	135 (54)
Frequency, days per month	
<6	95 (44)
7–14	89 (41)
>15	31 (15)
Preventive treatment	
Yes	(42)
No	(58)

TTH, tension-type headache; TAC, trigeminal autonomic cephalgia

Following evaluation through a structured interview conducted by the nurse—sometimes in joint decision with a neurologist—the primary results were as follows: in 215 cases (85%), a telephone consultation with the neurologist was arrange. The qualitative criteria underpinning this decision were non-acute headache without warning signs, long-standing headache, prior evaluation by a neurologist with a diagnosis of primary headache, and no recent change in the usual headache pattern or characteristics.

The remaining 36 patients (15%) were referred for in-person consultations, mainly to rule out secondary headache because they presented with some warning signs or a new-onset headache (Table 2).

Table 2. Type of consultation after structured interview conducted by the nurse and decision after the first telephone consultation

Type of consultation after nurse interview	**n (%)**
Telephone	215 patients (85)
In-person	36 patients (15)
Decision after first telephone consultation	
Discharged	115 patients (53)
Follow-up telephone consultation	66 patients (30)
In-person evaluation	34 patients (16)

The most frequently recorded alarm signs were headache triggered by exertion or the Valsalva manoeuvre (8 patients), recent changes in headache characteristics (7 patients), immunosuppression or an active oncological condition (5 patients), newly onset headaches showing progressive worsening (3 patients), and headaches disturbing sleep (3 patients).

According to the type of headache among the 215 patients evaluated by a physician, 162 (75%) had migraine; 53 (25%) had tension-type headache; 12 (5%) had trigeminal autonomic cephalalgias, primarily cluster headache; and 22 (9%) had another type of headache (Table 1). As is often the case, several patients presented with more than one headache type.

No secondary headaches were identified, either among the patients initially selected for face-to-face visits or among those assessed telephonically and later seen in person.

Based on headache duration, the patients were distributed as follows: 62 (25%) had headaches for less than 1 year, 54 (22%) for 1–3 years, and 135 (53%) for more than 3 years. Among all patients, 113 (45%) had previously been evaluated by a neurologist, and 132 (52%) had a diagnosis of primary headache from either a neurologist or a PC physician (Table 1). Regarding preventive treatment, 147 patients (58%) were not taking any form of preventive medication at the time of the interview (Table 1).

Among the 215 patients evaluated by telephone by a neurologist, 115 (53%) were discharged after the first consultation, with recommendations and/or treatment, and instructed to continue follow-up in PC. In 66 patients (30%), a follow-up telephone consultation was arranged to monitor progress, evaluate treatment response, or review test results. A total of 34 patients (16%) were scheduled for an in-person evaluation because of the physician's uncertainty about the headache's cause or to assess second-line preventive treatments (Table 2). In this group

of patients, the most frequent diagnosis was also migraine (61%), following tension-type headache (15%), primary exercise headache (12%) and primary thunderclap headache (9%).

This group also included a small number of patients who could not be contacted by phone. In this group 23 imaging studies were performed (14 head CT scans and 9 brain MRI studies).

A subsequent review of medical records for the patients selected for telephone evaluation revealed no adverse events or incidents during the 12 months following the procedure.

Discussion

Headache is a common health problem and the most frequent reason why PC physicians refer patients to neurology clinics (9). In our hospital, there is high demand for headache consultations, and the outpatient waiting list can be long. Delays in addressing headache may have negative repercussions on patient's quality of life.

In our sample, almost 60% of patients were not receiving preventive treatment at the time of their referral, similar to findings reported by other authors (10,11).

In PC, several resources have been implemented (e.g., consensus guidelines, practical recommendations) to support the diagnosis and management of patients with non-acute headache at the primary care level (12–16). Nevertheless, referral to neurology departments remains high. Evidence suggests that 25%–70% of patients referred to specialist consultations do not require an in-person appointment (17).

This finding aligns with the results of our study: 85% of patients with non-acute headache agreed to be evaluated telephonically by the neurologist, and of those, more than half (53%) were discharged after the first visit using this mode of consultation. Our hypothesis is thus fulfilled—not all patients with non-acute headache require in-person care. Most likely, as has already been noted, not all of them require referral to a neurologist.

Thanks to the use of the structured interview prior to the medical visit, a large group of patients were able to undergo teleconsultation, and those requiring in-person assessment were appropriately identified. The structured format allowed for the collection of relevant clinical data in a more orderly and objective manner, making it a useful tool not only for estimating the degree of patient impact but also for facilitating communication between healthcare professionals.
This selection mechanism made it possible to prioritize in-person consultation for patients with suspected secondary headaches, difficult-to-manage cases, or those experiencing high-impact headaches. It represents an effective way to optimize resources. Telephone consultations for headache are less time-consuming than face-to-face visits, and in our setting, waiting times are shorter for this type of appointment. Moreover, given the typical patient profile—generally young, comfortable with technology, and professionally active—this approach is well received because it minimizes disruption to daily activities.

The study also allowed us to detect and quantify a substantial proportion of patients who had previously been evaluated by a neurologist, were not receiving preventive treatment, or had long-standing or very long-standing headaches.

These findings prompt reflection on the need to update and align referral criteria from PC to neurology and also highlight the importance of ongoing training programmes for professionals. Such initiatives could enhance diagnostic skills and headache management across all levels of care.

It is important to emphasize that the structured interview—and its capacity to guide selection for physician-led telephone consultations—is not only effective but also safe. In our study, no secondary headaches were identified, even at 12-month follow-up after the telemedicine intervention. Similar experiences have been reported by other authors: Müller et al.(18) estimated that 20.200 consultations would be needed for a single case of secondary headache to go unnoticed.

That said, we must bear in mind that our study included only patients with non-acute headache, without warning signs, most of whom (75%) had symptoms lasting more than one year. Many had already received a diagnosis or been evaluated by a neurologist, thus reducing the likelihood of secondary headache in this population.

We believe that this structured interview for non-acute headache could also be conducted by previously trained PC professionals, whether nurses or physicians. In our healthcare sector, where telematic interconsultation between PC and neurology is already implemented, this model offers a valuable opportunity for collaborative care. It allows in-person consultations to be reserved for patients not previously assessed, or those with greater diagnostic or therapeutic complexity, or with more disabling conditions.

Our study does have limitations. The structured interview was applied to only a portion (38%) of patients referred for their first headache consultation, although selection was random. The sample represents only our health sector and was gathered during an extraordinary healthcare situation. Furthermore, we did not conduct an analysis of patients who were not selected for the structured interview.

Conclusion

Not all patients with non-acute headache require an in-person consultation with a neurologist. The use of a structured interview to assess patients with headache aids in identifying those who can be evaluated by telephone, thereby improving access to face-to-face care for those who truly need it.

The structured interview should be conducted by a healthcare professional—either a physician or a nurse—with appropriate training.

This new approach to assessment is not intended to replace the in-person clinical interview but to complement it, especially at a time when telemedicine is gaining broader acceptance and when optimizing available resources is essential.

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