



RESEARCH ARTICLE

A Test (Test_a)° for the Assessment of Headache

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Abstract

This report contains the main results of a quantitative research aimed at testing, through the administration of multiple-level questionnaires- patients (n = 2500) and physicians (n = 100), a simple tool for detecting the individual perception of recurrence and the severity of the symptom of headaches and how it is dealt with in terms of drug use and the use of appropriate reference health structures (general practitioner^a and headache centers). The ultimate goal of the project is to develop a tool that is an aid for the enhancement at all levels-from the pharmacist to the doctor-of the ability to intercept, sensitize and orient to a correct management of migraine and headache. The survey has been carried out in Italy, April-June 2017.

Keywords

Migraine and headache, Symptom evaluation, Medication over-use, Public health

Introduction

Headache is a very frequent pathology: In Europe more than 50% of the adult population suffers from headaches and the Italian data are in line with this figure [1]. Even children and adolescents are increasingly affected by the problem [2] as well as the symptom is frequently associated with age-related diseases [3].

Headaches are highly disabling disorders: Migraine, in particular, is counted by the WHO among the first 20 disabled pathologies in terms of years of life lost for disabilities [1]. Striking especially the central age groups, which are those of maximum work commitment and (re) productive, it also involves high personal and social costs.

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The symptomatic and preventive treatment of headaches makes use of numerous medications, many of which are easy to access from the patient directly to pharmacies. However, improper or excessive use of analgesics can not only induce undesirable side effects but, especially in patients with chronicity, can even aggravate the symptom by causing the so-called MOH-Medication Overuse Headache [4].

The proper monitoring and management of headaches is therefore a part of the public health objectives. In order to be prosecuted, they require a continuous improvement of access to the competent health facilities supported by further research in the field of diagnosis and treatment of headaches, as well as by appropriate educational programs and Population awareness [1,2].

Many studies have been performed either on how to prevent migraine or on the use of drugs. In particular, an important line of research has studied how patients feel migraine. Preventive therapy is probably indicated in about a third of patients with migraine, and a broad range of pharmaceutical and non-pharmaceutical options exist. Medication overuse is an important concern in migraine therapeutics and needs to be identified and managed [5].

With this aim, several substances have been tested in order to assess their role in preventing migraine, such as feverfew, with relatively scarce results [6]. Of great value is the Classification of Headache Disorders [7].

This work is part of this last field of research: Based



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on a quantitative survey among patients with headache symptoms, a simple tool for detecting the individual perception of recurrence and the severity of the symptom of headaches has been developed. It is dealt with in terms of the use of drugs and the use of suitable medical facilities (pharmacy, doctor and/or Center for Headaches).

The final aim of the project was the development of a measurement scale - called "Test_a" - to be used as an instrument that guides the patient in the self-evaluation of the severity level of his symptom and in how to deal with it; at the same time, the proposed tool could be of help to pharmacists and general practitioners (GPs), enhancing their ability to intercept, sensitize and orientate the patient himself to a correct management of migraine and headache.

Methodology

The research was based on the administration of two short detection cards shown in the Appendix: the first "self-assessment card" - was compiled autonomously by a sample of patients (n = 2500) with a symptom of headache waiting to be visited at the general practitioner surgeries; The second was compiled by the general practitioner on the occasion of the visit to the same patient. The first card, in addition to collecting a few basic personal information, presented the patient with a series of 6 items related to the severity of the symptom, the presence of other symptoms, the quality of life and the use and the responsiveness of the medications. In the encoding phase, a numeric score was assigned to each item so that they were added to each other by obtaining a severity scale from 0 to 10. The second card was used to verify the accuracy of the compilation and the satisfaction of the "evaluation card" by the patient in terms of clarity and simplicity of compilation as well as usefulness in order to describe their experience of Headache. For each patient of the sample, therefore, two questionnaires were detected and analyzed.

The sample

2500 individuals were interviewed, patients with a symptom of headache detected at the surgery of 100 different general practitioners, in the period April-June 2017. The sample is distributed between the main Italian geographical areas -and within them between selected cities-as per [Table 1](#).

As expected [8], women constitute the majority of the sample (70%) and the average age is 45.3 years (range = 11-96). The distribution by age of the sample is normally distributed ([Figure 1](#)), confirming the prevalence of the disorder in the middle ages and a lower frequency at the young and elder ages. Women with headaches have an average age of 44.2 versus 47.4 years of men (t-Student test of the differences between means significant at p-value = 0.000).

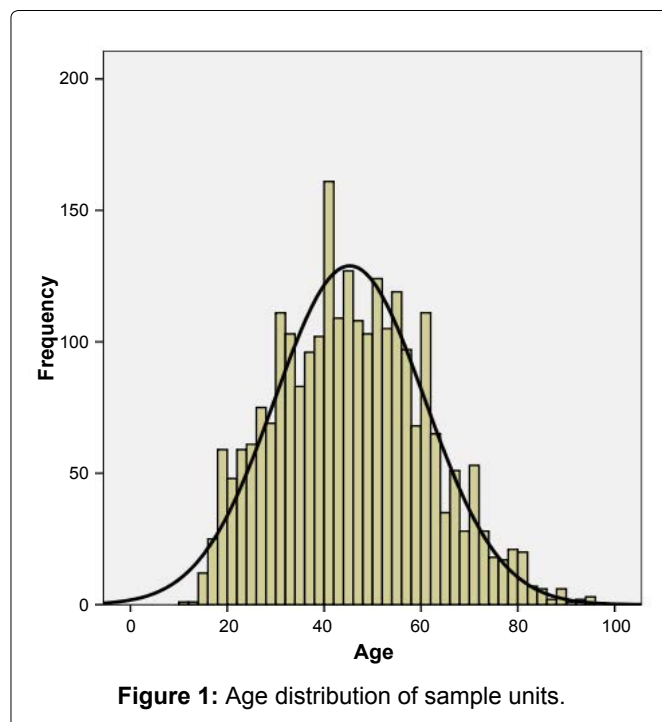


Figure 1: Age distribution of sample units.

Table 1: Territorial distribution of sample units.

| Territorial area | n. | % |
|------------------|------|-------|
| North-West | 625 | 25.0 |
| Torino | 300 | 12.0 |
| Milano | 325 | 13.0 |
| North-East | 450 | 18.0 |
| Bologna | 225 | 9.0 |
| Padova | 225 | 9.0 |
| Centre | 600 | 24.0 |
| Firenze | 250 | 10.0 |
| Roma | 350 | 14.0 |
| South-Islands | 825 | 33.0 |
| Bari | 275 | 11.0 |
| Napoli | 275 | 11.0 |
| Palermo | 275 | 11.0 |
| Total | 2500 | 100.0 |

Table 2: Patients by gender and age.

| | Women | Men | Total |
|------------|--------|--------|--------|
| Up to 20 | 81 | 46 | 127 |
| | 4.8% | 5.6% | 5.1% |
| 21-40 | 647 | 245 | 892 |
| | 38.7% | 29.6% | 35.7% |
| 41-60 | 709 | 377 | 1086 |
| | 42.4% | 45.5% | 43.4% |
| 60 or more | 235 | 160 | 395 |
| | 14.1% | 19.3% | 15.85 |
| Total | 1672 | 828 | 2500 |
| | 100.0% | 100.0% | 100.0% |

Crossing the age (grouped in classes) with Gender ([Table 2](#)), it is noted that the women interviewed have a structure for the youngest age of men, contrary to the demographics of the population who wants women on average older than men.

Headaches arose in 75% of cases before 40 years with significant gender differences: the average age at

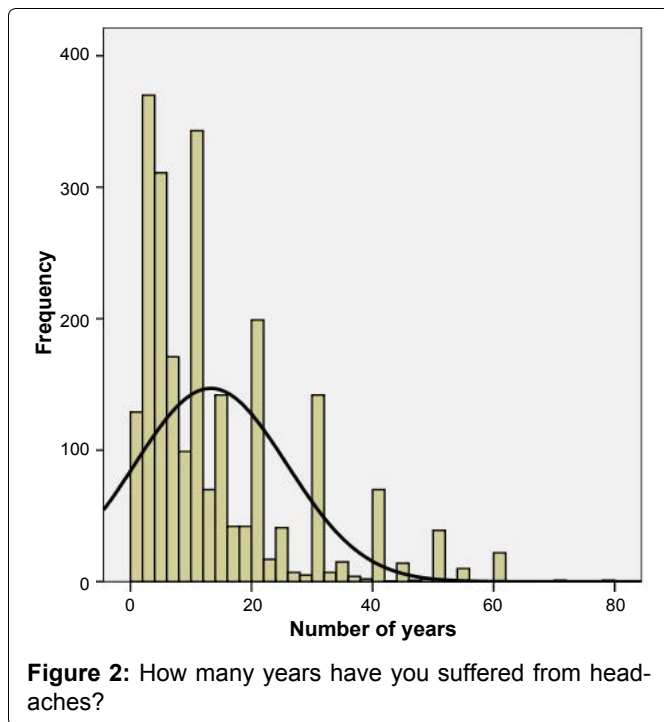


Figure 2: How many years have you suffered from headaches?

Table 3: “How many years have you suffered from headaches?” - Synthetic statistics by gender.

| Gender | Mean | N | SD |
|--------|-------|------|--------|
| Women | 13.42 | 1566 | 12.279 |
| Men | 12.98 | 752 | 13.186 |
| Total | 13.28 | 2318 | 12.579 |

Table 4: “How many years have you suffered from headaches?” - Synthetic statistics by age.

| Age class | Mean | N | SD |
|------------|-------|------|--------|
| Up to 20 | 3.58 | 97 | 2.349 |
| 21-40 | 7.44 | 808 | 5.593 |
| 41-60 | 14.7 | 1042 | 11.271 |
| 60 or more | 24.54 | 371 | 18.223 |
| Total | 13.28 | 2318 | 12.579 |

Significant ANOVA test P-value = 0.000.

onset is 31 years for women and 35 for men. It therefore affects men at a higher age than women, who begin to suffer earlier and therefore, on average, suffer for a longer time (Table 3).

Note, however, that the median of the variable “How long do you suffer from headache” is 10 years, i.e. 50% of the sample suffers from more than 10 years of the phenomenon; the distribution is in fact strongly asymmetrical (Figure 2) i.e. concentrated on the shortest times. Of course, this duration is strongly correlated to age (linear correlation coefficient = 0.53 significant at P- value = 0.000) growing significantly as the age grows (Table 4) and this will be considered in the commentary of subsequent results.

The “Test_a”

The main objective of the survey was to build a concise indicator of the individual assessment of the symptom, its severity in terms of frequency of episodes, other related symptomatology and the reduction of

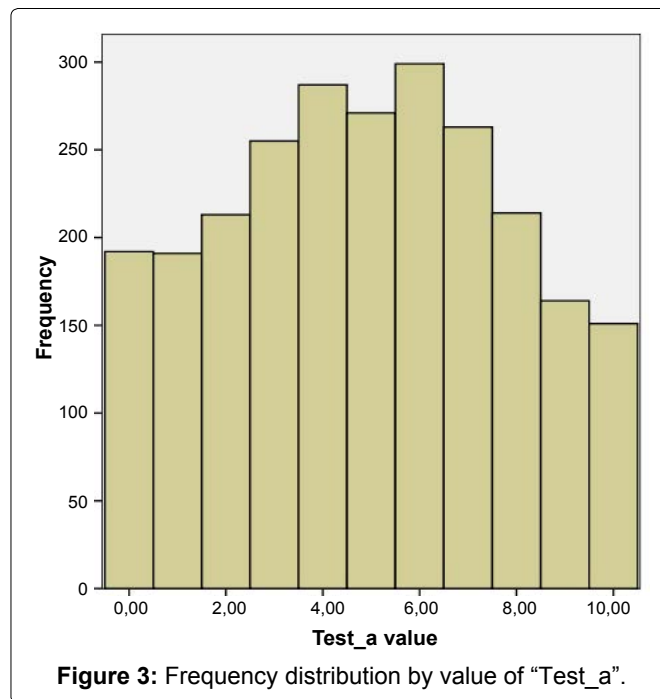


Figure 3: Frequency distribution by value of “Test_a”.

Table 5: Frequency distribution by value of “Test_a”.

| Test_a | N. | % | Cumulative % |
|--------|------|------|--------------|
| 0 | 192 | 7.7 | 7.7 |
| 1 | 191 | 7.6 | 15.3 |
| 2 | 213 | 8.5 | 23.8 |
| 3 | 255 | 10.2 | 34.0 |
| 4 | 287 | 11.5 | 45.5 |
| 5 | 271 | 10.8 | 56.4 |
| 6 | 299 | 12.0 | 68.3 |
| 7 | 263 | 10.5 | 78.8 |
| 8 | 214 | 8.6 | 87.4 |
| 9 | 164 | 6.6 | 94.0 |
| 10 | 151 | 6.0 | 100.0 |
| Total | 2500 | 100 | |

Scheme 1: Construction of the indicator “Test_a”.

| Item | Assigned value |
|--|----------------|
| dd1: “Do you have headaches for more than 3 times a month, every month?” | Yes = 2 No = 0 |
| dd2: “How many painkillers do you get every month for headaches?” | |
| dd2_1: “up to 3” | Yes = 0 No = 0 |
| dd2_2: “4 - 8” | Yes = 1 No = 0 |
| dd2_3: “8 or more” | Yes = 2 No = 0 |
| dd3: “Do you often think that headache does not respond to painkiller?” | Yes = 2 No = 0 |
| dd4: “During the headache have you ever had nausea or vomiting?” | Yes = 1 No = 0 |
| dd5: “Is pain pulsating or worsening with movement?” | Yes = 1 No = 0 |
| dd6: “When you have headaches, do you continue to carry out your normal activities?” | Yes = 0 No = 2 |

the quality of life, and the use and efficacy of painkiller medications. To this end, the scores attributed to 6 items detected with the card according to the following measuring scale were added (Scheme 1).

The sum of the scores attributed to the 6 items constitutes the objective indicator- called “Test_a”- which

varies from a minimum of 0 to a maximum of 10. The complete distribution is shown in Table 5.

The distribution is concentrated between the values 3 and 7 but with significant symmetrical “tails”: The variable is distributed with mean 4.89 (SD = 2.88) and median 5 (Figure 3). There are significant differences by gender (women have a higher average score); by age (the average grows with age) and with the duration of the disease (Table 6).

It should be noted that the average value of the indicator slightly decreases after age 60 and for those suffering from headaches for over 30 years, as if an “addictive” effect took over with the passage of time. Overall, the relationship between age and score it is not linear (correlation coefficient not significant).

Table 6: “Test_a” synthetic statistics by gender, age and duration of disease.

| Gender | Mean | N | SD |
|--------|--------|------|---------|
| Women | 5.1866 | 1672 | 2.8889 |
| Men | 4.2826 | 828 | 2.76571 |
| Total | 4.8872 | 2500 | 2.87976 |

Significant t-Student test P-value = 0.000.

| Age class | Mean | N | SD |
|------------|--------|------|---------|
| Up to 20 | 4.1732 | 127 | 2.77487 |
| 21-40 | 4.7601 | 892 | 2.87187 |
| 41-60 | 5.1759 | 1086 | 2.88 |
| 60 or more | 4.6101 | 395 | 2.85253 |
| Total | 4.8872 | 2500 | 2.87976 |

Significant ANOVA test P-value = 0.000.

| How many years | Mean | N | SD |
|----------------|--------|------|---------|
| Up to 1 | 3.3178 | 129 | 2.58597 |
| 5-Feb | 4.4596 | 681 | 2.65439 |
| 10-Jun | 5.135 | 600 | 2.81839 |
| 20-Nov | 5.6295 | 502 | 2.89575 |
| 21-30 | 5.8194 | 216 | 2.83988 |
| 30 or more | 5.4368 | 190 | 2.87181 |
| Total | 5.0311 | 2318 | 2.85242 |

Significant ANOVA test P-value = 0.000.

Headache management

The self-assessment form allows detecting two fundamental aspects of the patient’s behavior with headache problems and that is 1) If he has ever addressed, respectively but not exclusively: Pharmacist, General Practitioner or Headache Center and 2) If the drugs used they have been prescribed or not.

From a look at the simple distributions of the two variables we note the prevalence of “virtuous” behaviors: the patients who turn exclusively to the pharmacist^b (Figure 4) constitute just over 10% of the sample; 51% is addressed to the General Practitioner, a percentage that rises to 63% if we consider those who also turn to the pharmacist. Only 6.3% addressed (exclusively) to a Headache Center but if we also consider those who combine the use of the Center with the General Practitioner, the percentage rises to 15%. Also worthy of mention is the percentage of those who turned to “All”

^bOnly 3 patients said they were not addressed to anyone or did not indicate an answer. They were grouped with those who answered “Pharmacist”.

Table 7a: “Test_a” synthetic statistics by type of “rescue”.

| Did you address...? | Mean | N | SD |
|--|--------|------|---------|
| Pharmacist | 3.0749 | 267 | 2.48038 |
| General Practitioner | 4.4615 | 1272 | 2.7748 |
| Pharmacist and General Practitioner | 4.6754 | 419 | 2.63118 |
| Headache Center | 6.9241 | 158 | 2.4274 |
| General Practitioner and Headache Center | 7.1 | 220 | 2.27735 |
| All | 6.75 | 164 | 2.37413 |
| Total | 4.8872 | 2500 | 2.87976 |

Significant ANOVA test P-value = 0.000.

Table 7b: “Test_a” synthetic statistics by use of prescribed drugs.

| Usage of prescribed drugs | Mean | N | SD |
|---------------------------|--------|------|---------|
| NO | 3.6146 | 563 | 2.60896 |
| YES | 5.2571 | 1937 | 2.84971 |
| Total | 4.8872 | 2500 | 2.87976 |

Significant ANOVA test P-value = 0.000.

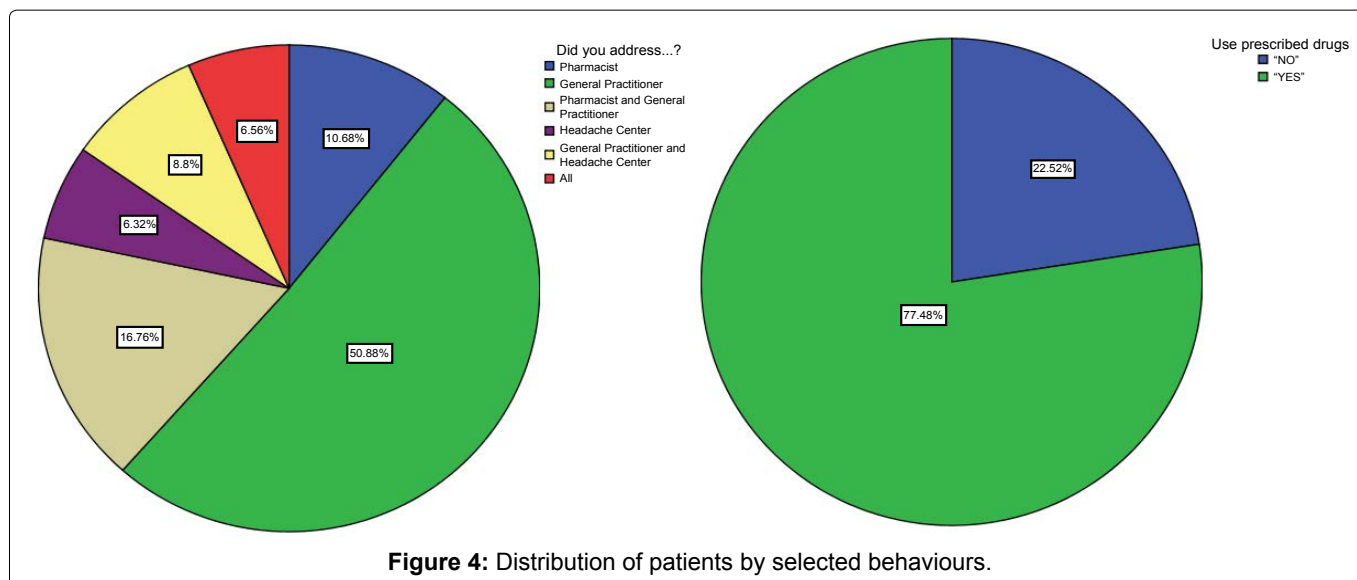


Figure 4: Distribution of patients by selected behaviours.

Table 8: Distribution of patients by Test_a value and type of “rescue”.

| Did you address...? | | | | | | | |
|---------------------|------------|----------------------|-------------------------------------|-----------------|--|--------|------|
| Test_a value | Pharmacist | General Practitioner | Pharmacist and General Practitioner | Headache Center | General Practitioner and Headache Centre | All | N. |
| 0 | 24.50% | 58.30% | 13.00% | 1.60% | 1.60% | 1.00% | 192 |
| 1 | 20.90% | 59.70% | 16.20% | 1.00% | 1.00% | 1.00% | 191 |
| 2 | 17.80% | 55.40% | 20.20% | 1.90% | 1.40% | 3.30% | 213 |
| 3 | 16.10% | 54.90% | 20.40% | 3.10% | 2.40% | 3.10% | 255 |
| 4 | 8.70% | 62.70% | 16.00% | 2.80% | 6.60% | 3.10% | 287 |
| 5 | 8.90% | 57.20% | 18.80% | 5.90% | 4.80% | 4.40% | 271 |
| 6 | 9.00% | 43.80% | 20.40% | 5.40% | 11.40% | 10.00% | 299 |
| 7 | 4.20% | 44.90% | 18.30% | 9.90% | 13.30% | 9.50% | 263 |
| 8 | 2.80% | 47.70% | 11.20% | 12.10% | 15.40% | 10.70% | 214 |
| 9 | 3.00% | 23.20% | 16.50% | 17.10% | 23.30% | 17.10% | 164 |
| 10 | 2.00% | 42.40% | 7.30% | 13.90% | 22.50% | 11.90% | 151 |
| Total | 10.70% | 50.90% | 16.80% | 6.30% | 8.80% | 6.60% | 2500 |

Significant χ^2 Test of the association between the two variables at P-value = 0.000.

(6.6%). As we will see, the use of different structures depends strongly on the severity of the symptom.

Regarding the use of drugs more than three quarters of the sample (77.5%) claim to use prescribed drugs and only 22.5% rely on “do-it-yourself”.

There are no significant differences with respect to these distributions either by gender or age.

As mentioned, these behaviors vary according to the severity level of the symptom, as is summarized in the following tables (Table 7a) showing the average value of the Test_a (and the standard deviation) in the different types of “rescue” and if the drug used is prescribed or not (Table 7b).

However, the average values hide many differences, that instead it is useful to highlight in order to achieve a correct management of the problem. In fact, it is necessary to understand if at increasing severity level of the symptom patients recognize the difficulty and the danger of self-medication and how much they are addressed to competent professionals. This more refined analysis could also be an aid for operators at different levels, from the pharmacist to the general practitioner, who, acquired an adequate sensitivity to recognize the symptom and its different characteristics, are able to orient the patient towards the treatment and the most suitable structures such as headache centers. It is therefore important to understand how the different severity levels of headaches take on different behaviors and what are the thresholds beyond which it is necessary to intervene with more appropriate tools.

From the intersection between the Test_a and the variable “Did you address...?” it is clear that the patient turns to different “specialists” also in combination with each other depending on the severity level (Table 8): the percentage of those who address exclusively to the Pharmacist declines rapidly as the indicator increases; that of those who go only to general practitioner remains constant more than 50% - up to an intermediate level, but from score = 6 onwards declines; the use of

Table 9: Distribution of patients by Test_a value and usage of prescribed drugs.

| Usage of prescribed drugs | | | |
|---------------------------|--------|--------|------|
| Test_a value | NO | YES | N. |
| 0 | 39.10% | 60.90% | 192 |
| 1 | 35.10% | 64.90% | 191 |
| 2 | 32.90% | 67.10% | 213 |
| 3 | 33.30% | 66.70% | 255 |
| 4 | 23.30% | 76.70% | 287 |
| 5 | 20.70% | 79.30% | 271 |
| 6 | 20.70% | 79.30% | 299 |
| 7 | 14.10% | 85.90% | 263 |
| 8 | 6.10% | 93.90% | 214 |
| 9 | 12.20% | 87.80% | 164 |
| 10 | 7.30% | 92.70% | 151 |
| Total | 22.50% | 77.50% | 2500 |

Significant χ^2 Test of the association between the two variables at P-value = 0.000.

the Headache Center increases significantly as the Score increases. In particular, it is possible to identify two critical levels of the Test_a starting from which the behavior changes radically: after the level 3 the percentage of those who go only to the pharmacist is halved (from 16.1% to 8.7%) mainly appeal to the General Practitioner (from 54.9 to 62.7%); after level 7 the appeal to the Pharmacist is halved (which drops to 4% and then declines to 2%) and doubles the use of the Headache Centers which reaches 10% (to 23.2% if added to the percentage of those who go both to the General Practitioner and to the Headache Center). From this level (in fact, already from level 6) also the percentage of those who address “everyone” to fight the symptom dramatically increases as a sign of a request for help that is really very urgent.

Even the use of prescribed medications or not is strongly associated with the level of Test_a (Table 9).

Again, the two thresholds level 3 and Level 7 appear to be critical to promote a change in the behavior of the sick of headaches: the percentage of those who use not prescribed drugs - who skim 40% at minimum levels of Test_a - reduced by well 10 points after level 3; it faces a significant

Table 10: Distribution of patients by grouped level of Test_a.

| | N. | % |
|--------------|------|------|
| 0-3 Mild | 851 | 34 |
| 4-6 Moderate | 857 | 34.3 |
| 7-10 Severe | 792 | 31.7 |
| Total | 2500 | 100 |

Table 11: Distribution of patients by level of test_a and symptom components.

| dd1: "Do you have headaches for more than 3 times a month, every month?" | No | Yes |
|--|-------|-------|
| 0-3 Mild | 83.1% | 16.9% |
| 4-6 Moderate | 27.3% | 72.7% |
| 7-10 Severe | 6.3% | 93.7% |
| Total | 39.6% | 60.4% |

| dd2: "How many painkillers do you get every month for headaches?" | Up to 3 | 4-8 | 8-more |
|---|---------|-------|--------|
| 0-3 mild | 76.6% | 22.3% | 1.1% |
| 4-6 moderate | 45.0% | 47.3% | 7.7% |
| 7-10 Severe | 11.2% | 49.2% | 39.5% |
| Total | 45.1% | 39.4% | 15.5% |

| dd3: "Do you often think that headache does not respond to painkiller?" | No | Yes |
|---|-------|-------|
| 0-3 Mild | 89.7% | 10.3% |
| 4-6 Moderate | 52.7% | 47.3% |
| 7-10 Severe | 6.9% | 93.1% |
| Total | 50.8% | 49.2% |

| dd4: "During the headache have you ever had nausea or vomiting?" | No | Yes |
|--|-------|-------|
| 0-3 Mild | 81.0% | 19.0% |
| 4-6 Moderate | 44.8% | 55.2% |
| 7-10 Severe | 12.5% | 87.5% |
| Total | 46.9% | 53.1% |

| dd5: "Is pain pulsating or worsening with movement?" | No | Yes |
|--|-------|-------|
| 0-3 Mild | 64.6% | 35.4% |
| 4-6 Moderate | 36.8% | 63.2% |
| 7-10 Severe | 10.4% | 89.6% |
| Total | 37.9% | 62.1% |

| dd6: "When you have headaches, do you continue to carry out your normal activities?" | No | Yes |
|--|-------|-------|
| 0-3 Mild | 85.4% | 14.6% |
| 4-6 Moderate | 60.0% | 40.0% |
| 7-10 Severe | 26.6% | 73.4% |
| Total | 58.1% | 41.9% |

new drop after level 7; then become low though not irrelevant (7.3%) at the highest level of the Test_a.

From these analyses we can draw two preliminary conclusions: 1) The Test_a built on the basis of the self-assessment Board is a good tool to scale the severity of the symptom; on the basis of the Test_a and its relation with the headache management indicators, it is possible to discriminate well between patients who are at a mild degree (≤ 3), moderate (4-6) or severe (≥ 7) of the Symptom (Table 10) and requiring interventions and care to very distinct levels. It is interesting that the

Table 12: "Test_a" synthetic statistics by territorial area.

| Territorial area | Mean | N | SD |
|------------------|--------|------|---------|
| North_West | 4.7808 | 625 | 2.7529 |
| North_East | 4.4867 | 450 | 3.40261 |
| Centre | 5.145 | 600 | 2.78032 |
| South_Islands | 4.9988 | 825 | 2.70674 |
| Total | 4.8872 | 2500 | 2.87976 |

Significant ANOVA Test P-value = 0.000.

three classes are very similar entities so that the "cut-off points" correspond in fact to the distribution's third parties. The result was not foreseeable a priori.

The components of the symptom

In this section we see in detail the relationship between the Test_a indicator reclassified to three categories as defined above- mild, moderate, elevated severity of symptom headache - and its individual components, i.e. the 6 items of the Self-evaluation card. The reports are all significant and, of course, in the expected sense-given the construction of the synthesis indicator. A comparative reading between the different distributions allows to better characterize the different groups of patients (Table 11).

First, the symptom occurs at least 3 times a month, every month in the majority of patients who have a degree at least "moderate" of the problem (73%) reaching almost all in those in the "severe" class.

The number of painkillers taken per month substantially increases between one class and the other. However, the percentage of those who use more than 8 painkillers per month reaches a percentage of 40% only among those who have a higher level of Test_a. For the others it stops well below 10%. However, the percentage of 47.6% among those with a "moderate" level of symptom taking 4 to 8 painkillers per month is worth noting.

Drugs are effective almost totally for those who have a mild disorder (about 90% say that it is not often not to respond to the painkiller) while the non-response to the drug is a problem that occurs in 93% of patients with high level of Test_a.

Among the two symptoms associated with headache characterizing as migraine- nausea/vomiting or pulsating pain/worsening to movement- the second appears most frequent, at all levels of severity of the Test_a.

Finally, a consideration about the quality of life: The headache is confirmed a strongly disabling disorder. Already at moderate severity, 40% declares that it is not able to perform normal activities, a quota that rises to 73% among the most severe patients.

Territorial differences

The sample of 2500 patients are well balanced between geographical areas (see Table 1). It is therefore possible to deepen at territorial level some of the most significant aspects of research.

Table 13: Patients distribution by level of “Test_a” and geographical area.

| | Geographical Area | | | | Total |
|--------------|-------------------|------------|--------|---------------|-------|
| | North_West | North_East | Centre | South_Islands | |
| 0-3 Mild | 36.0% | 44.2% | 30.5% | 29.6% | 851 |
| 4-6 Moderate | 34.1% | 23.6% | 36.0% | 39.0% | 857 |
| 7-10 Severe | 29.9% | 32.2% | 33.5% | 31.4% | 792 |
| Total | 625 | 450 | 600 | 825 | 2500 |

Significant χ^2 Test of the association between the two variables P-value = 0.000.

Table 14: Distribution of patients by usage of prescribed drugs and geographical area.

| | | Geographical Area | | | |
|------------------|-----|-------------------|------------|--------|---------------|
| | | North_West | North_East | Centre | South_Islands |
| Prescribed drugs | No | 22.9% | 14.9% | 26.7% | 23.4% |
| | Yes | 77.1% | 85.1% | 73.3% | 76.6% |
| Total | | 625 | 450 | 600 | 825 |

Significant χ^2 Test of the association between the two variables P-value = 0.000.

Table 15: Distribution of patients by type of “rescue” and geographical area.

| | | Geographical Area | | | |
|----------------------|--|-------------------|------------|--------|---------------|
| | | North_West | North_East | Centre | South_Islands |
| Did you address...?: | Pharmacist | 15.2% | 5.6% | 7.3% | 12.5% |
| | General Practitioner | 38.4% | 70.9% | 42.5% | 55.5% |
| | Pharmacist and General Practitioner | 19.7% | 14.0% | 23.2% | 11.4% |
| | Headache Center | 8.5% | 1.6% | 2.5% | 10.1% |
| | General Practitioner and Headache Center | 9.3% | 4.9% | 14.3% | 6.5% |
| All | | 9.0% | 3.1% | 10.2% | 4.0% |
| Total | | 625.0% | 450.0% | 600.0% | 825.0% |

Significant χ^2 Test of the association between the two variables P-value = 0.000.

The mean value of the synthetic indicator- Test_a is significantly lower in the North (east) than the center and the South-Islands (Table 12).

Consistently, the distribution of patients in the three severity classes of headache disorder is different between the North and the rest of the country (Table 13). However, the difference is placed at the low to lower levels of symptom intensity. In particular, in the North-east the percentage of those who rank in the lightest range- up to 3 of the Test_a- is equal to 44%, 10 points higher than the total Italy; Conversely, the proportion of those who suffer in a “moderate” way is lower (23.6 in the North-east versus 34.3% in total Italy). Instead, the percentage of sufferers in a more severe manner is almost equivalent between the shares.

Patients in the North-east appear more careful in the use of drugs (Table 14): Only 15% (versus 22.5 of total Italy) uses them without a prescription. In addition, in 71% of cases are addressed to general practitioner, and more rarely than elsewhere they are addressed exclusively to the pharmacist (Table 15). However, the use of headache centers is much lower. Note, in this regard, the comparatively higher value of the percentage of people who only resort to headache centers in the South-Islands area (10.1%).

The evaluation of the instrument

As reported in the preamble, the research has provided, for each patient of the sample, the compilation

Table 16: Non-responses by item.

| Item | Number of non-responses |
|----------|-------------------------|
| Item dd1 | 7 |
| Item dd2 | 8 |
| Item dd3 | 3 |
| Item dd4 | 2 |
| Item dd5 | 5 |
| Item dd6 | 2 |
| Total | 27 |

Table 17: Evaluation of the card by patients interviewed.

| How did you find the card to fill in general? | Number of patients quoting |
|---|----------------------------|
| Clear | 2497 |
| Understandable | 2498 |
| Simple/Easy | 2499 |
| Useful | 2470 |
| Complete | 2472 |
| Confused | 4 |
| Not adequate to my disorder | 26 |

also by his doctor of a short card in order to evaluate the accuracy with which the patient has compiled the card of Self-assessment as well as the clarity and perceived usefulness of the card by the patient.

From Table 16 it appears clear that the number of questions that have not been answered is very small: only 27 individuals report that they have not responded to any of the proposed items. The frequency is so low compared to the total of the sample that it deserves no deepening, nor would any significant statistical analysis be possible.

Table 18: Patients distribution by level of “Test_a” and satisfaction of the card.

| | Satisfied | Not satisfied | N. |
|--------------|-----------|---------------|------|
| 0-3 Mild | 97.5% | 2.5% | 851 |
| 4-6 Moderate | 98.0% | 2.0% | 857 |
| 7-10 Severe | 92.2% | 2.8% | 792 |
| Total | 97.6% | 2.4% | 2500 |

Not Significant χ^2 Test of the association between the two variables P-value = 0.560.

In addition, almost all the patients of the sample stated that they found clear, useful and complete the card (Table 17).

On the 60 patients who expressed some negativity with regard to the card (unclear, not useful, etc.), a brief analysis was carried out to assess whether these patients were selected from the symptom, i.e. severely suffering from headaches and thus not finding any utility in the proposed research. Conversely, the association between the Test_a level and the degree of “satisfaction” with respect to the card was not significant (Table 18).

Conclusions

Migraine and headache are among the most common pathological conditions, which cause however a high degree of personal suffering and a strong compromise - even temporary - of normal activities, with consequent high social costs.

Measuring the impact of migraine through the Migraine disability assessment test - MIDAS

During the last decades of studies on the epidemiology of these disorders, knowledge about the extent of public health problems related to migraine has greatly increased. Among these is the excessive recourse to self-medication and sometimes improper use of painkillers, which can even aggravate the symptom itself. Also, for this reason, the treatment of patients with migraine should be accompanied, from the onset of the disease, by a synergy of interventions that can provide adequate information and effective solutions to patients with a mild or moderate degree of the disorder, recommending recourse to specialist or headache centers in the most serious situations. In this sense, the awareness of patients but also of pharmacists and general practitioners appears to be a public health objective.

This research has intended to make a contribution in this last direction. Through a simple detection tool administered to a sample of General Practitioner patients with symptom headache you are given the possibility for the patient to self-evaluate their condition, related symptoms, quality of life and relationship with medications. The synthesis of these evaluations is a Test_a indicator that scales from 0 to 10 the severity level of the headache and allows to discriminate in a clear way between patients with mild, moderate and elevated lev-

els. They have very distinct behaviors in terms of drug use and use of the most appropriate health care facilities for treating headaches.

The results appear robust and statistically significant. The sample is in fact very large (n = 2500) and presents a structure by gender, age, date of onset in line with the epidemiological data known in the literature [1]. Moreover, being well balanced at the level of geographic breakdown allows for insights also at territorial level.

The proposed instrument - which is very welcome to the patients as it results from the evaluation of the detection card itself referred to in front of its General Practitioner-could therefore be used at a wider scale, widespread in medical studies and also at pharmacies. In order to raise awareness of a wider population range and to support physicians and pharmacists to address their patients to care and structures more consistent with the severity level of the symptom.

Conflict of Interest Statement

Both Authors declare No Conflict of Interest.

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