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# Public's Knowledge of Neurology in Headache and Vertigo: A Cross-section from Malatya

## *Baş Ağrısında ve Baş Dönmesinde Nörolojinin Bilinirliği: Malatya Şehrinden Bir Kesit*

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### Summary

**Objective:** To determine the public awareness of neurology as a branch of medicine using headache and vertigo parameters, and to investigate its relationship with sociodemographic characteristics of participants in our region.

**Materials and Methods:** A total of 303 patients and patient relatives, who consulted family physicians and emergency departments in Malatya, were included in the study. After obtaining informed consent for participation in the survey, data was collected using a written questionnaire or through face-to-face interviews, based on the literacy status of participants. We defined awareness of neurology as its association with symptoms of headache and vertigo.

**Results:** In our study, 40% (n=121) and 44.9% (n=136) of the participants indicated that they would consult a neurology outpatient clinic if they had symptoms of headache or vertigo, respectively; 60% (n=182) and 55.1% (n=167) stated that they would consult an outpatient clinic other than neurology, respectively. The rate of participants who had previously consulted a neurology outpatient clinic or an outpatient clinic other than neurology because of headache was 28.8% (n=45) and 71.2% (n=111), respectively. The rate of participants who had previously consulted a neurology outpatient clinic or an outpatient clinic other than neurology because of vertigo was 39.6% (n=36) and 60.4% (n=55), respectively. Higher education level, growing up and living in the city, and female sex were associated with a higher level of awareness of neurology, both for headache and vertigo. There was no statistically significant relationship between age and level of income with awareness of neurology.

**Conclusion:** In this study, more than one third of the participants linked headache and vertigo to admission to a neurology outpatient clinic. In this context, although awareness of neurology increased with female sex, higher education level, growing up and living in the city, it was not associated with age and level of income. We believe that increasing public awareness of medical professional fields in Turkey would reduce time, labor, and economic loss.

**Keywords:** Headache, vertigo, neurology, public awareness

### Öz

**Amaç:** Bu çalışmada, baş ağrısı ve baş dönmesi parametrelerini kullanarak bölgemizde nöroloji meslek alanının bilinirliğini ve katılımcıların sosyo-demografik özellikleriyle olan ilişkisini belirlemeyi amaçladık.

**Gereç ve Yöntem:** Malatya ilinde aile hekimlerine ve acil polikliniklere başvuran 303 hasta ve hasta yakını katılımcı olarak çalışmaya dahil edildi. Ankete katılım ile ilgili onay alındıktan sonra okur-yazar olan katılımcılardan yazılı anket yöntemiyle, olmayanlardan ise yüz yüze görüşme yöntemiyle veri toplandı. Nöroloji bilinirliğini, baş ağrısı ve baş dönmesi şikayetlerinin nöroloji ile ilişkilendirilmesi olarak tanımladık.

**Bulgular:** Çalışmamızda katılımcıların %40'ı (n=121) baş ağrısı, %44,9'u (n=136) baş dönmesi şikayeti olması halinde nöroloji polikliniğine başvurabileceğini belirtti. Katılımcıların %60'ı (n=182) baş ağrısı, %55,1'i (n=167) baş dönmesi şikayeti olması halinde nöroloji dışındaki polikliniklere başvuracaklarını ifade etti. Daha önce baş ağrısı şikayeti olduğunda nöroloji polikliniğine başvuranların oranı %28,8 (n=45), nöroloji dışındaki polikliniklere başvuranların oranı ise %71,2 (n=111) idi. Daha önce baş dönmesi şikayeti olduğunda nöroloji polikliniğine başvuranların oranı %39,6 (n=36), nöroloji dışındaki polikliniklere başvuranların

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oranı ise %60,4 (n=55) idi. Eğitim düzeyi yüksek olanlarda, şehirde büyüyenlerde, şehirde yaşayanlarda ve kadınlarda hem baş ağrısı hem de baş dönmesi ile ilişkili nöroloji bilinirliği daha fazlaydı. Yaş ve gelir düzeyi ile nöroloji bilinirliği arasında ise istatistiksel olarak anlamlı bir ilişki yoktu.

**Sonuç:** Bu çalışmada katılımcıların üçte birinden fazlası baş ağrısı ve baş dönmesi şikayetlerini nöroloji polikliniğine başvurma ile ilişkilendirdiler. Bu bağlamda nöroloji bilinirliği kadın cinsiyet, eğitim düzeyi artışı, şehirde büyüme ve şehirde yaşama ile artış gösterirken yaş ve gelir düzeyi ile ilişkili bulunmadı. Ülkemizde tıbbi meslek alanlarının bilinirliğini arttırmanın zaman, işgücü ve ekonomik kayıpları azaltacağını düşünmekteyiz.

**Anahtar kelimeler:** Baş ağrısı, baş dönmesi, nöroloji, bilinirlik

## Introduction

Neurology is defined as the science dealing with investigation of nervous system diseases and their treatment; a neurologist is defined as a physician who specializes in neurology (1). Neurology, which was originally a sub-branch of Internal Medicine, has developed over time owing to the interest of some internal specialists in neurologic diseases. Until 1973, neurology and psychiatry clinics were under the common name of "Neuropsychiatry Clinics" and expert physicians were known as "Neuropsychiatry Specialists" in Turkey (2). Neurology became a separate clinic in the last quarter of the twentieth century.

According to Address-based Population System results in 2012, Malatya has a total population of 762 366 with 426 381 people living in the city center. Of Turkey's 81 provinces, Malatya is ranked #42 according to Socio-economic Development Ranking Study of Provinces by the Ministry of Development in 2011. Located in the Eastern Anatolia Region, Malatya is the second highest ranked province with a literacy rate of 80.7% according to Statistical Institute of Turkey (TSI) data in 2008, and 60.7% of the total population has elementary or lower education (3).

Headache and vertigo are among the most common reasons for neurology outpatient clinic admissions (4,5,6,7). However, how the public associate symptoms of headache and vertigo with neurology is not known. We found no previous studies in the literature on awareness of neurology. In this study, we aimed to determine public awareness of neurology by using headache and vertigo parameters.

## Materials and Methods

### Sampling

A total of 303 patients and patient relatives, who presented to family practice center outpatient clinics and emergency departments of hospitals in the central district of Malatya in July and August in 2011, were included in the study. Criteria to be enrolled in the study were identified as consent to participate, being equal to or over the age of 18 years, and being mentally and physically capable of answering questions.

### Materials

The survey technique was used in this study. All participants were administered a questionnaire that consisted of 14 questions and was structured by researchers. The first six questions of the survey were related to socio-demographic characteristics, including age, sex, place of residence, place where he/she grew up, education level, and level of income. For the next eight questions, "Who do you consult if you have headache?" and "Who do you consult if you have vertigo?" were asked and multiple-choice answers were given (general surgery, internal medicine, neurology, orthopedics, urology, neurosurgery, otorhinolaryngology, I do not know, other). If more than one choice was marked, "Neurology" was considered correct if it was between the chosen answers. Participants were asked the question "Have you ever visited a physician for a previous headache/vertigo?" and participants with a "Yes" answer were asked where they presented with these symptoms. In addition, participants were asked how they could learn where to present for symptoms of headache/vertigo and were provided multiple-choice answers (Internet, neighbor/friend, pharmacy, emergency department, family physician, other, I do not know).

### Application

The survey was conducted to participants after obtaining informed consent for participation in the survey; data was collected from a written questionnaire or through face-to-face interviews, based on the literacy status of participants.

### Analysis

Statistical analysis was performed using SPSS 18.0 software. All data were expressed as mean ± standard deviation or percent. The relationship between variables was analyzed using Pearson's correlation analysis. $P<0.05$ was considered statistically significant.

In order to evaluate the effect of age, participants were divided in two groups and analyzed according to participants' age as below 35 years and 35 years and above. Similarly, 3 groups were formed for education, namely "literate / illiterate and primary school graduates," "middle- and high school graduates," and "college and above." Three groups were formed for level of income, <1000 TL / month, 1000-2000 TL / month, and >2000 TL / month. Regarding answers to questions in which participants were asked where they grew up and lived, countryside and village/town choices were combined and two groups were formed, namely "city" and "countryside/village."

## Results

A total of 303 participants with a mean age of 33.26±12.66 years were included in the study. Socio-demographic characteristics of the participants are presented in Table 1.

Some 39.8% (n=117) of the participants marked "neurology" and 60.2% (n=177) marked choices other than neurology for the question "Who do you consult when you have a headache?" The second most common answer to this question was "neurosurgeon" with 25.5% (n=75), and the third most common answer was "I do not know" with 12.9% (n=38). Forty-five percent (n=117) of participants marked "neurology" and 55% (n=143) of participants stated that they would present to outpatient clinics other than neurology for the question "Who do you consult when you have vertigo?" The second most common answer to this question was "neurosurgeon" with 17.7% (n=46), and the third most common answer was "I do not know" with 15% (n=39). Of 156 participants

who had previously applied to a physician for headache, 28.8% (n=45) stated that they had consulted a neurology clinic and 71.2% (n=111) stated that they had consulted outpatient clinics other than neurology. In second and third place, the participants most commonly stated that they had visited neurosurgeons with 19.9% (n=31) and emergency departments with 16% (n=25), respectively. Of the 91 participants who had previously presented to a physician for vertigo, 39.6% (n=36) stated that they had consulted a neurology clinic and 60.4% (n=55) stated that they had consulted outpatient clinics other than neurology. In second and third place, the participants most commonly indicated that they had visited emergency departments with 20.9% (n=19) and neurosurgeons at 15.4% (n=14), respectively (Table 2). For the question "How do you find out where to go when you have headache," 51.9% (n=149) of the participants responded "from family physician." Similarly, 53.8% (n=135) of the participants chose "from family physician" as the answer to the question "How do you find out where to go when you have vertigo?" Correlation analyses revealed that awareness of neurology was more highly related to questions, "Who do you consult when you have vertigo?" (p=0.018, $\chi^2$=0.147), "Where have you presented for a previous headache?" (p=0.002, $\chi^2$=0.244), and "Where have you presented for previous vertigo?" (p=0.002, $\chi^2$=0.242). Growing up in the city significantly increased awareness of neurology in the questions "Who do you consult when you have headache?" (p=0.001, $\chi^2$=0.203) and "Who do you consult when you have vertigo?" (p=0.000, $\chi^2$=0.235). Living in the city also significantly increased awareness of neurology in the questions "Who do you consult when you have headache?" (p=0.000, $\chi^2$=0.236), "Where do you consult when you have vertigo?" (p=0.000, $\chi^2$=0.326) and "Where have you presented for a previous headache?" (p=0.008, $\chi^2$=0.214). Increased level of education significantly increased awareness of neurology in the questions "Who do you consult when you have headache?" (p=0.000, $\chi^2$=0.268) and "Who do you consult when you have vertigo?" (p=0.000, $\chi^2$=0.316). There was no significant difference between age groups in terms of awareness of neurology. There was no association between level of income of participants and awareness of neurology (Table 3). When level of education was compared to living and growing up in the city, it was detected that they had a significant effect on the increase in the level of education (p=0.027, $\chi^2$=14.2 and p=0.000, $\chi^2$=19.6, respectively).

**Table 1. Socio-demographic characteristics**

| Characteristics | Number | % |
|---|---|---|
| Age (years) | | |
| <35 | 199 | 66.3 |
| 35≤ | 101 | 33.7 |
| Sex | | |
| Female | 154 | 51.3 |
| Male | 146 | 48.7 |
| Level of education | | |
| Elementary and below | 74 | 26.1 |
| Middle school / high school | 135 | 47.7 |
| College / university | 74 | 26.1 |
| Hometown place | | |
| Countryside / village | 170 | 58.4 |
| City | 121 | 41.6 |
| Living place | | |
| Countryside / village | 128 | 43.1 |
| City | 169 | 56.9 |
| Level of income | | |
| 0-1000 TL | 87 | 50 |
| 1000-2000 TL | 67 | 38.5 |
| 2000 TL and above | 20 | 11.5 |

## Discussion

This study is the first research conducted in our society on the public awareness of neurology using headache and vertigo as parameters. In our study, more than one-third of the participants chose "neurology outpatient clinic" as answer to the question, "Who do you consult when you have headache/vertigo?" However, the rate of those who had presented to the neurology outpatient clinic for previous symptoms of headache and vertigo was lower. This situation was thought to be caused by the small number of participants meeting this requirement. Participants chose neurosurgery outpatient clinic as the second most common

**Table 2. Outpatient clinic admission behaviors of participants**

| | Total (n) | Neurology outpatient clinic (n) % | Outpatient clinics other than neurology (n) % | The second most common answer (n) % | The third most common answer (n) % |
|---|---|---|---|---|---|
| Who do you consult when you have a headache? | 294 | 39.8 (117) | 60.2 (177) | Neurosurgeon 25.5 (75) | I do not know 12.9 (38) |
| Who do you consult when you have vertigo? | 260 | 45 (117) | 55 (143) | Neurosurgeon 17.7 (46) | I do not know 15 (39) |
| Where have you presented for a previous headache? | 156 | 28.8 (45) | 71.2 (111) | Neurosurgeon 19.9 (31) | Emergency department 16 (25) |
| Where have you presented for previous vertigo? | 91 | 39.6 (36) | 60.4 (55) | Emergency department 20.9 (19) | Neurosurgeon 15.4 (14) |

outpatient clinic to present with symptoms of headache and vertigo. This situation was thought to be caused by confusion of the two branches by the participants or the idea that these two branches are dealing with the same or similar diseases.

In the correlation analysis, awareness of neurology was found to increase with female sex, increased level of education, growing up and living in the city, and was not found to be associated with age and income. In addition, there was a significant relationship between level of education and growing up and living in the city. This finding suggests that the increased awareness of neurology and growing up and living in the city may be associated with increased levels of education. Moreover, Malatya is the second highest ranked province with a literacy rate of 80.7% according to TSI data in 2008, and 60.7% of the total population has elementary or lower education. In our study, the rate of participants who have primary school or lower education was 26.1% and it was striking that they have a relatively high education level compared with the provincial average. Therefore, in order to reflect the larger community homogeneously, studies with more participant groups with similar levels of education will be needed.

More than half of the participants in our study also stated that they would learn from their family physicians where to go if they had symptoms of headache or vertigo. This result may give clues about the approach of society to family medicine in the current health care system.

## Conclusion

In this study, awareness of neurology was approximately 40% in the context of headache and vertigo, and although it was found to increase with female sex, increased level of education, and growing up and living in the city, it was not associated with age and income level. Our study is the first to investigate the awareness of neurology in our society and new studies with greater participation are needed. We believe that increasing the awareness of neurology would improve patient satisfaction and reduce the health-related economic burden.

**Ethical Considerations:** The study was reviewed and approved by the study institution. Informed consent was obtained from each of the patients after verbal explanations of the study's

**Table 3. Correlation analysis**

| | Where do you consult when you have headache? | Where do you consult when you have vertigo? | Where have you applied for a previous headache? | Where have you applied for a previous vertigo? |
|---|---|---|---|---|
| Age | | | | |
| Pearson correlation ($\chi^2$) | -0.055 | -0.073 | -0.016 | 0.124 |
| Sig. (2-tailed) (p) | 0.353 | 0.243 | 0.842 | 0.244 |
| N | 291 | 258 | 155 | 90 |
| Sex | | | | |
| Pearson correlation ($\chi^2$) | -0.101 | -0.147* | -0.244** | -0.242* |
| Sig. (2-tailed) (p) | 0.085 | 0.018 | 0.002 | 0.022 |
| N | 291 | 258 | 153 | 89 |
| Level of education | | | | |
| Pearson corelation ($\chi^2$) | 0.268** | 0.316** | 0.108 | 0.006 |
| Sig.(2-tailed) (p) | 0.000 | 0.000 | 0.190 | 0.957 |
| N | 276 | 244 | 148 | 8 |
| Hometown place | | | | |
| Pearson corelation ($\chi^2$) | 0.203** | 0.235** | 0.149 | 0.156 |
| Sig.(2-tailed) (p) | 0.001 | 0.000 | 0.069 | 0.149 |
| N | 282 | 251 | 149 | 87 |
| Living place | | | | |
| Pearson corelation ($\chi^2$) | 0.236** | 0.326** | 0.214** | 0.184 |
| Sig.(2-tailed) (p) | 0.000 | 0.000 | 0.008 | 0.081 |
| N | 288 | 257 | 154 | 91 |
| Level of income | | | | |
| Pearson corelation ($\chi^2$) | -0.046 | -0.020 | 0.086 | 0.070 |
| Sig.(2-tailed) (p) | 0.745 | 0.846 | 0.298 | 0.367 |
| N | 53 | 99 | 147 | 168 |

*: Correlation significant at the 0.05 level, **: Correlation significant at the 0.01 level

purpose and the confidentiality of the data. **Approval of the Ethics Committee and Patient Consent:** The participants were interviewed face-to-face, given information about the study and survey used in this study, and asked to answer survey questions after receiving verbal consent regarding their willingness to participate. There was no need for ethics committee approval because this was a survey study and no scales were used. **Concept:** Aslıhan Baran, Zübeyde Aytürk, **Design:** Aslıhan Baran, Zübeyde Aytürk, **Data collection or processing:** Aslıhan Baran, Zübeyde Aytürk, **Analysis or Interpretation:** Aslıhan Baran, Zübeyde Aytürk, **Literature Search:** Aslıhan Baran, **Author:** Aslıhan Baran, **Peer-review:** Externally peer-reviewed. **Conflict of Interest:** The authors report no conflict of interests regarding this article. **Financial support:** We have received no financial support for this study.

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