



ORIGINAL ARTICLE

Survey of the knowledge and management of transient ischemic attacks among primary care physicians and nurses

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Acute management;
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Abstract

Introduction: Transient ischaemic attack (TIA) patients often report that Primary Care physicians (PCPs) and nurses are their main medical contacts after onset of symptoms in our health area. There are few studies on the knowledge and management of TIA among Community and Family Medicine professionals.

Material and methods: Our aim was to study the current knowledge and practice in the management of TIA patients among Primary Care physicians and nurses. A cross-sectional survey with seven questions about TIA was conducted among 640 PCPs and nurses from Primary Care centres in our health area.

Results: In total, 285 (46.7% PCPs) took part in the study. Of these, 239 (83.9%) participants knew the duration of a TIA. However only 40 (14%) recognised all clinical symptoms. An urgent neuroimaging was preferred by 67%. Only 42.5% agreed that an urgent cervical duplex would be useful in these patients. Transcranial Doppler was recognised by only 35.4%. A majority (78.2%) of participants agreed that TIA patients must be admitted to hospital. PCPs had the best knowledge of TIA (odds ratio [OR] 2.138; 95% CI 1.124-4.067; $P=0.021$) but there were no differences between physicians and nurses on the management of these patients. Nurses from rural Primary Care centers had the worst level of knowledge (OR 0.410; 95% CI 0.189-0.891; $P=0.024$).

Conclusion: TIA was well recognized as a medical emergency. However, knowledge of clinical symptoms of TIA must be improved.

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PALABRAS CLAVE

Manejo agudo;
Atención Primaria;
Ataque isquémico
transitorio

Encuesta sobre el conocimiento y manejo de los pacientes con ataque isquémico transitorio entre médicos y enfermería de Atención Primaria

Resumen

Introducción: La principal fuente de consulta de los pacientes con ataque isquémico transitorio (AIT) agudo en nuestra área sanitaria son los centros de salud de Atención Primaria. Existen muy pocos estudios sobre el conocimiento del AIT y su manejo entre profesionales de la medicina comunitaria y de familia.

Objetivo: Estimar el conocimiento del AIT, su manejo y las pruebas complementarias necesarias entre médicos y personal de enfermería de Atención Primaria de nuestra área de influencia. Para ello se envió una encuesta electrónica cerrada a 640 profesionales con 7 preguntas sobre el AIT.

Resultados: Se obtuvo una alta tasa de respuestas: 285 (46,7% médicos). 239 (83,9%) participantes mostraron un conocimiento adecuado de la duración del AIT. Sólo 40 (14%) de la sintomatología. Mientras que el 67% contestó adecuadamente que es necesaria una prueba de neuroimagen urgente. Sólo el 42,5% reconoció la necesidad una exploración con dúplex de troncos supraaórticos precoz. Únicamente, el 35,4% conocía qué es un doppler transcraneal, mientras que el 78,2% supo que era más adecuado enviar a estos pacientes a urgencias hospitalarias. El predictor independiente de mejor conocimiento fue ser un médico de Atención Primaria (MAP) (*odds ratio* [OR]: 2,138; IC 95% 1,124-4,067; $p = 0,021$) pero no hubo diferencias entre MAP y enfermería en el conocimiento del manejo de estos pacientes. En enfermería fue peor el conocimiento en el ámbito rural (OR: 0,410; IC 95% 0,189-0,891; $p = 0,024$).

Conclusión: El conocimiento de la actitud ante un AIT es correcto en la mayoría de casos, sin embargo es necesario mejorar el conocimiento de la sintomatología de los AIT.

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Introduction

Transient ischemic attack (TIA) is a true medical emergency. Clinical guidelines agree on the benefit of early treatment of patients who have suffered a transient episode of neurological deficit with an ischemic origin.¹⁻⁴ Conducting an early comprehensive study may have prognostic benefits for the patient by offering the opportunity to establish adequate treatment.⁵ In our geographical area of influence, most patients first attend Primary Care Centres (PCC).⁶ The correct recognition of symptoms and signs of these patients and their correct derivation by those professionals who initially serve these patients is extremely important.⁷

This paper presents our study on the knowledge of the definition, symptoms, diagnostic methods, clinical management and risk of recurrence of TIA among doctors and nursing staff of primary care centres (PCC) in the health area of Lleida through a survey.

Subjects and methods

The enclosed survey was sent to medical and nursing staff of 24 PCCs in the area of Hospital Arnau de Vilanova, in Lleida, in an electronic format.

The survey consisted of 7 questions (table 1). Answers A and B were considered correct for Question 1, the

identification of all the possible symptoms which a patient with TIA may present (motor, sensory, language and visual field alterations) without any distracters (alteration of consciousness and isolated vertigo), as well as for Question 2. Answer C was correct for Questions 3, 4 and 5, and B for Questions 6 and 7.

Data collection

Each doctor or nurse of the PCC received a standardised questionnaire via E-mail with a letter explaining the importance of the data collected. A second E-mail was sent after 15 days. Finally, surveys were delivered in paper format. We collected the following variables: age, gender, work environment (rural or urban) and profession (doctor or nursing staff). The total of subjects surveyed was 573 (258 [45.03%] were primary care physicians [PCP]).

Statistical study

Statistical analysis of the data was performed using the statistical package SPSS 12.0.

We used the Pearson χ^2 test and Fisher exact test for comparison of categorical variables. The comparison of two means was performed using the Student t-test. A significance level of $P < .05$ was considered statistically significant in all comparisons. Knowledge of TIA was considered acceptable when more than 3 correct answers

Table 1 Survey questionnaire

1. *How would you define a transient ischemic attack?*
 - a. Ischemic neurological deficit of less than one hour duration
 - b. Transient ischemic neurological deficit of less than 24 hours duration
 - c. Any transient neurological deficit regardless of the length of symptoms
 - d. Any transient neurological deficit which experiences a significant improvement
2. *Point out the characteristic symptoms of a patient who has suffered a transient ischemic attack*
 - a. Motor deficit
 - b. Sensory deficit
 - c. Speech alteration
 - d. Loss of consciousness
 - e. Visual field deficit or amaurosis
 - f. Isolated vertigo
3. *In patients with TIA, what is your opinion on the performance of a diagnostic neuroimaging test?*
 - a. It is not essential for the diagnosis and treatment of these patients to perform a cranial CT or brain MRI
 - b. Conducting a neuroimaging test is necessary but not urgent
 - c. A neuroimaging test must be conducted as soon as possible after TIA
4. *In patients with TIA, what is your opinion on conducting a diagnostic ultrasonography test of the supra-aortic trunks (SAT duplex scan)?*
 - a. It is essential for the diagnosis and treatment of these patients to perform a SAT duplex scan
 - b. Conducting an ultrasound test is necessary but not urgent
 - c. A SAT duplex must be conducted as soon as possible after TIA
5. *What do you know about the transcranial Doppler (TCD)?*
 - a. I do not know this diagnostic test
 - b. Conducting a TCD is necessary but not urgent
 - c. A TCD must be conducted as soon as possible after TIA
6. *What do you think is the most suitable attitude with a patient who has just suffered an episode consistent with TIA?*
 - a. Preferential referral to outpatient Neurology consultation
 - b. Referral to the emergency service
 - c. Ordinary derivation to outpatient Neurology consultation
 - d. Start of antiaggregation and request for complementary tests by the primary consultation
7. *The risk of stroke recurrence after TIA:*
 - a. Is the same as that of a patient with established cerebral ischemic stroke
 - b. Is higher than that of a patient with established cerebral ischemic stroke
 - c. Is lower than that of a patient with established cerebral ischemic stroke

were obtained. We considered the referral to an emergency service to carry out an urgent CT scan as a good attitude for TIA. Multivariate analysis was performed using multivariate logistic regression to identify independent predictors associated with good knowledge and a good attitude with these patients.

Results

A total of 285 people responded to the questionnaire, of which 138 (48.4%) were physicians. The demographic data are reflected in table 2. Statistically significant differences were observed between doctors and nurses interviewed. The physicians came more frequently from urban environments (47.7% versus 35.1% $P=.039$), while nurses were mostly female (92.5% versus 58.7% $P<.001$). There were no statistically-significant differences in age.

A total of 239 (83.9%) respondents correctly answered the question about the definition of TIA (less than one hour, 107 [37.5%], and less than 24 hours, 132 [46.3%]).

Only 40 (14.0%) respondents obtained a correct answer in the section on symptoms. The visual field deficit was the least identified (47.4%); isolated vertigo and loss of consciousness were considered erroneously as symptoms of cerebral ischemia by 77 (27.0%) and 80 (28.1%) professionals respectively. Conducting a neuroimaging test was correctly considered by 191 (67.0%) respondents. A smaller number of professionals, 121 (42.5%) replied that the supra-aortic trunks duplex is required and must be carried out early in these patients. A large number, 184 (64.8%), did not know what a transcranial Doppler was. Finally, most professionals, 223 (78.2%) would refer a patient who had just suffered a transient stroke to the emergency service. Only 21 (7.4%) respondents considered the risk of stroke recurrence less than that of patients with an established brain stroke.

Consequently, 166 (58.2%) professionals would act correctly with a patient suffering TIA: they would send him/her to a hospital emergency room for, at least, a neuroimaging test. However, only 1 in 4 respondents managed to adequately answer more than three questions.

Table 2 Demographic characteristics of respondents

	Total (n=285)		PCP (n=138)		Nursing staff (n=147)		<i>P</i>
	N	%	N	%	N	%	
<i>Environment</i>							
Urban	108	37.9	61	44.2	47	32.0	0.039
Rural	154	54.0	67	48.6	87	59.2	
Lost	23	8.1	10	7.2	13	8.8	
<i>Gender (female)</i>	217	76.1	81	58.7	136	92.5	<0.001
<i>Age</i>	43.2±9.1		43.3±8.4		43.1±9.6		0.059
20-30 years	21	7.4	7	5.1	14	9.5	0.058
30-40 years	84	29.5	42	30.4	42	28.6	
40-50 years	82	28.8	48	34.8	34	23.1	
>50 years	93	32.6	38	27.5	55	37.4	
Lost	5	1.8	3	2.2	2	1.4	

Differences between primary care physicians and nursing staff

As shown in table 3, there were statistically-significant differences between PCPs and nursing staff. The PCPs understood the definition of TIA and additional ultrasonography tests better. Furthermore, their knowledge of TIA symptoms was better, but there were no differences in the management of patients with TIA and the adequacy of conducting urgent neuroimaging tests.

Variables associated to a correct knowledge of transient ischemic attack among primary care physicians

There were no statistically-significant differences between PCPs in rural or urban environments, or between PCPs of different gender or age with respect to the number of correct responses, symptoms, neuroimaging and transcranial Doppler (table 4). In contrast, knowledge of the definition of TIA, duplex scanning of the SAT and referral of patients varied according to age. The cohort of PCPs > 50 years had the worst knowledge of TIA.

Variables associated to a correct knowledge of transient ischemic attack among nursing staff

With statistical significance, younger professionals answered more questions correctly, especially the questions related to neuroimaging, duplex scan of the SAT and Doppler CT. Similarly, professionals from the urban environment obtained more correct answers and had better knowledge about correct patient referral (table 5).

Independent predictors of correct knowledge and management of transient ischemic attack

Analysing all participants in the survey (table 6) reveals that the only independent predictor of good knowledge was

belonging to the PCP group (odds ratio [OR]: 2.138; 95%CI: 1.124-4.067; *P*=.021). No variable emerged as an independent predictor of correct knowledge among the PCP group. In the cohort of nurses, belonging to the rural environment was a predictor of poor TIA knowledge (OR: 0.305; 95%CI: 0.119-0.785; *P*=.014).

With respect to correct attitude towards TIA, only the nursing group displayed an independent predictor of inadequate knowledge, which was belonging to rural environments (OR: 0.410; 95%CI: 0.189-0.891; *P*=.024).

Discussion

This is the first study on the knowledge of TIA among primary care professionals to be held in our country. In our health area it is important to assess what these professionals know, given that most people prefer to consult these professionals first before going to a hospital emergency service.⁶ We found that PCPs have better knowledge of symptoms and complementary examinations, but the criteria on management of these patients did not differ between doctors and nurses. Overall, despite recent changes in the definition of TIA,^{3,8} there is sufficient understanding of the definition and, very importantly, 4 out of 5 respondents considered that it is an emergency condition that must be assessed at an emergency service. In addition, 67% considered it necessary to carry out at least one urgent neuroimaging test. Very few respondents did not consider it necessary to obtain an ultrasonography examination of the supra-aortic trunks. Unfortunately, the Doppler CT was completely unknown to the majority of respondents (nearly 3 out of 5 professionals). It is noteworthy that among nursing staff, younger professionals working in PCPs in urban environments were the ones with the best knowledge of TIA and its management. Among the PCPs surveyed, we did not identify any variable associated with a greater number of questions answered correctly; however, symptom knowledge was poor. Only 19.6% of PCPs and only 8.8% of nurses

Table 3 Survey responses. Differences between primary care physicians and nursing staff

Variable	PCP (N=138)	Nursing staff (N=147)	Total (N=285)	P
<i>Definition of TIA</i>				
< 1 hour	43 (31.2%)	64 (43.5%)	107 (37.5%)	<0.001
< 24 hours	81 (58.7%)	51 (34.7%)	132 (46.3%)	
Transient deficit of any duration	12 (8.7%)	23 (15.6%)	35 (12.3%)	
Significant improvement of symptoms	2(1.4%)	9 (6.1%)	11 (3.9%)	0.008
Correct response	124 (89.9%)	115 (78.2%)	239 (83.9%)	
<i>Symptoms of TIA</i>				
Isolated vertigo	47 (34.1%)	30 (20.4%)	77 (27.0%)	0.010
Loss of consciousness	42 (30.4%)	38 (25.9%)	80 (28.1%)	0.389
Alteration of speech	127 (92.0%)	132 (89.8%)	259 (90.9%)	0.513
Sensory deficit	116 (84.1%)	118 (80.3%)	234 (82.1%)	0.405
Motor deficit	127 (92.0%)	126 (85.7%)	253 (88.8%)	0.092
Visual field deficit	94 (68.1%)	41 (27.9%)	135 (47.4%)	<0.001
Correct respons	27 (19.6%)	13 (8.8%)	40 (14.0)	0.009
<i>Neuroimaging</i>				
Not necessary to carry out cranial CT or MRI	4 (2.9%)	14 (9.5%)	18 (6.3%)	0.041
Necessary but not urgent	42 (30.4%)	34 (23.1%)	76 (26.7%)	0.903
Neuroimaging is urgent	92 (66.7%)	99 (67.3%)	191 (67.0%)	
Correct response	92 (66.7%)	99 (67.3%)	191 (67.0%)	
<i>Ultrasound study of supra-aortic trunks</i>				
Not essential	9 (6.6%)	26 (17.8%)	35 (12.3%)	0.004
Necessary but not urgent	59 (43.1%)	68 (46.6%)	127 (44.6%)	0.013
Necessary and urgent	69 (50.0%)	52 (35.4%)	121 (42.5%)	
Correct response	69 (50.0%)	52 (35.4%)	121 (42.5%)	
<i>Transcranial Doppler</i>				
Does not know transcranial Doppler	76 (55.5%)	108 (73.5%)	184 (64.6%)	0.006
Necessary but not urgent	35 (25.5%)	22 (15.0%)	57 (20.0%)	0.086
Necessary and urgent	26 (18.8%)	17 (11.6%)	43 (15.1%)	
Correct response	26 (18.8%)	17 (11.6%)	43 (15.1%)	
<i>Management of patients with TIA</i>				
Referral to outpatient Neurology services in a preferential manner	13 (9.4%)	11 (7.5%)	24 (8.4%)	0.529
Emergency service of a hospital centre	108 (78.3%)	115 (78.2%)	223 (78.2%)	0.995
Referral to outpatient Neurology services in a normal manner	0 (0)	2 (1.4%)	2 (0.7%)	
Start of antiaggregation and continuing the study from Primary Care	17 (12.3%)	19 (12.9%)	36 (12.6%)	
Correct response	108 (78.3%)	115 (78.2%)	223 (78.2%)	
<i>Recurrence after TIA</i>				
Same as for an established brain stroke	65 (47.1%)	78 (53.1%)	143 (50.2%)	0.191
Higher than that of brain stroke	59 (42.8%)	62 (42.2%)	121 (42.5%)	0.922
Lower than that of brain stroke	14 (10.1%)	7 (4.8%)	21 (7.4%)	
Correct response	59 (42.8%)	62 (42.2%)	121 (42.5%)	
More than 3 correct responses	47 (34.1%)	26 (17.7%)	73 (25.6%)	0.002
Good attitude for TIA	83 (60.1%)	83 (56.5%)	166 (58.2%)	0.529

correctly recognised the symptoms of a patient with TIA. The worst-known symptom was visual field deficit, while almost one in every 3 PCPs erroneously considered isolated vertigo to be a manifestation of cerebrovascular disease.

These last findings are extremely important, because good knowledge of TIA management is inadequate if the patients who have suffered a true TIA are not properly recognised. There are several studies that have described the

Table 4 Variables associated with good TIA knowledge among primary care physicians

Variable	Correct responses		Definition of TIA		Knowledge of symptoms		Knowledge of neuroimaging	
	<4N (%)	≥4N (%)	p	Incorrect N (%)	Correct N (%)	p	Incorrect N (%)	Correct N (%)
Urban environment ^a	44 (52.4)	23 (52.3)	0.991	3 (25.0)	58 (50.0)	0.099	45 (43.7)	16 (64.0)
Gender (female) ^b	56 (61.5)	25 (53.2)	0.345	36 (78.3)	181 (75.7)	0.713	8 (57.1)	73 (58.9)
Age, years ^c	43.44 (8.91)	43.09 (7.49)	0.814	49.69 (6.74)	42.65 (8.33)	0.004	44.00 (8.48)	40.50 (7.71)
20-30 years	6 (6.7)	1 (2.2)	0.146	0 (0)	7 (5.7)	0.042	7 (6.4)	0 (0)
30-40 years	29 (32.6)	13 (28.3)		2 (15.4)	40 (32.8)		30 (27.5)	12 (46.2)
40-50 years	26 (29.2)	22 (47.8)		3 (23.1)	45 (36.9)		38 (34.9)	10 (38.5)
>50 years	22 (31.5)	10 (21.7)		8 (61.5)	30 (24.6)		34 (31.2)	4 (15.4)
Knowledge of SAT duplex scan								
Variable	Incorrect N (%)	Correct N (%)	Knowledge of Doppler CT					
Urban environment ^a	26 (41.9)	35 (53.0)	p		Incorrect N (%)	Correct N (%)	Knowledge of referral	
Gender (female) ^b	44 (63.8)	37 (53.6)	0.209		51 (43.0)	10 (41.7)	Incorrect (%)	Correct N (%)
Age (years) ^c	43.31 (9.42)	43.34 (7.40)	0.226		66 (58.9)	15 (57.7)	12 (42.9)	49 (49.0)
20-30 years	5 (7.5)	2 (2.9)	0.986		43.04 (8.26)	44.60 (9.22)	16 (53.3)	65 (60.2)
30-40 years	24 (35.8)	18 (26.5)	0.038		5 (4.5)	2 (8.0)	46.59 (8.49)	42.43 (8.23)
40-50 years	16 (23.9)	32 (47.1)			36 (32.7)	6 (24.0)	1 (3.4)	6 (5.7)
>50 years	22 (32.8)	16 (23.5)			40 (36.4)	8 (32.0)	5 (17.2)	37 (34.9)
					29 (26.4)	9 (36.0)	9 (31.0)	39 (36.8)
							14 (48.3)	24 (22.6)

^aN=128.^bN=138.^cN=135.**Table 5** Variables associated with good knowledge of TIA among nursing staff

Variable	Correct responses		Definition of TIA		Knowledge of symptoms		Knowledge of neuroimaging	
	<4N (%)	≥4N (%)	p	Incorrect N (%)	Correct N (%)	p	Incorrect N (%)	Correct N (%)
Urban environment ^a	33 (23.7)	14 (60.9)	0.004	9 (31.0)	38 (36.2)	0.607	41 (33.3)	6 (54.5)
Gender (female) ^b	110 (90.9)	26 (100.0)	0.214	28 (87.5)	108 (93.9)	0.223	124 (92.5)	12 (92.3)
Age, years ^c	43.39 (9.41)	41.58 (10.65)	0.387	45.42 (9.34)	42.42 (9.65)	0.125	43.17 (9.49)	42.00 (11.35)
20-30 years	7 (5.9)	7 (26.9)	0.007	2 (6.5)	12 (10.5)	0.433	11 (8.3)	3 (23.1)
30-40 years	38 (31.9)	4 (15.4)		6 (19.4)	36 (31.6)		38 (28.8)	4 (30.8)
40-50 years	29 (24.4)	5 (19.2)		9 (29.0)	25 (21.9)		33 (25.0)	1 (7.7)
>50 years	45 (37.8)	10 (38.5)		14 (45.2)	41 (36.0)		50 (37.9)	5 (38.5)
Knowledge of SAT duplex scan								
Variable	Incorrect N (%)	Correct N (%)	Knowledge of Doppler CT					
Urban environment ^a	27 (30.7)	20 (43.5)	p		Incorrect N (%)	Correct N (%)	Knowledge of referral	
Gender (female) ^b	86 (90.5)	50 (96.2)	0.141		40 (33.9)	7 (43.8)	Incorrect (%)	Correct N (%)
Age (years) ^c	43.18 (9.81)	42.84 (9.38)	0.215		119 (91.5)	17 (100.0)	5 (16.7)	42 (40.4)
20-30 years	6 (6.4)	8 (15.7)	0.841		42.64 (9.60)	46.23 (9.51)	30 (93.8)	106 (92.2)
30-40 years	33 (35.1)	9 (17.6)	0.034		11 (8.6)	3 (17.6)	45.42 (8.39)	42.42 (8.88)
40-50 years	18 (19.1)	16 (31.4)			42 (32.8)	0 (0)	2 (6.5)	12 (10.5)
>50 years	37 (38.4)	18 (35.3)			31 (24.2)	3 (17.6)	6 (19.4)	36 (31.6)
							17 (54.8)	38 (33.3)

^aN=134.^bN=147.^cN=145.

Table 6 Independent predictors of good knowledge and good attitude towards a patient with TIA

Objective	Cohort studied	Variable	Odds ratio	95%CI	P
Good knowledge of TIA (>3 correct answers)	All	Age	0.987	0.952-1.022	0.456
		Female gender	0.728	0.343-1.545	0.409
		Rural area	0.612	0.333-1.127	0.115
	PCP	PCP	2.138	1.124-4.067	0.021
		Age	0.972	0.920-1.028	0.325
		Female gender	0.551	0.222-1.368	0.199
	Nursing staff	Rural area	1.061	0.473-2.383	0.885
		Age	0.987	0.941-1.035	0.592
		Female gender	0.999	—	—
Good attitude	All	Rural area	0.305	0.119-0.785	0.014
		Age	0.971	0.942-1.000	0.054
		Female gender	0.540	0.269-1.082	0.082
		Rural area	0.673	0.391-1.158	0.153
	PCP	PCP	0.948	0.539-1.665	0.851
		Age	0.948	0.897-1.002	0.061
		Female gender	0.450	0.184-1.101	0.080
	Nursing staff	Rural area	1.205	0.542-2.679	0.648
		Age	0.977	0.942-1.014	0.221
		Female gender	0.716	0.197-2.605	0.612
		Rural area	0.410	0.189-0.891	0.024
		Age	0.977	0.942-1.014	0.221

discrepancy in TIA diagnosis between physicians not specialised in the management of stroke and neurologists with an interest in the neurovascular field.^{7,9-11}

In the literature, there are two previous publications that evaluate PCP knowledge of transient stroke. The first, conducted in most of the territory of the United States, obtained a participation rate well below ours.¹² Less than 10% of telephone survey respondents completed the questionnaire. We emphasise that among the 200 participants, the combination of adequate knowledge of symptoms and the definition of TIA was also low, specifically 22%. The second study, carried out in several regions of Germany, included 395 individuals. Although the survey also inquired about aspects of established stroke, 84.8% considered TIA as a medical emergency; however, 50.9% pointed to outpatient management as the best option. In this study, the PCPs from extra-metropolitan areas were the least likely to refer their patients to emergency services.¹³

On the other hand, numerous studies have been conducted on the knowledge of stroke in general population. Particularly in the rural region of Lleida,⁶ knowledge of the disease is unsatisfactory; only 16.3% had good knowledge of the risk factors and 20.9% had good knowledge of the symptoms. Specifically, when asked about their attitudes towards TIA, 84.5% would first turn to the PCP and 27% would not do so urgently. The same was true among young adolescents,¹⁴ who represent the future of our country, and the general population.^{15,16} As expected, if we look at the results of our survey, knowledge of the symptoms and their treatment was better among medical professionals than among the general population.

Although our response rate was satisfactory, a larger cohort would evidently provide a better insight into the reality of our region. We cannot know if the professionals who did not reply had poorer knowledge of the disease. However, we studied the differences regarding occupation, gender, age and scope of the responders and non-responders, noting that both cohorts presented similar characteristics. A larger cohort would have allowed us to study the variables associated with better management or knowledge for each working environment or age range.

We conclude that our study is novel and has allowed us to assess the knowledge that nursing staff and PCPs have of TIA. There is an awareness of the proper management of this disease, although it is necessary to increase awareness of the symptoms of these patients.

Conflict of interest

The authors declare no conflict of interest.

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