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STROKE AWARENESS, INTENDED EMERGENCY ACTION, AND CARE EXPERIENCE IN KAZAKHSTAN: A CROSS-SECTIONAL TWO-MODULE SURVEY (STROKETIMEBRAIN)

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Abstract

Introduction. Stroke remains a leading cause of death and disability, with rising global burden. Transient ischemic attack (TIA) is often overlooked despite requiring urgent care. Evidence on stroke awareness, intended action, and access to acute care in Kazakhstan is limited.

Aim. To assess public stroke awareness and its sociodemographic distribution, test whether knowledge predicts appropriate intended action, describe barriers in the acute stroke pathway, and identify targets for system improvement.

Materials and Methods. Two independent cross-sectional online surveys (StrokeTimeBrain v1.4) were conducted in February–April 2026. Module A included community adults aged ≥18 years (n=383), and Module B included patients and caregivers with a suspected stroke/TIA care contact within the previous 24 months (n=397). Outcomes included a composite knowledge score (0–15), three symptom vignettes, and a four-item care-experience scale. Analyses used χ^2 tests, nonparametric comparisons, and logistic/Poisson regression adjusted for age, sex, education, residence, and region.

Results. Overall knowledge was modest (mean 6.5/15). Only 20.4% identified the ≤4.5-hour thrombolysis window, and reperfusion-treatment awareness was low, although 94.5% knew the emergency number. Knowledge increased with age, while the youngest respondents were least informed. Appropriate "call EMS" responses declined from 83.6% for slurred speech to 60.8% for transient/TIA symptoms ($p<0.001$). Correct intended action was associated mainly with urban residence (aOR 3.22), not with total knowledge score. Willingness to use telestroke was high (78.1%). Among care users, satisfaction was high (7.9/10), and imaging delay was the main bottleneck (42.1%).

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Conclusion. Stroke awareness in Kazakhstan was modest and unevenly distributed. Education should emphasize urgency and TIA, while system improvement should prioritize EMS, imaging, and telestroke capacity, especially in weaker regions.

Key words: stroke, transient ischemic attack, health knowledge, emergency medical services, patient satisfaction, health services accessibility.

Introduction. Stroke is among the leading causes of death and acquired adult disability worldwide, and its global burden has continued to rise in absolute terms despite declining age-standardized rates [1]. Most strokes are ischemic, and for these the available reperfusion therapies are exquisitely time-dependent, hence, intravenous thrombolysis confers maximal benefit when started within 4.5 hours of symptom onset, and mechanical thrombectomy, although now feasible in selected patients out to 24 hours, yields better outcomes the earlier it is performed [2]. Because an estimated 1.9 million neurons are lost for every minute that a large-vessel occlusion remains untreated, the interval between symptom onset and the start of definitive care is the single most important modifiable determinant of outcome – the principle captured by the maxim that, in stroke, “time is brain”.

The earliest and most fragile link in the stroke chain of survival lies outside the hospital. Reperfusion can only be delivered to patients who recognize that something is wrong, attribute it to a medical emergency, and activate emergency medical services (EMS) without delay [3]. In low- and middle-income countries (LMICs), prehospital delay is the dominant reason that eligible patients never reach treatment in time, and this delay is driven less by the technical capacity of hospitals than by limited public awareness of stroke warning signs, low health literacy, and structural barriers to rapid transport [3,4]. A recurring and counter-intuitive observation is that improving factual knowledge of stroke does not reliably translate into faster help-seeking. Educational campaigns have repeatedly raised symptom recognition without changing behavior, implying that attitudinal and contextual factors like perceived urgency, trust in the system, and access also govern whether people act [4].

Transient ischemic attack (TIA) and rapidly resolving deficits represent a particular blind spot. Because the symptoms disappear, they are easily dismissed, yet they identify exactly the patients in whom prompt assessment and secondary prevention avert a disabling completed stroke. Whether the public extends the same urgency to fleeting symptoms as to fixed deficits has rarely been examined directly in population samples.

These issues are especially salient in Kazakhstan and the wider Central Asian region, where the burden of stroke is high and the risk of premature cerebrovascular death is among the greatest in the world [5]. National data show a rising incidence of cerebrovascular disease and substantial in-hospital mortality, alongside long prehospital intervals and an uneven distribution of specialized stroke services across a vast and largely rural territory [6,7]. Marked urban–rural and regional inequities in cardiovascular outcomes have been documented, and access to time-critical imaging and reperfusion remains concentrated in larger urban centers [8]. In such settings, telemedicine-supported stroke care (“telestroke”) has emerged internationally as a strategy to bridge geographical barriers, extend specialist expertise to peripheral hospitals, and increase the proportion of patients treated within the therapeutic window [9,10]. Its success, however, depends not only on infrastructure but on public willingness to use it.

Despite this, population-level evidence on what the public in Kazakhstan actually knows about stroke, how people intend to act when symptoms arise, how they perceive their access to emergency care, and how those who have already been through the system experienced it remains scarce. Most regional data derive from administrative mortality registries rather than from the community and patient perspective. Understanding these upstream and downstream

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weak points is a prerequisite for designing campaigns and service reforms that shorten the path from symptom onset to treatment.

We therefore conducted the StrokeTimeBrain (STB) survey, a cross-sectional study comprising two complementary instruments: a general-population module assessing stroke knowledge, intended response to symptom vignettes, perceived barriers to calling EMS, perceived access to hospital care, and willingness to use a 24/7 telestroke consultation service (Module A); and a separate module capturing the lived experience and satisfaction of patients and caregivers who had sought care for suspected stroke or TIA within the preceding 24 months (Module B). Our aims were to quantify public stroke awareness and its sociodemographic distribution, to determine whether knowledge predicts intended appropriate action, to characterize perceived and experienced barriers along the acute stroke pathway, and to identify the most actionable targets for system-level improvement in this setting.

Materials and methods

Ethical issues

This study complied with the ethical principles outlined in the Declaration of Helsinki and received approval from the local bioethics committee of the Kazakhstan School of Public Health (protocol No. 6, IRB-164-2024, date 02.05.2024) and continuations with protocols No. 12 from 06.05.2025 and No. 9 from 30.04.2026.

Study Design, Settings, Patient Population and Size

We conducted two cross-sectional surveys, collectively termed the StrokeTimeBrain (STB) Survey (Supplementary Material 1), to characterize stroke-related knowledge, intended emergency behavior and access to care in the general adult population (Module A) and the care experience and satisfaction of people who had recently sought emergency or hospital care for suspected stroke (Module B). The two modules used distinct instruments and target populations and were analyzed as independent samples.

The survey was conducted in Kazakhstan and covered all five macroregions (Southern, Northern, Western, Eastern and Central) and both urban and rural settlements. The questionnaire was available in Russian and Kazakh. Data were collected between February 2026 and April 2026 using Yandex survey platform of online questionnaire. The instrument was version 1.4 of the STB Survey. Module B captured care episodes that had occurred within the 24 months preceding questionnaire completion. Participants were recruited through an open online survey distributed via social media and through community networks. Participants were not recruited through clinical encounters. All responses were collected in a single standardized electronic format. Using one survey mode for every respondent minimized variability attributable to mixed administration modes. Recruitment was non-probability and self-selected, so the resulting sample is a convenience sample.

The required sample size was estimated using the standard formula for estimating a single population proportion (Cochran) [11]. For an infinite or very large population,

$$n_0 = Z^2 \cdot p(1 - p) / d^2, \quad (1)$$

where Z = 1.96 (corresponding to a 95% confidence level), p = 0.5 (the proportion assumed to yield the maximum required sample size in the absence of a prior estimate), and d = 0.05 (the desired margin of error). This gives approximately 384 respondents.

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A finite population correction was then applied using the annual number of incident strokes reported for Kazakhstan in 2019 (N = 31,814) as the reference population [7]:

$$n = n_0 / [1 + (n_0 - 1) / N] \quad (2)$$

$$n = 384.2 / [1 + 383.2 / 31,814] \approx 380, \quad (3)$$

yielding a target of approximately 380 completed questionnaires. The achieved samples (Module A, n = 383; Module B, n = 397) both met or exceeded this target. Because the reference population is large, the finite population correction had a negligible effect (385 versus 380). The target is therefore robust to the choice of denominator.

Module A was open to community-dwelling adults aged 18 years or older residing in Kazakhstan. Within the instrument, the single explicit eligibility step was informed consent: respondents who did not consent at the first item were routed out of the survey and not analyzed. Of 388 completed Module A questionnaires, 5 respondents who declined consent were excluded, leaving 383 participants for analysis.

Module B was directed at individuals who was as the patient or as an accompanying relative or caregiver had contact with EMS, a hospital emergency department, or inpatient care for suspected stroke or TIA within the previous 24 months. Eligibility was established through screening items on consent and on prior care contact. Diagnoses were not verified against medical records, discharge summaries, or imaging results. A total of 397 eligible respondents completed Module B. Because the two modules were not linked at the individual level, no respondent contributed paired records across modules

Variables

Module A. The principal outcomes were stroke knowledge and intended appropriate emergency response. Stroke knowledge was summarized using a composite index (range 0–15) constructed by the authors for this study. One point was awarded for each correctly identified item: recognition of each of the five cardinal warning signs (unilateral face/limb weakness or numbness; speech or comprehension disturbance; sudden visual loss or diplopia; vertigo with gait/coordination disturbance; sudden severe unusual headache – 5 points); identification of each established risk factor (hypertension, diabetes, smoking, obesity, atrial fibrillation, high cholesterol – 6 points); awareness of each reperfusion therapy (intravenous thrombolysis; mechanical thrombectomy – 2 points); selection of the correct thrombolysis time window (≤4.5 hours – 1 point); and identification of the correct emergency telephone number (1 point). Both "I do not know" and incorrect responses were scored 0; no negative marking was applied. The index was developed by the authors and has not undergone formal testing of reliability or validity. It should therefore be regarded as a pragmatic descriptive summary rather than a validated psychometric instrument. Intended emergency response was assessed with three clinical vignettes – sudden slurred speech, sudden unilateral limb weakness, and transient symptoms resolving within 10–15 minutes (suggestive of TIA). For each vignette, the response "immediately call EMS (103/112)" was defined as appropriate, and an appropriate-action score (0–3) summed the number of appropriate responses across the three vignettes. Secondary outcomes were perceived travel time to hospital, willingness to use a hypothetical 24/7 telestroke consultation service, and self-reported reasons for not calling EMS immediately. Candidate predictors and potential confounders were age group (18–29, 30–44, 45–59, ≥60

years), sex, education (secondary or below, vocational, higher, postgraduate), residence (urban/rural) and macroregion.

Module B. The outcomes were the patient/caregiver care experience and overall satisfaction. A four-item experience scale captured perceived speed of help, clarity of explanation, respectfulness of staff and coordination of the care team, each rated from 1 (strongly disagree) to 5 (strongly agree); the mean of the four items was used as a composite experience score after assessment of internal consistency. Overall satisfaction was measured with a single 0–10 global rating; because of a pronounced ceiling effect, the primary analytic outcome was a dichotomous "top-box" rating (≥9 of 10). Continuity-of-care outcomes were the clarity of discharge instructions (full / partial / none) and whether rehabilitation or follow-up had been organized (yes / partial / no). Candidate predictors were respondent role (patient versus caregiver), mode of arrival (EMS, self-transport, inter-hospital transfer), EMS arrival-time band, macroregion and time since the index episode.

All variables were obtained by participant self-report using the structured STB questionnaire (Module A, 20 items; Module B, 12 items). Single-choice items were recorded as mutually exclusive categories. Multiple-response items (stroke symptoms, risk factors, barriers to calling EMS, care-pathway problems, and information sources) were captured as independent binary indicators and, where relevant, summed into count scores. The four experience items used a common 5-point Likert format and the global satisfaction item a 0–10 numeric rating. Within each module, identical instruments and response formats were administered to all respondents. The two modules used distinct instruments appropriate to their respective populations, and no between-instrument comparison was made.

Statistical analysis

Categorical variables are summarized as counts and percentages and continuous scores as mean (SD) with median [IQR]. A composite knowledge score (0–15) combined symptom recognition, risk-factor knowledge, treatment awareness, the correct thrombolysis window, and the correct emergency number. Group differences were tested with the $\chi 2$ test (or Fisher's exact test), Mann–Whitney U and Kruskal–Wallis tests, and ordinal trends with the Spearman rank correlation. Within-subject differences across the three symptom vignettes were assessed with Cochran's Q and pairwise McNemar tests with Bonferroni correction. Multivariable associations were modelled with logistic regression (adjusted odds ratios, aOR) and Poisson regression (rate ratios, RR), adjusting for age, sex, education, residence, and region. Internal consistency of the four-item experience scale was assessed with Cronbach's α and McDonald's ω. Tests were two-sided at $\alpha = 0.05$; estimates are reported with 95% confidence intervals (CI).

Results

Sample characteristics

Characteristics of both samples are shown in Table 1. The Module A sample skewed younger and urban: 72.3% were under 45 years (32.1% aged 18–29 and 40.2% aged 30–44), whereas only 4.7% (n = 18) were aged 60 or older, which was the group at highest stroke risk. Just over half were women (55.1%) and four-fifths lived in urban areas (80.2%); vocational education was the most frequent level (42.6%). In Module B, caregivers accounted for 71.0% of respondents and patients for 29.0%. The index episode had occurred 12–24 months earlier for most respondents (57.9%), and patients had reached hospital by emergency medical service (EMS) in 52.6% of cases and by their own means in 45.1%.

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Table 1. Sample characteristics.

Characteristic	Value
MODULE A (N=383)	
Age	
18–29	123 (32.1%)
30–44	154 (40.2%)
45–59	88 (23.0%)
60+	18 (4.7%)
Sex	
Female	211 (55.1%)
Male	172 (44.9%)
Region	
South	114 (29.8%)
North	123 (32.1%)
West	62 (16.2%)
East	44 (11.5%)
Central	40 (10.4%)
Residence	
Urban	307 (80.2%)
Rural	76 (19.8%)
Education	
Secondary-	62 (16.2%)
Vocational	163 (42.6%)
Higher	142 (37.1%)
Postgraduate	16 (4.2%)
Knowledge score (0-15)	6.54 (3.20) / 6 [4, 8]
Appropriate-action score (0-3)	2.18 (1.03) / 3 [1, 3]
Telestroke willingness	
Yes	299 (78.1%)
No	26 (6.8%)
Unsure	58 (15.1%)
Perceived travel time	
<=15	164 (42.8%)
15–30	94 (24.5%)
30–60	39 (10.2%)
>60	20 (5.2%)
Don't know	66 (17.2%)
MODULE B (N=397)	
Respondent role	
Patient	115 (29.0%)
Caregiver	282 (71.0%)
Region	
South	115 (29.0%)
North	110 (27.7%)
West	70 (17.6%)
East	43 (10.8%)
Central	59 (14.9%)
Time since episode	
0–3m	85 (21.4%)

3–6m	26 (6.5%)
6–12m	56 (14.1%)
12–24m	230 (57.9%)
Mode of arrival	
EMS	209 (52.6%)
Self	179 (45.1%)
Transfer	9 (2.3%)
EMS arrival time	
<=15	113 (28.5%)
15–30	110 (27.7%)
30–60	50 (12.6%)
>60	15 (3.8%)
>120	4 (1.0%)
Not called / don't remember	105 (26.4%)
Experience scale (1-5)	4.17 (0.72) / 4 [4, 5]
Discharge instructions clear	
Full	260 (65.5%)
Partial	105 (26.4%)
No	23 (5.8%)
No discharge / don't remember	9 (2.3%)
Rehabilitation organised	
Yes	170 (42.8%)
Partial	127 (32.0%)
No	66 (16.6%)
Not required / don't know	34 (8.6%)
Overall rating (0–10)	7.86 (2.09) / 8 [7, 10]

Stroke knowledge and its sociodemographic gradient

Overall stroke knowledge was modest (mean composite score 6.5 of 15, SD 3.2; median 6) (Table 2). Specific gaps were marked: only 20.4% of respondents identified the correct ≤4.5-hour window for thrombolysis while 68.9% answered “don't know”, and awareness of reperfusion treatments was low (35.8% had heard of thrombolysis and 25.3% of thrombectomy), even though 94.5% knew the emergency telephone number. Knowledge increased monotonically with age, from 5.3 in those aged 18–29 to 9.3 in those aged 60+ (Spearman $\rho = 0.27$, $p < 0.001$), and more weakly with education ($\rho = 0.13$, $p = 0.011$). Urban residents scored higher than rural residents ($p = 0.012$), and scores differed across macroregions (Kruskal–Wallis $p = 0.004$). The age and education gradients are shown in Figure 1.

Table 2. Composite knowledge score (0–15) by sociodemographic group.

Characteristic	n (%)	Mean (SD)	Median	Test Statistic	p-value
Age, years				Spearman ρ = 0.266	<0.001
18–29	123 (32.1%)	5.30 (3.20)	5.0		
30–44	154 (40.2%)	6.94 (3.00)	6.0		
45–59	88 (23.0%)	7.03 (2.73)	7.0		
≥ 60	18 (4.7%)	9.28 (4.06)	7.5		
Education				Spearman ρ = 0.130	0.011
Secondary or less	62 (16.2%)	5.95 (2.54)	6.0		
Vocational	163 (42.6%)	6.20 (2.76)	6.0		

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Higher	142 (37.1%)	7.07 (3.70)	6.5		
Postgraduate	16 (4.2%)	7.69 (4.13)	9.0		
Residence				Mann-Whitney U = 13828	0.012
Urban	307 (80.2%)	6.75 (3.36)	6.0		
Rural	76 (19.8%)	5.70 (2.29)	5.5		
Region				Kruskal-Wallis H = 15.36	0.004
South	114 (29.8%)	7.06 (3.66)	6.0		
North	123 (32.1%)	5.76 (2.94)	5.0		
West	62 (16.2%)	6.05 (2.92)	6.5		
East	44 (11.5%)	7.34 (2.15)	7.0		
Central	40 (10.4%)	7.38 (3.42)	6.0		

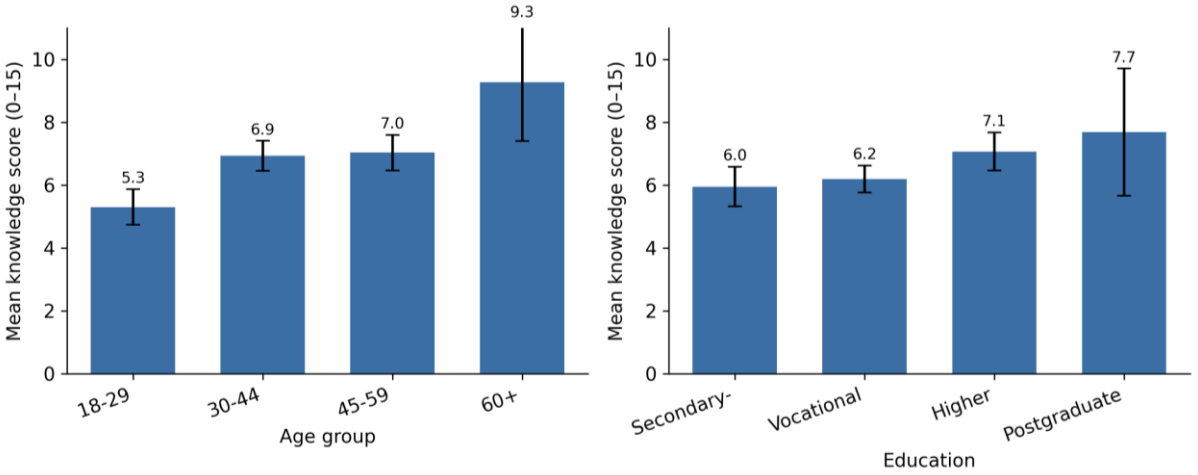

Figure 1. Stroke-knowledge gradient by age and education (mean composite score with 95% CI).

Knowledge rose steadily across age groups and, less steeply, across educational levels – indicating that the youngest adults, rather than the oldest, were the least informed about stroke. Although 90.9% of respondents said they would call EMS first at any suspicion of stroke, intended appropriate action fell progressively as the presenting symptoms became less dramatic. The proportion choosing to call EMS declined from 83.6% for sudden slurred speech, to 73.9% for one-sided limb weakness, to 60.8% for transient symptoms resolving within 10–15 minutes (Table 3). This within-subject decline was highly significant (Cochran's Q = 82.9, df = 2, $p < 0.001$), and all three pairwise comparisons remained significant after Bonferroni correction (each $p < 0.001$). The largest gap was between the overt-deficit and the transient-symptom scenarios, indicating that the public is least likely to seek emergency care precisely when symptoms are fleeting – the clinical situation in which rapid assessment is most valuable.

Table 3. Appropriate "call EMS" response rates across the three symptom vignettes.

Symptom Vignette	**Total (n)**	**Appropriate Response, n (%)**
Slurred speech	383	320 (83.6%)
Limb weakness	383	283 (73.9%)
Transient/TIA	383	233 (60.8%)

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Overall Difference: Cochran's Q = 82.88, df = 2, p < 0.001			
Pairwise Comparison	**Discordant (0→1)**	**Discordant (1→0)**	**Adjusted p-value**
Speech vs. Limb weakness	20	57	< 0.001
Speech vs. TIA	12	99	< 0.001
Limb weakness vs. TIA	19	69	< 0.001

Notes: EMS = Emergency Medical Services; TIA = Transient Ischemic Attack. Adjusted p-values for pairwise comparisons were calculated using the Bonferroni correction method. Discordant pairs represent the shift in responses between the compared vignettes (0=Inappropriate/Did not call EMS, 1=Appropriate/Called EMS).

Determinants of appropriate response and telestroke acceptance

In the multivariable model for appropriate response to the TIA vignette (Table 4), the composite knowledge score was not a significant predictor (aOR 1.03, 95% CI 0.96–1.11, p = 0.41). The dominant determinant was urban residence (aOR 3.22, 95% CI 1.81–5.73, p < 0.001), and respondents in the Western macroregion were markedly less likely to respond appropriately (aOR 0.23, 95% CI 0.09–0.59, p = 0.002); age, sex and education showed no independent association. The Poisson model for the number of appropriate vignette responses (0–3) gave concordant results – higher in urban residents (RR 1.39, p = 0.002) and lower in the West (RR 0.76, p = 0.045), again without an independent knowledge effect. Taken together, the appropriate-response gap appears geographic and structural rather than purely a function of knowledge.

Willingness to use a hypothetical 24/7 telestroke consultation was high overall (78.1% yes, 6.8% no). In the adjusted model, willingness rose strongly with age (45+ vs 18–29: aOR 7.47, 95% CI 3.04–18.35, p < 0.001) and was lower among men (aOR 0.42, 95% CI 0.24–0.74, p = 0.003), with higher acceptance in the Southern region (aOR 3.34, p = 0.021). Notably, all 18 respondents aged 60+ endorsed the service, producing complete separation; age was therefore collapsed into three categories for this model. The direction of the age effect is the opposite of the a-priori expectation that younger, more digitally engaged respondents would be most receptive.

Table 4. Predictors of appropriate TIA vignette response and telestroke utilization.

Characteristic	**Appropriate EMS Response to TIA Vignette OR (95% CI)**	**p-value**	**Willingness to Use Telestroke Service OR (95% CI)**	**p-value**	**Number of Appropriate Vignette Responses RR (95% CI)**	**p-value**
Age Group						
18–29	Reference	–	Reference	–	Reference	–
30–44	1.38 (0.81–2.37)	0.238	1.85 (1.00–3.42)	0.051	1.07 (0.91–1.27)	0.414
45–59 or ≥45*	1.30 (0.69–2.44)	0.416	7.47 (3.04–18.35) *	<0.001	1.03 (0.84–1.26)	0.794
≥60	0.73 (0.22–2.39)	0.604			0.93 (0.64–1.35)	0.702
Sex						
Female	Reference	–	Reference	–	Reference	–
Male	0.96 (0.61–1.51)	0.864	0.42 (0.24–0.74)	0.003	0.99 (0.86–1.14)	0.886
Education Level						
Higher/University	Reference	–	Reference	–	Reference	–
Secondary or lower	0.65 (0.34–1.25)	0.196	1.53 (0.64–3.65)	0.335	0.83 (0.66–1.04)	0.113
Vocational	1.11 (0.67–1.85)	0.682	1.11 (0.60–2.07)	0.734	1.04 (0.89–1.21)	0.647

Postgraduate	1.41 (0.44–4.57)	0.563	1.54 (0.37–6.34)	0.551	1.15 (0.83–1.61)	0.401
Residence						
Rural	Reference	–	Reference	–	Reference	–
Urban	3.22 (1.81–5.73)	<0.001	1.67 (0.84–3.32)	0.141	1.39 (1.13–1.70)	0.002
Region						
Central/Reference	Reference	–	Reference	–	Reference	–
North	0.51 (0.21–1.23)	0.135	1.49 (0.59–3.77)	0.403	0.90 (0.70–1.14)	0.380
South	0.50 (0.20–1.21)	0.124	3.34 (1.20–9.33)	0.021	0.87 (0.68–1.11)	0.260
East	0.88 (0.31–2.47)	0.809	2.39 (0.69–8.35)	0.171	0.91 (0.69–1.21)	0.510
West	0.23 (0.09–0.59)	0.002	0.51 (0.19–1.36)	0.179	0.76 (0.58–0.99)	0.045
Stroke Knowledge	1.03 (0.96–1.11)	0.413	1.09 (0.99–1.20)	0.065	1.01 (0.99–1.04)	0.236

Notes: OR = Odds Ratio; RR = Rate Ratio; CI = Confidence Interval; EMS = Emergency Medical Services; TIA = Transient Ischemic Attack. Appropriate vignette responses (0–3) were evaluated using a Poisson regression model. * For the Telestroke Service model, age was collapsed into three groups (18–29, 30–44, and ≥45) to resolve quasi-complete separation, as all 18 respondents aged ≥60 answered "yes". Therefore, the OR reported in the 45–59 row for this column applies to all participants aged ≥45.

Perceived access and barriers to calling EMS

Perceived time to reach a hospital varied widely: 42.8% expected to arrive within 15 minutes, while a substantial minority anticipated delays. Perceived travel time differed significantly by residence ($\chi^2 = 33.4$, $p < 0.001$) and by macroregion ($\chi^2 = 57.2$, $p < 0.001$), consistent with geographic inequity in access (Table 5). When asked why people sometimes do not call EMS immediately, the reasons respondents most frequently perceived were the belief that symptoms would pass (80.2%) and failure to recognise symptoms (76.8%), far exceeding structural barriers such as distrust of or delay in EMS (23.8%), fear of hospitalisation (23.5%), financial concerns (13.1%) and lack of transport (9.7%) (Figure 2). The barrier profile reinforces the recognition gap seen in the vignettes. These figures represent respondents' perceptions of why people in general may delay calling EMS and are not verified causes of delay in actual patients.

Table 5. Perceived travel time to hospital by residence and macroregion.

Characteristic	**≤15 min**	**15–30 min**	**30–60 min**	**>60 min**	**p-value**
Residence, n					<0.001
Rural	32	14	5	14	
Urban	132	80	34	6	
Macroregion, n					<0.001
Central	20	9	5	0	
East	26	1	7	4	
North	52	39	11	11	
South	27	42	9	2	
West	39	3	7	3	

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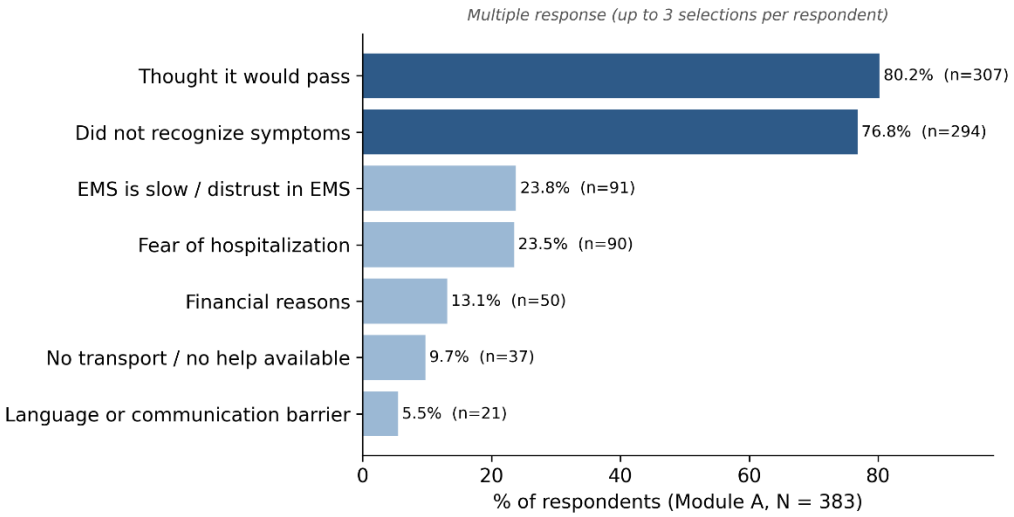

Figure 2. Reasons for not calling EMS immediately (multiple response; N = 383).

Patient/caregiver experience and satisfaction (Module B)

The four-item experience scale (speed, clarity of explanation, respectfulness, team coordination; each 1–5) showed acceptable internal consistency (Cronbach's α = 0.65, McDonald's ω = 0.65). Item means were highest for respectful treatment (4.32) and team coordination (4.38) and lowest for perceived speed of help (3.86), which also had the weakest item-rest correlation (Table 6). Overall satisfaction was high but ceiling-loaded: the mean rating was 7.9 of 10 (median 8), with 42.3% giving a top-box rating of 9–10.

Table 6. Reliability and item statistics of the four-item experience scale.

Item	Mean	SD	Item-rest r	Alpha if dropped
Speed (e_speed)	3.86	1.2	0.388	0.612
Clarity (e_clear)	4.13	1.02	0.441	0.565
Respect (e_respect)	4.32	1.01	0.47	0.545
Coordination (e_coord)	4.38	0.92	0.416	0.585
Overall Scale Reliability (N = 397): Cronbach's alpha = 0.645; McDonald's omega total = 0.653				

In the multivariable model for a top-box overall rating (Table 7), no measured pathway factor reached statistical significance; organised rehabilitation/follow-up showed a non-significant positive trend (aOR 1.98, 95% CI 0.94–4.20, p = 0.074). EMS arrival time was not associated with the overall rating (Spearman ρ = 0.017, p = 0.77), and patients and caregivers rated care similarly (p = 0.31). Measured structural and timeliness factors thus explained little of the variation in satisfaction, which may reflect the ceiling effect and the predominance of caregiver proxies.

Table 7. Predictors of top-box overall rating (≥9/10) for hospital experience.

Characteristic	OR (95% CI)	p-value
Mode of Arrival		
EMS (Ambulance)	Reference	–
Self	0.69 (0.38–1.23)	0.207
Transfer	1.46 (0.18–12.21)	0.726

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EMS Response Time		
15–30 min	Reference	–
≤15 min	0.73 (0.40–1.32)	0.292
30–60 min	0.82 (0.38–1.79)	0.625
>60 min	1.07 (0.31–3.74)	0.917
>120 min	0.62 (0.06–7.04)	0.702
Discharge Status / Preparedness		
Yes (Complete)	Reference	–
Partial	0.69 (0.37–1.30)	0.254
No	1.70 (0.56–5.14)	0.348
Rehabilitation		
No	Reference	–
Partial	1.03 (0.48–2.20)	0.942
Yes	1.98 (0.94–4.20)	0.074
Respondent Role		
Caregiver	Reference	–
Patient	1.09 (0.58–2.05)	0.784
Macroregion		
Central	Reference	–
North	1.83 (0.81–4.16)	0.146
South	1.06 (0.47–2.40)	0.894
East	2.70 (0.79–9.29)	0.115
West	1.39 (0.56–3.44)	0.478

Notes: OR = Odds Ratio; CI = Confidence Interval; EMS = Emergency Medical Services.

Overall ratings were essentially flat across arrival-time bands from ≤15 to >60 minutes (7.6–8.2) with no monotonic dose–response (Spearman ρ = 0.017, p = 0.77) (Figure 3). The apparent drop in the >120-minute band rests on only four respondents and should not be over-interpreted.

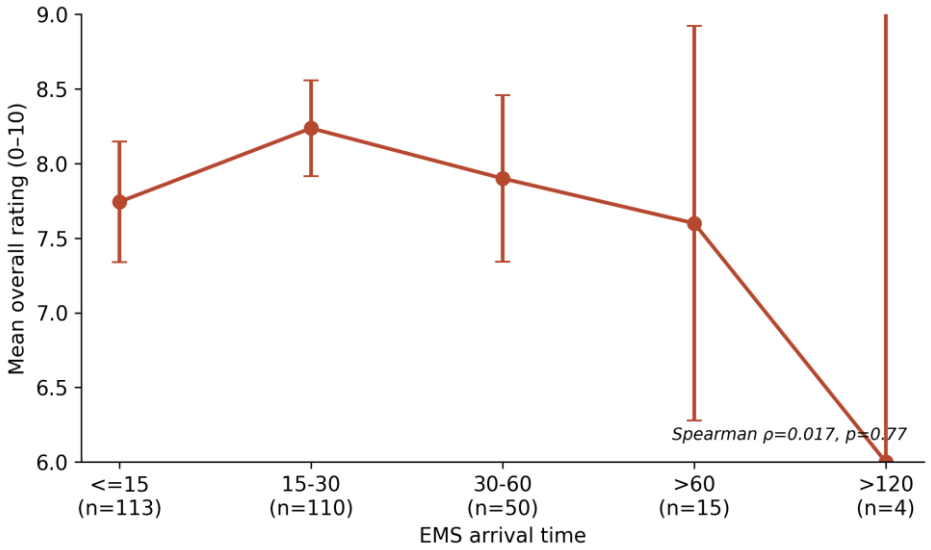

Figure 3. Mean overall care rating (0–10) by EMS arrival-time band, with 95% CI.

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When asked to identify the most problematic step(s) (multiple responses permitted) in obtaining care, respondents most often cited long waits for imaging (CT/MRI), reported by 42.1% – nearly double any other category (Figure 4). This was followed by insufficient information or explanation (23.7%), difficulty accessing rehabilitation (21.9%), long waits for EMS (18.6%) and routing or inter-facility transfer difficulties (9.6%). The prominence of imaging delay represents a frequently reported, participant-perceived concern in the acute stroke pathway rather than an objectively confirmed bottleneck.

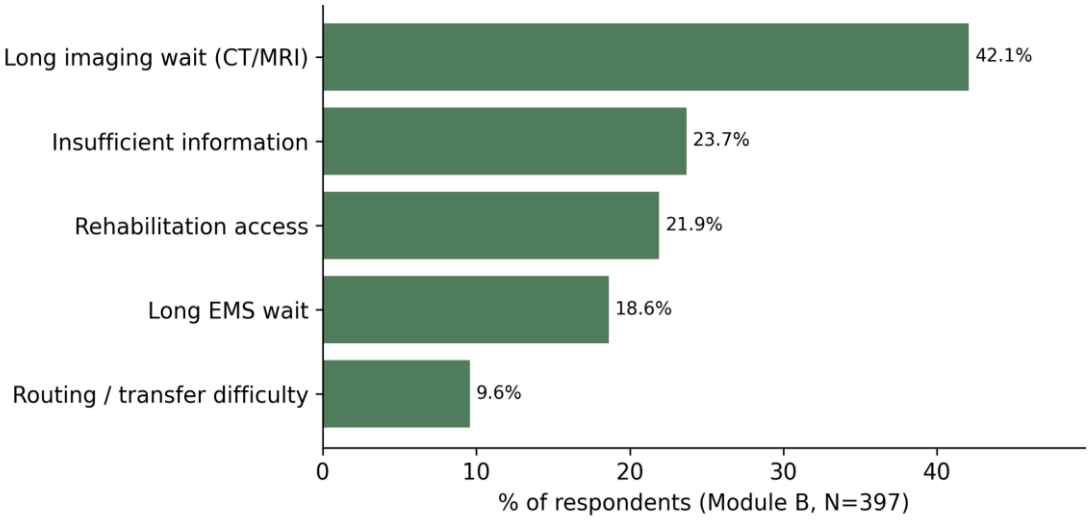

Figure 4. Most problematic step in the care pathway (N = 397; multiple response).

Discussion. In two independent cross-sectional samples from related but distinct populations in Kazakhstan – the general adult public (Module A) and patients and caregivers who had sought care for suspected stroke or TIA (Module B) – this study maps. Four findings stand out. First, public stroke knowledge was modest and contained specific, treatment-relevant gaps. Second, intended appropriate action declined steeply as symptoms became less dramatic, with the largest deficit for transient symptoms suggestive of TIA. Third, intended action was governed more by geography and residence than by knowledge itself. Fourth, among those with care experience, satisfaction was high and ceiling-loaded, yet respondents converged on a single, concrete bottleneck presented as delays to diagnostic imaging.

Overall knowledge was limited (mean composite score 6.5 of 15), and the deficits clustered precisely where they matter most for reperfusion. Only one in five respondents identified the correct ≤4.5-hour thrombolysis window and more than two-thirds answered “don’t know”, while awareness of thrombolysis (35.8%) and thrombectomy (25.3%) was low. This contrasts sharply with near-universal recognition of the emergency telephone number (94.5%), indicating that the public knows how to call for help but not why speed is decisive or what time-critical treatments exist. This dissociation between high awareness of the emergency number and low awareness of treatment timeliness mirrors patterns reported elsewhere in LMICs [4,10,12–14].

Knowledge rose monotonically with age from 5.3 in respondents aged 18–29 to 9.3 in those aged 60+ and more weakly with education, while urban residents and certain macroregions scored higher. The age gradient is notable because the youngest adults, rather than the oldest, were the least informed. Although some LMIC surveys have reported better knowledge among older or more educated respondents, the practical implication here is specific: younger adults, who are frequently the bystanders and first responders for an older relative experiencing a stroke, are precisely the group least equipped to recognize it [4,14–17].

Public education that targets only older, higher-risk individuals would therefore miss the people most likely to make the first decision in a real event.

Although the overwhelming majority said they would call EMS for a generic suspicion of stroke, intended appropriate action fell progressively across the three symptom vignettes from 83.6% for sudden slurred speech, to 73.9% for unilateral limb weakness, to 60.8% for transient symptoms resolving within 10–15 minutes. This within-subject decline was highly significant, and the largest gap separated overt deficits from transient symptoms. In other words, the public is least likely to seek emergency care in exactly the scenario, a possible TIA in which rapid assessment offers the greatest opportunity to prevent a disabling stroke [18–21]. This pattern reframes the educational problem where it is not enough to teach what a stroke looks like at its most dramatic. Campaigns must explicitly counter the intuition that symptoms which pass can be safely ignored.

Perhaps the most consequential finding is that the composite knowledge score did not independently predict appropriate response to the TIA vignette (adjusted odds ratio 1.03; 95% CI 0.96–1.11). Instead, the dominant determinant was urban residence (aOR 3.22; 95% CI 1.81–5.73), with respondents in the Western macroregion markedly less likely to respond appropriately (aOR 0.23; 95% CI 0.09–0.59). In this particular model the total knowledge score was not an independent predictor of appropriate response. This does not exclude an effect of specific knowledge components, or one not captured by this model and sample. The appropriate-response gap thus appears to be shaped mainly by geography and residence. This is consistent with a wider literature showing that knowledge gains do not automatically yield behavioral change, and that perceived access, urgency, and trust shape help-seeking as much as factual recall [4,13,16,17]. The barrier data reinforce this interpretation from a different angle: the reasons most often endorsed for not calling EMS were the belief that symptoms would pass (80.2%) and failure to recognize symptoms (76.8%) – recognition and appraisal failures – which far exceeded structural barriers such as distrust of EMS, fear of hospitalization, cost, or lack of transport. Recognition and appraisal, not logistics, are the proximate targets, but they operate within a geography that determines whether prompt action is even feasible.

Willingness to use a hypothetical 24/7 telestroke consultation was high (78.1% yes), supporting the acceptability of telemedicine-based models in this setting. Internationally, telestroke has been shown to bridge geographical and temporal barriers, raise thrombolysis rates, shorten onset-to-treatment times, and improve functional outcomes and mortality in rural and underserved areas [9,10,22]. Given the urban–rural and regional disparities observed here, such models are a logical fit. The direction of acceptance was unexpected, however: willingness rose strongly with age (all respondents aged 60+ endorsed the service) and was lower among men, the opposite of the a-priori assumption that younger, more digitally engaged respondents would be most receptive. This suggests that demand may be driven by perceived need and risk rather than by digital fluency, and that telestroke services should be designed for, and marketed to, older and higher-risk users rather than assuming a young early-adopter base.

Perceived time to reach a hospital varied widely and differed significantly by both residence and macroregion, consistent with documented geographic inequity in access to acute cardiovascular and stroke care in Kazakhstan and the wider region [6,8]. Because reperfusion eligibility is dictated by elapsed time, populations with longer perceived (and likely actual) travel times are systematically disadvantaged regardless of how well-informed they are [23,24]. This is the structural counterpart to the recognition gap and the strongest practical argument for distributing time-critical capabilities – including telestroke-supported peripheral hospitals and pre-hospital notification, beyond major urban centers.

Among respondents with real care experience, the four-item experience scale showed acceptable internal consistency, and overall satisfaction was high but ceiling-loaded (mean 7.9

of 10). No measured pathway factor independently predicted a top-box rating. Notably, EMS arrival time was unrelated to overall satisfaction, and patients and caregivers rated care similarly. The flat relationship between objective timeliness and subjective rating likely reflects the ceiling effect, the predominance of caregiver proxies, and the well-recognized tendency of global satisfaction measures to capture interpersonal warmth more than technical timeliness [25]. Satisfaction scores should therefore not be mistaken for indicators of pathway efficiency.

When asked to identify the most problematic step(s) in obtaining care (multiple responses permitted), respondents most often cited long waits for CT/MRI imaging were cited by 42.1% which is nearly double any other category, and well ahead of insufficient explanation, difficulty accessing rehabilitation, and EMS waits. This convergence points to diagnostic throughput as a participant-prioritized and potentially actionable target for system-level improvement, because these are participant reports rather than measured door-to-imaging times, objective confirmation would require institutional data. Because imaging is the gateway to reperfusion decision-making, shortening door-to-imaging time is a concrete lever that complements public-facing efforts to shorten the onset-to-door interval. Affordable and rapid imaging access is also a recurring priority in regional and LMIC stroke-care frameworks [3,4].

Taken together, the findings point to a coherent set of priorities. Public education should be retargeted toward younger adults and rural and lower-performing regions rather than older, higher-risk individuals alone, and its message should shift from passive symptom lists to two specific behaviors: treat transient or resolving symptoms as emergencies, and call EMS immediately because effective treatments are time-limited. Because knowledge alone is unlikely to change behavior, campaigns should pair recognition messaging with measures that reduce appraisal delay and reinforce trust in EMS. At the system level, the data support extending time-critical capacity – including telestroke-enabled peripheral hospitals, pre-hospital notification, and expanded acute imaging capacity – into the geographically disadvantaged regions where both perceived access and appropriate response were poorest. The high public willingness to use tele-consultation provides a favorable environment for such investment.

Strengths and limitations

The principal strengths of this study are its dual design, coupling general-population awareness with the lived experience of patients and caregivers, and its direct interrogation of the knowledge–action relationship and the TIA scenario, which are seldom examined together. Several limitations temper interpretation. The samples were skewed toward younger and urban respondents, under-representing the oldest and rural groups at highest stroke risk, so population estimates should be read as conservative for the least-informed segments. The cross-sectional, self-report design measures intended rather than actual behavior, and the well-documented gap between stated intention and real-world action means the true action deficit may be larger than reported [4]. Module B relied substantially on caregiver proxies (71%) and on recall of events up to 24 months earlier, and overall satisfaction showed a pronounced ceiling effect. The experience scale's internal consistency was modest (Cronbach's α 0.65), and the most problematic-step and barrier items were single-occasion self-reports. Some subgroup estimates, rest on small cell counts and should not be over-interpreted. This was a convenience sample recruited through open online distribution rather than a nationally representative probability sample. Urban residents were over-represented (80.2%) and adults aged ≥60 years – the group at highest stroke risk – were under-represented (4.7%). Therefore, population estimates should therefore be read as conservative for the least-informed and least-accessible segments. It is noteworthy, that we considered the sample size adequate for descriptive prevalence estimates and exploratory subgroup comparisons. Findings are hypothesis-generating rather than

confirmatory. Finally, the data derive from a single country and may not generalize beyond comparable Central Asian health systems.

Conclusion. Public stroke awareness in this population was modest and patterned by age, residence, and region, with the youngest adults least informed and transient TIA-like symptoms least likely to prompt emergency action. Critically, in our model intended appropriate action was shaped more by geography and residence than by the total knowledge score, suggesting that information campaigns alone are unlikely to close the gap. The convergence of high willingness to use telestroke, clear geographic inequities in access, and a single dominant in-hospital bottleneck – imaging delay, as reflected in the shared experiences of both patients and their accompanying relatives – defines an actionable agenda: retarget and reframe public education toward urgency and TIA, and further assess and strengthen stroke-care pathways across regions – including EMS, acute imaging, and telestroke capacity – particularly where recognition and access were weakest. Aligning upstream awareness with downstream system capacity is the most promising route to shortening the path from symptom onset to treatment in this setting.

Conflict of interest. The authors declare no conflict of interest.

Authors' contribution. Author Contributions: Conceptualization, SM and YA; methodology, SM, YA and BT; software, SM; validation, YA, BT and RBP; formal analysis, ShM, DO, and AM (Alisher Makhmutov); investigation, SM, MS, MM, AZ, MB, and AM (Aiman Maidan); resources, MB, MS, and RBP; data curation, SM and AM (Aiman Maidan); writing – original draft preparation, SM and DO; writing – review and editing, YA, BT, RBP, MS, and MB; visualization, SM and AM (Alisher Makhmutov); supervision, YA, BT, and MB; project administration, SM and YA. All authors have read and agreed to the published version of the manuscript. The authors declare that this material has not been previously published and is not under consideration by any other publisher.

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ОСВЕДОМЛЁННОСТЬ ОБ ИНСУЛЬТЕ, ГОТОВНОСТЬ К ЭКСТРЕННЫМ ДЕЙСТВИЯМ И ОПЫТ ПОЛУЧЕНИЯ МЕДИЦИНСКОЙ ПОМОЩИ В КАЗАХСТАНЕ: КРОСС-СЕКЦИОННОЕ ДВУХМОДУЛЬНОЕ ИССЛЕДОВАНИЕ (STROKETIMEBRAIN)

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Аннотация

Введение. Инсульт остается одной из ведущих причин смертности и инвалидности, а его глобальное бремя продолжает расти. Транзиторная ишемическая атака (ТИА) нередко остается недооцененной, несмотря на необходимость срочной медицинской помощи. Данные о знаниях населения Казахстана об инсульте, предполагаемом поведении при его симптомах и доступности помощи ограничены.

Цель. Оценить уровень осведомленности населения об инсульте и его социально-демографические различия, определить связь между знаниями и правильными намерениями действий, выявить барьеры на пути оказания помощи при инсульте и определить направления для совершенствования системы.

Материалы и методы. В феврале–апреле 2026 года проведены два независимых онлайн-опроса (StrokeTimeBrain v1.4). В модуле А участвовали взрослые жители Казахстана ≥18 лет (n=383), в модуле В – пациенты и лица, осуществлявшие уход, имевшие контакт с системой здравоохранения по поводу подозрения на инсульт/ТИА в течение предыдущих 24 месяцев (n=397). Оценивались суммарный балл знаний (0–15), ответы на три клинических сценария и четырехпунктовая шкала опыта получения помощи. Использовались критерий χ^2, непараметрические тесты и логистическая/пуассоновская регрессия с поправкой на возраст, пол, образование, место проживания и регион.

Результаты. Средний уровень знаний был умеренным (6,5/15). Только 20,4% респондентов знали о терапевтическом окне тромболизиса ≤4,5 часа, а осведомленность о реперфузионном лечении оставалась низкой, хотя 94,5% знали номер экстренной помощи. Уровень знаний повышался с возрастом, тогда как самые молодые респонденты были наименее информированы. Доля правильных ответов «вызвать скорую помощь» снизилась с 83,6% при нарушении речи до 60,8% при транзиторных симптомах ТИА ($p<0,001$). Правильное намерение действий было связано преимущественно с

проживанием в городе (aOR 3,22), а не с общим уровнем знаний. Готовность использовать телемедицинские инсультные консультации составила 78,1%. Среди пользователей медицинской помощи удовлетворенность была высокой (7,9/10), а основным узким местом оказалась задержка нейровизуализации (42,1%).

Заключение. Осведомленность об инсульте в Казахстане остается умеренной и неравномерной. Приоритетами являются акцент на срочности обращения и ТИА в образовательных программах, а также развитие экстренной помощи, нейровизуализации и телемедицины, особенно в наиболее уязвимых регионах.

Ключевые слова: инсульт, транзиторная ишемическая атака, медицинские знания, неотложная медицинская помощь, удовлетворенность пациентов, доступность медицинских услуг

ҚАЗАҚСТАНДАҒЫ ИНСУЛЬТ ТУРАЛЫ ХАБАРДАРЛЫҚ, ШҰҒЫЛ ӘРЕКЕТКЕ ДАЙЫНДЫҚ ЖӘНЕ МЕДИЦИНАЛЫҚ КӨМЕК АЛУ ТӘЖІРИБЕСІ: КӨЛДЕНЕҢ ҚИМАДАҒЫ ЕКІ МОДУЛЬДІ ЗЕРТТЕУ (STROKETIMEBRAIN)

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Түйіндеме

Кіріспе. Инсульт өлім мен мүгедектіктің жетекші себептерінің бірі болып қала береді, ал оның жаһандық ауыртпалығы артып келеді. Транзиторлық ишемиялық шабуыл (ТИШ) жедел медициналық көмекті қажет етсе де, жиі еленбей қалады. Қазақстан халқының инсульт туралы білімі, симптомдар пайда болғандағы әрекет ниеті және медициналық көмекке қолжетімділігі жөніндегі деректер шектеулі.

Мақсаты. Халықтың инсульт туралы хабардарлық деңгейін және оның әлеуметтік-демографиялық ерекшеліктерін бағалау, білім деңгейінің дұрыс әрекет ету ниетімен байланысын анықтау, инсульт кезіндегі көмек көрсету жолындағы кедергілерді сипаттау және денсаулық сақтау жүйесін жетілдіру бағыттарын айқындау.

Материалдар мен әдістер. 2026 жылдың ақпан–сәуір айларында StrokeTimeBrain v1.4 платформасы арқылы екі тәуелсіз онлайн зерттеу жүргізілді. А модуліне 18 жастан асқан тұрғындар (n=383), В модуліне соңғы 24 айда инсульт немесе ТИШ күдігімен медициналық көмек алған пациенттер мен күтім жасаушылар (n=397) қатысты. Негізгі көрсеткіштерге білімнің жиынтық балы (0–15), үш клиникалық жағдайға жауаптар және

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көмек алу тәжірибесін бағалайтын төрт тармақты шкала кірді. Талдауда χ^2 критерийі, параметрлік емес тесттер және жас, жыныс, білім деңгейі, тұрғылықты жері мен өңірге түзетілген логистикалық және Пуассон регрессиясы қолданылды.

Нәтижелер. Білім деңгейі орташа болды (орташа балл 6,5/15). Респонденттердің тек 20,4%-ы тромболизистің ≤4,5 сағаттық терапиялық терезесін білді, ал реперфузиялық ем туралы хабардарлық төмен болды. Дегенмен, 94,5%-ы жедел жәрдем нөмірін дұрыс атады. Білім деңгейі жас ұлғайған сайын артты, ал ең жас респонденттер ең аз хабардар топта байқалды. «Жедел жәрдем шақыру» жауабының үлесі сөйлеу бұзылысы жағдайында 83,6%-дан ТИШ симптомдары кезінде 60,8%-ға дейін төмендеді ($p<0,001$). Дұрыс әрекет ету ниеті жалпы білім деңгейінен гөрі қалалық жерде тұрумен байланысты болды (aOR 3,22). Телемедициналық қызметін пайдалануға дайындық жоғары болды (78,1%). Медициналық көмек алғандар арасында қанағаттану деңгейі жоғары (7,9/10), ал негізгі мәселе нейровизуализацияның кешігуі болып саналды (42,1%).

Қорытынды. Қазақстанда инсульт туралы хабардарлық деңгейі орташа және өңірлер мен халық топтары арасында біркелкі емес. Білім беру бағдарламаларында ТИШ пен жедел әрекет етудің маңызын күшейту, сондай-ақ жедел жәрдем, нейровизуализация және телемедициналық қызметтерін, әсіресе әлсіз өңірлерде, дамыту қажет.

Түйінді сөздер: инсульт, өтпелі ишемиялық шабуыл, денсаулық туралы білім, жедел медициналық көмек, пациенттердің қанағаттануы, медициналық қызметтердің қолжетімділігі

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Supplementary Material 1. StrokeTimeBrain (STB) Survey Questionnaire (v1.4). This supplementary material contains the complete bilingual (Russian/Kazakh) survey instruments used in the study. Module A evaluates stroke awareness and perceived barriers to emergency services in the general adult population. Module B measures the healthcare pathway experiences and satisfaction levels among recent patients and caregivers. Abbreviations: EMS, Emergency Medical Services; TIA, Transient Ischemic Attack; TLT, Thrombolysis; MTE, Mechanical Thrombectomy.

Модуль А – «Осведомлённость и доступность» / А модулі «Хабардарлық және қолжетімділік»

Краткая цель: Оценить осведомлённость об инсульте, готовность действовать (мини-сценарии), барьеры немедленного вызова СМП, доступность (время до стационара) и потребность в 24/7 консультации.

Таргет: Население 18+, квоты по 5 макрорегионам и типу населённого пункта

№	Вопрос / Сұрақ	Тип / Формат	Варианты ответов / Жауап нұсқалары
Q1	Согласны ли вы участвовать? / Сауалнамаға қатысуға келісесіз бе?	Один вариант	Да / Иә; Нет / Жоқ (завершить анкету)
Q2	Возраст / Жасы	Один вариант	18–29; 30–44; 45–59; 60+
Q3	Пол / Жынысы	Один вариант	Мужчина / Ер; Женщина / Әйел; Предпочитаю не указывать / Көрсеткім келмейді
Q4	Макрорегион проживания / Тұратын макроөңіріңіз	Один вариант	Южный / Оңтүстік; Северный / Солтүстік; Западный / Батыс; Восточный / Шығыс; Центральный / Орталық
Q5	Тип населённого пункта / Елді мекен түрі	Один вариант	Город / Қала; Село / Ауыл
Q6	Образование / Білім деңгейі	Один вариант	Среднее и ниже / Орта және төмен; Среднее специальное / Арнаулы орта; Высшее / Жоғары; Послевузовское / Жоғары оқу орнынан кейінгі
Q7	Какие симптомы могут быть признаком инсульта? / Инсульт белгілері	Несколько вариантов	Онемение или слабость / Ұю немесе әлсіреу; Нарушение речи / Сөйлеу бұзылысы; Потеря зрения / Көрудің төмендеуі; Головокружение / Бас айналу; Сильная головная боль / Қатты бас ауруы; Затрудняюсь / Білмеймін
Q8	Какие факторы риска инсульта вы знаете? / Қауіп факторлары	Несколько вариантов	Артериальная гипертензия; Сахарный диабет; Курение; Ожирение; Аритмия; Высокий холестерин; Затрудняюсь / Білмеймін (на двух языках)
Q9	Номера экстренной помощи / Жедел көмек нөмірі	Один вариант	103; 112; Оба (103 и 112) / Екеуі де; Не знаю / Білмеймін
Q10	Слышали ли вы о тромболизисе (ТЛТ)? / Тромболизис (ТЛТ) туралы естідіңіз бе?	Один вариант	Да / Иә; Нет / Жоқ
Q11	Слышали ли вы о тромбэктомии (МТЭ)? / Тромбэктомия (МТЭ) туралы естідіңіз бе?	Один вариант	Да / Иә; Нет / Жоқ
Q12	В какой срок наиболее эффективно начать тромболизис? / Тромболизисті қашан бастаған тиімді?	Один вариант	До 4,5 часов / 4,5 сағатқа дейін; До 8 часов / 8 сағатқа дейін; До 24 часов / 24 сағатқа дейін; Не знаю / Білмеймін
Q13	Что вы сделаете в первую очередь при подозрении на инсульт? / Инсульт күдігі болса, алдымен не істейсіз?	Один вариант	Вызову скорую / 103 немесе 112 шақырамын; Поеду в больницу / Ауруханаға барамын; Позвоню в

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			поликлинику / Емханаға хабарласамын; Подожду / Күтемін; Не знаю / Білмеймін
Q14	Сценарий: внезапно стала невнятная речь / Сценарий: сөйлеуі түсініксіз болды	Один вариант	A) Вызову скорую; B) Поеду в больницу; C) Позвоню в поликлинику; D) Подожду; E) Не знаю (на двух языках)
Q15	Сценарий: внезапно ослабла рука/нога с одной стороны / Сценарий: қол/аяқ бір жақтан әлсіреп қалды	Один вариант	A) Вызову скорую; B) Поеду в больницу; C) Позвоню в поликлинику; D) Подожду; E) Не знаю (на двух языках)
Q16	Сценарий: симптомы прошли за 10–15 минут / Сценарий: белгілер 10–15 минутта өтті	Один вариант	A) Вызову скорую; B) Поеду в больницу; C) Позвоню в поликлинику; D) Подожду; E) Не знаю (на двух языках)
Q17	Почему люди иногда НЕ вызывают скорую сразу? / Неге кейде бірден жедел жәрдем шақырмайды?	Несколько вариантов (до 3)	Не распознали симптомы; Думали «пройдёт»; Долго едет; Страх госпитализации; Нет транспорта; Финансовые причины; Языковые трудности; Другое (на двух языках)
Q18	Сколько времени нужно, чтобы добраться до больницы? / Инсульт күдігімен ауруханаға жету уақыты	Один вариант	≤15 минут; 15–30 минут; 30–60 минут; >60 минут; Не знаю / Білмеймін
Q19	Если бы был единый 24/7 колл-центр, воспользовались бы? / Егер 24/7 колл-орталығы болса, пайдаланар ма едіңіз?	Один вариант	Да / Иә; Нет / Жоқ; Не знаю / Білмеймін
Q20	Откуда вы чаще получаете информацию об инсульте? / Инсульт туралы ақпаратты қайдан аласыз?	Несколько вариантов (до 2)	Врачи; Социальные сети; ТВ/радио; Сайты/новости; Родственники/друзья; Памятки в поликлиниках; Другое (на двух языках)

Модуль B – «Опыт и удовлетворённость» / B модулі «Тәжірибе және қанағаттанушылық»

Целевая группа: Лица (пациент или сопровождающий родственник), которые обращались за экстренной/стационарной помощью по поводу подозрения на инсульт/ТИА за последние 24 месяца.

Краткая цель: Оценить опыт взаимодействия с системой (скорость, коммуникация, уважение, координация) и преемственность (выписка, реабилитация).

№	Вопрос / Сұрақ	Тип / Формат	Варианты ответов / Жауап нұсқалары
Q1	Согласны ли вы участвовать? / Сауалнамаға қатысуға келісесіз бе?	Один вариант	Да / Иә; Нет / Жоқ (завершить анкету)
Q2	Был ли у вас (или у близкого при вашем участии) контакт со СМП/приёмным покоем/стационаром по поводу подозрения на инсульт/ТИА за последние 24 месяца? / Соңғы 24 айда инсульт/ТИА күдігімен жедел жәрдем/қабылдау/стационарға жүгіндіңіз бе?	Один вариант	Да / Иә (продолжить); Нет / Жоқ (завершить анкету)
Q3	Кто вы в этой ситуации? / Бұл жағдайда сіз кім болдыңыз?	Один вариант	Пациент / Науқас; Сопровождающий родственник/ухаживающий / Туыс/қараушы
Q4	Когда было обращение (последний эпизод)? / Соңғы жүгіну қашан болды?	Один вариант	0–3 месяца; 3–6 месяцев; 6–12 месяцев; 12–24 месяца
Q5	Как доставили в больницу? / Ауруханаға қалай жеткізілді?	Один вариант	СМП (скорая) / Жедел жәрдем; Самостоятельно / Өз бетімен; Перевод из другой больницы / Басқа ауруханадан ауыстыру

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Q6	Если вызывали СМП: сколько времени прошло до прибытия? / Егер жедел жәрдем шақырылса: келу уақыты	Один вариант	≤15 минут; 15–30 минут; 30–60 минут; >60 минут; Не вызывали/не помню / Шақырмадым/есімде жоқ
Q7	Оцените по шкале 1–5 (1 – совсем не согласен, 5 – полностью согласен) / 1–5 шкаламен бағалаңыз (1 – келіспеймін, 5 – толық келісемін)	Матрица (шкала от 1 до 5)	• Помощь была достаточно быстрой / Көмек жеткілікті жылдам болды • Объясняли понятным языком / Түсінікті тілмен түсіндірді • Отношение было уважительным / Қарым-қатынас құрметті болды • Действия команды были согласованными / Команданың әрекеті келісілген болды
Q8	Были ли вам понятны рекомендации при выписке (лекарства, контроль, дальнейшие шаги)? / Шығарылғанда ұсыныстар (дәрілер, бақылау, келесі қадамдар) түсінікті болды ма?	Один вариант	Да, полностью / Иә, толық; Частично / Ішінара; Нет / Жоқ; Не было выписки/не помню / Шығарылмады/есімде жоқ
Q9	Была ли организована реабилитация и/или дальнейшее наблюдение после выписки? / Шығарылғаннан кейін оңалту және/немесе бақылау ұйымдастырылды ма?	Один вариант	Да / Иә; Частично / Ішінара; Нет / Жоқ; Не требуется/не знаю / Қажет емес/білмеймін
Q10	Что было самым проблемным на пути получения помощи? / Көмек алу жолындағы ең үлкен мәселе не болды?	Один вариант	Долгое ожидание СМП; Долгое ожидание обследований (КТ/МРТ); Недостаток информации/объяснений; Трудности с маршрутизацией/переводом; Трудности с реабилитацией; Другое (на двух языках)
Q11	Общая оценка помощи (0–10) / Көмектің жалпы бағасы (0–10)	Шкала 0–10	0 – очень плохо / өте нашар; 10 – отлично / өте жақсы
Q12	Что, по вашему мнению, следует улучшить в первую очередь? / Сіздің ойыңызша, алдымен нені жақсарту керек?	Открытый вопрос	Свободный текст (1–2 предложения / 1–2 сөйлем)