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AWARENESS OF STROKE SYMPTOMATOLOGY, RISK FACTORS, SIGNIFICANCEOF ACUTE MANAGEMENT AND PREVENTION IN AL-MADINAH COMMUNITY

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ABSTRACT

Background: Stroke outcome is known to be affected by the level of stroke awareness in the community and the subjective risk factor perception is an important component of the motivation to change unhealthy life styles. The aim of the study is to assess the public knowledge of stroke in Al Madinah Al Monawarrah in Saudi Arabia. **Method:** A cross-sectional study applied in Al-Madinah community on 3572 adults older than 18 years old. The study sample was selected randomly from public places. A validated comprehensive questionnaire was distributed among the participants to determine their awareness about stroke symptoms, risk factors, significance of acute management and prevention. **Results:** 39% of participants didn't know what are the early sign and symptom of stroke. Difficulty of speech was the most identified presentation of stroke38.8%.Obesity was the most commonly recognized risk factor 49.9%, while diabetes mellitus and hypertension represented by 42.4%, 41.5% respectively. Cardiac disease account about 35.6%, anemia 25.1% and AV-malformation 25.1%, hemophilia 24.9%, smoking 22.2%, hormonal contraceptive 12.7%, thrombolytic medication 8%, family history 6.9%, alcohol 3.7%.1.5% of the participants were with positive previous history of stroke. Older age and higher level of education and male participants were associated with better knowledge about risk factors and warning symptoms of stroke. Older age and higher education groups identified "go to hospital" as the action while The other groups identified to wait 12 hours and go to hospital if symptoms still present or ignore the symptoms. **Conclusion:** There is an alarming deficit in the level of stroke awareness in Al Madinah population. Urgent public health measures to correct this deficiency are promptly needed. People with lower age and lower education level should be the targets of educational programs.

INTRODUCTION

Stroke is a major cerebrovascular disease resulting in high mortality and morbidity in adults across the world. And it is the first leading cause of physical disability in adults, the second cause of dementia and the third leading cause of death in Western countries.[1]

Survivors of stroke are often left with severe mental and physical disabilities, which create a major social and economic burden. The Kingdom of Saudi Arabia (KSA) is the largest country in the Middle East occupying approximately four-fifths of the Arabian Peninsula supporting a population of more than 28 million. Stroke is becoming a rapidly increasing problem and an important cause of illness and deaths in Saudi Arabia.[2]

In Saudi Arabia, a study reported that hypertension (52%) was the most important risk factor of stroke, then diabetes mellitus and cardiac disorders in the Saudi population. Further, the frequent causes of cerebral infarcts found were atherosclerosis 36% followed by hypertensive and/or diabetic arteriolopathy 24% and cardiac embolisms 19%of the cases.[3]

Another study described some of the common risk factors of stroke, which were hypertension associated with diabetes mellitus (40.4%), hypertension alone (24.9%), diabetes alone (11.6%), atrial fibrillation (5.8%), other cardiac factors (5.5%), Transient Ischemic Attack (TIA) and prior stroke (2.1% each), and smoking (1.8%).[4]

In a Study reported in Riyadh suggested that there is an alarming deficit in the level of stroke awareness in the Saudi population, in which only (64%) were able to define stroke correctly, the mass media was the source of their knowledge (49.9%). (45.9%) of the respondents believed that stroke and brain death have the same pathologic mechanism and outcome. (21.7%) of the participants correctly chose ≥5 risk factors and made ≤1 error. (18.4%) of the respondents in this study were able to correctly identify ≥3 symptoms of the list and make ≤1 error.[5]

The Gulf Cooperation Council stroke awareness study reported that most of the participant had not even heard the term stroke. The Stroke awareness was poorest among the groups that were at the highest risk for stroke because those people had a higher incidence of diabetes, hypertension, and had more than one risk factor. Hypertension (23.1%) and smoking (27.3%) were the commonest risk factors identified. Weakness (23%) and speech problems (21.7%) were the most frequently identified stroke symptoms. Of those who recognized stroke, the

commonest identified cause of stroke was blockage of blood vessels (22%) followed by tension/worrying (20%). In the univariate comparison, younger age, higher level of education, and female gender were associated with better predicted stroke awareness.[6]

A study was conducted in Jordan to assess the awareness level of the Jordanian general population regarding the definition, risk factors, signs and symptoms, and consequences of stroke. Speech loss (54.7%) was the most recognized symptom. Less than 50% of the population recognize all other symptoms. 75% knew that the brain is the organ involved in stroke while 85% would contact the ambulance on noticing stroke signs, even if symptoms subsequently improved.[7]

The Saudi Arabia is a rapidly developing part of the world with major changes in the lifestyle that can increase the risk of stroke. Stroke outcome is known to be affected by the level of stroke awareness in the community and the subjective risk factor perception is an important component of the motivation to change unhealthy life styles. Secondary prevention of stroke has been shown to dramatically reduce recurrence.[8] Therefore, to design effective stroke treatment and prevention strategies, an assessment of the public knowledge of stroke is required.

Subjects and Method

Cross-sectional study conducted in Al-Madinah community (adults) older than 18 years old. The study period extended between November2016 and January 2017. A total of 5630 questionnaires were collected out of which 2058 were excluded because they are not residents in Al-madinah. The study sample was3572from Al-Madinah and selected randomly from public places (Hospitals - Clinics –Shopping Malls – Restaurants - Universities).

A validated comprehensive questionnaire prepared in accordance to relevant literatures included 25 questions in 7 sections, the first section included 6 questions about socio-demographics. The second section questions about previous incidence of stroke. The rest sections include15 questions related to the prevalence of participants risk factors and the awareness of the early warning signs and symptoms, complication of delayed treatment, stroke risk factors respectively, the questionnaire designed to determine the community knowledge about stroke awareness. Validity of the questionnaire will be tested through the opinions of three experts for language clarity, content, relevancy, ability to understand questions, and the time needed to answer.

Group of medical students, belonging to medical college will use self-administered structured questionnaire/electronic questionnaire to get the responses from participants, in Arabic language. The semi-structured questionnaires pre-tested on 150 of the subjects to explore if there is any ambiguity or items leading to misunderstanding in the questionnaire in order to reach to its current final form. These 150 subjects will not be included in the main survey. The reliability test will be conducted for the internal consistency of the items by using the reliability coefficients (Cronbach's alpha= 0.8) which is suitable for the questionnaire.

Statistical Analysis: Statistical Analysis will be used. Data will be coded, entered, and analyzed using the Statistical Package for Social Science (SPSS) version 20.0 (SPSS, Chicago, IL, USA).

Ethical considerations: Official permission was obtained from the scientific ethical committee of the college. Informed consent was obtained from all the participants after describing the aim of the study. Privacy and confidentiality were assured.

RESULTS

Table 1: Socio- demographic characteristics of the participants.

	N	%
Age:		
< 20	*849*	*5.62*
21- 30	*8449*	*4864*
31- 40	*.24*	*8961*
41- 50	*122*	*868*
>50	*814*	*169*
Sex:		
Male	8818	1864
Female	5448	.961
Nationality:		
Saudi	1598	8568
Non Saudi	591	468
Marital state:		
Married	8254	4564
Non married		
(single, separated	2045	57.3
& widow)		
Educational level:		
Elementary	814	169
High School	822	5.64
Bachelor degree	5542	.162
Higher education	8.4	464
Other	4.	861

Table (1) shows the socio demographic characteristics of the participants in this study. 26.5% were less than 20, 41.4% were between 21-30years, 18.3% were between 30-41years, 9.9% were between 41-50years and 3.8% of the participants were more than 50 years. Female participants were 68.3% while males were 31%. Saudi nationality represented by 92% was more frequent than non-Saudi 7.8%.42.7 were married. 63.5% had a Bachelor degree.

Table 2: The nationality distribution of the previous stroke among the participants.

	Saudi		Non Saudi			Total
	N	%	N	%	N	%
No previous stroke	3240	98.5	277	97.9	3517	98.5
Previous stroke	49	1.5	6	2.1	55	1.5
Total	3289	100	283	100	3572	100

Table 3: The gender distribution of the previous stroke among the participants

		Male	Female		P	95% confidence interval
	N	%	N	%		
No previous stroke	1111	98.2	2406	98.5	0.45	.464- 1.406
Previous stroke	20	1.8	35	1.4		
Total	1131	100	2441	100		

Table 4: The age distribution of the previous stroke among the participants.

Previous stroke	< 40 years		> 40 years		P	95% confidence interval
	N	%	N	%		
No previous stroke	3034	98.8	474	96.3	0.000	.181- .567
Previous stroke	37	1.2	18	3.7		
Total	3080	100	55	100		

Tables (2-4) show that 55 (1.5%) of the participants were with positive previous history of stroke. 1.5% of the Saudi participants had previous stroke while 2.1% of the non Saudi participants had a previous stroke. 1.8% of the male had previous stroke while 1.4% of the females had a previous stroke. There was a significant difference as regard the age of the participants who had previous stroke (3.7% were more than 40 years, while 1.2% were less than 40 years).

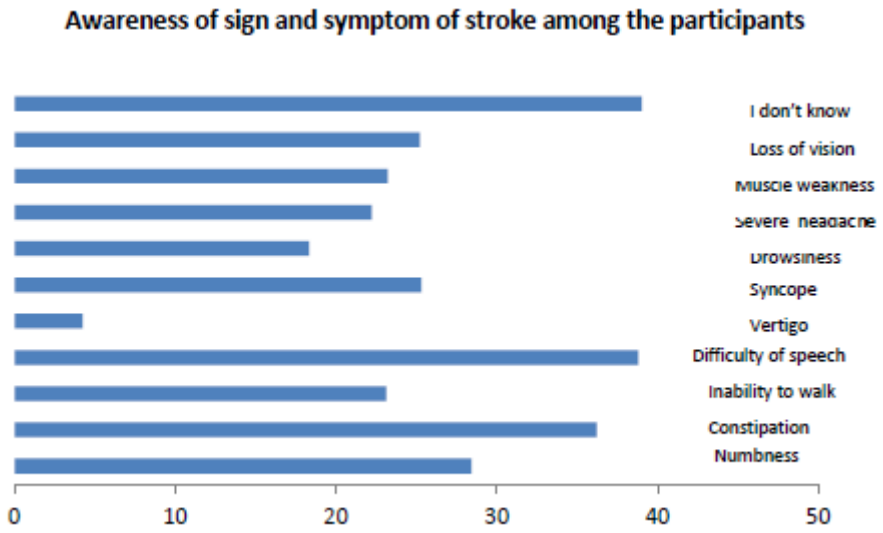

Figure 1: Awareness of signs and symptoms of stroke among the participants.

Figure (1) shows that about 39% of participants didn't know what are the early sign and symptom of stroke. Difficulty of speech was the most identified risk factor 38.8% followed by constipation 36.2%, muscle weakness 23.2%, numbness 28.4%, loss of vision 25.2% and syncope 25.3%, severe headache 22.2%, drowsiness 18.3%, vertigo 4.2% and inability to walk 23.1%.

Table 5: Awareness of risk factors of stroke among the participants.

Risk factors	N	%
Obesity	1782	49.9%
Smoking	790	22.1%
Alcohol	133	3.7%
Hypertension	1482	41.5%
Diabetes	1514	42.4%
Cardiac diseases	1271	35.6%
Haemophilia	889	24.9%
Anemia	897	25.1%
AV malformation	895	25.1%
Family history	245	6.9%
Thrombolytic medication	285	8.0%
Hormonal contraceptive	455	12.7%
I don't know	1104	30.9%

Table (5) shows that obesity was the most commonly recognized risk factor 49.9%, while diabetes mellitus and hypertension represented by 42.4%, 41.5% respectively. Cardiac disease account about 35.6%, anemia 25.1% and AV-malformation 25.1%, hemophilia

24.9%, smoking 22.2%, hormonal contraceptive 12.7%, thrombolytic medication 8%, family history 6.9%, alcohol 3.7%. 30.9% of the participants didn't know the risk factors of stroke.

Table 6: Comparison of different age groups and awareness of the sign and symptoms of stroke.

Sign & Age	< 20		21- 30		31- 40		41-50		>50		P
	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	
Numbness	274	28.9	428	29	186	28.4	92	25.9	34	24.8	.683
Difficulty Of speaking	336	35.4	558	37.8	267	40.8	158	44.5	65	47.7	.004
Inability to walk	16	1.7	38	2.6	41	6.3	13	3.7	6	4.4	.000
Loss of vision	273	28.8	385	26	136	20.8	77	21.7	29	21.2	.002
Severe headache	254	26.8	330	22.3	106	16.2	69	19.4	31	22.6	.000
Drowsiness	202	21.3	251	17	108	16.5	65	18.3	27	19.7	.06
Vertigo	43	4.5	64	4.3	21	3.2	11	3.1	11	7.3	.092
Syncope	281	29.6	337	25.5	142	21.7	73	20.6	30	21.9	.001
Muscle Weakness	280	29.5	498	33.7	228	34.9	128	36.1	47	34.3	.089
Constipation	276	29.1	518	35	285	43.6	162	45.6	62	45.3	.000

Table (6) shows that there was a significant difference as regard the awareness of the signs and symptoms of stroke as the older the participants reported difficulty of speaking, inability to walk and constipation. While the younger participants reported loss of vision, severe headache and syncope.

Table 7: Comparison of different age groups and awareness of the risk factors of stroke.

Risk factors / Age	< 20		21- 30		31- 40		41-50			>50	P
	Yes	%	Yes	%	Yes%		Yes%		Yes	%	
Obesity	370	39	704	47.6	371	56.7	240	67.6	97	70.8	.000
Smoking	167	18.6	326	22.1	154	23.5	90	25.4	44	32.1	.001
Alcohol	37	3.9	58	3.9	22	3.4	13	3.7	3	2.2	.846
Hypertension	21	2.2	34	2.3	52	25.4	54	15.2	44	32.1	.000
Diabetes	12	1.3	32	2.2	52	8	54	15.2	43	31.4	.000
Cardiac diseases	4	0.4	7	0.5	11	1.7	11	3.1	3	2.2	.000
Haemophilia	98	10.3	161	10.9	97	14.8	63	17.7	35	25.5	.000
Anemia	63	6.6	93	6.3	62	9.5	40	11.3	15	10.9	.002
AV malformation	239	25.2	367	24.8	154	23.5	92	25.9	43	31.4	.419
Family history	65	6.9	119	8.1	25	3.8	29	8.2	7	5.1	.006
Thrombolytic medication	5	.5	4	0.3	9	1.4	21	5.9	8	5.8	.000
Hormonal contraceptive	14	1.5	18	1.2	16	2.4	11	3.1	2	1.5	0.07

Table (7) shows that the awareness of the risk factors of stroke was known significantly among the older age groups than younger age.

Table 8: Comparison of different age groups and awareness of the treatment of stroke

Treatment	< 20		21- 30		31- 40		41-50		>50		P
Age	Yes	%	Yes	%	Yes%		Yes%		Yes%		
Immediately	438	50.9	807	54.6	401	61.3	236	66.5	95	69.3	.000
go to hospital											
Wait 12hours	379	40.0	524	35.5	209	32.0	97	27.3	33	24.1	.000
and go to											
hospital if											
symptoms still											
present											
Ignore symptoms	85	9.0	146	9.9	43	6.6	22	6.2	9	6.6	.000

Table (8) shows that there was a significant difference as regard the awareness of the treatment of stroke as the older the participants reported immediate go to hospital. While the younger participants reported wait 12hours and go to hospital if symptoms still present or ignore symptoms.

Table 9: Comparison of different education level groups and awareness of the sign and symptoms of stroke.

Sign & Age	Elementary		High School		Bachelor degree		Higher education			Other	P
	Yes	%	Yes	%	Yes%		Yes%			Yes%	
Numbness	21	15.7	264	27.6	657	28.9	61	36.5	11	23.9	.002
Difficulty Of speaking	34	25.4	299	31.3	948	41.8	90	53.9	13	28.3	.000
Inability to walk	21	15.7	39	4.1	43	1.9	7	4.2	4	8.7	.000
Loss of vision	33	24.6	224	23.5	580	25.6	51	30.5	12	26.1	.372
Severe headache	23	17.2	227	23.8	496	21.9	34	20.4	10	21.7	.431
Drowsiness	20	14.9	157	16.4	438	19.3	33	19.8	5	10.9	.154
Vertigo	8	6.0	37	3.9	95	4.2	9	5.4	1	2.2	.671
Syncope	20	14.9	214	22.4	908	26.8	54	32.3	7	15.2	.000
Muscle weakness	30	22.4	273	28.6	796	35.1	66	39.5	16	34.8	.000
Constipation	24	17.9	292	30.6	897	39.5	77	46.1	13	28.3	.000

Table (9) shows that there was a significant difference as regard the awareness of the sign and symptoms of stroke as the bachelor and higher education groups reported numbness and difficulty of speaking, muscle weakness and constipation. While the younger participants reported inability to walk.

Table 10: Comparison of different education level groups and awareness of the risk factors of stroke.

Risk factors	Elementary		High School		Bachelor degree		Higher education		Other		P
Age	Yes	%	Yes	%	Yes%		Yes%		Yes%		
Obesity	46	34.3	415	43.5	1200	52.9	98	58.7	23	50	.000
Smoking	28	20.9	190	19.9	524	23.1	39	23.4	9	19.6	.354
Alcohol	7	5.2	37	3.9	83	3.7	4	2.4	2	4.3	.772
Hypertension	49	36.6	343	35.9	995	43.8	80	47.9	15	32.6	.000
Diabetes	52	38.8	364	38 .1	1003	44.2	78	46.7	17	37	.013
Cardiac diseases	25	18.7	295	30.9	879	38.7	61	36.5	11	23.9	.000
Haemophilia	32	23.9	246	25.8	547	24.1	55	32.9	9	19.6	.103
Anemia	30	22.4	239	25	577	25.4	43	25.7	8	17.4	.710
AV malformation	17	12.7	218	22.8	594	26.2	55	32.9	11	23.9	.000
Family history	11	8.2	55	5.8	164	7.2	14	8.4	1	2.2	.303
Thrombolytic medication	8	6	58	6.1	190	8.4	24	14.4	5	10.9	.003
Hormonal contraceptive	7	5.2	109	11.4	314	13.8	23	13.8	2	4.3	.008

Table (10) shows that the awareness of the risk factors of stroke was known significantly among the bachelor and higher education groups than the other groups.

Table 11: Comparison of different education level groups and awareness of the treatment of stroke.

Treatment/ Age	Elementary		High School		Bachelor Degree		Education		Other		p
	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	
Immediately go to hospital	66	49.3	500	52.4	1323	58.3	108	64.7	25	54.3	.006
Wait 12hours and go to hospital if symptoms still present	51	38.1	357	37.4	769	33.9	49	29.3	16	34.8	.006
Ignore symptoms	16	11.9	98	10.3	175	7.8	10	6.0	5	10.9	.006

Table (11) shows that there was a significant difference as regard the awareness of the treatment of stroke as the higher educational level participants reported immediate go to hospital. While the other groups reported wait 12hours and go to hospital if symptoms still present or ignore symptoms.

Table 12: Comparison of male and female groups and awareness of the sign and symptoms of stroke.

Sign & Sex	Male		Female		P	95% confidence interval
	Yes	%	Yes	%		
Numbness	273	24.1	741	30.4	.000	1.138- 1.592
Difficulty Of speaking	336	29.7	104	42.9	.000	1.531- 2.069
Inability to walk	59	5.2	55	2.3	.000	.288- .609
Loss of vision	243	21.5	657	26.9	.000	1.138- 1.592
Severe headache	213	18.8	577	23.6	.001	1.119- 1.591
Drowsiness	168	14.9	485	19.9	.000	1.173- 1.722
Vertigo	52	4.6	95	4.0	.421	.615- 1.224
Syncope	224	19.8	679	27.8	.000	1.315- 1.851
Muscle weakness	329	29.1	852	34.9	.001	1.122- 1.523
Constipation	347	30.7	956	39.2	.000	1.252- 1.690

Table (12) shows that there was a significant difference as regard the awareness of the sign and symptoms of stroke as the female group reported numbness and difficulty of speaking, loss of vision, severe headache, drowsiness, syncope, muscle weakness and constipation. While the male group reported inability to walk

Table 13: Comparison of male and femalegroups and awareness of the risk factors of stroke.

Risk factors/ Sex	Male		Female		P	95% confidence interval
	Yes	%	Yes	%		
Obesity	508	44.9	1274	52.2	.000	1.162- 1.542
Smoking	282	24.9	508	20.8	.006	.670- .934
Alcohol	48	4.2	85	3.5	.263	.567- 1.168
Hypertension	510	45.1	972	39.8	.003	.699- .929
Diabetes	508	44.9	1006	41.2	.037	.746- .991
Cardiac diseases	398	35.2	873	35.8	.739	885- 1.188
Haemophilia	271	24	618	25.3	.383	.913- 1.268
Anemia	264	23.3	633	25.9	.097	.975- 1.356
AV malformation	244	21.6	651	26.7	.001	1.118- 1.563
Family history	81	7.2	164	6.7	.626	.708- 1.230
Thrombolytic medication	60	5.3	225	9.2	.000	1.351- 2.432
Hormonal contraceptive	166	14.7	289	11.8	.018	.636- .959

Table (13) shows that the awareness of the obesity was known significantly among the female group than the male group. While, smoking, hypertension, diabetes and hormonal contraceptives were known more among male group.

Table 14: Comparison of male and female groups and awareness of the treatment of stroke.

Treatment / Sex	Male Yes%		Female Yes%		P	95% confidence interval
Immediately go to	615	54.4	1407	57.6	.001	
hospital						
Wait 12hours and						
go to hospital if	388	34.3	854	35.0	.001	
symptoms still						
Ignore symptoms	127	11.2	178	7.3	.001	

Table (14) shows that there was a significant difference as regard the awareness of the treatment of stroke as the female group reported immediate go to hospital and wait 12 hours and go to hospital if symptoms still present. Ignore symptoms was more replied among male group.

DISCUSSION

At the best of our knowledge, this is the first study to assess the awareness of sign and symptom, risk factors and treatment of stroke in Al Madinah Al Monawarrah in Saudi Arabia. The study showed that about 39% of participants didn't know what are the early sign and symptom of stroke, while 30.9% of the participants didn't know the risk factors of stroke. This result is similar to earlier result that found that 33.0% were unaware of any stroke symptoms and49.8% were unaware of any stroke risk factors (Kumar et al., 2012).[9]

The most identified presentation of stroke was difficulty of speech 38.8%. This finding is consistent with the finding of previous study of Oh et al. (2016).[10] Pandian et al. (2005),[11] Kothari et al.(1997),[12] and other studies conducted in Australia (Das et al., 2007),[13] and US (Sama et al., 1997),[14] found the most common symptom identified by respondents was weakness of one side of body.

The present study showed that 1.5% of the participants were with positive previous history of stroke.1.5% and 2.1% of the Saudi and non-Saudi participants had previous stroke respectively. 1.8% of the male while 1.4% of the females had previous stroke. There was a significant difference as regard the age of the participants who had previous stroke (3.7% were more than 40 years, while 1.2% were less than 40 years). Age has been identified as a marker of risk for stroke [Orzuza et al., 2011].[15]

The findings of the present study showed that older age and higher level of education were associated with better knowledge about risk factors and warning symptoms of stroke. This finding is similar to the findings from few western studies by Pancioli et al.(1998)[16] and Yoon et al.(2001).[17] in which it was found that knowledge about stroke varies positively with education and age.

The present study found that the knowledge about risk factors and was more among male than female participants. This finding is in contrast with the finding by Pancoili et al.(1998).[16] and Yoon et al.(2001).[17] who found lower knowledge among men than women. Hypertension (58.20%) is recognized as the most common risk factor in this study This finding is similar to the observation made in other studies from India (45.1%) (Pandian et al., 2005),[11] ichigan (32.3%) (Revees et al.,2002),[18] Australia (31.8%) (Yoon et al., 2001),[17] and Ohio (49%) Pancoili et al.(1998).[16] Framingham heart study and other international prospective epidemiological studies identified the major risk factors for stroke such as hypertension, diabetes mellitus, hyperlipidemia, and smoking (Wolf et al., 2004).[19]

However, this finding is in contrast with a recent study in Jeddah by Basfar 2016,[20] who found that female and younger age had more awareness knowledge and they explained this finding by their over representation in their study sample.

Older age, female and higher education groups identified “go to hospital as the action while The other groups identified to wait 12 hours and go to hospital if symptoms still present or ignore the symptoms.

Recommendation

Awareness and knowledge in general population, regarding risk factors and warning symptoms of stroke are essential for the prevention and initiation of immediate effective treatment of stroke. Besides that awareness of risk factors may also improve adherence to medical advice regarding lifestyle modifications. People with lower age and lower education level should be the targets of educational programs.

LIMITATION

The sample used does not represent the entire population of Al Madinah.

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