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Assessing the efficacy of an educational video on stroke knowledge in Lebanon: a single-arm interventional study

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Abstract

Objective This study aimed to assess the public's knowledge of stroke before and after viewing an educational video about stroke risk factors, preventive measures, and alarming signs.

Methods A single-arm interventional study was conducted in Lebanon using a 3-minute video-based education about stroke. A pre- and post-structured questionnaire compared the level of knowledge about stroke.

Results The study included 685 participants. Knowledge of stroke, risk factors, warning signs, treatment, and preventive measures significantly increased post-educational video sessions. A higher baseline knowledge score was associated with a family history of stroke (Beta = 1.76) and being a healthcare professional (Beta = 3.35). Participants between 25 and 34 years (Beta=-1.39) and those with a high risk of stroke (Beta=-1.03) were significantly associated with a lower knowledge score.

Conclusion This study demonstrated the effectiveness of a video-based educational tool to raise awareness about stroke. Short, targeted audio-visual resources using lay language can convey health education messages and influence behavioral changes. The community can benefit from a large-scale educational campaign that targets different socio-economic statuses to enhance knowledge of stroke and save lives.

Keywords Stroke, Educational video, Health promotion, Awareness, Population health

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Introduction

A stroke is a medical emergency that requires urgent and specialized care [1]. Early recognition of stroke warning signs and prompt access to care is critical for improving patient outcomes and reducing the risk of disability and death [2]. Studies have shown that public knowledge of stroke is limited [3] and highlighted the importance of educational programs for disease and complications avoidance [4], that can significantly improve stroke knowledge and awareness in patients and their families [5].

In fact, educational campaigns must target at-risk individuals, family members, and communities at large, to reduce stroke morbidity and mortality [6]. Educational material should focus on enhancing public awareness and knowledge of stroke signs and symptoms, encouraging individuals to take quick action, avoiding risk factors, and taking preventive strategies [7–9]. Educational strategies can be health campaigns, community outreach programs, and educational resources, including brochures, videos, and seminars [10].

Relevant international societies made efforts to address this gap. For example, the American Heart Association/American Stroke Association (AHA/ASA) implemented a community-based stroke education program using interactive sessions covering the disease risk factors, warning signs, and the importance of seeking timely medical attention [11]. Data shows that in low- and middle-income countries (LMICs), the burden of stroke is still increasing [12]. In Lebanon, stroke is the second leading cause of death, with rates ranging between 14.1 and 22% [13]. Despite the detrimental impact of stroke, knowledge and awareness about this disease remain limited [14, 15]. Therefore, this study aimed to assess the effect of an educational video intervention and identify predictors that may contribute to variations in knowledge and awareness outcomes by conducting a comparative analysis of knowledge and awareness levels among participants before and after the implementation of the intervention.

Methods

Study design

A single-arm cross-sectional study with an interventional approach was conducted between July 01, 2022, and September 30, 2022, to comprehensively evaluate the effect of and the factors influencing an educational video intervention.

Participants

Eligible participants were adults aged 25 years and older residing in Lebanon. The threshold of 25 years was chosen because individuals between the ages of 18 and 25 are considered emerging adults [16] who are unlikely to be interested in chronic diseases.

Procedure

Data were collected through an anonymous online questionnaire created on Google Forms, a cloud-based survey powered by Google™. The online survey included a 3-minute educational video titled "Think Fast, Act Fast to Save a Life" embedded after the pre-test knowledge survey and before the post-knowledge section. Both the questionnaire and the educational video were compatible with the American Stroke Association online awareness materials and were translated into Arabic, the native language of Lebanon and other countries in the region, according to the World Health Organization's translation guidelines [17]. A forward translation was first performed from English into Arabic, and then the translated version was back-translated into English. The two English versions were compared, with minor discrepancies corrected by consensus between the translators and the authors. Thus, the questionnaire was available in both languages and was electronically distributed via social media platforms, e.g., WhatsApp, Instagram, Twitter, and Facebook. The link to the questionnaire is available in supplementary material.

Before administration, the questionnaire was pilot-tested with a sample of 20 individuals to identify any potential ambiguities. Further validation involved content review by experts, including one of the authors, to ensure comprehensive coverage of relevant content. Subsequent feedback prompted necessary revisions for clarity and cultural relevance. Additionally, the validation process assessed construct validity and reliability, utilizing Cronbach's alpha for internal consistency, to ensure the questionnaire effectively measures the intended construct. Results of the Factor analysis (Promax rotated component matrix) are found in supplementary material. In brief, the questionnaire explains 48.67% of the variance and its internal consistency was confirmed through Cronbach's alpha, yielding a high value of 0.911. Furthermore, the questionnaire encompassed the following six sections: (1) demographics, (2) lifestyle, (3) health status, (4) pre-test of knowledge and awareness about the disease, attributable risk factors, alarming signs, and preventive measures, (5) a three-minute educational video available in both English and Arabic (links available in supplementary material), followed by (6) a post-test that consisted of the same sets of questions included in the pre-test.

Ethical considerations

This study, approved by the Institutional Review Board at Abu Dhabi University under code CoHS–22-05-00018 on 05/16/2022, adhered to the Declaration of Helsinki. Before filling out the online survey, participants were briefed about the study objectives and their right to withdraw at any time. Informed consent was obtained from all participants, by including a consent statement at the beginning of the survey. Participants were required to read the statement and click a checkbox indicating their agreement to participate in the study before proceeding to the questionnaire. Participants did not receive any financial reward for their participation. The online survey was anonymous and voluntary. Collected data were encrypted, stored in password-protected computers, and presented as de-identified electronic files in Microsoft Excel and SPSS.

Sample size calculation

The minimum sample size was calculated using the G-Power software version 3.0.10.

The calculated effect size was 0.0526, expecting squared multiple correlations of 0.05 (R2 deviation from 0) related to the Omnibus test of multiple regression. The minimum necessary sample was $n=371$, considering an alpha error of 5%, a power of 80%, and allowing 15 predictors to be included in the model. A minimum sample of 400 participants was targeted to account for potential missing values.

Data analysis

Data were analyzed on SPSS software version 25. A descriptive analysis was performed using absolute frequencies and percentages for categorical variables and means and standard deviations (SD) for quantitative measures.

As the skewness and kurtosis values of the dependent variable (knowledge total score) were within the acceptable range (−2 and +2), the data were considered to be normally distributed. In addition, the normal probability plots of the dependent variables were analyzed and the results showed a normal distribution.

The paired sample t-test was used to compare the stroke knowledge score before and after the education session. Also, a repeated measures ANOVA was performed to evaluate the mean change of the stroke total knowledge pre- and post-educational session after adjusting for the following covariates: age, gender, marital status, smoking, alcohol consumption, education level, healthy lifestyle index, having a stroke, a family history of stroke, and having any medical illness. The healthy lifestyle index, based on prior research [18–21], considers three types of variables: eating well, healthy weight and physical activity and provides a consolidated measure reflecting adherence to health-promoting habits and behaviors. It is calculated by summing individual scores for maintaining body weight in the normal range, being a non-smoker or former smoker, abstaining from alcohol, engaging in various levels of exercise (mild, moderate, and vigorous), and consuming fruits, vegetables, and fluids daily.

Three linear regressions were conducted, with the knowledge total score before and after the educational session and the difference between the two sessions as separate dependent variables. The model included sociodemographic variables along with those related to stroke risk factors. A p-value <0.05 was considered significant.

Results

Sample description

A total of 685 participants were included in the study. Participants were predominantly females 63.8%, highly educated, and aged 25 to 44. Only 2% had a history of previous stroke was seen in 2%, while 35.6% had a family history of stroke, 27% had a family history of myocardial infarction, 19% had high cholesterol, and 16% had high blood pressure. Around half had a healthy lifestyle, including no smoking, mild to moderate exercising, and a normal BMI (Table 1).

Comparison of stroke knowledge before and after the educational session

Table 2 presents the percentages of correct answers about stroke, stroke types, risk factors, warning signs, preventive measures, treatment, and the emergency status of disease occurrence. The frequency of correct responses improved after the educational intervention as compared to before.

Figure 1 shows the means of the knowledge total score before and after the educational session, after adjustment over age, gender, marital status, smoking, alcohol consumption, education level, healthy lifestyle, having a stroke, a family history of stroke, and having any medical illness. A significantly higher increase was found in the total knowledge score after the educational video (22.26 vs. 26.06, Mean difference = 3.80, confidence level 3.44–4.15, $p<0.001$).

Bivariate analysis

The pre-test results showed a significantly higher mean score knowledge among healthcare professionals and participants with a family history of stroke. The post-test results indicated a significantly higher mean knowledge in participants 55 years and above. The difference in knowledge score pre- and post-intervention in each variable is significant where a higher

Table 1 Sociodemographic characteristics of the participants

Variable	*N* (%)
Total participants	685 (100)
Gender	
Male	248 (36.2%)
Female	437 (63.8%)
Age	
25–34	285 (41.6%)
35–44	127 (18.5%)
45–54	155 (22.6%)
55 and above	118 (17.2%)
Marital status	
Single/widowed/divorced	325 (47.4%)
Married	360 (52.6%)
Education level	
Primary	30 (4.4%)
Secondary	50 (7.3%)
University	605 (88.3%)
Being a healthcare professional	
Yes	135 (19.7%)
No	550 (80.3%)
Stroke risk factors	
Family history of stroke	
Yes	244 (35.6%)
No	441 (64.4%)
Previous stroke	
Yes	14 (2.0%)
No	671 (98.0%)
Smoking	
Never smoke	401 (58.5%)
Current smoker	234 (34.2%)
Former smoker	50 (7.3%)
Physical activity	
Inactive (Sedentary)	24 (3.5%)
Mild	359 (52.4%)
Moderate	229 (33.4%)
Vigorous	73 (10.7%)
BMI categories	
Underweight	24 (3.5%)
Healthy weight	334 (48.8%)
Overweight	225 (32.8%)
Obese	102 (14.9%)
Having any of the following health conditions	
High blood pressure	110 (16.1%)
History of myocardial infarction	35 (5.1%)
Family history of myocardial infarction	184 (26.9%)
History of coronary artery disease	65 (9.5%)
High cholesterol level	130 (19.0%)
Diabetes	68 (9.9%)
History of deep vein thrombosis	30 (4.4%)
History of pulmonary embolism	19 (2.8%)
Severe headache (migraine)	132 (19.3%)
	Mean ± SD
Household crowding index	0.95 ± 0.52

mean knowledge score was found in the post intervention group as compared to the pre intervention group ($p < 0.001$ for all) (Table 3).

Multivariable analysis

A first linear regression model was performed, taking the stroke knowledge pre-educational video as the dependent variable. The results showed that having a family history of stroke (Beta = 1.76) and being a healthcare professional (Beta = 3.35) were significantly associated with a higher knowledge score (Table 4, Model 1).

When taking the knowledge of stroke post-education, the results showed that being between 25 and 34 years (Beta=-1.39) and having any high-risk disease (Beta=-1.03) were significantly associated with a lower knowledge score (Table 4, Model 2).

A third linear regression analysis taking the difference between the knowledge of stroke pre- and post-education as the dependent variable showed that having a family history of stroke (Beta=-1.42) and being a healthcare professional (Beta=-2.47) were significantly associated with a lower difference in the knowledge score (Table 4, Model 3).

Discussion

Our study showed that a brief educational video could enhance the public's knowledge about stroke risk factors, symptoms, and preventive measures within the Lebanese community.

A prior study in Lebanon indicated insufficient awareness of stroke risk factors and the importance of dialing 112 (the emergency number in Lebanon) when stroke symptoms occur, underscoring the need for health education programs to reduce stroke-related morbidity and mortality [15]. Educational videos have been recognized as efficient tools for a broad audience, with visual images offering advantages over verbal communication, including conveying additional information within a limited timeframe, simplifying complex ideas, illustrating dynamic concepts, and engaging and retaining the audience's attention more efficiently [22]. For example, studies utilizing animated video formats for educational interventions have shown consistent improvements in short-term patient health outcomes [23]. Similarly, a systematic review in 2012 confirmed the value of video-based education in altering health behaviors, showing efficacy in promoting various health-related actions, including prostate cancer screening, sunscreen adherence, human immunodeficiency virus (HIV) testing, and treatment adherence [24]. The literature focusing on stroke knowledge and awareness has also demonstrated positive outcomes [25, 26].

Table 2 Public knowledge of stroke among participants

Question	Pre-education	Post-education	*p*-value
	n (%)	*n* (%)	
Definition of stroke (1 correct answer: brain)			
Correct	619 (90.4%)	648 (94.6%)	< 0.001
Wrong	30 (4.4%)	17 (2.5%)	
Unknown	36 (5.3%)	20 (2.9%)	
Types of stroke (2 types)			
1 type correct (ischemic or hemorrhagic)	584 (85.3%)	651 (95.0%)	< 0.001
2 types correct (ischemic and hemorrhagic)	297 (43.4%)	520 (75.9%)	< 0.001
Unknown	236 (34.5%)	67 (9.8%)	< 0.001
Risk factors for stroke - Diseases (Overall 5 factors)			
At least 1 factor correct	123 (18.0%)	52 (7.6%)	< 0.001
2 factors correct	72 (10.5%)	40 (5.8%)	
3 factors correct	93 (13.6%)	62 (9.1%)	
More than 3 factors correct	397 (58.0%)	531 (77.5%)	
Unknown	617 (90.1%)	592 (86.4%)	0.004
Risk factors for stroke - Lifestyle and others (Overall 6 factors)			
At least 1 factor correct	82 (12.0%)	30 (4.4%)	< 0.001
2 factors correct	57 (8.3%)	10 (1.5%)	
3 factors correct	104 (15.2%)	33 (4.8%)	
More than 3 factors correct	442 (64.5%)	612 (89.3%)	
Unknown	160 (23.4%)	47 (6.9%)	< 0.001
Stroke warning signs (overall 5 symptoms)			
At least 1 symptom correct	68 (9.9%)	27 (3.9%)	< 0.001
2 symptoms correct	45 (6.6%)	8 (1.2%)	
3 symptoms correct	76 (11.1%)	21 (3.1%)	
More than 3 symptoms correct	496 (72.4%)	629 (91.8%)	
Unknown	307 (44.8%)	99 (14.5%)	< 0.001
Stroke Treatment (overall 2 treatment options)			
1 treatment option correct	566 (82.6%)	647 (94.5%)	< 0.001
2 treatment options correct	388 (56.6%)	587 (85.7%)	< 0.001
In case of stroke, when to call ambulance			
Correct	624 (91.1%)	650 (94.9%)	< 0.001
Wrong	61 (8.9%)	35 (5.1%)	
Prevention of stroke (overall 6 lifestyle measures)			
At least 1 measure correct	2 (0.3%)	18 (2.6%)	< 0.001
2 measures correct	2 (0.3%)	-	
3 measures correct	5 (0.7%)	6 (0.9%)	
More than 3 measures correct	676 (98.7%)	661 (96.5%)	

In our study, the three-minute video employed persuasive techniques, images, and modeling to communicate essential information and influence participants' health behavior. Participants exhibited a notable improvement in identifying stroke resulting from bleeding or an obstruction in blood flow to the brain. This improved awareness aligns with findings from previous studies conducted globally [27–29]. Furthermore, the ability to distinguish between a stroke and a heart attack is crucial, and our results contribute to reducing confusion between these two conditions, evident in the increased understanding of stroke's definition after watching the educational video, especially recognizing that it occurs in the brain, not the heart.

Notably, participants demonstrated an enhanced understanding of diseases and lifestyle factors associated with an elevated risk of stroke. The pre-test revealed a lack of knowledge about risk factors, consistent with earlier research [29, 30]. However, post-education scores significantly increased, emphasizing the pivotal role of health education in expanding public awareness.

Improvements were also evident in participants' recognition of stroke warning signs, particularly those emphasized by FAST (Facial, Arms, Speech, Time). Previous studies highlighted challenges in the community in detecting these signs [30, 31]. However, our results indicated increased awareness, with

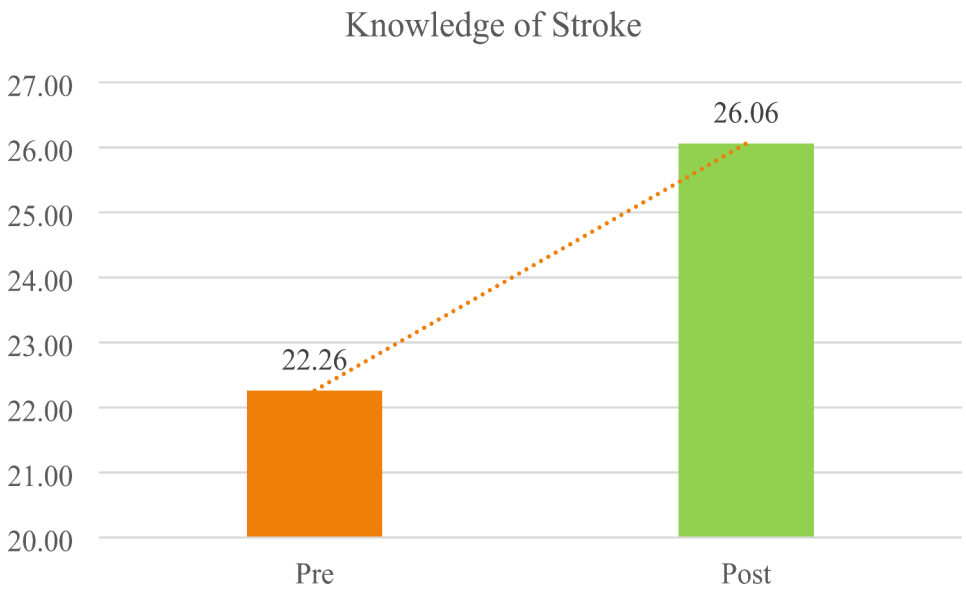

Fig. 1 Adjusted mean of the knowledge total score before and after educational video

respondents expressing a willingness to promptly seek medical assistance and call an ambulance in the event of a stroke, both before and after the intervention, mirroring findings from other studies [27–29]. This consistency highlights the prevailing perception among the public that stroke is a life-threatening and urgent medical condition.

Family history of stroke emerged as a predictor of stroke knowledge, consistent with research in Nigeria, Morocco, and France, emphasizing the role of interpersonal relationships in disseminating medical information [32–34]. Traumatic experiences with close relatives may contribute to heightened awareness and understanding of stroke [35]. Moreover, older participants (aged 55+) had higher improvement in stroke knowledge, potentially influenced by a greater likelihood of comorbidities, motivating them to learn more about the condition.

Before watching the video, most respondents had a robust understanding of stroke prevention strategies, a comprehension that remained consistently high after the educational intervention. In contrast to earlier research findings, our sample displayed a superior level of optimal knowledge [36, 37]. This difference may be attributed to variations in the socioeconomic and sociodemographic characteristics of the participants, particularly the higher rate of formal education in our sample.

While a few studies have suggested a gender-based difference in stroke awareness and interest in health-related topics, with females exhibiting a higher level of understanding [38–40], our findings did not align with this specific trend.

Some studies have demonstrated that individuals who embrace healthy behaviors such as regular exercise [41] and maintaining a nutritious diet [42] tend to possess greater awareness of the warning signs, risk factors, and preventive measures associated with stroke. However, our findings did not provide evidence supporting this relationship.

Furthermore, our study revealed a deficiency in participants' understanding of the optimal stroke treatment, validating similar findings in existing research [43, 44]. Previous studies on stroke awareness have predominantly focused on symptoms and risk factors, rather than adequate attention to treatment alternatives. Without knowledge about available treatments or the urgency of the situation, the recognition of symptoms alone is unlikely to prompt individuals to take swift action [45], hence the importance of time in public awareness campaigns when advocating for the best possible treatment approaches. Following the educational video, participants demonstrated an increased awareness of stroke treatment, reinforcing the idea that the visual and auditory elements inherent in video content provide a more immersive learning experience, enhancing the comprehension and retention of critical concepts related to stroke awareness and management. Combining visual representations of symptoms, emergency response procedures, and preventive measures created a comprehensive learning environment that caters to various learning styles. Moreover, the accessibility of videos such as the one used in this study across digital platforms ensures a broader reach, enabling wide dissemination of vital information to communities, thereby contributing significantly to the

Table 3 Factors affecting the knowledge score (pre/post-test)

Variable	Knowledge score				
	Pre-test	*P* value	Post-test	*P* value	*p*-value of the difference in knowledge score pre- and post-intervention
Gender					
Male	22.46 ± 6.03	0.528	26.26 ± 4.74	0.442	
Female	22.15 ± 6.33		25.95 ± 5.07		
Mean ± SE	22.31 ± 0.24		26.11 ± 0.19		**< 0.001**
Age (years)					
25–34					
No	22.01 ± 6.05	0.202	26.26 ± 4.23	0.256	
Yes	22.62 ± 6.44		25.80 ± 5.81		
Mean ± SE	22.32 ± 0.24		26.03 ± 0.19		**< 0.001**
35–44					
No	22.36 ± 6.19	0.411	26.15 ± 4.94	0.315	
Yes	21.85 ± 6.33		25.66 ± 4.98		
Mean ± SE	22.11 ± 0.30		25.91 ± 0.24		**< 0.001**
45–54					
No	22.34 ± 6.20	0.571	25.97 ± 5.14	0.344	
Yes	22.01 ± 6.30		26.40 ± 4.23		
Mean ± SE	22.18 ± 0.28		26.18 ± 0.22		**< 0.001**
55 and above					
No	22.28 ± 6.38	0.849	25.93 ± 5.23	**0.036**	
Yes	22.16 ± 5.41		26.71 ± 3.20		
Mean ± SE	22.22 ± 0.31		26.32 ± 0.25		**< 0.001**
Marital status					
Single/widowed/divorced	22.86 ± 6.01	**0.017**	25.98 ± 5.38	0.674	
Married	21.72 ± 6.35		26.14 ± 4.53		
Mean ± SE	22.29 ± 0.24		26.06 ± 0.19		**< 0.001**
University degree					
No	22.47 ± 4.99	0.752	26.50 ± 4.67	0.408	
Yes	22.24 ± 6.36		26.01 ± 4.99		
Mean ± SE	22.35 ± 0.37		26.25 ± 0.29		**< 0.001**
Being a healthcare professional					
No	21.62 ± 6.22	**< 0.001**	25.93 ± 5.04	0.159	
Yes	24.91 ± 5.49		26.60 ± 4.55		
Mean ± SE	23.26 ± 0.29		26.27 ± 0.24		**< 0.001**
Previous stroke					
No	22.22 ± 6.25	0.221	26.05 ± 4.98	0.623	
Yes	24.28 ± 3.72		26.71 ± 2.94		
Mean ± SE	23.25 ± 0.84		26.38 ± 0.67		**< 0.001**
Family history of stroke					
No	21.67 ± 6.58	**< 0.001**	26.00 ± 5.00	0.649	
Yes	23.34 ± 5.34		26.18 ± 4.87		
Mean ± SE	22.51 ± 0.24		26.09 ± 0.19		**< 0.001**
Any high risk disease					
No	22.45 ± 6.20	0.386	26.39 ± 4.39	0.067	
Yes	22.04 ± 6.24		25.68 ± 5.53		
Mean ± SE	22.25 ± 0.24		26.04 ± 0.19		**< 0.001**
Current smoker					
No	22.24 ± 6.31	0.875	26.27 ± 4.77	0.135	
Yes	22.32 ± 6.04		25.67 ± 5.27		
Mean ± SE	22.28 ± 0.25		25.97 ± 0.19		**< 0.001**
Consumes alcohol					

Table 3 (continued)

Variable	Knowledge score				
	Pre-test	***P* value**	**Post-test**	***P* value**	***p*-value of the difference in knowledge score pre- and post-intervention**
No	22.25 ± 6.37	0.936	26.00 ± 5.21	0.710	
Yes	22.28 ± 6.06		26.14 ± 4.67		
Mean ± SE	22.26 ± 0.24		26.07 ± 0.19		**< 0.001**
Healthy lifestyle index					
No	22.15 ± 6.21	0.250	26.05 ± 5.02	0.890	
Yes	22.93 ± 6.26		26.13 ± 4.51		
Mean ± SE	22.54 ± 0.34		26.09 ± 0.27		**< 0.001**

SE: Standard Error

overall effort to enhance public awareness and preparedness for stroke and how to manage it.

Limitations and strengths

The study has several limitations that need to be acknowledged. The online survey could introduce selection bias as individuals with no internet access and those unfamiliar with technology would be excluded. Consequently, an overestimation of the knowledge results is likely as less privileged populations may have had a lower chance of inclusion. In addition, a large proportion of participants were healthcare professionals (19.7%), who may possess higher baseline knowledge compared to the general public, thus limiting the possibility of representing the broader Lebanese population.

The questionnaire employed in the study consisted of closed-ended questions, which could lead to an overestimation of stroke knowledge among respondents. Participants self-reported their characteristics and responses, which could contribute to non-differential information bias. We also relied on participants' honesty in following the instructions to view the educational video in its entirety and to complete the survey in the correct order. Moreover, the platform used did not have mechanisms to enforce these steps, which may introduce bias in the data collection process. Furthermore, the study did not measure the long-term effects of the educational intervention. Larger-scale prospective studies would be required to evaluate this outcome. Nonetheless, our study used of a meticulously validated questionnaire to ensure the reliability and validity of our data collection and represents the first attempt to assess the effectiveness of an educational video in improving stroke knowledge in Lebanon potentially saving lives.

Conclusion

This study demonstrated the effectiveness of a video-based educational tool to raise awareness about stroke. Short, targeted audio-visual resources using lay language can convey health education messages and influence behavioral changes. The community can benefit from a large-scale educational campaign that targets different socio-economic statuses to enhance knowledge of stroke and save lives.

Table 4 Factors associated with knowledge, before and after the educational video as well as the difference between them

Model 1: taking the knowledge of stroke pre-test as the dependent variable					
	Unstandardized Beta	**Standardized Beta**	***p*-value**	**Confidence interval**	
				Lower Bound	**Upper Bound**
Age in years (25–34)	-0.722	-0.057	0.371	-2.304	0.861
Age in years (35–344)	-0.360	-0.022	0.652	-1.925	1.206
Age in years (45–54)	-0.220	-0.015	0.773	-1.717	1.277
Gender (female vs. male*)	-0.370	-0.029	0.465	-1.365	0.624
History of stroke (yes vs. no*)	2.252	0.051	0.177	-1.019	5.522
Family history of stroke (yes vs. no*)	1.769	0.136	**< 0.001**	0.801	2.737
Healthcare professional (yes vs. no*)	3.354	0.215	**< 0.001**	2.158	4.550
Alcohol (yes vs. no*)	0.220	0.018	0.655	-0.748	1.188
Healthy lifestyle (yes vs. no*)	0.592	0.033	0.377	-0.725	1.909
Current smoker (yes vs. no*)	0.115	0.012	0.768	-0.647	0.876
Any high-risk disease (yes vs. no*)	-0.652	-0.052	0.189	-1.626	0.322
Marital status (Married vs. single*)	-0.899	-0.072	0.129	-2.062	0.263
University degree (yes vs. no*)	-0.596	-0.031	0.444	-2.125	0.933
Model 2: taking the knowledge of stroke post-test as the dependent variable					
	Unstandardized Beta	**Standardized Beta**	***p*-value**	**Confidence interval**	
				Lower Bound	**Upper Bound**
Age in years (25–34)	-1.399	-0.139	**0.034**	-2.694	-0.104
Age in years (35–344)	-1.193	-0.094	0.068	-2.475	0.088
Age in years (45–54)	-0.485	-0.041	0.437	-1.710	0.741
Gender (female vs. male*)	-0.219	-0.021	0.597	-1.034	0.595
History of stroke (yes vs. no*)	0.778	0.022	0.569	-1.900	3.456
Family history of stroke (yes vs. no*)	0.326	0.032	0.419	-0.466	1.119
Healthcare professional (yes vs. no*)	0.879	0.071	0.078	-0.100	1.859
Alcohol (yes vs. no*)	0.266	0.027	0.510	-0.526	1.058
Healthy lifestyle (yes vs. no*)	0.052	0.004	0.924	-1.026	1.130
Current smoker (yes vs. no*)	-0.083	-0.011	0.794	-0.707	0.541
Any high risk disease (yes vs. no*)	-1.031	-0.104	**0.011**	-1.828	-0.234
Marital status (Married vs. single*)	-0.119	-0.012	0.807	-1.070	0.833
University degree (yes vs. no*)	-0.356	-0.023	0.577	-1.608	0.896
Model 3: taking the difference between the knowledge of stroke pre and post session as the dependent variable.					
	Unstandardized Beta	**Standardized Beta**	***p*-value**	**Confidence interval**	
				Lower Bound	**Upper Bound**
Age in years (25–34)	-0.651	-0.065	0.304	-1.893	0.591
Age in years (35–344)	-0.794	-0.063	0.206	-2.025	0.437
Age in years (45–54)	-0.274	-0.023	0.646	-1.445	0.897
Gender (female vs. male*)	0.126	0.012	0.750	-0.650	0.901
History of stroke (yes vs. no*)	-1.525	-0.044	0.242	-4.082	1.032
Family history of stroke (yes vs. no*)	-1.424	-0.139	**< 0.001**	-2.185	-0.663
Healthcare professional (yes vs. no*)	-2.475	-0.200	**< 0.001**	-3.414	-1.536
Alcohol (yes vs. no*)	0.050	0.005	0.897	-0.709	0.810
Healthy lifestyle (yes vs. no*)	-0.558	-0.040	0.290	-1.593	0.477
Current smoker (yes vs. no*)	-0.569	-0.055	0.151	-1.345	0.207
Any high risk disease (yes vs. no*)	-0.360	-0.036	0.355	-1.124	0.404
Marital status (Married vs. single*)	0.749	0.076	0.108	-0.165	1.663
University degree (yes vs. no*)	0.154	0.010	0.803	-1.055	1.363

Variables entered in the three models: gender, age, ever stroke, History of stroke, healthcare professional, smoking, alcohol, healthy lifestyle, medical illness, marital status and level of education

*Reference group

Abbreviations

AHA/ASA American Heart Association/American Stroke Association
LMICs Low- and Middle-Income Countries
SPSS Statistical Package for the Social Sciences
ANOVA Analysis of Variance
HIV Human Immunodeficiency Virus

Supplementary Information

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Supplementary Material 1

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Not applicable.

Author contributions
M.C obtained funding. M.C, K.I and P.S developed the research question and contributed to the study design and analysis plan. M.C, K.I, P.S developed the educational video and piloted the questionnaire. S.Y, T.A, Y.S collected the data. J.S, F.S, H.S, H.H contributed to literature review. C.H performed the statistical analyses. C.H and K.I validated the questionnaire. J.S, K.I, H.S, H.H, F.S, S.Y, T.A, Y.S drafted the manuscript. All authors critically revised the manuscript, gave final approval and agree to be accountable for all aspects of work ensuring integrity and accuracy.

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Data availability
All data generated or analysed during this study are included in this published article and its supplementary information files. The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The Institutional Review Board at Abu Dhabi University gave approval to conduct this study (CoHS-22-05-00018.16/May/2022), and informed consent was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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