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## **USING TALKING PHOTONOVELAS FOR EDUCATION ABOUT STROKE: A DATA-DRIVEN TUTORIAL AND DEMONSTRATION**

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### **ABSTRACT**

To address health disparities, professionals and settings are called upon to develop new and creative approaches for health education purposes. In particular, one segment of the population that needs special attention are individuals who have low literacy levels. This population has been identified as at high risk for many conditions including hypertension and stroke. This article presents a tutorial for developing Talking Photonovelas (TPs) to educate about stroke for audiences who may not have the reading skills required to understand written materials usually presented at high readability levels. In addition, a demonstration on the use of the TP developed and a summary of results are included. After using the TP, adult students increased their scores. The percentage of students gaining an increase in scores varied depending on the TP subthemes. Finally, based on accuracy levels, it was determined that one TP view would not suffice to gain all the basic information needed about stroke, stroke prevention and how to proceed in the presence of a stroke victim.

**KEYWORDS:** health disparities, health literacy, stroke, photonovelas, fotonovelas, stroke education

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## **Introduction**

### **Literacy and Health Literacy**

Pursuing preventative measures to avoid communication disorders and etiological factors includes developing information materials for hospitals, clinics, health fairs and other settings. However, there is a plethora of literature pointing to health education materials testing at readability levels above the literacy levels of the intended audience, including too much information, offering limited or no explanations of uncommon words, and containing instructions that are too complex.

In the field of communication sciences and disorders, the picture is quite similar. For example, Martinez (2010) gauged the readability levels of handouts and brochures disseminated by the American Speech-Language-Hearing Association (ASHA), National Institutes of Health (NIH), and the American Academy of Audiology (AAA). These are the agencies that are charged with educating the population about communication disorders, including the impact of stroke on communication skills. Martinez found that the average readability level of 51 brochures authored by these three agencies and addressing a diversity of topics, was grade 8.8 and the reading levels ranged from grades 5.0 to 12.8. Only one-fourth of the brochures contained information at the sixth grade level or lower. In addition, the readability level of brochures related to stroke (N=5) averaged a grade of 12. Martinez's results run in concert with other studies about stroke related materials. For example, on-line materials have been gauged at 10.4 and 12.1 grade level depending on the formulas used (Hoffman & McKenna, 2006; Hoffman, McKenna, Worrall, & Read, 2004; Sharma, Tridimas, & Fitzsimmons, 2014; Vallance, Taylor, & Lavalley, 2008).

High readability levels of health related literature present a challenge to health educators when addressing the population that is low literate. The 2003 National Assessment of Adult Literacy (NAAL) (Baer, Kutner, & Sabatini, 2009) measured three types of literacy skills: prose, document and quantitative skills. Prose skills help readers to understand continuous texts in brochures and instructional materials. Document skills help to

understand non-continuous texts such as maps, schedules, and drug and food labels. Quantitative skills comprise computational skills required for completing order forms and determining quantities of food to be served. The 2003 NAAL study reported that eleven million adults (above the age of 16) were found to be non-literates, and of those, 7 million may not respond to simple test questions, and the rest may present with language barriers. Also, another 30 million had no more than the most simple and concrete literacy skills (below basic) and 68 million could perform simple and everyday literacy activities (basic). These two groups –below basic and basic – comprise 43% of the population tested. The populations at risk were found to be those without High School diplomas, persons with no English spoken at home, Hispanics, African Americans, older persons (aged 65+) and those persons with multiple disabilities.

Beyond everyday literacy skills, health literacy skills may also be problematic to some within the African American, Hispanic, American Indian/Alaskan Native and multiracial sectors (Kutner, Greenberg, Jin, & Paulsen, 2006). The following are some definitions:

- "...the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (US Department of Health and Human Service, 2010a, 2010b).
- "...the use of a wide range of skills that improve the ability of people to act on information in order to live healthier lives. These skills include reading, writing, listening, speaking, numeracy, and critical analysis, as well as communication and interaction skills" (Canada's Office of Literacy and Essential Skills, 2011).
- "...a set of higher level skills to facilitate evaluating information, analyze risks and benefits, make calculations of medicines, and interpret test results among others." It also includes skills such as reading abilities, and oral and visual abilities used to clarify and understand pictures and graphs. The World Health Organization extends this definition by focusing on social and political issues that affect the health of clients. For them, health literacy is "the cognitive and social skills which determine the

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motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health” (The World Health Organization, 2015).

Health literacy means more than being able to read pamphlets and successfully make appointments. By improving people's access to health information and their capacity to use it effectively, health literacy is critical to empowerment.” By using the notion of empowerment they reflect the thoughts of Paulo Freire (1970) and others who view the role of education as that of empowering individuals and communities to take action and proactively change their situations through policy and organizational change.

Studies addressing the skills of patients also point to gaps in health literacy skills. Apart from straight literacy skills, the 2003 NAAL also found that 14% of the population has below basic health literacy skills and 22% of the population has basic health literacy skills (Kutner et al., 2006). The Center for Disease Control and Prevention (2016) estimates that nine of 10 adults have difficulties with information that is unfamiliar, complex and technical. Studies regarding patients appear just as disconcerting. In a survey of 85 studies containing over 31,000 patients, it was found that 26% of the population had low health literacy skills and 20% had marginal health literacy skills (Passche-Orlow, Parker, Gasmararian, Nielsen-Bohlman & Rudd, 2005). Those most at risk include the elderly, persons with limited education, ethnic minorities, persons speaking languages other than English during childhood, immigrants, unemployed persons, low income populations, and Medicaid users (Kutner et al., 2006).

Since literacy and health literacy skills have been proven to correlate to health status, it is unsurprising that the report *Healthy People 2010* (U. S. Department of Health and Human Services, 2000) addressing health disparities recommended the aim of “*improved consumer health literacy* (Objective 11-2)” and identified health literacy as an important component of health communication. Thus, offering alternative communication methods for populations at risk such as listed above, addresses Healthy People 2010 overarching goal of eliminating health disparities. This article presents a tutorial for developing Talking Photonovelas (TPs) on stroke education for audiences who may not have the reading skills required to

understand written materials usually presented at high readability levels. Also included is a training demonstration of the use of the TP developed for a sample of adults with low-literacy levels and a summary of results.

## **Talking Photonovelas**

When addressing literacy limitations, clinicians need to be aware of the difficulties faced by clients when receiving health education. Egbert and Nanna (2009) noted that low-literate individuals are challenged when obtaining health information, processing/understanding health information, and using health information for decision making.

A strategy that has been used with low-literate populations to educate them about health, education, politics and other issues are photonovelas. Photonovelas use stories to convey a message similar to comic books by relating a story using photographs and dialogue boxes or bubbles containing simple language. This format takes advantage of the strong oral traditions of some cultural groups such as African Americans and Hispanics, while also addressing the needs of other populations with low-literacy skills. They have been used effectively to disseminate information regarding health, education, and governance in underdeveloped worlds as well as the United States (Kepka, Coronado, Rodriguez, & Thompson, 2011; Nimmon, 2007; Rudd & Comings, 1994; Rural Women's Health Project, 2011; Unger, Cabassa, Molina, Contreras, & Baron, 2013; Valle, Yamada, & Matiella, 2006). Furthermore, recommendations have been made to emphasize narratives (with imaging) in adult literacy programs because non-literate populations are very much attuned to storytelling. In essence, since people live within narratives, the world is grasped through narratives and stories, those that individuals live themselves and those that are told to them. Therefore, many have advocated for integrating storytelling and have identified its effectiveness in adult literacy and health literacy programs, because they tap on factual information along with emotions and experiential learning (Caminotti & Gray, 2012; Day, 2009; Eck, 2006). As well, storytelling can also be used for scaffolding, an instructional approach which supports the learning of new information by integrating it to prior knowledge.

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Talking Photonovelas (TPs) (Martinez & Lyons, 2004; Martinez, Smith, & Ellie, 2004) go one step further by using technology to enhance the story telling experience. The TPs are delivered through computers and accompany the pictures and dialogue boxes with voiceovers. The website [www.myhealthstories.com](http://www.myhealthstories.com) includes examples of TPs with communication sciences and disorders content. This approach is innovative in that it uses computers to present the photonovelas which are accompanied by voice-overs. Voice-overs then enhance the learning experience for those who have problems reading, but offers the opportunity to learn aurally.

This study illustrates the production and use of Talking Photonovelas as a method to teach about stroke as part of prevention efforts to low-literate populations. Its purpose is to offer a systematic process to clinicians who want to engage in an educational approach with their clients as it pertains to stroke and its prevention.

## **Method**

### **Participants**

A total of nine African Americans, ranging in age from 26 to 62 years ( $M = 42.78$ ), participated in the training. They included four females and five males whose educational levels ranged between 1<sup>st</sup> and 12<sup>th</sup> grade ( $M = 7.89$ ). Table 1 provides the demographic information for the students. Each student had a reading level assigned to them through the literacy program based on prior literacy assessments. Their reading levels ranged between 1<sup>st</sup> and 8<sup>th</sup> grades ( $M = 3.89$ ). Those students with a significant history of hearing, visual, cognitive impairments or prior stroke experience were excluded.

### **Materials and Procedures**

**Rationale.** A concern in the field of communication sciences and disorders is the rate of strokes in individuals because they may directly impact patients' post-morbid communication skills. The concern increases with regard to African Americans and Hispanics since they are at a greater risk than other ethnic populations. Therefore, professionals are obliged to carry out more aggressive educational activities to those populations, in particular as it relates to prevention. Nevertheless, health education materials tend to contain advanced and specialized terminologies and high

readability levels that preclude sectors of the African American population from increasing their knowledge about strokes, identifying symptoms and risk indicators, and carrying out rescue activities in case of a stroke incident.

Strokes present a larger danger to minorities such as African Americans and Hispanics who are most at risk of hypertension (Quiñones, Liang, & Ye, 2012). For example, there is likelihood that 50 % more African American adults, when compared to White adults, will experience a stroke, and they are 70% more likely to die from a stroke. In fact, for African Americans the risk of death from stroke is four times larger at ages 35-54, three times larger at ages 55-64 and two times larger at ages 65-74. Furthermore, they are more likely to become disabled and have difficulty with activities of daily living than their white counterparts. Putting them at risk are factors such as hypertension, diabetes, smoking, obesity, and physical inactivity which have also been identified as present in African Americans in higher rates than their white counterparts (Center for Disease Control and Prevention, 2016; Payne, 2016).

Proper management of controllable factors (i.e., diabetes, obesity, alcohol and tobacco use, smoking) requires awareness of risks and approaches for avoiding them. The majority of strokes are preventable, but many individuals are unaware of the populations at risk, or what symptoms to look for that may be specific indicators of stroke. Those were the findings when 39 studies between 1966 and 2008 were examined by Jones, Jenkinson, Leathley, and Watkins (2010). In summary, these studies reported that knowledge for recognizing and preventing strokes was very poor. In these studies, participants were asked, for example, to name symptoms and explain actions to take when presented with a stroke situation. It is vital to help populations' understanding that a stroke treated with urgency is key to preventing death or morbidity.

**Themes.** For validity reasons, a literature review served to identify important themes that would facilitate stroke prevention. The American Stroke Association (2011), National Stroke Association (2013, 2016), and the National Institute of Neurological Disorders and Stroke (2016) helped identify six basic themes.

- Theme 1: Definition of stroke
- Theme 2: Populations at risk
- Theme 3: Risk factors

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Theme 4: Stroke consequences

Theme 5: How to act

Theme 6: Definition of FAST.

With the themes identified, learning objectives were developed that served as the basis for producing the Talking Photonovela (TP) (or Talking Fotonovela) (see Appendix A).

**Story.** Since the intent of a TP is to educate through the use of stories that are relatable to the trainees, the story “Helping a Stroke Victim” was developed. For such purpose, the story revolved around a married couple having breakfast when the husband presents with a stroke. Later on, the wife and the daughter meet in the hospital and the wife relates the story to the daughter. The conversation with the daughter describes the definitions of stroke, the populations at risk, the risk factors, stroke consequences, and the behaviors noted in her husband that pointed to a stroke. Finally, the discussion addresses what to do when presented with a person having a stroke and the definition of FAST, which is an acronym that stands for Facial drooping, Arm weakness, Speech difficulties and Time. This mnemonic device helps detect and enhance awareness and responsiveness to stroke victim needs by anyone who is with them (National Stroke Association, 2016)

**Script and dialogue.** The first production step involved writing a script. Because the information related should be short with a readability level appropriate for low literate populations, each dialogue sentence was assessed and modified to accomplish the goal. The dialogue included high frequency, and low readability words, as well as low readability sentences. The dialogue contained 285 words with an average of 3.8 characters per word. Fifty-two sentences are presented with an average of 5.4 words per sentence. The Flesch Kincaid Readability Formula (Microsoft Word, 2007) was used to measure each sentence as well as overall readability level. The Flesch Kincaid average grade level obtained was 1.3, with sentences ranging between grades 0.1 and 12.8. The Mode for grades was 3.0. The highest ranking sentences presented lists, such as “*Asians, Hispanics and African Americans must be careful*” (Grade level 12.8) and “*Also, high blood pressure, high cholesterol, diabetes, or if you are too heavy*” (Grade level 8.5.) To facilitate reading understanding, they were accompanied by pictures and/or the sentences were parsed into dialogue boxes.

**Storyboards.** The story was further elaborated using story boards that presented each scene to be photographed as well as the dialogues. The elaboration of story boards is a necessary step that helps organize the project. Storyboards help to visualize how the story will flow by sketching out (like a comic book) what would be contained in each of the pictures of the TP, what may be important to remember, and the logical sequence of events. It also helps to envisage how the final product will look like therefore, making the production efforts more efficient. There are many story board templates available in the internet. For our purposes, two templates (see Appendix C) were used from Creativemtemplate.net (2017). Each picture to be taken should be sketched out in these storyboards. While drawing complete scenes are useful (as in movie productions), drawing stick figures is sufficient. Figures may be placed from left to right in the order in which their dialogue will appear, therefore guiding us as to angles that will be photographed. Also, space is available to notate any emotional feelings that need to be portrayed, props to be used, setting/ambience, and other information. A second template was used to further elaborate each picture. Picture sketches were refined and the placement of dialogue bubbles was also polished. Dialogue boxes should be placed from left to right, and top to bottom in the appropriate dialogue order to facilitate reading. Other information such as props, setting, talent clothing, angles of pictures, etc. are also listed or commented upon in the storyboard.

**Photography.** Photographic production begins after story boards are developed. Suggestions include to keep color to a minimum, considering both foreground and background. For example, if the setting has a yellow background, the talent (actors) should avoid using yellow clothing. Props should also stand out, so that if a red telephone is used, it should not be placed on top of a red tablecloth. Also, as many photos possible of the same scenes from different angles should be taken. Although scenes in the storyboards have already been set up, extra photos are helpful in case another photo is needed to clarify a point or to strengthen the story’s cohesion and coherence. Finally, one must keep in mind that photo-editing is needed for cropping out unnecessary visuals or for honing in on specific props or talents. There are many photo-editing software available, such as Adobe Photoshop (Adobe, 2007) used for our TP.

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**Slide show.** Using Microsoft PowerPoint (Microsoft, 2007) a slide show was produced. Once photos were placed in a slide show, dialogue bubbles are placed. To do so, PowerPoint’s toolbar offers the option to insert a shape called “callout” from where one can select a dialogue bubble. Dialogue bubble placement should be from left to right in the correct order of the dialogue and from top to bottom to facilitate reading. Inside the bubble the dialogue is typed trying to keep sentences on one line and always left aligned. Center alignment should definitely be avoided as it would interfere with readers’ saccadic eye movements. The US Department of Health and Human Services, Centers for Medicare and Medicaid Services (2010) recommends using serif font, such as Times Roman.

**Voice-overs.** The next step is to do voice-overs. If the talent photographed is able, they can perform the voice-overs. Nevertheless, in this production, other talent performed the voice-overs. Doing voice-overs requires a separate production stage. At the beginning, the talent is given the script to study and, subsequently, rehearsals are carried out, which includes discussing the story. Later, the script is rehearsed without the slide show, addressing diction, intonational patterns, rate of speech and volume. Eventually the rehearsals include the slide show for synchronization/timing purposes. Finally, the voice-overs are recorded using PowerPoint’s slideshow recording capabilities with a microphone attached to a lap top computer. When setting up the timing of slide shows, considerations must be made regarding future viewers timing needs for reading and listening to each slide. Nevertheless, if they are to be used by individual learners, then it is preferable for them to have command of the forward and back buttons to set their own pace. A copy of the completed TP is included in Appendix D.

The TP “Helping a Stroke Victim” was used to educate low-literate adults enrolled as students in an adult literacy program in a large metropolitan city. The students were given consent forms and attended an orientation meeting about the purpose of the training, what was involved in their participation, and how their privacy and confidentiality would be ensured. Because of the low literacy levels of the participants, the consent forms were read aloud and each section explained offering the participants the opportunity to ask questions. After the orientation, the participants signed the consent forms and

were individually interviewed to obtain demographic data.

Table 1. Demographic Characteristics of Participants (N=9)

Participant	Age	Gender	Reading Grade	Education	Occupation
1	27	f	7	12	Supervisor
2	62	f	8	8	None
3	50	m	1	5	None
4	58	m	2	10	Vendor
5	47	f	5	7	None
6	40	m	3	12	None
7	27	m	4	10	None
8	48	m	4	6	None
9	26	f	1	1	None
Means	42.78		3.89	7.89	

**Baseline scores.** Before the training a baseline of knowledge was obtained for each student. The interview for baseline scores included open-ended questions about content based on the objectives of the training (see Appendix C). The information gathered was audiotaped.

**Training.** The students viewed the TP individually using a lap top computer. They were free to view the TP at their own pace. They were permitted to go back to any previous pages if they felt the need since they had control of the forward and back buttons in the computer. The clinician sat next to the participant as they viewed the PT.

**Post lesson interview.** The Post Lesson Interview included the same open-ended questions in the Baseline Interview addressing content. It also included open-ended questions about Use (how user-friendly was the tool) and Affect (how they felt about the knowledge they gained, if they could explain and advise others about stroke, and if they felt they could now take better care of themselves). The interview protocol is included in Appendix B. The Post Lesson interview was audiotaped to facilitate analysis.

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## Results

### Content

The students' knowledge growth about content was measured by looking at differences between Baseline and Cumulative scores. That is, the participants' baseline interview responses (Table 2) were used as baseline data. Correct responses were given a score of 1. Correct responses in the post lesson interviews were also given a score of 1. A final cumulative score was obtained by adding baseline to post lesson scores. For example, if a respondent mentioned one risk factor during the baseline and then offered three more different risk factors during the post lesson interview, the final cumulative score would be four points. Table 2 also presents accuracy levels for each theme based on the target score of

responses. When baselines and cumulative scores were compared the following percentage of the individuals increased their scores in all but one theme: Theme 1: from 22.2% to 55.5%; Theme 2: from 55.5% to 66.6%; Theme 3: from 55.5% to 77.7%; Theme 4 from 55.5% to 100.0%; Theme 5: from 66.6% to 77.7%; and Theme 7 from 0.0% to 44.4%. There was no percentage increase in Theme 6 (55% stayed stable). In summary, more individuals raised their scores in themes 4 (stroke effect/impact) and 7 (FAST explanation), followed by theme 1, then theme 3. Themes 2 and 5 presented with fewer individuals increasing their scores. A perusal at the accuracy levels obtained point to only a few individuals obtaining or surpassing 85% accuracy levels in any of the themes. Cumulative accuracy levels ranged from 0.00% to 250.00% (the latter due to offering more accurate information than target responses).

Table 2. Individual Performances in Raw Scores and Target Score Accuracy

Theme 1 Stroke Definition Target Score 6													Theme 2 Populations at Risk Target Score 5				Theme 3 Risk Factors Target Score 5			
Participant	Baseline	Accuracy	Cummulative	Accuracy	Baseline	Accuracy	Cummulative	Accuracy	Baseline	Accuracy	Cummulative	Accuracy								
1	0	0.00%	2	33.33%	1	20.00%	7	140.00%	3	60.00%	5	100.00%								
2	0	0.00%	0	0.00%	2	40.00%	2	40.00%	0	0.00%	3	60.00%								
3	0	0.00%	1	16.67%	0	0.00%	2	40.00%	0	0.00%	2	40.00%								
4	1	16.67%	1	16.67%	1	20.00%	4	80.00%	1	20.00%	1	20.00%								
5	0	0.00%	0	0.00%	1	20.00%	3	60.00%	2	40.00%	3	60.00%								
6	1	16.67%	2	33.33%	2	40.00%	4	80.00%	3	60.00%	10	200.00%								
7	0	0.00%	3	50.00%	1	20.00%	2	40.00%	0	0.00%	1	20.00%								
8	0	0.00%	0	0.00%	1	20.00%	1	20.00%	0	0.00%	0	0.00%								
9	0	0.00%	2	33.33%	1	20.00%	1	20.00%	1	20.00%	4	80.00%								
<b>Totals</b>	<b>2</b>		<b>11</b>		<b>10</b>		<b>26</b>		<b>10</b>		<b>29</b>									

  

Theme 4 Stroke Effect/Impact Target Score 2				Theme 5 Stroke Symptoms Target Score 4				Theme 6 How to Act Target Score 4				Theme 7 FAST Explanation Target Score 4				
Participant	Baseline	Accuracy	Cummulative	Accuracy	Baseline	Accuracy	Cummulative	Accuracy	Baseline	Accuracy	Cummulative	Accuracy	Baseline	Accuracy	Cummulative	Accuracy
1	1	50.00%	5	250.00%	1	25.00%	4	100.00%	1	25.00%	1	25.00%	0	0.00%	3	75.00%
2	0	0.00%	2	100.00%	2	50.00%	3	75.00%	0	0.00%	1	25.00%	0	0.00%	0	0.00%
3	1	50.00%	2	100.00%	0	0.00%	0	0.00%	0	0.00%	1	25.00%	0	0.00%	0	0.00%
4	2	100.00%	5	250.00%	2	50.00%	5	125.00%	1	25.00%	1	25.00%	0	0.00%	3	75.00%
5	1	50.00%	3	150.00%	0	0.00%	2	50.00%	0	0.00%	1	25.00%	0	0.00%	0	0.00%
6	0	0.00%	1	50.00%	1	25.00%	1	25.00%	1	25.00%	2	50.00%	0	0.00%	0	0.00%
7	0	0.00%	2	100.00%	0	0.00%	1	25.00%	1	25.00%	1	25.00%	0	0.00%	2	50.00%
8	0	0.00%	1	50.00%	1	25.00%	4	100.00%	1	25.00%	1	25.00%	0	0.00%	3	75.00%
9	2	100.00%	4	200.00%	2	50.00%	4	100.00%	0	0.00%	1	25.00%	0	0.00%	0	0.00%
<b>Totals</b>	<b>7</b>		<b>25</b>		<b>9</b>		<b>24</b>		<b>5</b>		<b>10</b>		<b>0</b>		<b>11</b>	

Note: Accuracy based on performance score and target score.

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Using the Statistical Package for Social Science (SPSS), version 19 (IBM-SPSS, 2011) quantitative analysis were performed. Table 3 presents overall group performance. The mean Baseline score was 4.778 (SD = 2.587) and the mean Cumulative score was 15.111 (SD = 6.153). Table 4 shows the results of matched-pairs t-tests used to determine differences in performance between Baseline and Cumulative scores. The first analysis looked at overall performance of the group. There was a significant effect for the group ( $t = -7.46$ ,  $df = 8$ ,  $p = 0.00$ ), suggesting growth in content knowledge. Further t-tests served to look at differences in score performance for each of the themes. They revealed that Cumulative scores were

significantly higher than Baseline scores in all of the themes: Theme 1: Definition of Stroke,  $t = -2.68$ ,  $df = 8$ ,  $p = 0.03$ ; Theme 2: Populations at Risk,  $t = -2.77$ ,  $df = 8$ ,  $p = 0.02$ ; Theme 3: Risk Factors,  $t = 2.95$ ,  $df = 8$ ,  $p = 0.02$ ; Theme 4: Stroke Repercussions,  $t = 6.00$ ,  $df = 8$ ,  $p = 0.00$ ; Theme 5: Stroke Symptoms,  $t = -4.08$ ;  $df = 8$ ,  $p = 0.00$ ; Theme 6: How to Act,  $t = -3.16$ ,  $df = 8$ ,  $p = 0.01$ ; Theme 7: Define FAST,  $t = -2.48$ ,  $df = 8$ ,  $p = 0.04$ . It was therefore concluded that for each of the themes addressed in the PT, there was significant group growth in content knowledge.

Table 3. Group Performance by Theme (N=9)

		Baseline				Cumulative			
		Score	Range	M	SD	Score	Range	M	SD
Theme									
1	Stroke Definition	2	0-1	0.222	0.441	11	0-3	1.222	1.093
2	Populations at Risk	10	0-2	1.111	0.601	26	0-7	2.889	1.900
3	Risk Factors	10	0-3	1.111	1.269	29	0-10	3.222	2.991
4	Stroke Effect/Impact	7	0-2	0.778	0.833	25	0-5	2.778	1.563
5	Stroke Symptoms	9	0-2	1.000	0.866	24	0-5	2.667	1.735
6	How to Act	5	0-1	0.556	0.527	10	1-2	1.111	0.333
7	FAST Explanation	0	0-0	0.000	0.000	11	0-3	1.222	1.481
Total		43		4.778	2.587	136		15.111	6.153



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Table 4. Comparison of Baseline and Cumulative Scores analysis using two-tailed t-tests (N=9).

		Baseline	Cumulative	T-Test	p
		M (SD)	M (SD)		
Theme					
1	Stroke Definition	0.222 (0.441)	1.222 -91.093	<i>*2.683</i>	0.028
2	Populations at Risk	1.111 (0.601)	2.889 (1.900)	<i>*2.775</i>	0.024
3	Risk Factors	1.111 (1.269)	3.222 (2.991)	<i>*2.949</i>	0.018
4	Stroke Effect/Impact	0.778 (0.833)	2.778 (1.563)	<i>*6.000</i>	0
5	Stroke Symptoms	1.000 (0.866)	2.667 (1.732)	<i>*4.082</i>	0.003
6	How to Act	0.556 (0.527)	1.111 (0.333)	<i>*3.162</i>	0.013
7	FAST Explanation	0.000 (0.000)	1.222 (1.481)	<i>*2.476</i>	0.038
	All Themes	4.778 (2.587)	15.111 (6.150)	<i>*7.464</i>	0

Note. Df=8, \*significant values noted in italics

Table 5. Pearson Correlation Matrix for Variables (N=9)

	Baseline	Cumulative
Reading	0.015	0.165
Gender	-0.173	-0.214
Age	0.094	-0.391
Education	0.401	0.561
Baseline		<i>*0.858</i>

Note. Df = 7, p = .05, critical p = .666,  
\*significant values in italics

A series of SPSS Pearson Correlations statistical (IBM-SPSS, 2011) were performed on Baseline and Cumulative scores to examine the relationships between demographic characteristics and performances. The results of four demographic characteristic correlations are provided in Table 5. These correlations were statistically insignificant at the .05 level, df = 7. Correlations with Baseline scores were as follows: Reading Level, r = 0.015; Gender, r = -0.173; Age, r = 0.094; Education, r = 0.401. For Cumulative scores the correlations obtained were as follow: Reading Level, r = 0.165; Gender, r = -0.214; Age, r = -0.391; Education, r = 0.561. It is therefore concluded that demographic characteristics did not impact performance outcome in Baseline nor Cumulative scores. For the correlation between the Baseline and Cumulative scores performances, a level of significance was obtained at the .05 level (r = .856). Therefore, it should be noted that there is a relationship between participants' baseline scores and cumulative scores.

## Use

Eight participants were able to offer comments regarding the user-friendliness of the tool. Of the group, seven

(88.0%) found the story easy to understand, and one stated s/he had some difficulty. The words in the bubbles were found to be easy by 7 (88.0%) of the participants, and one also stated that it was still hard. About the pictures, all but one (88.0%) of the participants liked them. When asked if they liked listening to the story, all (100.0%) liked listening, with the following comments: *“Made it easier, it made it clear, it was better to understand.”* One of the participants stated that *“First, it was hard, then it became easy.”* When asked what they liked about the story, they stated that it gave a good view of stroke; it was helpful to learn about who is at risk; that learning about being diabetic scared him/her; that it helped to learn about the symptoms; and that they liked the story. All (100.0%) liked using the computer to learn, although two (25.0%) of them mentioned preferring books. All (100.0%) found the back and forward buttons easy to manipulate, and two of them actually needed to use the back button to understand better. Finally, all (100.0%) of the participants would like to learn more about health this way, and would recommend that others learn this way. They stated that *“It helped with comprehension, it was easier than reading books, and it was easy to do.”* Finally, participants did not offer any ideas for improvement.

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## **Affect**

Eight participants responded to questions about how they felt about their abilities to address a stroke and to offer information to others. Six (75.0%) felt that they had a better understanding of strokes, and one was unsure. Some comments included *“Before he did not really understand, now knows the symptoms, it will be helpful, showed what needed to be done.”* Nevertheless, only four (50.0%) felt they could explain what a stroke is, and two responded they could explain a *“little bit.”* Of the eight, six (75.0%) felt they can identify the symptoms and seven (88.0%) felt they could explain them. Six (75.0%) participants felt they can explain the risk factors. All (100.0%) felt they knew what to do in the presence of a stroke incident. Finally, six (75.0%) expressed that because of the story they will take better care of themselves, and seven felt they could advise others about taking better care of themselves.

## **Discussion**

The importance of continuing to educate the population about stroke in order to prevent the high levels of death and morbidity has called attention for the need to continue more aggressive preventative activities. Of prominence is the fact that minorities and low-literate populations are at higher risks of having strokes and being impacted than their white counterparts. Therefore, there is a need to create and disseminate more prevention materials, especially materials that are effective, by reducing the literacy demands of readers.

This article presents a data-driven tutorial and an example of using Talking Photonovelas (TP) as an alternative approach to other health educational approaches to teaching clients about stroke and its prevention. Photonovelas have historically been developed only in print material; therefore, the materials developed are innovative for their use with computers accompanied by voice-overs. Furthermore, this culturally-appropriate storytelling format may facilitate the learning experience as suggested in the literature.

The cohort of African American students who participated in the lesson were registered in an adult literacy program. Their ages ranged between 26 and 62 years of age, and their reading levels ranged between first and eighth grade. The students viewed the TP once. As a

group, their performances improved after using the TP to learn about stroke. Moreover, they showed improvements with each of the seven sub-themes from pre to post training. However, further probing into each group showed variability in the percentage of students who actually increased their scores after viewing the TP. All of the individuals increased their scores when targeting the effects/impact of stroke (Theme 1). Three-fourths of individuals improved their scores after learning about risk factors (Theme 3) and stroke symptoms (Theme 5). Also, over two-thirds of the individuals improved their scores when addressing risk factors and stroke symptoms. In the areas of populations at risk, two-thirds of the students increased their scores. Half of the individuals were able to increase their scores when defining stroke. Finally, explaining how to act when presented with someone with a stroke and explaining what FAST stands for seemed to be the most difficult concepts to grasp, since for the former, no one increased their scores, and for the latter, less than half were able to improve their scores. Nevertheless, all themes showed significant differences between overall scores before and after the lesson especially in themes 2, 3 4 and 5 (populations at risk, risk factors, stroke effect/impact, and stroke symptoms respectively).

The participants' performances were not affected by the different characteristics of the students such as reading level, gender, age or education; yet, there was a positive correlation between the scores before and after the lesson. Thus, there may be a relationship between how much prior knowledge supports scaffolding for the new knowledge being obtained.

It was also important to gauge the user-friendliness or ease of use of the materials and activity procedures (e. g. laptop computer, using forward/backward buttons, pictures, dialogue bubbles). User-friendly designates hardware and software that is not difficult to learn, understand or use. The majority of the participants found it easy to understand, and they talked favorably about the pictures and the bubbles with words. All of them felt at ease using the computers and the buttons to control the TP. They would also like to learn about other health issues using this type of activity and would recommend it to other persons.

Finally, when the participants were queried as to how they felt about addressing stroke issues, most stated they had a

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better understanding of stroke, but only half felt they could explain the concept. Most of them also stated that they could now identify and explain symptoms, as well as risk factors. All of them felt that they now know what to do when there is a CVA incident and they said that because of the story, they will take better care of themselves and could also advise others.

## **Conclusion**

This tutorial may be used to guide developers in any area of communication sciences and disorders. The particular example demonstrated that with only one viewing there were increases in the knowledge the students had about stroke. Nevertheless, the accuracy levels may have increased if the students had the opportunity to view the TP more than once. It would be useful to continue gathering information about this particular TP, to find out how many trials it would take to obtain 85% accuracy and to refine themes with low percentages of individuals increasing their scores.

These materials may be used for prevention (i.e. educating), assessment (i.e. explaining expectations during a particular clinical exam), and treatment (i.e. recommending pre-morbid dietary or post-morbid rehabilitation activities). They may be used in waiting rooms, during interviews and educational activities. Further, with the increasing use of technology, they can be used in kiosks in public places, as well as with electronic pads and phones in apps. Also, educational groups may use the TPs to guide conversations and to reinforce knowledge gained. Just as well, the TPs can be printed out offering alternatives to documents with high readability levels. In keeping, the printout of these materials will not only serve the particular client but may also educate those family and community members with whom the materials are shared.

## **Acknowledgement**

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## Appendix A. Learning Objectives and Target Responses for Talking Photonovela

	Objectives	Target Responses
	After viewing the Talking Photonovela, the student will:	
Theme 1	define stroke.	<ul style="list-style-type: none"> <li>•Stroke is like a brain attackSomething blocks the blood</li> <li>•Without oxygen cells die, Third cause of death in U. S.</li> <li>•Blood takes oxygen to the brain</li> <li>•Blood cannot reach the brain</li> <li>•Something blocks the blood</li> <li>•Third cause of death in U. S.</li> </ul>
Theme 2	list populations at risk for having a strok	<ul style="list-style-type: none"> <li>• More men have strokes</li> <li>• More women die of strokes</li> <li>• More strokes in women forty and over</li> <li>• Over the age of 55</li> <li>• African Americans, Hispanics, Asians</li> </ul>
Theme 3	will name stroke risk factors	<ul style="list-style-type: none"> <li>• Overweight</li> <li>• High blood pressure</li> <li>• High cholesterol</li> <li>• Diabetes</li> <li>• Drinking and smoking</li> </ul>
Theme 4	name effects of stroke	<ul style="list-style-type: none"> <li>• Death</li> <li>• Paralysis</li> </ul>
Theme 5	name symptoms of stroke	<ul style="list-style-type: none"> <li>• Headache.</li> <li>• Cannot smile, stiff face</li> <li>• Cannot raise arms.</li> <li>• Speech becomes slurred.</li> </ul>
Theme 6	describe what can be done when a person is having a stroke in front of them	<ul style="list-style-type: none"> <li>• Ask questions</li> <li>• Determine symptoms</li> <li>• Remember FAST</li> <li>• Call 911</li> </ul>
Theme 7	will describe what the acronym FAST stands for.	<ul style="list-style-type: none"> <li>• F stands for Face, look for a smile</li> <li>• A stands for Arms, look to see if victim can raise them</li> <li>• S stands for Speech, look to see if he has slurred speech</li> <li>• T stands for Time, act fast and timely and dial 911</li> </ul>

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## Appendix B. Interview Protocol

Area	Questions
Content	<ul style="list-style-type: none"> <li>• What is a stroke?</li> <li>• What happens to the blood flow in the brain?</li> <li>• Why is it important that people learn about strokes?</li> <li>• Who can get a stroke?</li> <li>• What puts people at risk of a stroke?</li> <li>• What may happen to people when they have strokes?</li> <li>• What are the symptoms when a person gets a stroke?</li> <li>• What can you do at the moment when someone gets a stroke?</li> <li>• What does FAST stand for?</li> </ul>
Use	<ul style="list-style-type: none"> <li>• Did you find it easy to understand the story?</li> <li>• How did you find the words that were in the bubbles? Were they easy or hard to read?</li> <li>• What did you like about the story? What did you not like about the story?</li> <li>• How did you find the pictures? Did they help you learn more about stroke?</li> <li>• Did you like using the computer to learn about strokes? Why? Why not?</li> <li>• Did you like being able to listen to the story? Why? Why not?</li> <li>• Was it easy to use the button to turn the pages back and forth?</li> <li>• Did you need to turn the pages back to understand some more?</li> <li>• Would you like to learn more about health in this same way? Why? Why not?</li> <li>• How would you improve everything you have seen or done?</li> <li>• Would you recommend that others learn about stroke and other health matters this same way?</li> <li>• If you had a copy of the story, would you share it with others. With whom and how?</li> </ul>
Affect	<ul style="list-style-type: none"> <li>• Do you feel that you now have a better understanding of a stroke because of the story? Why? Why not?</li> <li>• Do you feel that you may be able to identify some of the symptoms in a stroke victim because of the story?</li> <li>• Do you feel that you know what to do if a person has a stroke because of the story?</li> <li>• Do you think you can explain to others about what is a stroke to others? Why? Why not?</li> <li>• Do you think you can explain to others the factors that put people at risk of strokes?</li> <li>• Why and how would you explain?</li> <li>• Do you think that you can explain to others about the symptoms? Why?</li> <li>• Do you think that you can explain to others about what to do with a stroke victim?</li> <li>• Do you think that because of the story, you may take better care of yourself? In which ways?</li> </ul>

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## Appendix C

StoryBoards

Project Name: \_\_\_\_\_ of \_\_\_\_\_  
By: \_\_\_\_\_ Date: \_\_\_\_\_


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Creativetemplate.net (2017). *Storyboard Template*. Retrieved from <http://www.creativetemplate.net/storyboard-template.html>.



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Fotonovela \_\_\_\_\_ page \_\_\_ of \_\_\_

Script

<p>Picture Sketch</p>	<p>Dialogue</p> <p>Dialogue</p> <p>Special Directions</p>
-----------------------	-----------------------------------------------------------

<p>Directions</p>	
<p>Page _____</p>	
<p>Actors Needed</p>	
<p>Place</p>	
<p>Props Needed</p>	
<p>Background</p>	
<p>General Mood</p>	

Creativetemplate.net (2017). *Storyboard Template*. Retrieved from <http://www.creativetemplate.net/storyboard-template.html>.

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## Appendix D. Talking Photonovela.

Produced by  
Howard University Photonovela Project

- Silvia Martinez, Ed. D., CCC-S  
– Principal Investigator
- Nyla Funderburk  
– Research Assistant

### My Health Stories

#### Helping a Stroke Victim



I was worried.

I am so happy to see you!

What is a stroke?

A stroke is like brain attack.

Blood can't reach the brain because something is in the way.



What happened?

Your father had a stroke. We came to the hospital quickly.

Without blood, the brain can't get oxygen.