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# Perceptions of Stroke Risk Factors, Warning Signs, and Rehabilitative Services in the Elderly

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An Option II Paper  
Presented to the  
Faculty and Students of  
Western Washington University  
By  
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# Rationale for Topic

- American Stroke Association (2007)

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  - Approximately 700,000 people experience a new or recurrent stroke each year
  - Stroke risk doubles each decade after age 55
  
- Michael & Shaughnessy (2006)
  - 40% of stroke patients face moderate functional impairments
  - 15-30% of stroke patients deal with severe disability
  
- Schneider et al. (2003)
  - Populations at greatest risk of stroke are the least knowledgeable about stroke

# Rationale for Topic

- Stern, Berman, Thomas, & Klassen (1999)
  - A lack of knowledge remains the leading factor for delays in seeking help
  - Reducing the amount of time from onset of a stroke to hospital arrival offers the best opportunity for effective stroke treatment
- According to Clark and Smith (1998)
  - Information helps patients and their families stay calmer
  - Families have more appropriate and realistic expectations for the patient with more education

## Purpose:

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Investigate a sample of elderly men and women (60+) regarding their awareness and knowledge of stroke. The results will yield information to further educate this population as found appropriate.

# Methods

## ■ Subjects

- Four counties in Washington State
- 60 years or older
- Senior centered facilities
- 244 participants

## ■ Procedures

- Consent form
- Survey form- modified questionnaire by Hux et al. (2000)
  - 41 yes/no/don't know questions
  - 7 personal questions
- After completion, given stroke brochures

# Age/ Sex Distribution

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- **Age**

- 61 subjects age 60-69 (25%)
- 88 subjects 70-79 (36.1%)
- 76 subjects 80-89 (31.1%)
- 19 subjects 90+ (7.8%)

- **Sex**

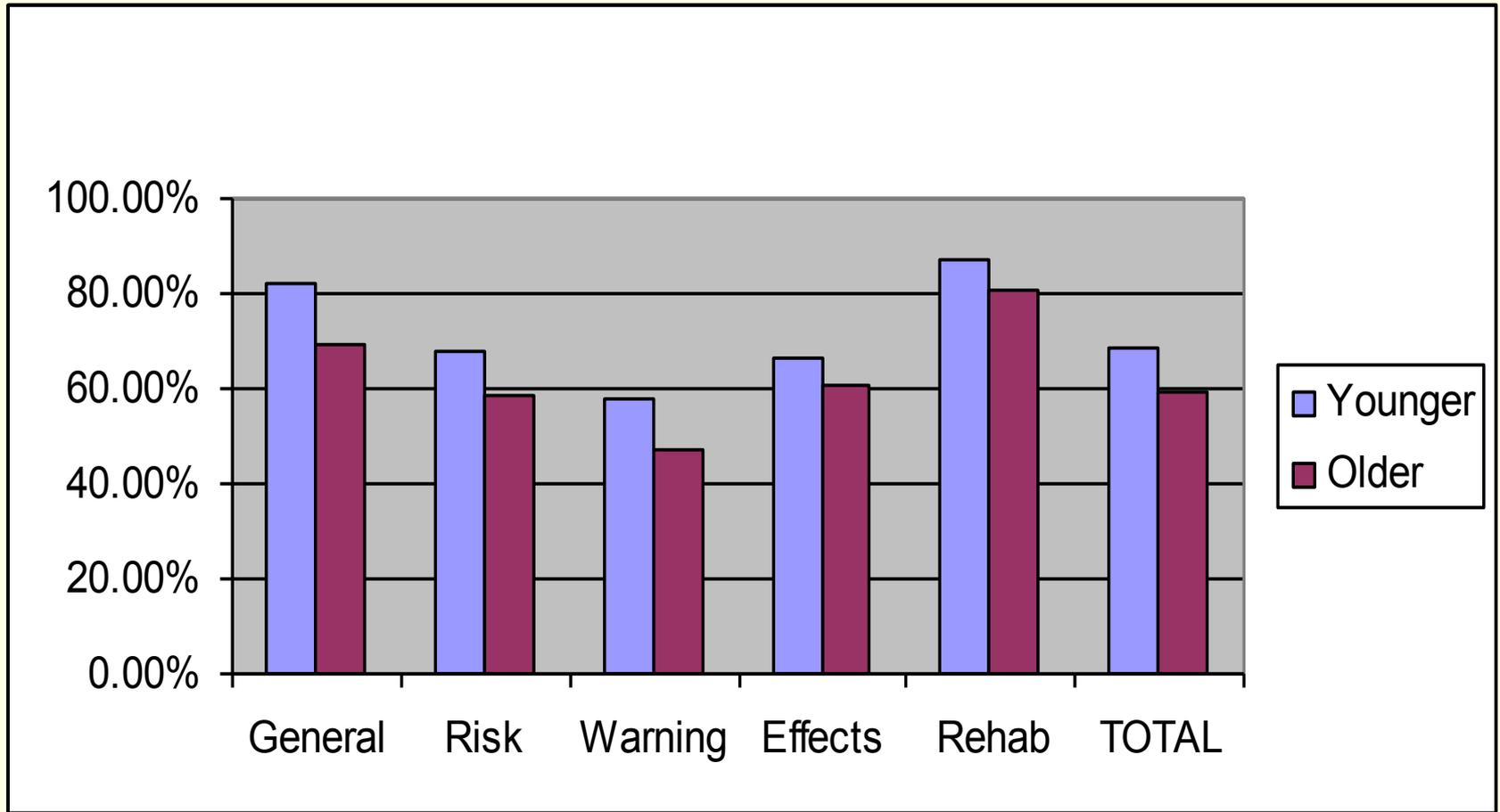
- Females (67.2%)
- Males (32.8%)

# Results

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- Responses tabulated using Microsoft Excel
- Statistics calculated with SPSS 14.0
- Comparison groups
  - (a) 60-79 year old subjects (n= 149; 61.1%) versus 80-102 year old subjects (n= 95; 38.9%)
  - (b) males (n= 80; 32.8%) versus females (n=164; 67.2%)
- Chi-squared and ANOVA analyses used to determine the significance between the groups' knowledge

# Younger vs. Older Percentage Correct



# Percentage correct on general questions

## Younger group vs. Older group

General Questions	Younger %	Older %	Significance
1.) Caused by a blood flow problem? (Y)	93.5	96.2	no
2.) Caused by a muscle problem? (N)	91.7	83.9	no
3.) Happen to children/ young people? (Y)	93.6	94.5	no
4.) Can one recover from a stroke? (Y)	97.9	100.0	no
5.) Recovery only in the first months? (N)	88.0	84.7	no

■ Both age groups were fairly knowledgeable about stroke physiology, incidence, and recovery

# Percentage correct on risk factors

## Younger group vs. Older group

Risk Factors		Younger %	Older %	Significance
6.) High blood pressure	(Y)	100.0	97.8	no
7.) Arthritis	(N)	89.7	83.1	no
<b>8.) Diabetes</b>	<b>(Y)</b>	<b>70.9</b>	<b>55.7</b>	<b>yes, <math>\chi^2=4.11, p=.043</math></b>
9.) Heredity/ genetics	(Y)	93.2	85.7	no
<b>10.) Race</b>	<b>(Y)</b>	<b>58.7</b>	<b>49.3</b>	<b>no</b>
11.) Smoking	(Y)	92.1	91.3	no
12.) High cholesterol	(Y)	95.0	97.5	no
13.) Alcohol/ drug abuse	(Y)	82.5	91.4	no
14.) Heart disease	(Y)	86.5	90.3	no
15.) Medication to decrease risk?	(Y)	92.6	89.3	no
16.) Can effects be reversed?	(Y)	84.1	85.3	no
<b>17.) Males more at risk?</b>	<b>(Y)</b>	<b>42.7</b>	<b>45.3</b>	<b>no</b>
18.) Females more at risk?	(N)	73.3	63.8	no

# Risk Factors- Results

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- A notable percentage of both age groups did not identify the following as risk factors of stroke:
  - Race
  - Sex (males)
  - Diabetes
    - A significantly higher proportion of younger participants (70.9%) answered that diabetes is a risk factor for stroke question (correct) than older participants (55.7%),  $\chi^2 (1, n = 178) = 4.11, p = .043$

## Percentage correct on warning signs Younger group vs. Older group

Warning Signs		Younger %	Older %	Significance
19.) Numbness/ weakness in one arm/ leg?	(Y)	94.0	89.3	no
<b>20.) Sudden pain in arm/leg?</b>	<b>(N)</b>	<b>29.4</b>	<b>26.6</b>	<b>no</b>
<b>21.) Heart “skips a beat”?</b>	<b>(N)</b>	<b>74.3</b>	<b>57.4</b>	<b>yes, <math>\chi^2=5.08, p=.024</math></b>
22.) Sudden change in vision?	(Y)	90.3	81.0	no
23.) Dizziness/ loss of balance?	(Y)	94.6	93.2	no
<b>24.) Frequent mild headaches?</b>	<b>(N)</b>	<b>41.7</b>	<b>46.3</b>	<b>no</b>
25.) Sudden severe gastric problems?	(N)	72.8	69.2	no
26.) Sudden severe headache?	(Y)	91.7	84.8	no
27.) Difficulty speaking/ understanding	(Y)	97.2	92.7	no
<b>28.) Sudden severe tinnitus?</b>	<b>(N)</b>	<b>35.6</b>	<b>32.6</b>	<b>no</b>

# Warning Signs- Results

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- The majority of both age groups incorrectly identified the following as warning signs of stroke:
  - Sudden pain in the arm/ leg
  - Frequent mild headaches
  - Sudden, severe tinnitus
  - Heart “skipping a beat”
    - A significantly higher proportion of younger participants (74.3%) as compared to older participants (57.4%),  $\chi^2(1, n = 166) = 5.08, p = .024$

# Percentage correct on consequences

## Younger group vs. Older group

Effects		Younger %	Older %	Significance
29.) Stroke cause Alzheimer' s?	(N)	89.2	84.4	no
30.) Stroke cause brain damage?	(Y)	97.0	98.7	no
31.) Cause paralysis on one side?	(Y)	99.3	89.9	no
<b>32.) Strokes typically cause loss of clear thinking?</b>	<b>(N)</b>	<b>8.9</b>	<b>6.1</b>	<b>no</b>
33.) Can learn new things after?	(Y)	97.7	92.9	no
34.) Unable to walk after stroke?	(Y)	99.3	97.7	no
35.) Unable to speak after stroke?	(Y)	97.2	96.5	no
<b>36.) Stroke cause hearing loss?</b>	<b>(N)</b>	<b>81.1</b>	<b>61.9</b>	<b>yes, <math>\chi^2=5.14</math>, <math>p=.023</math></b>
<b>37.) If trouble talking, can write/ type to communicate?</b>	<b>(N)</b>	<b>19.1</b>	<b>27.8</b>	<b>no</b>
38.) Medical Tx to decrease effects?	(Y)	97.1	98.8	no

# Functional Consequences- Results

## Younger vs. Older

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- The majority of both age groups incorrectly identified the following as consequences of stroke:
  - Loss of clear thinking
  - Ability to write/ type what they want to say
- Chi-square analysis
  - A significantly higher proportion of younger participants (81.1%) answered that hearing loss is a consequence of stroke (incorrect) than older participants (61.9%)

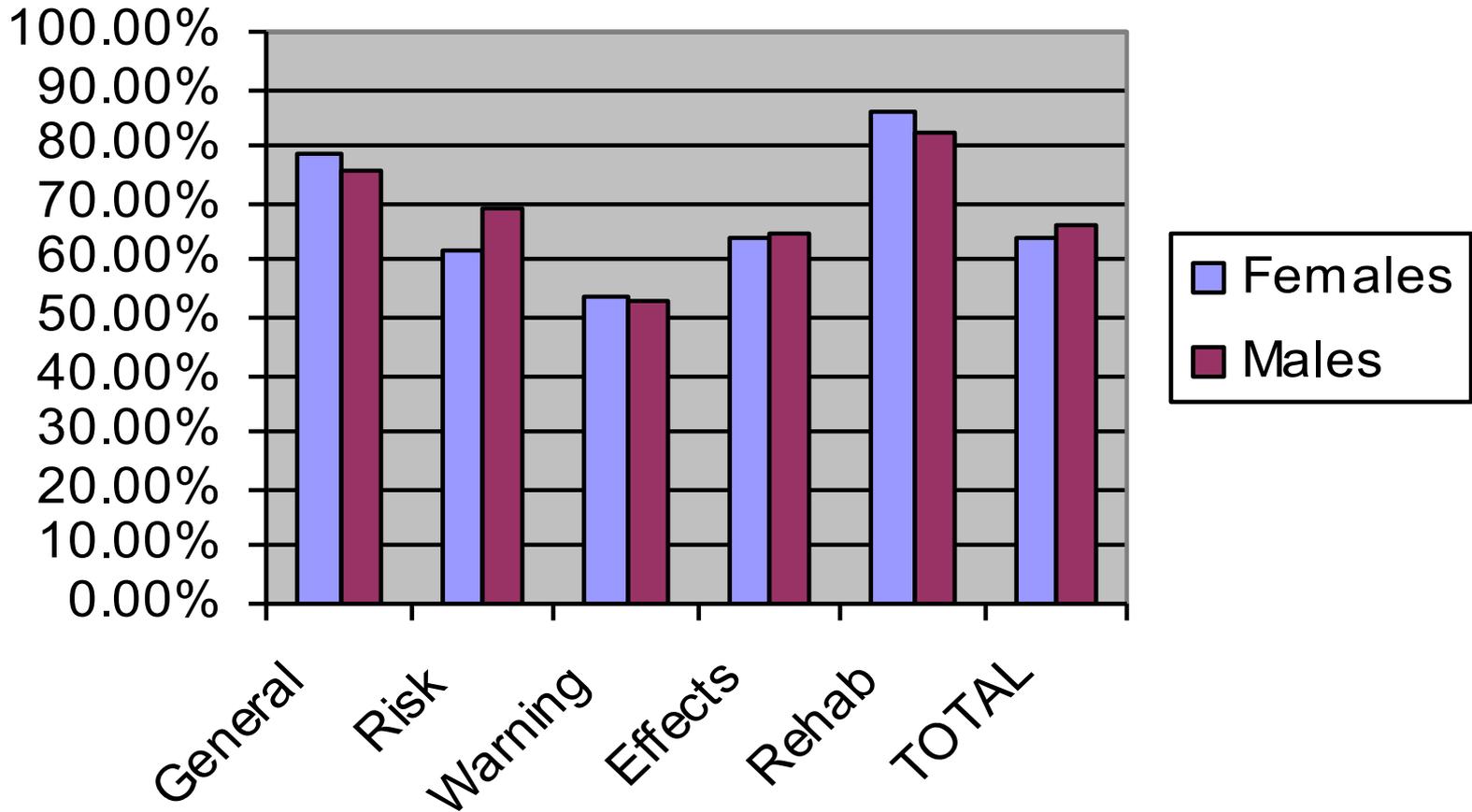
# Percentage correct on rehabilitation questions

## Younger group vs. Older group

Rehabilitation Questions		Younger %	Older %	Significance
39.) Physical therapists?	(Y)	99.3	97.8	no
<b>40.) Speech/ lang. pathologists?</b>	<b>(Y)</b>	<b>97.9</b>	<b>92.4</b>	<b>yes, <math>\chi^2=3.86</math>, p= .05</b>
41.) Occupational therapists?	(Y)	93.3	94.6	no

- A significantly higher proportion of younger participants (97.9%) answered that speech-language pathologists help with rehabilitation after a stroke than older participants (92.4%)
- Overall, both age groups knowledgeable about rehabilitation specialists

# Females vs. Males Percentage Correct



# Percentage correct on general questions

## Females vs. Males

General Questions	Female %	Male %	Significance
1.) Caused by a blood flow problem? (Y)	95.1	93.2	no
2.) Caused by a muscle problem? (N)	91.1	84.7	no
3.) Happen to children/ young people? (Y)	95.7	90.3	no
<b>4.) Can one recover from a stroke? (Y)</b>	<b>100.0</b>	<b>96.1</b>	<b>yes, <math>\chi^2= 6.00, p= .014</math></b>
<b>5.) Recovery only in the first months? (N)</b>	<b>91.5</b>	<b>77.6</b>	<b>yes, <math>\chi^2= 6.65, p= .010</math></b>

- Both males and females were knowledgeable about stroke physiology, incidence, and recovery.

# Percentage correct on risk factors

## Females vs. Males

Risk Factors		Females%	Males %	Significance
6.) High blood pressure	(Y)	99.4	98.7	no
7.) Arthritis	(N)	88.1	86.2	no
<b>8.) Diabetes</b>	<b>(Y)</b>	<b>59.0</b>	<b>78.7</b>	<b>yes, <math>\chi^2=6.92</math>, <math>p=.009</math></b>
9.) Heredity/ genetics	(Y)	91.9	88.7	no
<b>10.) Race</b>	<b>(Y)</b>	<b>50.8</b>	<b>63.2</b>	<b>no</b>
11.) Smoking	(Y)	93.1	89.5	no
12.) High cholesterol	(Y)	96.6	94.8	no
13.) Alcohol/ drug abuse	(Y)	86.2	85.1	no
14.) Heart disease	(Y)	87.5	88.6	no
15.) Medication to decrease risk?	(Y)	90.8	92.5	no
<b>16.) Can effects be reversed?</b>	<b>(Y)</b>	<b>88.5</b>	<b>77.1</b>	<b>yes, <math>\chi^2= 4.55</math>, <math>p=.033</math></b>
<b>17.) Males more at risk?</b>	<b>(Y)</b>	<b>40.7</b>	<b>49.0</b>	<b>no</b>
18.) Females more at risk?	(N)	65.9	77.1	no

# Risk Factors- Results

## Males vs. Females

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- A significant percentage of males and females did not identify the following as risk factors of stroke
  - Race
  - Sex (males)
- Chi-square analysis
  - A significantly higher number of male participants (78.7%) answered that diabetes is a risk factor of stroke than females (59.0%)
  - A significantly higher proportion of females (88.5%) answered that the effects of stroke can be reversed after the stroke has occurred (correct) than males (77.1%)

# Percentage correct on warning signs

## Females vs. Males

Warning Signs		Females%	Males %	Significance
19.) Numb/ weak in one arm/ leg?	(Y)	92.3	92.4	no
<b>20.) Sudden pain in arm/leg?</b>	<b>(N)</b>	<b>32.2</b>	<b>21.0</b>	<b>no</b>
21.) Heart “skips a beat”?	(N)	72.6	60.0	no
22.) Sudden change in vision?	(Y)	87.4	86.8	no
23.) Dizziness/ loss of balance?	(Y)	95.5	91.2	no
<b>24.) Frequent mild headaches?</b>	<b>(N)</b>	<b>45.6</b>	<b>38.9</b>	<b>no</b>
<b>25.) Sudden severe gastric problems?</b>	<b>(N)</b>	<b>77.2</b>	<b>61.5</b>	<b>yes, <math>\chi^2=3.98, p= .046</math></b>
26.) Sudden severe headache?	(Y)	89.7	88.5	no
27.) Difficulty speak/ understand?	(Y)	94.0	98.6	no
<b>28.) Sudden severe tinnitus?</b>	<b>(N)</b>	<b>36.9</b>	<b>30.8</b>	<b>no</b>

# Warning Signs- Results

## Males vs. Females

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- The majority of both age groups incorrectly identified the following as warning signs of stroke:
  - Sudden pain in the arm/ leg
  - Frequent mild headaches
  - Sudden, severe tinnitus
- Chi-square analysis
  - A significantly higher number of female participants (77.2% incorrect) answered that sudden, severe gastric problems are a warning sign of stroke than males (61.5% incorrect)

# Percentage correct on functional consequences

## Females vs. Males

Functional Consequences		Female %	Male %	Significance
29.) Stroke cause Alzheimer' s?	(N)	89.0	84.2	no
30.) Stroke cause brain damage?	(Y)	98.5	95.9	no
31.) Cause paralysis on one side?	(Y)	98.7	100.0	no
<b>32.) Strokes typically cause loss of clear thinking</b>	<b>(N)</b>	<b>8.0</b>	<b>7.2</b>	<b>no</b>
33.) Can learn new things after?	(Y)	95.6	96.8	no
34.) Unable to walk after stroke?	(Y)	98.1	100.0	no
<b>35.) Unable to speak after stroke?</b>	<b>(Y)</b>	<b>98.7</b>	<b>93.5</b>	<b>yes, <math>\chi^2= 4.53, p=.033</math></b>
36.) Stroke cause hearing loss?	(N)	77.8	68.2	no
<b>37.) If trouble talking, can write/ type to communicate?</b>	<b>(N)</b>	<b>25.8</b>	<b>16.4</b>	<b>no</b>
38.) Medical Tx to decrease effects?	(Y)	98.6	97.2	no

## Percentage correct on rehabilitation questions Females vs. Males

Rehabilitation Questions		Female%	Male%	Significance
39.) Physical therapists?	(Y)	99.4	97.3	no
40.) Speech/ lang. pathologists?	(Y)	97.3	93.1	no
41.) Occupational therapists?	(Y)	95.3	90.6	no

- Nearly all participants were aware that all therapists listed aid in recovery after a stroke
- Overall, population is well informed

# Summary

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- Many participants lacked awareness of the risk factors and the warning signs of stroke
- Individuals over 60 need to become more aware of the signs and symptoms associated with stroke
  - Increased awareness of warning signs through educational programs can reduce the amount of time between the onset of symptoms and hospital arrival
- The elderly should receive educational materials and possibly short seminars specifically targeted to their generation
- Medical and rehabilitation personnel should consider offering short informational presentations on this topic in locations and venues where the elderly tend to meet

# Sources of knowledge

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- Personal reading (67.2%)
- Television (49.2%)
- Doctors/ nurses (48.8%)
- Newspapers (45.9%)
- School (16%)

# Limitations

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- Ethnic comparisons invalid
- Participants more confident with knowledge
- Yes/ No/ Don't know format makes it difficult to assess participants' knowledge

# References

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- American Stroke Association (2007). Heart disease and stroke statistics: 2006 update. Available online: [www.strokeassociation.org](http://www.strokeassociation.org).
- Clark, M. & Smith, D. (1998). Knowledge of stroke in rehabilitation and community samples. *Disability and rehabilitation*, 20(3), 90-96.
- Hux, K., Rogers, T., & Mongar, K. (2000). Common perceptions about stroke. *Journal of Community Health*, 25(1), 47-65.
- Morgan, L., Chambers, R., Banerji, J., Gater, J., & Jordan, J. (2005). Consumers leading public consultation: the general public's knowledge of stroke. *Family Practice*, 22(1), 8-14.
- Schneider, A, Pancioli, A., Khoury, J., Rademacher, E., Tuchfarber, A., Miller, R., et al. (2003). Trends in community knowledge of the warning signs and risk factors for stroke. *Journal of the American Medical Association*, 289(3), 343-346.
- Stern, E., Berman, M., Thomas, J., & Klassen, A. (1999). Community education for stroke awareness: an efficacy study. *Stroke*, 30, 720-723.