Association of Information Sources and Knowledge on HIV/AIDS in Rural China

Wen Yu-feng [1], Wang Hua-dong [2], Chen Bai-feng [3], Chen Yu-juan [4], Zhang Tie-jun [5], Xu Tan [6], Sun Wen-jie [7*]

[1] School of Public Health, Wannan Medical College, China
[2] Anhui Provincial Center for Disease Control and Prevention, China
[3] School of Public Health, Wannan Medical College, China
[4] School of Public Health, Wannan Medical College, China
[5] School of Public Health, Fudan University, China
[6] School of Public Health, Medical College of Soochow University, China and School of Public Health and Tropical Medicine, Tulane University, USA
[7] School of Food Science, Guangdong Pharmaceutical University, China; and School of Public Health and Tropical Medicine, Tulane University, USA

***Corresponding Author:** Dr. Wen-jie Sun
School of Food Science, Guangdong Pharmaceutical University, China
School of Public Health and Tropical Medicine, Tulane University, USA
Email: wsun3@tulane.edu

Abstract

Objective: To investigate the association between the number of available information sources on HIV/AIDS and HIV/AIDS-related knowledge in a rural population in China.

Design: We performed a cross-sectional survey on the number and types of sources of HIV/AIDS information available to rural residents of China and assessed HIV/AIDS-related knowledge in this population. We collected information from 5,355 Chinese rural residents and then correlated the results of the scores on knowledge to the numbers of information sources, and adjusted for age, sex, education and occupation.

Results: The sources of HIV/AIDs information reported by subjects included television, radio, newspapers, periodicals, discussions with neighbors and friends. There were significant differences in sources of information based on gender, occupation, educational level and age. The average number of information sources was 3.01 ± 1.74. The average score on the AIDS related knowledge questionnaire was 8.21 ± 4.23. Subjects who reported 6 sources of HIV/AIDS information had an average score of 11.67 ± 3.0 on the HIV/AIDS knowledge questionnaire. Subjects who reported between 3-7 sources of HIV/AIDS information had significantly higher scores than those who had 1,2 or 8 sources of information.

Conclusions: There is an association between HIV/AIDS knowledge and the number of available information sources. By increasing the sources, one could not always make more people curious or interested in HIV/AIDS knowledge.

Key words: HIV/AIDS, Awareness, Information Source, Knowledge

Introduction

In general, the rate of HIV/AIDS in China is low [12]; however, HIV/AIDS continues to spread throughout the country and certain subsets of the population are at higher risk for acquiring HIV, including rural populations. Almost 80% of people living with HIV/AIDS live in rural areas and there is a significant portion of the population with a knowledge deficit regarding HIV/AIDS.[3,4] Increasing the awareness and understanding of HIV/AIDS could both reduce the discrimination [5,6] and stigma faced by people living with HIV/AIDS and change health behaviors to prevent the spread of infection amongst the rural population.[7] However, what is the most effective means to educate rural population on this disease is unclear. Government agencies and Non-Government Organization have undertaken several educational health initiatives to increase population's awareness and understanding of HIV/AIDS.[8] Significant health resources were invested in creating and utilizing the various outlets to deliver HIV/AIDS information to the public. These sources included television and radio, newspapers and periodicals, direct counseling from medical staff and dispersion of information through local family and friend networks. Because of these interventions, HIV/AIDS related knowledge increased within a short period of time.[9-11] Information disparity on diseases has been shown to contribute to decreased disease control.[12,13] Furthermore, the link between HIV/AIDS related knowledge and health outcomes have been widely accepted. However it is not known whether access to information on a disease, as measured by the number of information sources available to individuals, is correlated with knowledge about the disease.

To our knowledge, there has been no study, thus far, addressing the association between the number of available sources of information on HIV/AIDS and knowledge of HIV/AIDS. It is therefore important to evaluate what is the optimal number of sources of information that will produce the greatest increase in HIV/AIDS related knowledge. We hypothesized that an increase in availability of information sources on HIV/AIDS is associated with an increase in HIV/AIDs related knowledge. In the present study, we investigate the number of sources of information available to participants with the degree of knowledge and awareness of HIV/AIDS amongst the rural population in Anhui Province, China.

Methods

Sample

Data were collected in Suixi county Anhui province, China from 2007 to 2009, where HIV spread due to illegally commercial blood donation.[14] The goal of the survey was to study HIV/AIDS related knowledge, attitudes and practice amongst the population and correlate it with number of available sources of information reported by participants.

Design

A cross-sectional study was conducted in a region consisting of 1.06 million people near the provinces

of Henan, Shandong and Jiangsu. The stratified cluster sampling was carried out, according to the HIV/AIDS epidemic level. First, all of 18 HIV epidemic villages were divided into 3 groups, the higher epidemic group had 3 villages which prevalence was ≥1.0%, the median epidemic group had 6 villages which prevalence was 0.5% ~ 1.0%, and the lower epidemic group had 9 villages which prevalence was < 0.5%. Second, randomly clusters sampled one third villages in each group and 6 villages were sampled. Three groups contained 974, 1796 and 2585 people, respectively. Finally, 5355 participants recruited.

Measures

The questionnaire used in this study was modified from the Family Health International HIV/AIDS Behavioral Survey [15] and validated in previous study[2]. The questionnaire consisted of 3 parts; 1) socio-demographic characteristics (including gender, family income, educational background and occupation), 2) Sources of HIV/AIDS information and 3) HIV/AIDS knowledge, attitude and practices (HIV/AIDS KAP). All participants signed informed consent and were assured of confidentiality and anonymity.

Source of AIDS information

There were eight sources of information that were assessed in this study: television/radio, newspaper/periodical, family communication, neighbor/friend, medical staff, school/teacher, and other health related activity e.g. special health promotion program (In China, there are some special health program for the certain rural residents on the local common diseases from time to time). Subjects were asked whether they had received HIV/AIDS related information from any of the eight sources in the past year. The possible number of information sources ranged from 0-8.

HIV/AIDS knowledge

Fifteen questions were assessed respondents' knowledge about HIV/AIDS. Three sets of question were assessed AIDS knowledge. The first set contained 3 items and assessed knowledge of definition and causation of HIV/AIDS. The second set consisted of 6 questions assessing modes of HIV transmission, and the others questions regarding AIDS symptoms and preventive measures. The correct answer was scored as 1; wrong answer or "don't know" was coded as 0. The possible score ranges from 0 to 15.

Statistics

We determined the mean and the standard deviation for continuous variables, and the frequency and percentage for categorical variables. We then described the distribution of socio-demographic characteristics of the respondents and the distribution of the number of sources of HIV/AIDS information. We examined the relationship between socio-demographic variables with the types of HIV/AIDS information sources with the Chi-square test. We also examined the relationship between the number of sources of HIV/AIDS information and the different socio-demographic variables with the T-test or the analysis of variance. The different HIV/AIDS knowledge scores were compared to the

varying number of sources of available information through the analysis of variance (Student-Newman-Keuls). Finally, we used the analysis of co-variance to compare the HIV/AIDS knowledge scores between any of the two groups of knowledge sources and adjusted it by age, sex, education and occupation. SAS for Windows Statistical Software Package Version 8.2 (SAS Institute, Cary, NC, USA) was used for data processing and analysis.

Results

Demographic characteristics

There were 3,015 (56.30%) male and 2,340 (43.70%) female respondents who completed the questionnaire. The average ages of the respondents were 29.88 ± 12.33. The majority of the respondents were farmer (39.3%) and students (27.71%) (Table 1)

The distribution of the information sources

Participants reported that they acquired HIV/AIDS information most commonly through television (84.5%), newspaper/periodical (54.5%) or through neighbors/friends (43.66%). There was a significant difference between men and women in reported acquisition of HIV/AIDS knowledge through family communication and in the school/teacher environment. There were also significant differences in sources of HIV/AIDS information based on occupation, educational level and age.

The numbers of HIV/AIDS knowledge information sources

The average number of sources of information on HIV/AIDS available to participants was 3.01± 1.74. Based on occupation, local workers only had 2.17± 1.04 information sources of information, whereas students reported 3.82 ± 1.71 sources of information. The number of information sources for HIV/AIDS information increased with education level (from 2.07±1.43 to 3.57±1.50) but decreased with increasing age (from 3.65 ± 1.74 to 2.33 ± 1.62).

The association between the numbers of the information sources with the knowledge scores.

There was a significant difference in how individuals scored on HIV/AIDS knowledge question based on their reported number of available HIV/AIDS information sources. Participants that cited only one available source of HIV/AIDS information scored an average of 8.29 ± 4.73 on the HIV/AIDS knowledge questions. In comparison participants who cited an average of six sources of HIV/AIDS information scored an average of 11.67 ± 3.0 on the HIV/AIDS knowledge questions.

Discussion

There are differences in both the types and numbers of sources of information on HIV/AIDS available

amongst rural Chinese residents. Lagraded et al previously had found disparities between the genders in terms of sources of HIV/AIDS information; men were more likely to acquire HIV/AIDS information through the radio whereas women were more likely to receive that information through attendance at health centers for obstetric and maternity care.[16] In our study, women were more likely to acquire HIV/AIDS related knowledge through family and school compared to men. Younger residents were more likely to acquire HIV/AIDS information through newspapers/periodical and through school/teachers. Furthermore, younger participants tended to be students with higher educational backgrounds and tended to have more available sources of information both from school and outside the school setting.

Our study is consistent with previous studies that found that the main source of HIV/AIDS information in the public is through mass media- television/radio and newspapers/periodical. With the Chinese economic boom, mass media has been able to reach thousands of residents in rural areas of the country and remains a key source for HIV/AIDS health education programs in the future. However, there were notable differences in the sources of information amongst the different subsets of populations. Although face-to-face education of HIV/AIDS seems to be a less common source of information overall, for subsets of the population including the elderly, women, and low-literacy residents, face-to-face communication remains an important means for education and is an area that should be strengthened amongst these groups.

Furthermore, it should be noted that Hormes et al had previously conducted a study on the accessibility and effectiveness of different sources of HIV/AIDS information with regards to the prevalence of HIV-related risk and protective behaviors in a rural southeastern Louisiana population.[17] Although most participants reported that they acquired HIV/AIDS related knowledge through the mass media, exposure to this form of information was not found to be significantly associated with the prevalence of HIV related risk or protective behaviors. The authors concluded that although HIV-related information was widely accessible in rural communities in the U.S., this unfortunately did not have a significant impact on HIV-related behaviors.[17]

The number of AIDS information source

Different educational levels and occupations were associated with differing accessibility to HIV/AIDS related information. Overall, the average number of information sources reported by participants in this study was 3.01 ± 1.74, but this varied based on socio-demographic features. For example, participants less than 20 years of age and students who had completed senior high school or beyond, had more access to HIV/AIDS information sources (average of 3.5 sources) than local workers, participants over 55 years of age or those who were illiterate (average of 2.07 sources).

Our study shows a trend that increased number of available sources of HIV/AIDS information was associated with increased HIV/AIDS knowledge. We found that those who reported having only one source of information scored an average of 8.21 ± 4.23 on our HIV/AIDS knowledge test, compared with those who reported having access to 6 sources of information scored an average of 11.67 ± 3.03 on our HIV/AIDS knowledge test. Furthermore, our study shows that this trend was consistent even amongst differing subpopulations.[18]

However, it should be noted that there was only a marginal improvement in scores beyond having access to greater than 2 information sources for participants and no further improvement in scores beyond 6 sources of information. Furthermore, there was a non-significant trend towards decreasing

scores beyond 6 sources of information. We hypothesize that this may be due to more conflicting information based on a multitude of different sources. Thus although there is an association between increasing number of sources of information and increasing knowledge of HIV/AIDS, given limited available health resources and a lack of significant improvement in scores with increasing sources of information beyond 2 sources, we believe that the focus should be placed more on the quality and effectiveness of sources of information, rather than the absolute number of sources**.**

Our results suggest that there is an association between HIV/AIDS knowledge and the number of available information sources. Furthermore, there are important disparities in access to information amongst subpopulations in rural China. However, given that there was not a linear association between absolute number of sources and improved knowledge, beyond a certain point, public health officials should seek to develop more effective and economical ways to deliver that information to the wider public. In the future, we believe studies on improving HIV/AIDS knowledge should focus more on understanding which sources are most effective in producing increased HIV/AIDS knowledge in order to maximize public health efforts in rural regions.

Limitations

Our study has several limitations. First, due to the cross sectional study design, we cannot draw a conclusion on a causal relationship between number of sources of information and HIV/AIDS related knowledge. For example, if a participant is curious /interested in knowing more about HIV/AIDS, then the participant will name more information sources because of curiosity/interest they have, and the participant will have more knowledge as a results of the curiosity/interest. However, few Chinese rural residents have such strong curious/interested in HIV/AIDS. Second, it should be noted that local undergraduate students were not able to be included in this study because of the timing of the study and the timing of the undergraduate school semester. Third, we recognize that the association between absolute numbers of sources and knowledge is a weaker association if we do not have an understanding of the quality of those sources. In this study, we were not able to compare the quality of information of different sources. Furthermore, we recognize there can be significant variability in sources of information within categories (i.e. differing effectiveness of family communications, neighbors/friends). Given that most individuals are exposed to multiple sources of information, it becomes difficult, if not impossible, to determine the exact effect of each individual source of information on the individual's overall knowledge. However, our study does show that there is an information disparity amongst Chinese rural resident that could be contributing to the knowledge disparity in HIV/AIDS. Further study with the sources been assessed independently from the participant, then the conclusion that way they draw may have been more credible, are warranted.

Conclusion

The discoveries have been counterintuitive: people can named more sources cannot lead to more knowledge, not less. By increasing the sources, one could not always make more people curious or interested in HIV/AIDS knowledge.

Competing interests: The authors declare that they have no conflict of interest.

Authors' contributions
YF Wen was involved in the conception and design of the study, analysis and interpretation of data, drafting the manuscript, and revising it critically for important intellectual content. WJ Sun was involved in the conception and design of the study, analysis and interpretation of data, drafting the manuscript, and revising it critically for important intellectual content. All authors read and approved the final manuscript.

List of abbreviations
HIV: Human Immunodeficiency Virus
AIDS: Acquired Immune Deficiency Syndrome

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Table 1: The socio-demographic characteristic of the participants in Suixi County

Characteristic		*n*	Male (%)	Female (%)	%
age	<20	1846	32.2	37.4	34.5
	20~30	1073	22.2	17.3	20.0
	30~40	1502	27.1	29.3	28.0
	40~50	675	13.5	11.5	12.6
	>=50	259	5.0	4.6	4.8
Occupation	Farmer	2027	35.3	45.0	39.5
	Local workers	445	10.1	6.1	8.3
	Migrant workers	1234	27.7	17.1	23.0
	Teacher	102	2.0	1.8	1.9
	Student	1457	25.0	30.1	27.2
Education	Illiterate	577	7.1	15.6	10.8
	Primary school	1051	18.7	20.8	19.6
	Junior middle school	1856	39.7	28.2	34.7
	Senior high school	1674	30.1	32.7	31.3
	Above senior high school	197	4.4	2.7	3.7
	Total	2720	56.3	43.7	100

Table 2: The information resources of HIV/AIDS by demographic characteristics of participants from Suixi County

Characteristics	Television/radio	Newspapers/periodicals	Family communication	Neighbor/friend	Medical staff	Preventive medical staff	School/teacher	Health activity
Sex								
Male	84.76	54.87	12.79*	44.61	23.98	28.70	34.83*	17.32
Female	84.15	54.13	17.20	42.40	22.91	26.84	42.45	18.24
Occupation								
Farmer	80.67*	38.37*	13.72*	40.04*	24.11*	26.55*	19.63*	22.26*
Local work	89.14	37.50	9.21	33.88	10.86	14.47	8.55	14.80
Migrant work	87.12	56.22	11.63	45.56	16.52	23.45	21.40	11.99
Teacher	80.41	58.76	14.43	36.08	23.71	31.96	63.92	19.59
Student	86.12	74.58	19.15	48.77	30.69	35.22	75.58	17.41
Education								
Illiterate	72.91*	19.21*	9.61*	37.68*	16.26*	15.52*	15.02*	22.17
Primary school	81.02	29.87	14.63	35.91	21.16	20.68	17.29	20.31
Junior middle school	85.96	51.14	12.25	43.31	21.68	27.30	21.86	16.67
Senior high school	86.84	76.11	18.65	47.41	29.44	34.93	70.49	17.03
Above senior high school	91.67	85.42	13.54	61.46	15.63	31.77	47.40	11.98
Age								
<20	85.90*	70.43*	18.40*	46.70*	28.25*	32.95*	70.14*	16.22
20~30	86.96	57.87	11.08	45.76	20.50	26.19	23.81	15.42
30~40	83.54	40.39	12.49	38.69	21.57	23.36	17.60	19.63
40~50	80.29	40.25	15.09	44.86	19.50	27.88	18.87	19.71
>=50	78.65	30.96	12.81	37.37	19.93	22.42	10.68	23.13
Total	84.50	54.55	14.67	43.66	23.52	27.90	38.09	17.72

Note: [a] standing for the Chi-square test; *: represented the significant difference among the different socia-demographic characteristic, $P<0.05$.

Table 3: The number of the HIV/AIDS knowledge sources in different sex, occupation, education, age groups

Characteristic	*n*	The number of the information source[a]
Sex		
Male	3015	2.98±1.74
Female	2340	3.06±1.75
Occupation		
Farmer	2116	2.63±1.66‡
Local work	445	2.17±1.40§
Migrant work	1234	2.72±1.60‡
Teacher	102	3.26±1.72†
Student	1458	3.82±1.71*
Education		
Illiterate	577	2.07±1.43§
Primary school	1051	2.40±1.53‡
Junior middle school	1856	2.77±1.67†
Senior high school	1674	3.77±1.71*
Above senior high school	197	3.57±1.50*
Age		
<20	1846	3.65±1.74*
20~30	1073	2.86±1.62†
30~40	1502	2.56±1.58‡
40~50	675	2.64±1.74‡
≥50	259	2.33±1.62§
Total	5355	3.01±1.74

Note: [a] Standing for the mean with variance; ‡, §, †, *, ¶ represented the significant difference among different groups, $P<0.05$.

Table 4: The HIV/AIDS knowledge scores in different number of information sources

The number of the information source	n	The knowledge score[a]
0	653	8.08±3.17‡
1	1145	8.29±4.73‡
2	980	10.19±3.90†
3	921	11.44±3.10*
4	696	11.43±3.02*
5	463	11.41±3.01*
6	255	11.67±3.03§
7	110	11.57±3.21*
8	132	10.82±3.77¶

Note: [a] Standing for the mean with variance; ‡, §, †, *, ¶ Represented the significant difference among the 8 number groups, $P<0.05$.

Table 5: The comparison of knowledge scores between two any groups from eight information sources

The number of information source	statistic	The number of information source*							
		0	1	2	3	4	5	6	7
1	*t*	-1.017							
	P value	0.309							
2	*t*	7.427	9.863						
	P value	<0.001	<0.001						
3	*t*	11.306	14.343	4.790					
	P value	<0.001	<0.001	<0.001					
4	*t*	9.694	12.144	3.425	-0.987				
	P value	<0.001	<0.001	<0.001	0.324				
5	*t*	8.257	10.102	2.485	-1.396	-0.543			
	P value	<0.001	<0.001	0.009	0.163	0.616			
6	*t*	7.417	8.701	2.596	-0.527	0.167	0.543		
	P value	<0.001	<0.001	0.009	0.598	0.867	0.587		
7	*t*	4.954	5.643	1.371	-0.822	-0.325	-0.031	-0.400	
	P value	<0.001	<0.001	0.170	0.411	0.745	0.975	0.689	
8	*t*	3.498	4.197	-0.446	-2.827	-2.251	-1.861	-2.108	-1.396
	P value	<0.001	<0.001	0.656	0.005	0.024	0.063	0.035	0.163

Note: * Adjusted by the age, sex, education and occupation.