

THE ROLE OF HEALTH EDUCATION FOR SCHISTOSOMIASIS CONTROL IN HEAVY ENDEMIC AREA OF POYANG LAKE REGION, PEOPLE'S REPUBLIC OF CHINA

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Abstract. For exploring the impact of health education for schistosomiasis control in a heavy endemic area of Poyang Lake region, China, the residents residing in the heavy endemic area were divided into three kinds of target population: pupils, adult women and adult men, and then targeted health education was implemented respectively among the three kinds of population after a baseline survey. The result was compared with that in the control group. The anti-schistosomiasis knowledge level among the three kinds of population improved significantly, the correct rate of attitude to examination and chemotherapy among pupils and adult men and the correct rate of anti-schistosomiasis value concept among women were raised greatly, obedience to examination and chemotherapy among adult men increased, the rate of infested water exposure and infection rate among pupils and adult women declined remarkably. Therefore, infection with *Schistosoma japonicum* (*Sj*) can be controlled effectively among women, especially pupils and obedience to examination and chemotherapy among adult men can be improved by implementing health education.

INTRODUCTION

There are snail-ridden areas of 491,010,000 m² in the Poyang Lake region, Jiangxi Province, China. It is still one of the most serious endemic areas with *Schistosoma japonicum* in China because the annual reinfection rate of residents remains serious nowadays in spite of implementing mass chemotherapy of praziquantel in heavy endemic areas, due to limited snail eradication and frequent resident activities in flood land (Wu *et al*, 1994).

Since 1984, WHO suggested that health education should be the emphasis of schistosomiasis control, the role of people's behavior should be paid attention. Since the health education of schistosomiasis control in China was initiated in 1992, its importance has gotten increasingly high attention. Therefore we conducted a study on the impact of health education for schistosomiasis control in a heavy endemic area of Poyang Lake region, from 1992-1994.

MATERIALS AND METHODS

Selection of field sites

Two natural villages, Lotun and Taojia, located in Xinjian county of Jiangxi Province, were

selected as field sites. The two villages lie to the southwest of Poyang Lake, at a distance of 17 km. All conditions about their environment, social-economics, education level, production styles and living conditions are similar, planting rice in combination with fishing are their production activities, drinking water comes from wells. Experimental group (Lodun village) and control group (Taojia village) were determined by the method of random cluster. The total population of Lodun and Taojia are 487 and 561 respectively. The observations in the two groups have been divided into three kinds of target population, namely, pupils, adult women aged 15~60 years and adult men aged 15~60 years, according to the ways in which residents make infested water contact.

Baseline survey

Before survey, all surveyors received training to unify the time, contents, methods and standards.

Anti-schistosomiasis knowledge: Questionnaires for pupils and adult persons were designed respectively in which 6 and 10 questions included, score of 60 was identified to be passed, finally, the number of passed persons and passed rate were calculated.

Anti-schistosomiasis attitude and value concept: The attitude to examination and chemotherapy of

schistosomiasis among pupils and adults men have been investigated respectively to calculate the number of people who answered correct and correct rate.

Anti-schistosomiasis value concept among adult women was investigated at the same time to calculate the number of people who have correct anti-schistosomiasis value concept and correct rate.

Behavior survey

Behavior of infested water exposure: Adult women and adult men have been divided into 3 groups respectively, and then their frequency and modes of infested water exposure in snail-ridden flood lands within 2 days have been surveyed respectively in the first ten days, second ten days and third ten days of a month. The survey contents about behavior of infested water exposure among pupils were same as the adult's, except for once a week.

Obedience to examination and chemotherapy of schistosomiasis among adult men: During the period of examination and chemotherapy, the persons who send actively feces sample after getting announcement and take actively praziquantel on time were identified as active behavior, and then calculation obedience rate.

Parasitology examination and treatment: In the early and end of the first year, the observation subjects in experimental and control group received stool examination with Kato-Katz (BEDC, 1990) method to calculate respectively infection rate with *Sj* and then took praziquantel to observe new infection and reinfection during this period.

Health education

Health education were implemented only in the experimental group, and the different interruption measures were adopted respectively according to main modes and causes of infested water exposure in three kinds of population.

Pupils: Video-listening education: spreading the anti-schistosomiasis knowledge by giving the course of anti-schistosomiasis, showing video-tape about schistosomiasis control, exhibiting the samples of schistosomiasis japonica and pasting up the pictures about schistosomiasis control.

Technique training: lecturing the technique of protecting from infection with *Sj* and setting an example for how to wear appliances and smear

medicine for protecting from infection with *Sj*.

Behavior encouragement: under the support of school, formulating the school discipline and class rule about schistosomiasis control to limit pupil's non-hygienic behavior, rewarding the pupils who do not contact actively infested water or conduct actively protection when contacting infested water, otherwise, giving punishment.

Adult women: Video-listening education: in view of existing wrong anti-schistosomiasis value concept among adult women, adopting media and sample exhibition to introduce the harm of schistosomiasis, and knowledge about methods of preventing infection with *Sj*.

Technique training: same as the pupil's.

Adult men: Adopting video-listening education and technique training to implementing the interruption measures.

The investigations during the period of health education

All of the items, contents, methods, standards and time were same as those in baseline survey.

RESULTS

Anti-schistosomiasis knowledge

After implementing health education, the passed rate of anti-schistosomiasis knowledge among pupils, adults women and adult men in experimental group increased significantly, raising up respectively 89.5%, 32.5% and 15.7% as compared with that in control group (Table 1).

Anti-schistosomiasis attitude and value concept

Correct rate of anti-schistosomiasis attitude among pupils and adult men in experimental group after health education increased significantly, raising up respectively 50.1% and 31.3% as compared with that in control group (Table 2).

Correct rate of anti-schistosomiasis value concept among adult women in experimental group and control group before health education were 68.0% (70/103) and 68.3% (69/101) respectively and 91.9% (91/99) and 71.8% (74/103) after health education. The correct rate in experimental group after health education increased 21.8% as compared with that in control group.

Table 1
Change of anti-schistosomiasis knowledge among three kinds of target population before and after education.

Target population	Before education		After education	
	No. asked	Passed rate (%)	No. asked	Passed rate (%)
Pupils				
Experimental group	89	9.4	89	94.4
Control group	81	7.4	81	9.1
Adult women				
Experimental group	103	55.3	99	84.9
Control group	101	56.5	103	57.3
Adult men				
Experimental group	85	80.0	81	91.4
Control group	84	78.6	109	78.9

Table 2
Change of anti-schistosomiasis attitude among pupils and adult men before and after education.

Target population	Before education		After education	
	No. survey	Correct rate (%)	No. survey	Correct rate (%)
Pupils				
Experimental group	89	55.1	89	98.9
Control group	81	51.9	81	49.4
Adult men				
Experimental group	85	67.1	81	97.5
Control group	84	72.6	109	74.3

Table 3
Frequency of infested water exposure among three kinds of target population before and after education.

Target population	Before education		After education	
	No. survey	Exposure rate (%)	No. survey	Exposure rate (%)
Pupils				
Experimental group	8,544	14.6	8,544	1.9
Control group	7,776	13.9	7,776	13.3
Adult women				
Experimental group	2,208	9.5	2,208	6.7
Control group	2,160	10.7	2,110	11.5
Adult men				
Experimental group	1,800	38.4	1,800	41.4
Control group	1,800	35.7	1,800	38.2

Behavior of infested water exposure

Frequency of infested water exposure: There were no significant difference of exposure rate among three kinds of target population before health

education. After health education, the exposure rate among pupils and adult women declined significantly, but no change found among adult men (Table 3).

Table 4
 Modes of infected water exposure among three kinds of target population before and after education.

Target population	Time	No. of investigation	Fishing		Herdng		Collecting herbs		Washing clothes		Swimming		Playing		Total	
			No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)	No. exposed	Exposure rate (%)
Pupils																
Experimental	- Before edu	8,544	55	0.6	49	0.6	34	0.4	51	0.6	588	6.9	466	5.5	1,245	14.6
	After edu	8,544	40	0.5	24	0.3	32	0.3	14	0.2	34	0.4	16	0.2	160	1.9
Control	- Before edu	7,776	46	0.6	38	0.5	25	0.3	90	1.2	503	6.5	382	4.9	1,084	13.9
	After edu	7,776	39	0.5	42	0.5	31	0.4	82	1.1	493	5.7	398	5.1	1,031	13.3
Adult women																
Experimental	- Before edu	2,208	8	0.4	38	1.7	0	0	159	7.2	4	0.2	0	0	209	9.5
	After edu	2,208	17	0.8	6	0.3	0	0	124	5.6	0	0	0	0	147	6.7
Control	- Before edu	2,160	5	0.2	43	0.2	0	0	177	8.2	6	0.3	0	0	231	10.7
	After edu	2,160	3	0.1	39	1.8	0	0	202	9.4	4	0.2	0	0	248	11.5
Adult men																
Experimental	- Before edu	1,800	451	25.1	24	1.3	35	2.0	0	0	181	10.1	0	0	691	38.4
	After edu	1,800	655	36.9	24	1.3	10	0.6	0	0	41	2.3	0	0	740	41.4
Control	- Before edu	1,800	388	21.6	31	1.7	56	3.1	0	0	168	9.3	0	0	643	35.7
	After edu	1,800	433	24.1	27	1.5	39	2.2	0	0	189	10.5	0	0	688	38.2

Ways of infested water exposure: Before health education, the main modes of infested water exposure among pupils, adult women and adult men were swimming and playing with water, washing clothes, and fishing respectively. After health education, the frequency of various infested water exposure modes among pupils and adult women in experimental group decreased remarkable, the frequency of infested water exposure due to entertainment (swimming) among adult men also dropped off greatly, but the frequency of infested water exposure due to production (fishing) increased significantly ($p < 0.01$) (Table 4).

Obedience to examination and chemotherapy among adult men

Before health education, the obedience rate to examination and chemotherapy were 71.9% (64/89) and 75.3% (67/89) respectively in experimental group and 77.6% (76/98) and 81.6% (80/98) respectively in control group; after health education, the obedience rate to examination and chemotherapy were 85.2% (75/88) and 92.1% (81/88) in experimental group respectively and 65.2% (73/112) and 69.6% (80/112) in control group. The two index in experimental group all raised greatly after health education ($p < 0.05$), but declined remarkable in control group ($p < 0.05$). After health education, the obedience rate to examination and chemotherapy in experimental group was raised up 30.8% and 32.2% respectively as compared with that in control group.

Epidemic situation changes

After health education, the infection rate among

pupils and adult women in experimental group decreased remarkably, especially in pupils; while the infection rate of adult men in experimental group increased, there was no significant difference ($p > 0.05$) (Table 5).

DISCUSSION

Nowadays health education has been listed in the first among national comprehensive program for schistosomiasis control because it can help people change their behavior, prevent or reduce infection with *Sj* and encourage communities participate in schistosomiasis control program (Hu, 1997). In this study, after implementing target health education according to their main causes of schistosomiasis infection in different target population, the anti-schistosomiasis knowledge level among three kinds of target population, was improved insignificantly; the correct rate of attitude to examination and chemotherapy among pupils and adult men and correct rate of anti-schistosomiasis value concept among women all raised up greatly; the rate of infested water exposure and infection rate declined remarkably among pupils and adult women; obedience rate to examination and chemotherapy in adult men increased obviously, their frequency of infested water exposure due to amusement decreased insignificantly. The results mentioned above show that health education is one of effective means for schistosomiasis control.

Before health education, the main modes of infested water exposure in pupils was swimming and playing with water for fun due to weak consciousness of anti-schistosomiasis. Health educa-

Table 5
Prevalence of schistosomiasis among three kinds of target population before and after education.

Target population	Before education		After education	
	No.stool examined	Positive rate (%)	No.stool examined	Positive rate (%)
Pupils				
Experimental group	89	13.5	89	2.3
Control group	81	13.6	81	18.5
Adult women				
Experimental group	103	19.4	98	7.1
Control group	99	15.2	95	21.1
Adult men				
Experimental group	89	28.1	99	41.4
Control group	98	19.3	112	25.0

tion can control effectively this group's schistosomiasis infection because they do not go to swimming and playing with water do not reduce family income and influence living, moreover, children have psychology of liking to be praised and rewarded and unwilling to be criticized and punished. So, the hygienic behavior in pupils can be strengthened by implementing the measure of rewardness and punishment.

The main mode of infested water exposure among adult women was washing clothes, wrong anti-schistosomiasis value concept was the main reason of infection. So, the health education for them only was aimed directly at the wrong concept to implement, namely, the information, such as harm of schistosomiasis for women health, the influence for family economics and the loss due to infection with *Sj* for convenience etc, should be spreader to set up the correct value.

Fishing was the main mode of infested water exposure among adult men, so, infested water exposure due to production was inevitable to be

their main cause of infection. It is impossible to reduce their infection rate only by adopting health education when old production style remain because fishing is the main economic source in most families of Poyang Lake region and individual protection was hard to do constantly for most people. Therefore, the goal of health education for this population should focus on the improvement of obedience to examination and chemotherapy.

REFERENCES

- Bureau of Endemic Diseases Control (BEDC), Ministry of Health. Handbook of Schistosomiasis Control, 1st ed. Shanghai: Shanghai Publication of Scientific Technology. 1990: 115-6.
- Hu GH. Health Education for Schistosomiasis Control, 1st ed. Beijing: People's Military Surgeon Publication, 1997: 162-3.
- Wu ZD, Zhang SJ, Pan BR, *et al.* Reinfection with *Schistosoma japonicum* after treatment with praziquantel in Poyang Lake region, China. *Southeast Asian J Trop Med Public Health* 1994; 25: 21-7.