

ORIGINAL ARTICLES

Communicating information about sore throats and rheumatic fever to South Auckland high-school students

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Abstract

Aims. The present study examined the effectiveness of three modes of communication designed to increase high school students' knowledge about throat infections and rheumatic fever in a high risk area.

Methods. The study was part of an evaluation of a rheumatic fever prevention programme that has established 27 school-based 'sore throat' clinics in South Auckland. The rationale for the clinics was explained to students through: assemblies conducted by public health nurses, written information sheets and classroom lessons. The effectiveness of each communication mode was assessed by comparing the knowledge of students from eight classes at an intervention school with eight classes at a control school

before and after the intervention school students received the teaching.

Results. Students at the intervention school showed a significant improvement in knowledge compared to students at the control school. The assembly presentations by health professionals were more effective in informing students than information sheets or classroom lessons.

Conclusions. This study suggests that presentations by health professionals are an effective method of teaching basic health information to students in these South Auckland secondary schools. Classroom teachers need to be provided with appropriate resources, if they are to provide effective instruction. Written information sheets should not be relied on.

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Rheumatic fever, a serious disease that may lead to heart damage, begins with a streptococcus throat infection that can be diagnosed through a simple throat swab and treated with penicillin. The incidence of rheumatic fever has decreased since the 1950's in most Western countries,¹ but remains high in New Zealand. The population at greatest risk is Maori and Pacific Island children of school age.²

In an attempt to prevent rheumatic fever, the School-based Prevention of Rheumatic Fever Project was established and involves 23 primary and four secondary schools being provided with throat swabbing clinics, with a further 27 schools acting as controls. Children with sore throats are able to attend the clinic for a free diagnostic swab, and if positive for *streptococcus pyogenes* are offered a course of penicillin.

In secondary schools, the success of the clinics depends on an adolescent population that is motivated to attend when they have a sore throat. Theories of health behaviour³⁻⁶ suggest that preventative behaviours are more likely when people feel vulnerable to the negative outcome in question, when the negative outcome is perceived to be extreme, when the preventive strategy suggested is perceived to be highly effective in reducing the risk of a negative outcome and when the preventive behaviour is seen to be consistent with social norms. As the key social reference group for adolescents is often their peers,⁷ it was vital that the clinics were accepted by the student population as a whole and that the rationale for the clinics was firmly established.

The students were informed about the clinics through three basic means. First, assemblies in year level groupings were conducted by experienced public health nurses and community workers. Second, a classroom lesson was conducted by the students' life skills teacher. Third, a written information sheet about rheumatic fever and the sore throat clinics was provided to take home.

The key question of interest in evaluating the informing process was the effectiveness of the process as a whole in

putting across the key messages, and the relative efficacy of each of the different information sources.

Methods

A total of four secondary schools received sore throat clinics as part of the School-based Prevention of Rheumatic Fever Project. One school (the last to receive a clinic) was chosen for detailed study of the informing process, as by this stage the procedures for informing students about the clinic had been fine-tuned. This school was co-educational with a roll of 1300 students from Year Seven to Year Thirteen (aged between twelve and eighteen years). The majority of the students were of Pacific Island descent or Maori. An indicator of socio-economic status, developed by the Ministry of Education, rated the school as decile one (the indicator codes schools from decile one- low socioeconomic status to ten- high socio-economic status using catchment data, census data and school ethnicity data).

A control school was chosen from a different area of Auckland. Although smaller, (400 students) it is also a decile one co-educational school. It was chosen as it is one of the few schools in Auckland to have a similar demographic profile to the schools in the area covered by the project.

Eight classes from each school (two from each of the year levels nine to twelve) were randomly chosen to participate in a pre/post knowledge questionnaire. On each occasion, the questionnaire was filled in anonymously by students present on the day of the test administration. No students refused to participate.

The pre-test questionnaire was given to students at the intervention and control schools by two researchers during life skills class. The study was explained and the importance of filling in the questionnaire individually was stressed. The questionnaire contained seven items that measured the students' understanding of the key messages designed to increase the students' motivation to attend the clinic as identified by the management team of the School-based Prevention of Rheumatic Fever Project. Each question was in a multiple choice format and offered four response options. Students were also asked their age, gender and ethnicity.

Approximately one to two weeks after the pre-test, the sore throat clinic was described to the students at the intervention school through assemblies to each year level presented by experienced Public Health Nurses and community workers. The assemblies were attended by one of the researchers. Each assembly took 20-30 minutes and involved 200-300 students. They covered the rationale for the clinics and provided basic information about rheumatic fever and sore throats. Resources included overheads, charts and the opportunity for student questions.

The students at the intervention school also received a lesson on rheumatic fever and the sore throat clinics taught by their life skills

(health education) teacher. The teachers were provided with resource materials including a video about a girl who develops rheumatic fever, as well as a video about the project, and detailed information sheets and booklets about the causes, prevention, symptoms and consequences of rheumatic fever. Each teacher then tailored a lesson appropriate for the class being taught. Three individual classes involved in the knowledge survey (year levels nine, eleven and twelve) were observed by a researcher. The techniques used by the teachers included: watching one or both of the videos, role plays, discussion of the social and emotional impact of rheumatic fever, brainstorming of ideas and written exercises.

After the life skills lesson, the students received a two-page information sheet about the clinics to take home. It was designed primarily to inform families of the purpose and function of the clinics and to ask parents or guardians for consent to their child's participation.

The students at both schools received the post-test questionnaire, four weeks after the pre-test. The post-test questionnaire had the same questions as the pre-test questionnaire, and additional questions for the students from the intervention school. The additional questions concerned whether they had attended the year level assembly about the project, if they attended the life skills class and if they had read the information sheet that was sent home. They were also asked if they had any questions about sore throats, rheumatic fever or the clinics to pinpoint any gaps in the education process. Finally, they were asked if they thought it was a good idea to have a sore throat clinic in their school, to see if they had a positive attitude towards the clinics which may help motivate attendance.

Analysis of variance was used to determine if there was a significant difference between the pre-test and post-test knowledge scores of the students from the intervention and control schools, and to assess if each of the information sources had made a statistically significant impact on the students at the intervention school. An estimate of covariance (Eta squared) provided an indication of the extent to which each aspect of the education process, as well as the process as a whole, had improved the knowledge of the students at the intervention school. As individual subjects were not coded, all analyses were performed using independent sample designs.

Results

Demographic characteristics of students from the two schools are shown in Table 1.

	Intervention		Control	
	Pre-test n=167	Post-test n=131	Pre-test n=93	Post-test n=82
Mean age	15.03	14.82	15.03	14.96
Gender*	%	%	%	%
Male	40	46	39	33
Female	60	54	61	67
Ethnicity*	%	%	%	%
Pacific Island	64	63	76	75
Maori	19	14	16	14
East Asian	7	9	2	4
Indian	5	9	1	3
Pakeha/European	4	4	4	4
Other	2	1	1	0

*Percentages given for each group. Rounding means they do not always add to 100.

Out of the total of seven knowledge items, the mean number correctly answered by the intervention students before the education had taken place was 3.62 (SD=1.56). The post-test mean score for this group, measured after the students had received the education, was 5.27 (SD=1.74). The control group's pre-test and post-test mean scores were 2.68 (SD=1.35) and 2.32 (SD=1.14) respectively. An ANOVA produced a significant school / time interaction ($F(1, 460) = 53.41, p < 0.0005$). The ANOVA indicates that the teaching received by the students in the project school improved their knowledge significantly. The covariance estimate indicated that the increase in knowledge in the intervention school accounted for ten percent of the variation in knowledge scores.

Table 2 shows the changes in knowledge of the intervention school students for each item on the survey

before and after the introduction process. As can be seen, the students improved on all questions. Most impressively, the information the students received appeared to increase the understanding of around half the group about the link between streptococcal throat and rheumatic fever, penicillin as the treatment and that rheumatic fever can affect the heart.

Table 2. Intervention group: proportion of correct answers to individual questions.

	Pre-test n=167 %	Post-test n=131 %	Improvement %
1. What are sore throats caused by? (Germs)	81	89	8
2. If you have a sore throat what is the best thing to do? (See a doctor or nurse straight away)	65	87	22
3. Are sore throats catching? (Yes)	49	59	10
4. A strep throat is (A sore throat which can lead to RF)	29	82	53
5. The best treatment for strep throat is (Penicillin)	18	65	47
6. RF is a disease which affects your (Heart)	23	69	46
7. When some people get RF they get (Sore joints, headaches, tiredness)	48	79	31

Note: Correct answers in parentheses. RF=rheumatic fever.

The proportion of students in the project school who participated in each of the three communication procedures are shown in Table 3. This table also shows the differences in mean scores between the students who had participated and not participated in each activity.

Table 3. Mean scores for each informing activity (Scores out of 7).

	Attended assembly (n=129)			Eta
	Yes n=110 (85%)	No n=19 (15%)		
Knowledge of RF	M=5.51 SD=1.57	M=3.90 SD=2.16		0.067*
	Attended life skills class (n = 129)			Eta
	Yes n=108 (84%)	No n=21 (16%)		
Knowledge of RF	M=5.35 SD=1.65	M= 4.76 SD=2.21		0.016
	Read information sheet (n = 126)			Eta
	Yes n=47 (37%)	Some of it n=50 (40%)	No n=29 (23%)	
Knowledge of RF	M=5.32 SD=1.68	M=5.22 SD=1.62	M=5.10 SD=2.14	0.007

* $p < 0.005$. RF = rheumatic fever. Data are mean (m) and standard deviation (SD).

Most students had attended the assembly (85%) and a life skills class (84%). Fewer students had fully read the information sheet (37%). For each information source, the students who had participated in the activity scored more highly than those who had not participated. An ANOVA conducted on the post-test knowledge scores, showed that only attendance at the rheumatic fever assembly had a significant effect on the scores ($F(1, 113) = 8.131, p < 0.005$). This result was confirmed by an analysis of covariance that showed that seven percent of the variance in knowledge scores could be attributed to attendance at the assembly. The other sources of information showed much less impact on knowledge.

There were 75 responses to the item on the post-test that asked students from the intervention school to write down any questions they still had. The most common were about the nature, symptoms and seriousness of rheumatic fever. There were also a number of questions about the causes of the disease and whether it is contagious. A small number of questions concerned the way in which the disease is treated and how to prevent it. There were also questions about sore throats and the appropriate action to take.

Most of the 125 responses to the question on the post-test "Do you think it is a good idea to have a Sore Throat Clinic at your school?" were positive. Some of the reasons that the students thought the clinics were a good idea included: the clinic's function in preventing rheumatic fever, their value as educational sources, their convenience, and not having to go to (and pay for) the doctor.

Discussion

The results of this evaluation suggest that the informing process conducted by the School-based Prevention of Rheumatic Fever Project was successful in improving the understanding of the students from this South Auckland secondary school about the nature and consequences of rheumatic fever and the importance of seeking medical attention for a sore throat. Of the three sources of information the students received, the most effective appeared to be the year-level assemblies conducted by public health nurses. The least effective source seemed to be the information sheet.

The effectiveness of the year-level assemblies was probably due to the consistent format that had been fine-tuned in the three secondary schools previously incorporated into the project. The assemblies were conducted by health professionals who were highly knowledgeable themselves and fully committed to the project. The use of simple language, humour, examples of people who had contracted rheumatic fever, and a confident, authoritative approach appeared to capture the students' attention.

While the assemblies were consistently effective in capturing students' attention, the observations made in three life skills sessions (taught by classroom teachers) indicated that there was wide variation in the quality of these sessions. Two teachers had designed age-appropriate exercises and discussions around the causes, consequences and prevention of rheumatic fever. The third teacher simply showed the class the two videos provided by the project, and instructed students to copy out information about the disease. Many students in this class were inattentive during the videos and around half did not complete the written exercise. It seems likely that the variable quality of teaching in the classes had an impact on the knowledge of the students. While the difference between classes did not reach a statistically significant level, this could have been due to the small numbers (class sizes ranged from eight to 23 students).

In future projects of this type, it may be possible to facilitate better classroom teaching. An essential part of the process is to actively engage the teachers. Teacher

commitment has been found to have a measurable effect on the gains made by students in a New Zealand school-based personal safety programme.⁸ It is also important that teachers are provided with guidelines for effective teaching and that these are followed. One study of a US elementary school safety education programme found a positive impact on seat-belt use only in schools where the programme protocol was strictly adhered to.⁹ The current project relied on teachers to formulate effective lessons, which appeared to lead to inconsistent presentations.

Another possibility is that, for these South Auckland students, large group presentations by people who are seen as experts are more effective in increasing health knowledge than regular classroom teaching. In the intervention group, more than 60% of the students were of Pacific Island descent. Traditional Pacific Island teaching structures tend to involve a teacher giving direct instruction, rather than self-directed learning processes. It is possible, therefore, that the large-group assembly presentation was a culturally effective format for these students,¹⁰ but may not be as effective in schools with different ethnic compositions.

The informing process as a whole was successful, not only in increasing students understanding, but also in engendering a positive attitude towards the clinics, as indicated by the qualitative responses of the students. Clearly establishing the rationale for the clinics and generating enthusiasm for them from the student body is likely to be critical to ensure that students attend when they have a sore throat. Ongoing monitoring of student attendance at the clinics has been taking place since the clinics were opened. Further evaluations could investigate the extent to which the knowledge measured in current study and other attitudinal factors appear to correlate with student attendance.

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