
Skin cancer prevention: a peer education model

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Results from a quasi-experimental project indicate that skin cancer prevention and sun protection education can successfully be promoted by using peer educators. Senior high students (40) facilitated and taught a sun protection curriculum to third-grade students (508) enrolled at the experimental sites. The curriculum's effects were assessed with pre-program, post-program, and 6-month follow-up survey instruments. The experimental sites using high school (peer) facilitators were effective in conveying knowledge to younger students based on knowledge gained on the post-program surveys. Overall, the intervention group demonstrated a mean improvement of 3.4 questions on the post-program survey, while the control group improved 0.1 questions ($p < 0.01$). Additional benefits included a knowledge gain by the peer facilitators, a self-reported possible increase in desired behavior change, and an improved attitude about sun protection. Implications for pediatric clinical practice are noted. *Wis Med J.* 1995;94(2):75-79.

SINCE 1973, the incidence rate of melanoma has increased about 4% per year. There has been a steady increase in the number of non-melanoma skin cancers since 1988.¹ Cancer has been reported as the second leading cause of death among male

farm residents and the leading cause of death among female farm residents.^{2,3}

A series of protocols was developed as part of the Wisconsin Farmers' Cancer Control Program (WFCCP) to improve access to cancer education and screening for rural residents in Wisconsin. The program, funded by the National Institute for Occupational Safety and Health, was designed and implemented by staff at the National Farm Medicine Center in Marshfield in collaboration with the Wisconsin Department of Health and Human Services and the American Cancer Society--Wisconsin Division (ACS). Its goals were to identify barriers to health care for rural residents and to help improve the access of cancer screening and education, especially

for skin cancer.⁴

In farm family focus groups conducted at the beginning of the project, three key recommendations were identified: the importance of education materials being simple and brief, the need for educating farm children on healthy lifestyles and cancer risks, and the need to conduct education on the farm. One way the educational component targeted the farming community was by working with an existing farm-oriented organization to deliver skin cancer prevention education to rural youth and adult farmers.

In an attempt to achieve a community diffusion effect necessary to reach those who may not be reached by other health professionals,^{5,6} an intervention was designed using an existing school-based agricultural education program. The FFA organization was chosen as one vehicle to reach the farming community. The FFA organization is a national association of high school agriculture students preparing for careers in agricultural production, processing, supply and service, mechanics, horticulture, forestry, and natural resources. A prominent feature of the organization is the use of peer education whereby older students teach younger children principles about agriculture. Previous peer education programs in FFA have been focused

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1. When should you protect yourself from the sun?
 - a. summer only
 - b. spring and summer
 - c. the whole year
2. The time of day when the sun is strongest is _____.
 - a. every morning
 - b. noon
 - c. late afternoon
3. The best way to protect yourself from the sun is by using _____.
 - a. baby oil
 - b. sunblock
 - c. tanning lotion
4. I will wear sunblock number _____ when I'm outside.
 - a. 10
 - b. 12
 - c. 15 or greater
5. The skin type that needs the most sun-protection is _____.
 - a. light color skin
 - b. medium color skin
 - c. dark color skin
6. In the ABC's of sun-protection, the A means _____.
 - a. away
 - b. after
 - c. always
7. In the ABC's of sun-protection, the B means _____.
 - a. block
 - b. baby oil
 - c. burn
8. In the ABC's of sun-protection, the C means _____.
 - a. check
 - b. color
 - c. cover-up
9. What SPF number should be on sunblock that your family buys?
 - a. 10
 - b. 12
 - c. 15 or greater
10. Which one does not protect you from the sun?
 - a. long sleeve shirt
 - b. baby oil
 - c. sunblock

Fig 1.—Survey instrument for third-grade students.

on farm safety and their "Building Our American Communities" program.⁷ Sun protection and skin cancer awareness fit easily into this format. Literature reveals that adults have difficulty making lifestyle changes because of habits and behavior learned in early childhood.⁸ It is believed that the full potential of health education can be reached through the education of our youth. An additional important reason for directing cancer education programs

at youth is that children may take home specific messages which may lead to parental and older sibling action.⁹

The goal of the demonstration project was to deliver sun-protection education to youth through the FFA organization. For this project, which took place in the 1991-1992 school year, three northern Wisconsin counties were chosen—Barron, Rusk, and Shawano—because of their high farming populations and their

distance from any large tertiary care center. School personnel (ie, agriculture teachers who serve as FFA advisors and curriculum coordinators) from six high schools in the pilot counties were contacted. Meetings were also held with school boards and curriculum committees to elicit their approval and support. The planning process involved the ACS staff, state FFA representatives, local FFA advisors, and FFA members to design the plan of implementation.

It was felt that this would ensure successful integration of existing educational materials into the project, with the hope that these two organizations could continue their alliance once funding for WFCPP was terminated.

Method

The Children's Guide to Sun Protection K-3, developed by the ACS and the American Academy of Dermatology was used for the intervention.¹⁰ Background information on the basic anatomy of the skin, skin cancer, the sun, the damage it causes, and methods of sun protection were included in the curriculum. Learning objectives, lesson plans, work sheets, and hand-outs dealing with sun protection were provided.

A survey instrument consisting of 10 knowledge-based questions about sun protection was developed for the third-grade students (Fig 1). The survey instrument was tested, and checked for validity and reliability. A pre-program survey preceded the first FFA facilitator presentation to the third-grade students at intervention sites, and a post-program survey was administered at the conclusion of the second presentation. Six months later, a follow-up survey was administered to these same students by their fourth-grade teachers. Control groups were surveyed with the identical instrument in the same manner as the intervention groups, with no education session between the pre-program and

the post-program surveys.

Students who correctly responded to a question on the post-program survey after incorrectly answering it on the pre-program survey were said to have had a knowledge gain for that question. For each of the 10 questions, the number of students experiencing knowledge gain in the intervention and control groups were compared using chi-square tests. The control and intervention group change score values were compared using the Mann-Whitney U test. A somewhat conservative significance level of 0.01 was used in comparisons of the 10 questions.

WFCCP staff and ACS staff trained 40 FFA members (peer facilitators) at a 1-day workshop. The workshop included background

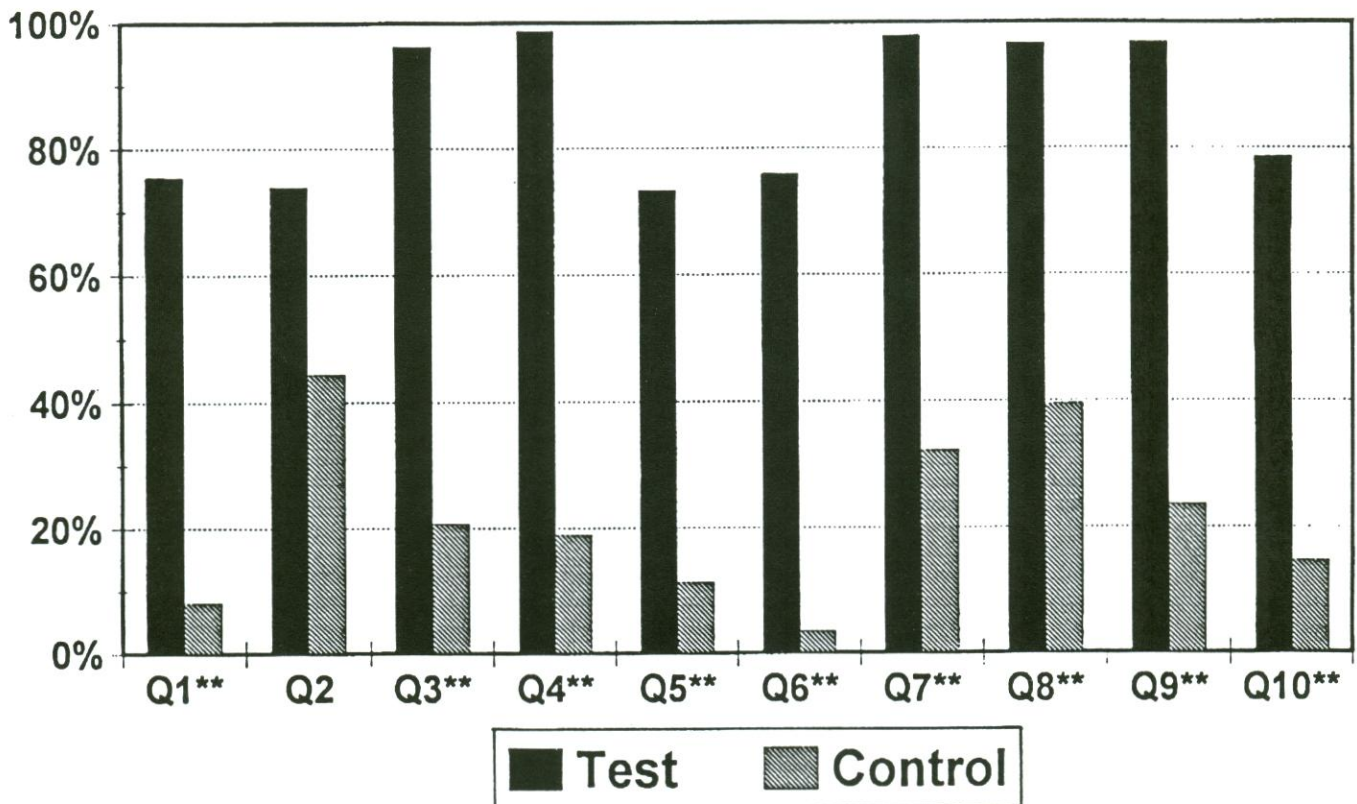
information on skin cancer and sun protection, the introduction and practice of the sun-protection curriculum, and some teaching skills training. They also received instructions on administering the pre-program and post-program surveys to the third-grade students.

The facilitators presented the education materials (emphasizing the ABCs of sun protection)¹⁰ to third-grade students in their school districts in April and May (in preparation for peak sun exposure time in the summer). The education was conducted in two 30- to 40-minute sessions on 2 days within a 1-week period. The timing of the education sessions was coordinated by the advisors associated with each school facilitator group.

As part of the education process,

the third-grade students used sun-protection activity sheets (work sheets and coloring sheets with a sun protection theme) which could be taken home. Other materials distributed at the end of the intervention to be taken home included the skin cancer brochure developed by WFCCP specifically for farmers, an informational skin cancer sheet from ACS, a bookmark with the ABCs of sun protection, and a sun protection factor (SPF) #15 sunscreen sample.

Within each school district, control classrooms were chosen at random by the advisors. Wherever possible, an outlying school within the district became the control. Seven of the 26 classrooms acted as controls, with the remaining nineteen classrooms designated for intervention.



*Students selected for incorrectly answered question on pre-survey and correctly answered question on post-survey

**Test and Control significantly different ($p < 0.01$)

Fig 2.--Students who improved from pre-program to post-program survey.*

Table 1.—Results of three administrations of the knowledge survey: mean score for each survey by test group.

| | Mean | SD | 95% CI | Mean | SD | 95% CI | Mean | SD | 95% CI |
|--------------|------|------|------------|------|------|------------|------|------|------------|
| Intervention | 5.8 | ±1.9 | (5.6, 6.0) | 9.2 | ±1.1 | (9.1, 9.3) | 8.1 | ±1.3 | (7.9, 8.3) |
| Control | 5.9 | ±2.0 | (5.5, 6.3) | 6.0 | ±1.8 | (5.7, 6.3) | 7.8 | ±1.5 | (7.5, 8.1) |

Forty FFA, FHA, and Natural Helper members (46% boys and 54% girls) were involved in teaching the sun protection curriculum. Thirty-three (83%) completed all three surveys and were included in the data analysis.

Results

The survey was administered to 508 third-grade students. The three survey instruments were fully completed by 401 (79%) students and these were included in the evaluation process. Lack of paired responses in 107 students (80 intervention, 27 control) was due to absences when any one of the surveys was administered or to the relocation of students from one school year to the next.

There were no significant differences between the intervention and control third-grade students on any of the pre-program survey questions. Scores indicate that the two groups had similar background knowledge levels regarding sun protection at the start of the project.

For nine of the 10 questions, the intervention group had a statistically significant ($p < 0.01$) higher proportion of students experiencing knowledge gain than did the control group for pre-program to post-program surveys (Fig 2).

Overall, the intervention group had significantly improved scores on the post survey, in comparison with the control group scores which showed little change ($p < 0.01$). The mean improvement for the intervention group was 3.4 questions, while the control group showed virtually no improvement (mean = 0.1 questions) (Table 1).

The sun protection education was

given to the control groups in a brief session after the post-program survey was administered. Therefore, it was difficult to interpret the results of comparisons between the intervention and control groups for 6-month follow-up data. Both groups showed a significant improvement in knowledge from pre-program to 6-month follow-up surveying (Table 2).

Time and effort logs were completed by peer facilitators and advisors. The time spent in preparation and presentation of the sun protection education sessions by the peer facilitators ranged from 6 to 27.5 hours with the average being approximately 16 hours (including 8 hours of training and travel time).

Advisors reported an average time of 26 hours (ranging from 12 to 62 hours) spent implementing the program. Since several districts expanded the program to include other classrooms and meetings, the time represented may not truly reflect the needs for the FFA program as originally designed (third-grade students only). The FFA pilot project materials costs were \$0.55 per third-grade student and \$3.50 per facilitator.

An additional goal of this project was to influence the behavior and attitudes of the facilitators regarding sun protection, with special emphasis on "the more sun one gets exposed to, the greater the chances of developing skin cancer." To this end, the facilitators were assessed by the use of a 13-question survey instrument about skin cancer and sun protection, which included attitude, behavior, and knowledge questions. The identical instrument was used three times: at the begin-

ning of the 1-day training session, at the end of the 1-day training session, and 6 months later.

For the 33 facilitators completing all surveys, 6 (18%) improved their overall score on the three knowledge questions. On each of the two behavior questions on the survey, an increase in the percentage of facilitators who were likely to practice the desired behavior was seen.

Discussion

A definite interest of the third-grade students in sun protection and a positive acceptance of the peer facilitators were noted in observations by WFCCP staff in 10 of the 19 classroom interventions. Evaluations by the facilitators indicated that third-grade students identified them as teachers of sun protection information and appeared to recall the sun protection education project within the next 3 months.

Knowledge retention could be demonstrated through 6-month follow-up surveys. There was a slight loss of knowledge by the intervention group on the 6-month follow-up survey, but they still achieved an overall knowledge gain of two questions for the sun protection intervention.

There is a possibility that the sun protection education could become part of a pediatric practice since this is an important prevention issue that older children could take control of themselves. The pediatrician or family physician could distribute the ABCs sun protection bookmark and briefly discuss it with patients 8 or more years, with a special emphasis on the need for reducing total sun exposure over a lifetime. Sun protection education to parents during

Table 2.--Results of three administrations of the knowledge survey: percent correct on each question by test group.

| Question | Intervention (n=294) | | | Control (n=107) | | |
|----------|-------------------------|--------------|-------------------|--------------------|--------------|-------------------|
| | Pre-program | Post-program | 6-month follow-up | Pre-program | Post-program | 6-month follow-up |
| 1 | 59.9 | 86.4 | 76.9 | 54.2 | 53.3 | 71.0 |
| 2 | 83.0 | 90.8 | 85.0 | 83.2 | 89.7 | 80.4 |
| 3 | 72.1 | 98.0 | 98.0 | 72.9 | 75.7 | 98.1 |
| 4 | 50.3 | 99.0 | 96.6 | 45.8 | 50.5 | 83.2 |
| 5 | 64.3 | 85.7 | 78.2 | 58.9 | 54.2 | 77.6 |
| 6 | 11.2 | 77.2 | 21.1 | 17.8 | 15.0 | 27.1 |
| 7 | 69.4 | 98.3 | 92.5 | 73.8 | 75.7 | 86.9 |
| 8 | 60.2 | 98.0 | 84.7 | 69.2 | 68.2 | 86.9 |
| 9 | 47.3 | 97.6 | 93.9 | 48.6 | 53.3 | 88.8 |
| 10 | 60.2 | 90.1 | 78.6 | 68.2 | 62.6 | 79.4 |

well-child visits by pediatricians or family physicians could also be effective. Providing this information during the newborn period or in infancy could also help prevent childhood sunburns which are associated with skin cancer.^{11,12}

Conclusion

The findings of this educational intervention demonstrate the effectiveness of peer facilitators (high school students) in educating younger students concerning a highly sensitive issue regarding human health, specifically skin cancer. Pre-program and post-program survey analyses showed significant increases in third-grade student sun protection knowledge gained in the intervention group.

The success of this project would suggest that this education intervention should be replicated on a larger scale to determine if a larger intervention could sustain similar educational gains. If successful on a larger sample size, this teaching module could be implemented in any FFA or similar organization on a national scale. Coalitions could be developed with the ACS and the FFA organization to sustain this activity. Other human health issues

concerning heart disease, cancer, and safety could most likely be adapted into this format.

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