

**Title:** Nurses' logs as an evaluation tool for school-based violence prevention programs.

**Date:** 5/1/1997; **Publication:** Journal of School Health; **Author:** Powell, Kenneth E.

Programs for preventing violence among youth should be evaluated to determine if they are effective. Nurses' logs appear to be a useful tool for evaluating school-based violence prevention programs. The logs provide a record of students' visits to the school nurse that can be used to determine if a violence prevention program is associated with a reduction in fighting -- and other injury-related nurse visits. This method has many strengths: it is simple and inexpensive, it does not interrupt the school routine, it permits school-level rather than student-level data collection, it provides a ready "baseline, " and it allows continuous data collection. However, potential limitations do exist. For example, the method may provide insufficient information and may be affected by factors unrelated to the intervention. School officials can increase the usefulness of the logs by encouraging standardization and providing training in their use. (J Sch Health. 1997-,67(5):171-174)

Violence among youth is an important public health problem in the United States, and violence in schools has become a particular concern. Results from a 1995 survey indicated that 15.5% of high school students nationwide had been involved in a physical fight on school property in the preceding 12 months, and 9.8% had carried a weapon on school property in the preceding 30 days.[1] To reduce youth violence, primary prevention programs should be developed and implemented in schools and communities. Such programs must be evaluated so that ineffective programs can be discontinued and those that most effectively prevent youth violence can be more widely implemented.

Evaluation of violence prevention programs for youth is a relatively new endeavor. In conducting such studies, researchers have used a variety of measurement tools such as student self-report instruments, classroom or playground observations of student behavior, and routinely-collected data like attendance and disciplinary records.[2-6] While the reliability and validity of some methods have been established,[7] more research is needed to develop and determine the best evaluation methods for youth violence prevention programs.

In a recent study,[8] a new tool -- school nurses' logs -- was used to evaluate a school-environment violence prevention program for elementary school students called PeaceBuilders.[R] (Use of trade names is for identification only and does not constitute endorsement by the Public Health Service or the U.S. Dept. of Health and Human Services.) PeaceBuilders[R] was developed for elementary schools (grades K-5) and fosters prosocial behavior. Activities are designed to improve daily interactions among students, teachers, administrators, support staff, and parents. Children learn five simple principles: praise people, avoid put-downs, seek wise people as advisors and friends, notice and correct hurts, and right wrongs. Children are provided with models of positive behavior, environmental cues to signal this behavior, opportunities to rehearse it, and rewards for practicing it.[9,10]

As part of a larger evaluation of the PeaceBuilders[R] program in Tucson, Arizona, the study examined nurses' logs to assess whether the program was associated with a change in visits to the school nurse. Schools had been matched on demographic factors and randomly assigned as intervention or comparison schools. Results from the preliminary investigation showed that, relative to comparison schools, the rate of injury-related visits decreased in schools with the program. In addition, the rate of fighting-related visits showed little change in the intervention schools, but increased dramatically in the comparison schools.

There are several reasons to expect that a decrease in the number of visits to the school nurse might be associated with implementation of a violence prevention program. First, such a program should reduce the number of fights, thereby reducing the number of fighting-related injuries requiring a nurse's attention. Second, various program components could reduce the incidence of unintentional injuries. For example, in PeaceBuilders[R] schools, "PeaceFeet" are placed in the hallways to show children where and in what direction to walk, thereby making shoving and collisions less likely.[9,10] Third, it is possible that a violence prevention program that creates an environment where students receive positive reinforcement from peers, teachers, and other adults may reduce the number of nonmedical visits to the school nurse.[11-14]

Past research has demonstrated the effectiveness of using medical records for evaluating injury-prevention programs,[15] but nurses' logs apparently had not been used previously to evaluate school-based violence prevention programs. This paper describes nurses' logs, explains how they can be used to evaluate school-based violence prevention programs, and compares the strengths and limitations of this tool with those of other tools.

## BACKGROUND

Provision of school health services is well-established in the United States. For example, although data from elementary schools are not available, 98.4% of middle/junior high schools and senior high schools nationwide provide first aid to students.[16] This service, in addition to evaluation of sick students, is provided not only by school nurses, but by secretaries, teachers, and health assistants. Many schools keep records of these encounters. For simplicity, these records may be referred to as "nurses' logs," although they sometimes are maintained by school personnel other than nurses. Although data are not available for elementary schools, 56.9% of middle/junior high schools and senior high schools report maintaining such records.[16]

The decision about what information to record in school nurses' logs and the protocol for recording it usually is made at the school level. Therefore, although the content of nurses' logs may vary among schools, logs usually provide a systematic record of the number of encounters and at least some description of each encounter. For example, although the format of logs in each of the two school districts involved in the PeaceBuilders[R] evaluation differed, both contained information about the time of the visit and student's name, grade, complaint, and treatment plan. In both school districts, the care provider also had recorded if the visit was due to illness or injury and whether a parent was

notified. From these logs, the number of visits could be counted and categorized according to whether the primary problem was illness or injury. For each injury, the description of the complaint also could be coded according to its cause such as nonfighting, possible fighting, or confirmed fighting.[8] Throughout the process, to maintain confidentiality, staff examined only the part of the records that contained no identifying information.

No matter the format, as long as nurses' logs contain a brief description of each encounter, they can provide a useful measure for evaluation of violence prevention programs. For example, a description might read "fell while playing -- applied Band-Aid." This item would be coded as an injury not caused by fighting. Such a coding scheme can be used for an entire log or for a sample of it, allowing counts for injuries and fights. These counts then can be converted to rates of visits per student per school day. Depending on the evaluation design, researchers can compare rates before and after program implementation within a school, or they can compare rates in intervention schools with those in comparison schools.

## STRENGTHS OF METHOD

Figure 1 summarizes strengths and limitations of using nurses' logs to evaluate violence prevention programs. A primary advantage is the relative ease and low cost of data collection. Typically, evaluators use questionnaires or interviews to collect data. However, writing and pilot-testing questionnaires requires advance preparation and expertise. Hiring external consultants, if needed, can be costly, as can administration of questionnaires and interviews. These methods also can be time consuming and difficult logistically, especially if face-to-face interviews are required. School administrators often are reluctant to provide the class time or teacher-release time required for data collection. Using an extant data source like nurses' logs overcomes these problems by requiring little advance preparation, no disruption of classes, and only a small amount of school staff time to orient data collectors.

Another advantage of using nurses' logs is that data are not collected directly from students. Students vary widely in their cognitive abilities, especially during the elementary grades, and it is difficult to design an instrument that can be completed by students at various levels. To counter this problem, researchers sometimes use different assessment methods for different grades, but such results may be difficult to compare.

Collecting data from students also requires obtaining parental permission. Drafting consent forms and having them approved is time consuming, and usually difficult to distribute and collect once approved. Active parental permission especially can be labor-intensive because it necessitates follow-up with parents who do not return their forms. In addition, studies requiring active parental permission usually have lower response rates,[17] which affects generalizability of the results. Research has shown that students who do not return signed permission forms are more likely than their peers to engage in risky behavior.[18] In contrast to data collected directly from students, data from nurses'

logs are abstracted in aggregate form with no student identifiers, so parental permission is not necessary.

Collecting data directly from students also is difficult because of absenteeism. It is important to locate students who are absent from school on the day of data collection, because absentees are more likely than their peers to exhibit problem behavior[19] and to engage in health risks.[20] In addition, absent students contribute to low response rates. Using nurses' logs does not eliminate entirely the problem presented by absenteeism because chronic absentees have fewer opportunities to visit the school nurse. However, because nurses' logs contain data for the entire school year, absentees are represented at least partially in logs, whereas they might not be represented in a data collection instrument that is administered only once or periodically.

For all these reasons, using a school-level as opposed to an individual-level data source is advantageous. School-level data like nurses' records also are appropriate especially when the intervention takes place at the school level. In most school-based program evaluations, the school, not the individual student, is the unit of assignment. In contrast, outcomes usually are measured at the individual rather than at the school level. While it is possible to analyze such data using mixed-effect models,[21] using nurses' logs provides school-level data, which is more appropriate given the design, and therefore simplifies analysis.

The nature of the data obtained from nurses' logs creates other advantages. These records provide a prospective measure. Therefore, no matter when program implementation begins, "baseline" data already have been collected. This fact is important, because programs often are implemented before evaluation is planned, and they cannot be evaluated properly without baseline measures. Using nurses' logs also avoids time-related sampling biases. The records contain information on every day of the school year. In contrast, when questionnaires, interviews, or observational methods are used, data must be collected at particular points in time and may be influenced by extraneous factors. For example, children may be more rambunctious just before a holiday than at other times during the year, so an observation made at this time might be misleading.

Another benefit is that information abstracted from nurses' logs is likely to be relatively standard. Some logs might contain more complete and detailed information than others. However, as long as a brief description of each visit has been recorded, the logs will provide enough information for the data to be compared with that of previous and subsequent years in the same school. Data abstracted from logs from different schools will be less comparable because of potential differences in record-keeping. However, it still is possible to make between-school comparisons, by examining changes in rates over time rather than absolute rates.

## LIMITATIONS OF METHOD

Using nurses' logs for evaluation also has limitations. First, the necessary data may be unavailable. Although more than half of middle/junior high schools and senior high

schools maintain nurses' records,[16] the percentage of elementary schools that do so is unknown. Even when schools do maintain records, those from previous years may have been discarded or misplaced. Existing records also might be incomplete. For example, data from one week might not have been recorded.

Even when records are easily accessible and complete, they might not contain sufficient information for an in-depth evaluation. A brief description usually is sufficient to distinguish illnesses from injuries, but often more information is needed to determine whether an injury was intentional or unintentional. For example, in the nurses' logs examined for the PeaceBuilders[R] evaluation, coders often were unable to determine the exact cause of an injury. This difficulty can result in misclassification of visits. Even when efforts are made to ensure reliability between coders, subjective judgments are unavoidable.

A third limitation is that the reliability and validity of this evaluation tool has not yet been established. While this may seem like a major limitation, it is important to realize that this is true of many tools used to evaluate violence prevention programs for youth.[7] In terms of the reliability of nurses' logs, some variability likely will occur in record-keeping, both within and between schools. This fact may reduce the reliability of the data. Using nurses' logs for evaluation is therefore most appropriate when the format of the logs is standardized and similar across sites, as was the case in Tucson. However, even when this is not the case, data that can be abstracted from the logs likely is to be comparable. In addition, variability in logs will be distributed randomly across pre- and post-intervention records as well as records from intervention and comparison schools, thereby reducing the effect of the limitation.

Another potential limitation is that factors unrelated to the intervention could influence the number and type of events recorded in the nurses' logs. Examples of such factors are an outbreak of head lice, or changes in staff, type of services offered, or method of recording nurse visits. By identifying such factors in interviews with nurses and other school officials, controlling for such factors in analyses may be possible, but still a potential pitfall.

Additionally, because both students and nurses in intervention schools are aware of their participation in a program, nurse records may be biased. For example, students in schools with violence prevention programs might be more reluctant to tell the nurse that their injury was caused by fighting than students in schools without such programs. Similarly, nurses may complete their logs differently if they know that these records will be used to evaluate the program.

Finally, nurses' logs may be less appropriate as an evaluation tool at the middle/junior high school and senior high school levels because older students are less likely than elementary school students to visit the nurse for minor illnesses, minor injuries, or nonmedical reasons.[11] Therefore, nurses' logs may be more appropriate for evaluating violence prevention programs at the elementary school level, where students are more likely to seek care.

## CONCLUSION

Nurses' logs appear to be a useful tool for evaluating school-based violence prevention programs. Collecting data at the school level rather than at the individual level eliminates several difficulties typically encountered in school-based research. This method also provides a ready "baseline" and reduces potential biases by collecting data continuously. In addition, using nurses' records is simpler, and therefore less expensive, than any method requiring the development of questionnaires or interview protocols.

Because of the potential usefulness of this method, future studies should explore further the value of using nurses' logs for evaluating school-based violence prevention programs. Future evaluations of PeaceBuilders[R] and other school-based violence prevention programs will inform researchers about the feasibility and validity of using these records for evaluation.

Several actions of school officials could improve the validity of data in nurses' logs. All school personnel who provide health services to students should keep a record of each visit and save the records for at least a few years, although few school districts require this. The records can be quite simple. As long as they provide a few words about each visit, counts of injury-related visits can be made. Of course, information about whether the injury was intentional or unintentional would make the records even more useful for evaluating violence prevention programs, but a balance must be reached. If the logs are too detailed, they become a burden to complete and completion becomes less likely. School districts also might encourage standardization of the logs by providing schools with log forms and protocols for completing them. Finally, school personnel should receive training in maintaining the logs. Not only are these records useful for program evaluation, but they also may be needed for legal reasons.

Ideally, when evaluating school-based violence prevention programs, nurses' logs should be used in conjunction with other methods. As with any evaluation, process data concerning how well the intervention was implemented should be collected in addition to outcome data. But in situations where a program might not otherwise be evaluated because of a lack of resources, time, or expertise, nurses' logs provide a simple, inexpensive, and useful evaluation tool.

## References

- [1.] CDC. Youth risk behavior surveillance -- United States, 1993. MMWR. 1995;44:1-56.
- [2.] National Center for Injury Prevention and Control. The Prevention of Youth Violence: A Framework for Community Action. Atlanta, Ga: Centers for Disease Control and Prevention; 1993.

- [3.] Powell KE, Dahlberg LL, Friday J, Mercy JA, Thornton T, Crawford S. Prevention of youth violence: Rationale and characteristics of 15 evaluation projects. *Am J Prev Med.* 1996; 12:5(supp):3-12.
- [4.] Hammond RW, Yung BR. Preventing violence in at-risk African-American youth. *J Health Care Poor Underserved.* 1991;2:359-373.
- [5.] Tolan P, Guerra N. *What Works in Reducing Adolescent Violence: An Empirical Review of the Field.* Boulder, Colo: Center for the Study and Prevention of Violence; 1994.
- [6.] Wilson-Brewer R, Cohen S, O'Donnell L, Goodman IF. *Violence Prevention for Young Adolescents: A Survey of the State of the Art, working paper.* Washington, DC: Carnegie Council on Adolescent Development; 1991.
- [7.] Dahlberg LL, Toal SB, Behrens CB. *The measurement of violence-related attitudes, beliefs, knowledge, and behavior among youth: A compendium of instruments.* Atlanta, Ga: Centers for Disease Control and Prevention; 1997.
- [8.] Krug EG, Brener ND, Dahlberg LL, Ryan GW, Powell KE. An evaluation of an elementary school-based violence prevention program using nurses' logs as a preliminary indicator of effectiveness. *Am J Prev Med.* In press.
- [9.] Vazsonyi AT. *PeaceBuilders project: An evaluation of a community-based violence prevention program.* Paper presented at the first Family and Youth Violence Task Force Meeting, November 27, 1995, Tucson, Ariz.
- [10.] Embry DD, Flannery DY, Vazsonyi AT, Powell KE, Atha H. *PeaceBuilders: A theoretically driven, school-based model for early violence prevention.* *Am J Prev Med.* 1996;12:5(supp):91-100.
- [11.] Flinn Foundation. *Finally documentation that healthy kids learn better.* *NASN Newsletter.* 1990;5:4-6.
- [12.] Hansen S, Deysach R. Effect of positive reinforcement on physical complaints at a therapeutic summer camp. *J Clin Psychol.* 1977;33: 107-112.
- [13.] Schneider MB, Friedman SB, Fisher M. Stated and unstated reasons for visiting a high school nurse's office. *J Adolesc Health.* 1995;16:35-40.
- [14.] Stephenson C. Visits by elementary school students to the school nurse. *J Sch Health.* 1983;53:594-599.
- [15.] Davidson LL, Durkin MS, Kuhn L, O' Connor P, Barlow B, Heagarty MC. The impact of the Safe Kids/Healthy Neighborhoods Injury Prevention Program in Harlem, 1988 through 1991. *Am J Public Health.* 1994;84:580-586.

[16.] Small ML, Majer LS, Allensworth DD, Farquar BK, Kann L, Pateman BC. School health services. *J Sch Health*. 1995;65:319-326.

[17.] Ellickson PL, Hawes JA. An assessment of active versus passive methods for obtaining parental consent. *Eval Rev*. 1989;13:45-55.

[18.] Dent CW, Galaif J, Sussman S, Stacy A, Burton D, Flay B. Demographic, psychosocial and behavioral differences in samples of actively and passively consented adolescents. *Addict Behav*. 1993;18:51-56.

[19.] Pirie PL, Murray DM, Luepker RV. Smoking prevalence in a cohort of adolescents, including absentees, dropouts, and transfers. *Am J Public Health*. 1988;78:176-178.

[20.] Weitzman M, Klerman LV, Lamb G, Menaiy J, Alpert JJ. School absence: A problem for the pediatrician. *Pediatrics*. 1982;69:739-746.

[21.] Main DS, Iverson DC, McGloin J, Banspach SW, Collins JL, et al. Preventing HIV infection among adolescents: Evaluation of a school-based education program. *Prev Med*. 1994;23:409-417.