

Evaluation of a School Health Program Directed to Children with History of High Absence

A Focus for Nursing Intervention

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A nursing intervention program directed toward high absence schoolchildren is evaluated.

Introduction

In recent years nursing personnel associated with the Palm Beach County Health Department have become involved in efforts to assess the effectiveness of their services, with particular emphasis on determining the

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benefits to the populations they serve. The present study was developed in response to questions concerning whether the skills of professional nurses were being utilized to best advantage within the school system.

In Palm Beach County public health nurses are responsible for providing generalized nursing services to the community as well as services to children in the schools. Thus, except for vision and hearing programs, services provided as part of their school-related responsibilities are frequently limited to one-time or episodic encounters with individual children who are referred by teachers, principals, and occasionally themselves. Although response to such service demands may be necessary, confining the school program to these activities results in episodic problem solution rather than a balanced program with an appropriate concentration on preventive services. A major implication of such an approach is that children with unidentified problems, particularly problems at an early stage of development, may never come to the attention of the nurse. Awareness of the possible existence of these

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difficulties within the school health program in Palm Beach County led to a decision to continue the usual services to the school while also testing the feasibility of a pilot program, preventive in spirit and directed to a defined group of children.

Industrial studies have shown that a small proportion of persons are responsible for the majority of illnesses in work groups.¹ Likewise, a recent school health study² indicated that a good predictor of a pupil's future absence record is his past year's absence record. Other national studies^{3,4} have found that at least 80 per cent of the school absences are for health reasons. In addition, the nursing staff of the Palm Beach County Health Department conducted a small preliminary pilot study of 40 high absence pupils randomly selected from the high absence group in two schools which indicated that these children had a high prevalence of health problems.

On the basis of the data cited above it was decided that identification of children with a past record of high absence would be a reasonable way of defining a group of children with a high risk of future episodes of illness and possibly a high prevalence of basic health problems. Since it was anticipated that children so defined—and their families—could benefit from nursing service, it was concluded that high absence children constituted an appropriate risk group to which nursing services could be profitably directed. This group was therefore selected for the pilot program. The major objectives of the study were (1) to consider the utility of directing nursing services to a defined risk group and (2) to document the results of the experience in terms of patient outcomes, specifically, change in absence experience. The basic working hypothesis was that focused nursing attention would be positively associated with a reduction in days absent.

Methodology

Research Design

Since the research design was detailed in an earlier paper⁵ only highlights will be presented here. The basic strategy was to: (1) select two groups of high absence children comparable in factors thought to be associated with absence experience; (2) direct professional nursing services to one of the two groups (intervention group); and (3) document the results of the program in terms of change in absence.

The total group of 68 elementary schools in Palm Beach County was stratified into three socioeconomic levels (high, middle, low). From each socioeconomic level two schools were randomly selected as intervention schools (for a total of six schools) and two schools matched on socioeconomic level were selected as controls for each intervention school (a total of 12 schools). Within each intervention and control school, pupils in grades 2 through 5 with 14 or more absence days in the previous school year (1969–70) were identified. Each high absence pupil from an intervention school was matched with a pupil from a

control school on number of days absent, grade level, sex, and race. In September, 1970, the new program was begun in the intervention schools.

Pilot Intervention Program

During the study year a public health nurse was assigned to each of the six intervention schools, with no nurse being responsible for both an intervention and a control school. All schools, intervention and control, continued to receive the usual nursing services: nurse participation in "staffing" (an interdisciplinary team approach to assessment and planning for children with complex problems), routine vision and hearing screening and follow-up, teacher-nurse conferences, and referral by school personnel for home visits regarding identified or suspected problems. In addition, the high absence pupils in the intervention schools received focused attention from the nurse assigned to that school which was initiated at the start of the 1970–1971 school year and continued throughout the academic year.

At the beginning of the school year, each nurse assigned to an intervention school was given a list of high absence pupils in her school and asked to make a family-centered assessment of each pupil as early in the year as possible. In the process the nurse was expected to utilize her assessment skills to identify possible explanations for the previous year's absences, to determine the child's current health status, and to assist the family in recognizing and coping with any problems or situations which might result in future difficulties. The plan for the intervention program was systematic in that nursing services were to be directed to each high absence child and his family; yet nurses were to exercise their professional judgment in the intervention program within the overall guidelines provided.

Two major aspects of the intervention program were the activities of the nurse and the record of her activity. A uniform record of contact was designed to record the nurse's activities and to increase the possibility of describing the relationship between input (activities of the nurse) and patient progress. For each contact made the nurse was asked to record on the contact record identifying information, the reason for contact, findings, and the plan of action. For each child in the experimental group brief continuous accounts of the contacts and results were also recorded on a summary sheet. It was anticipated that such a record would be helpful to the nurses by providing a means of quickly noting problems identified, problem solving efforts, and the presence or absence of progress toward solutions.

Activities involved in carrying out the program included: (1) examinations of all available school and health records of the child, (2) home visits, and (3) conferences with the classroom teacher. Other types of contacts utilized for assessment and management purposes were: (1) nurse-pupil conferences, (2) nurse-principal conferences, (3) participation in "staffing" (the interdisciplinary case review), (4) phone calls, and (5) written

communications. Close communication was maintained between the nurses and the study supervisory staff. In addition to participating in initial in-service sessions designed to prepare the nurses for involvement in the program, the project coordinator met monthly with the nurses serving in the intervention schools during the study year to discuss any problems they were having. Individual conferences were arranged as needed.

The nurses in the control schools were not given the names of the high absence children matched with the intervention group but were asked to provide services in the school as usual. When a child was seen, information was recorded on the child's cumulative health record at the school, in the school folder maintained for each school, and on the contact record which was adopted system-wide. Thus, a mechanism for recording contacts with control children was provided.

The Study Sample

At the beginning of the 1970–1971 school year there were 349 children in the intervention schools who met the criteria for high absence, that is, who had absences of 14 or more days during the previous (1969–1970) school year. Of these pupils, 47 withdrew from school during 1970–1971 and were dropped from the study.

The 47 intervention pupils lost to the study during the school year had more days of absence in 1969–1970 than the rest of the intervention group (mean of 25.8 versus 21.6 days of absence); this difference was found to be statistically significant ($t = 2.30$ with p less than 0.05 for a two-tailed test). Loss rates differed little between schools of different socioeconomic levels and between grade levels (nonsignificant by chi-square analysis). Although the differences were not statistically significant, the dropout rates for white females (16.8 per cent) and white males (12.8 per cent) were higher than for nonwhite females (8.1 per cent) and nonwhite males (7.1 per cent). It is possible that these differences may have been related to the integration experience which took place during the study year. As compared to the original sample the final study sample was, due to losses, somewhat underrepresentative of

the higher absence pupils and of whites, although not to any great extent.

The original design of individual matching had to be modified somewhat because of the implementation of integration in the schools and the resulting transfers of large numbers of children. Of the 302 pairs of children remaining at the end of the study period, the majority of the intervention children ($N = 199$) were matched with a child from one of the two matched control schools as called for in the original design. In a second group ($N = 45$) the matches for the intervention children were selected from either of two control schools matched with the other intervention school within the same socioeconomic level. In the remaining group ($N = 58$) the matches for the intervention children were drawn from the eight control schools outside the socioeconomic level of the intervention school (Table 1).

The accuracy of the matching procedure in regard to days of absence can be assessed from Table 2, which shows that the difference in days of absence between the children in the intervention group and their matched controls was quite small.

Results

As previously mentioned, it was anticipated that by directing professional nursing service to children who experienced high absence levels during the 1969–1970 school year, it would be possible to decrease their health problems and thus their absences during the study year. The data in Table 3 indicate that between 1969–1970 and 1970–1971 the intervention group experienced a mean decline in absence of 7.08 days. The control group's mean decline was 5.10, resulting in a statistically significant mean difference of 1.98 between the intervention and control groups. In other words, pupils in the intervention group showed a decline in absences which averaged 2 days more than the reduction experienced by those in the control group, and this difference can be viewed as a nonchance occurrence. The decline in mean absence for the intervention group was 32.7 per cent while the decline was only 23.9 per cent for the matched controls, the difference between the groups being 8.8 per cent. When the decline is expressed in actual days there were 597 less days of absence

TABLE 1—Percentage Distribution of Intervention Children and Controls by Socioeconomic Level of School and Matching Status

| Socioeconomic Level of School | Pairs Matched on Socioeconomic Level of School | | Children Not Matched on Socioeconomic Level of School | | | |
|-------------------------------|--|-------|---|-------|---------|-------|
| | | | Intervention | | Control | |
| | No. | % | No. | % | No. | % |
| High | 93 | 38.1 | 19 | 32.8 | 10 | 17.2 |
| Middle | 87 | 35.7 | 33 | 56.9 | 8 | 13.8 |
| Low | 64 | 26.2 | 6 | 10.3 | 40 | 69.0 |
| Total | 244 | 100.0 | 58 | 100.0 | 58 | 100.0 |

TABLE 2—Means, Standard Deviations, Medians, and Modes for Days of Absence, 1969–1970* School Year, by Intervention Group and Matched Controls

| Days Absent 1969–1970 | Intervention Group (N = 302) | Control Group (N = 302) |
|-----------------------|------------------------------|-------------------------|
| Mean | 21.65 | 21.34 |
| Standard deviation | 8.14 | 7.53 |
| Median | 19.28 | 19.17 |
| Mode | 14.00 | 14.00 |

* This was the school year immediately prior to the initiation of the study.

TABLE 3—Change in Mean Days of Absence for Intervention Children and Matched Controls, 1969–1970 to 1970–1971

| Days of Absence | Intervention Group (N = 302) | Matched Controls (N = 302) | Mean Difference: Intervention and Control Groups |
|--|---------------------------------|-------------------------------|--|
| 1969–1970 | | | |
| Mean | 21.65 | 21.34 | 0.31 |
| Standard deviation | 8.14 | 7.53 | |
| 1970–1971 | | | |
| Mean | 14.57 | 16.24 | -1.67 |
| Standard deviation | 10.57 | 11.18 | |
| Change in days absent (1970–1971) to (1969–1970)* | | | |
| Mean | -7.08 | -5.10 | -1.98* |
| Standard deviation | 9.93 | 10.87 | |
| % change | 32.70 | 23.90 | 8.80 |

* *t* for difference of means, matched pairs = 2.53 with 301 df. *p* is less than 0.01, one-tailed test.

among the 302 intervention children during the study year than among their matched controls.

The difference in absence decline between the intervention and control groups exceeded the minimum level specified as worthwhile from a programmatic point of view. In the original estimate the control group was expected to have a natural decline of 30 per cent in days absent without intervention from one year to the next. It was decided before the study began that if the program effort and expense were to be worthwhile the intervention should bring about a 10 per cent greater relative reduction in absences among the experimental group than the control group or an absolute difference of 3 per cent ($0.30 \times 0.10 = 3$ per cent). The actual difference which occurred was 8.8 per cent or almost 3 times that expected. The results can therefore be considered meaningful from a practical point of view.

In an attempt to discover whether the intervention program was more successful for certain types of students, a series of individual *t*-tests (matched pairs) were done for each race/sex and each grade level. The null hypothesis tested was that within each subgroup no difference in absence decline would be found between the intervention and the control groups. The data in Table 4 show that statistically significant differences ($p < 0.05$) in decline of days of absence between the intervention and control groups were found in females and in third and fifth grade pupils (both sexes combined), indicating that these groups contributed most to the overall difference between the two groups. The next step in the analysis was to determine whether there were significant differences in the magnitude of the mean change scores (determined by subtracting the mean decline in absence for the control group from the mean decline for the intervention group). A series of one-way analyses of variance was done to assess differences by race/sex and grade level; no statistically significant differences were found (Table 4).

To summarize, it is clear that the absence decline experienced by the intervention group differed significantly

from that experienced by the control group. And, although the females and the third and fifth graders seemed to contribute most to the overall differences between the intervention and control groups, analyses of variance showed that the relative differentials in absence decline experienced by these groups were not sufficient to conclude that nonchance differences existed between them and the other subgroups. The data thus indicate that a real difference cannot be attributed to the effect of sex/race group or grade level.

Discussion and Implications

Data generated by the study indicate that the intervention group showed a difference in absence decline from that of the control group which was statistically significant and of some practical consequence. However, the question still remains whether the differences observed between the intervention and the control groups can be attributed to nursing service. Information available on nursing activities showed that there was a considerable difference in the amount of service effort expended on behalf of the intervention group as compared to the controls. For 99.7 per cent of the children in the intervention group (all but one) the nurse reported an attempt to make some type of assessment. These assessments led to additional interventions on behalf of about 32 per cent of the children. In contrast, only 3.9 per cent or 12 of the 302 children in the control group were even mentioned by name in any of the records associated with them.

Despite the clear difference between the nursing service provided to the two groups, associations between nursing service and the change in absence can only be viewed as suggestive, for two basic reasons. First, it is possible that the differential in absence decline experienced by the intervention group can be partially attributed to a Hawthorne effect. In other words, perhaps during the

TABLE 4—Means and Standard Deviations for Differences between Intervention and Control Group in Change in Days Absent, 1969–1970 to 1970–1971 by Race/Sex Group and Grade Level

| | Race/Sex Group | | | | Total |
|---------------------|----------------|--------------|---------------|-----------------|--------|
| | White Male | White Female | Nonwhite Male | Nonwhite Female | |
| Mean* | -0.813 | -2.706 | -0.385 | -4.882 | -1.980 |
| Standard deviation | 14.629 | 12.521 | 16.130 | 10.688 | 13.575 |
| No. of observations | 123 | 119 | 26 | 34 | 302 |

| | Grade | | | | Total |
|---------------------|--------|--------|--------|--------|--------|
| | 2 | 3 | 4 | 5 | |
| Mean† | -1.867 | -2.773 | 0.467 | -3.913 | -1.980 |
| Standard deviation | 15.482 | 13.709 | 12.929 | 11.362 | 13.575 |
| No. of observations | 83 | 75 | 75 | 69 | 302 |

* *t* values for difference of means, matched pairs: WF $p < 0.025$; NWF $p < 0.01$; total $p < 0.01$. Analysis of variance = *F* with 3,298 df = 1.055, nonsignificant.

† *t* values for difference of means, matched pairs: Grade 3 $p < 0.05$; Grade 5 $p < 0.005$; total $p < 0.01$. Analysis of variance = *F* with 3,298 df = 1.371, nonsignificant.

assessment of the child and his family the nurse called undue attention to the child's absence history and this and/or the nurse's interest in the child—rather than the resolution of any underlying health problem—was responsible for the absence reduction. Second, it is difficult to relate absence decline to actual nursing intervention because of: (1) inability to obtain systematic assessment data on each child and family, and (2) difficulty in determining the nature of the nursing service actually rendered.

A special record for reporting every contact made on behalf of a child was developed for use throughout the school system. However, because of a decision not to develop and use a common approach to family and child assessment, and because of a general lack of uniformity among the nurses in recording patterns, an audit of the records did not provide adequate reliable information on problems identified and strategies utilized by the nurses in problem resolution.

Despite inability to be certain about the role which provision of nursing service might have had in the absence reduction experienced by the intervention group, the study validated that with careful planning it is possible to incorporate a prevention-oriented service directed to a defined risk group into an on-going school health program. Further, the data suggest the need for additional study of the contribution which nursing service might make by focusing on vulnerable groups of children such as those defined as high risk due to past absence experience.

Recent data suggest that through the identification of high absence children within the schools it is not only possible to offer preventive services to these children but it may also be possible to locate families in the community who are in particular need of health service. In a cross-sectional survey Boardman⁶ identified two pools of

elementary school children: one group who had experienced 10 or more episodes of absence in two successive school years and one who had had three or fewer episodes in the same time period. From these groups 100 randomly selected families of children defined as high absence were matched (according to race, sex, grade, and school of the index child) with 100 families of low absence children. The data indicated that family members of the high absence children were reported to have almost twice as much chronic disease as family members of the low absence children.

The present study points up the need (1) to develop systematic and reliable approaches to assessing children and their families and (2) to document nursing action. Clearly, before it will be possible to understand the contribution which nursing may be able to make to children with a history of high absence, or to study the processes involved, it will be necessary to describe in a systematic way the child and his family in terms of health status and other characteristics, such as family and child attitudes toward school attendance, which may affect absence experience. Further, it will be necessary to conceptualize and specify the nature of the services provided by the nurse. And finally, in order to understand the processes involved it is essential that attempts be made to study the interaction between child and family characteristics, nursing actions, and change in absences which may be due to change in health status or behavior of the child and/or his family. It is encouraging to note that such work is proceeding.⁷

In Palm Beach County, following analysis of the data in 1971–1972, plans were made to reorganize the school health services in order to further explore the processes and interactions between the nursing services and the target populations. In 1973–1974, a public health nurse coordinator position was established to assist in planning,

assessing, and evaluating nursing intervention activities, with implementation in 1974-1975.

From the perspective of the service agency some of the concomitant benefits from the study are: (1) the methodology, using absence as an indicator, suggests a practical approach to identification of a high risk population; (2) the school health program can be planned to further explore emphasis on prevention through selected priorities rather than continuing to be crisis-oriented; and (3) efforts can be directed toward development of improved documentation of nursing intervention not only to provide an improved data base for evaluation but also to meet the current demand for accountability.

In addition to providing a meaningful experience in program evaluation for nursing staff within the health department, participation in the study has promoted more effective communication between the school system and the health department which share joint responsibility for the school health program.

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NAS/NRC NAMES BOARD ON MATERNAL, CHILD, AND FAMILY HEALTH RESEARCH

A newly organized Board on Maternal, Child, and Family Health Research has been named by the National Academy of Sciences to study the long term effects of developmental processes on the health of the people in the United States. The functions of the board will be to identify the health needs of young persons, viewing these persons as the potential parents of unborn generations; extract material on a continuing basis from research reports and national health statistics in order to identify health needs and suggest priorities for improving maternal, child, and family health; maintain broad surveillance of private and public policies and practices that influence health care and research and provide a forum for discussion and study of change; and help direct resources toward a coherent national effort on behalf of maternal, child, and family health.

The 24-member Board, through its members, consultants, and staff, will establish studies in the following areas:

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Artemis P. Simopoulos, MD, National Research Council, will serve as executive director and the following individuals have been named to membership in the multidisciplinary Board on Maternal, Child, and Family Health Research:

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