

Would relieving the nurse of certain duties by supplying clerical assistance give her more time for follow-up activities that would result in a larger number of children receiving health care? This study attempted to answer this question in terms of experimental and control schools. In general, the use of clerical personnel did not appear to make a significant difference, or, more hands do not necessarily do more work. Other factors are undoubtedly involved.

EFFECTIVENESS OF HEALTH OFFICE CLERKS IN FACILITATING HEALTH CARE FOR ELEMENTARY SCHOOL CHILDREN

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DURING the school year 1963-1964, the Los Angeles City School system was selected for a public health survey, "Medical Care of School Children: Factors Influencing Outcome of Referral from a School Health Program."¹ In this study, efforts were made to identify the factors that influenced referrals made for correction of defects found in school health examinations. It was found that children in low social rank areas were less likely to receive attention than were children in high social rank areas. Within low social rank areas, children were more likely to receive care if their parents "received more than one notification and were notified by more than one contact technique." Certain patterns of follow-up yielded a larger number of defects corrected than others. All effective referral patterns involved personal interaction between school personnel and parents.

Based upon earlier findings, schools for this study were selected predominantly from lower social rank areas since

the rate of health care in these areas was significantly lower. Nurses in experimental schools were assigned health office clerks in order to provide them with additional time for conducting more intensified follow-up programs involving direct personal contact with families whose children had school-detected defects. Questions such as the following were asked: What effect would added clerical service in the school health office have on the utilization of the nurses' time and skills in follow-up activities? Would children in experimental schools be more likely to receive care? Would more notification patterns involving personal contact be employed and would these patterns yield a greater number of defects corrected?

Methodology

I. Control-Experimental Schools

In this project, 22 elementary schools in the Elementary Area West of the Los Angeles City Schools were selected, with

Table 1—Experimental and control schools with matching factors

Experimental school	Matching factors			Control school	Matching factors		
	Pupil enrollment	Social rank	Nurse time*		Pupil enrollment	Social rank	Nurse time*
Broadway	998	5	5	Alta Loma	998	4	4.25
24th Street	1,397	4	5	Marvin	1,242	4	5
59th Street	998	4	4	36th Street	894	4	5
Westminster	1,100	5	5	Cienega	1,068	5	5
Walgrove	1,480	5	5	Sixth Avenue	1,260	4	5
Shenandoah	1,020	2	2.5	Nora Sterry	675	2	2.5
Westwood	597	2	2.5	Crescent Hgts.	653	2	2.5
Arlington Hgts.	1,060	4	2.5	Beethoven	861	5	2.5
Wilton Place	495	4	2.5	Roosevelt	606	5	2.5
42nd Street	671	4	2.5	Coliseum	570	4	2.5
39th Street	708	4	2.5	Virginia Road	852	4	2.5

* Stated in days. For example, if the nurse time is listed as 5 this means that the nurse spent five days per week or full time in the particular school.

a total school population of 20,203. Eleven experimental schools and 11 control schools were matched as nearly as possible. Criteria used for matching schools were: pupil enrollment, social rank, and nurse-time assigned to the school.

Pupil enrollment—This was one of the criteria used in matching schools in this study. For example, 24th Street School with a pupil enrollment of 1,397 was matched with Marvin Avenue whose enrollment was 1,242; variations ranged from 0-285 pupils. Fourteen of the schools in the study had enrollments of less than 1,000; the remaining eight had enrollments in excess of 1,000 pupils (Table 1).

Social rank—Eighteen of the schools selected for the study were in lower social ranks (IV and V), whereas four were in upper social ranks (II).^{*} Of the 22 elementary schools used in this study, 20 were part of the earlier study mentioned. Two schools, Cienega and Coliseum, were not. They were chosen

because they were in social ranks IV and V and compared favorably with experimental schools of the same social rank.

Based upon evidence presented in the earlier study, schools in social ranks IV and V were treated as a single sample. It may be noted from Table 1 that in two instances social rank IV schools have been matched with social rank V schools.

Nurse time—The third criterion used in matching schools was the amount of nurse time assigned to schools. Nurse time was assigned largely according to school enrollment. (A full-time nurse is generally assigned to a school with an enrollment in excess of 1,200. However, other variables are considered in the assignment process, such as socioeconomic status, mobility of the school population, and special programs in the school.)

Eight of the schools utilized the services of a full-time nurse, whereas 14 of the matched schools made use of the services of a school nurse half time or more. Part-time nurses were assigned to two schools participating in the study, as shown in Table 1. For example, Coliseum Street School was matched with 42nd Street School, each being assigned a half-time nurse; Cienega was matched

* In Marchia Meeker's study, "Background for Planning,"² all study areas within Los Angeles County were ranked on a scale of I to VI, social rank I being the highest social rank on the scale, and social rank VI being the lowest.

with Westminster, each having a full-time nurse.

II. *Health Office Clerks*

It was originally thought that we could recruit middle-aged women who had had experience working in community groups. Recruitment was more difficult than anticipated. We were unable to find applicants who lived in the area who were willing to accept positions in the project area. It became necessary to employ applicants from the central city or southeast areas of the city, educate them, and then assign them to schools in the project area. When replacements became necessary, this situation continued to prevail.

We employed eight individuals from the clerk-typist eligibility list. A careful screening interview preceded the selection of clerks, followed by a preservice training program for health office clerks. During the two-month period of preservice training, conducted in the central part of the city, an employment "bonus" was paid the trainees. Discontinuance of this added pay was upsetting to the clerical staff when they assumed their regular school assignments.

The preservice program did not stress clerical skills. It stressed orientation to the activities of the health office, and ways in which the clerk could assist the school nurse with filing, record-keeping, typing health forms and accident reports, maintaining the health office in an orderly manner, performing minor first-aid, and related duties outlined in a formal statement. The health office clerks were also alerted to relevant Board of Education rules and regulations.

An experienced school nurse was in charge of the preservice program, for the most part utilizing other members of the staff of the Health Services Branch to assist when indicated. It was her responsibility to coordinate the health office clerk program with the on-going program of the school nurse.

A summer school program was used as part of the clerk's inservice orientation experience. During the fourth week of the training program the clerks were placed with nurses in schools to gain some experience in an actual school setting. This gave trainees an opportunity to become familiar with similar duties in the regular elementary school health office. The afternoon periods were devoted to group discussion of these activities and to continuing presentations of the broader aspects of the regular school health program. Typical topics discussed were the activities of the school nurse, ways in which clerks could be of assistance, use of health records and the terminology commonly employed, the administrative pattern and lines of communication in the school district, the importance of cooperation between the health office personnel and school faculty, ways of working with parents and community agencies, and so forth. Role-playing of routine activities in a health office was attempted. Procedures were demonstrated and practiced for the care of minor first-aid, temperature-taking techniques, care of thermometers, and height-weight measuring and recording before pupil examinations. Field trips to both official and voluntary health agencies were arranged.

As the year progressed, bids were made for their services in the regular school program. This was attractive to the health office clerk who had only a one-year contract in the pilot program and was looking for more stability in a long-term position. Although assured and reassured that their status with the Board of Education was not jeopardized but rather enhanced because of the special experience gained in the study, most of these employees needed encouragement to persuade them to continue with the pilot program. Although the project called for eight health office clerks, in reality there were 11 employed. Five stayed for the entire year, two had six

months or more in the program, and four others served less than six months.

III. Instruments

The instruments used for data-gathering were (a) the pupil health record, (b) the physicians' tally sheet, and (c) the nurses' record book of follow-up activities. The pupil health record identified the health defect noted by the physician; the physicians' tally sheet identified the number of examinations done in each school; and the nurses' record book provided the measure of time spent in telephone calls and visitations.

IV. Sample

During the school year 1966-1967, school physicians performed 6,745 health examinations within the 22 schools participating in this study.* They discovered many children with defects. Of this number, 1,587 children were selected for our sample since parents of these children had received at least one notification indicating that professional care was needed. When a child had more than one defect, only the most urgent defect was studied. Urgency was based on the physician's rating of the defects on a scale of one (low) to four (high).

Only those dental defects found by school physicians were identified in this sample, and not the dental defects found by school dentists. This made the number of dental defects for which home notifications were sent somewhat smaller than would be expected.

V. Data Collection

Three nurses, the nurse coordinator for the project, and three health office

* In Los Angeles City Schools, pupils are examined on school admission (entrance to children's centers, preschool, kindergarten, or first-grade); they are reexamined generally in the fourth grade or upon special referral.

clerks were used to gather data after the close of the school term. Before they collected the data, an orientation program was required so that a uniform procedure would be followed. Data were gathered from the health records, the physicians' tally sheets, and the nurses' record books.

Results

Health Office Clerks and Child's Receipt of Care

The major hypothesis tested in this study was that a significantly greater proportion of the children who attended experimental schools would be likely to receive health care than would children who attended control schools. Experimental schools were defined as those schools to which health office clerks were assigned, whereas control schools were defined as those schools whose nurses were not provided with health office clerk assistance. It was assumed that allied assistance would increase the nurse's effectiveness as measured by the child's receipt of care following referral from a school health service program. However, the hypothesis was rejected. The finding was significant ($P < 0.05$) but in the opposite direction, that is, children in control schools were more likely to receive care. As shown in Table 2, 32 per cent of the children in experimental schools received attention as compared with 38 per cent of the children in control schools.

Why were the children in control schools more likely to receive care? One wondered if the pupil-nurse ratio was significantly different in control-experimental schools.† In exploring this possibility by means of chi-square it was found that no significant difference in the ratio existed within control-ex-

† The nurse-pupil ratio in experimental schools was 1:1,315, whereas, the ratio in control schools was 1:1,209.

perimental schools. Therefore the pupil-nurse ratio was eliminated as a possible explanation for the fact that children from control schools were more likely to receive professional care.

Likewise one wondered if the number of children examined by the physician and the number of health defects discovered by the physician were significantly different in control-experimental schools.* A chi-square analysis revealed a significant difference between control-experimental schools in the number of routine physical examinations performed by school physicians ($P < 0.001$) but no significant difference in the number of defects identified during these examinations. Therefore it can be concluded that more examinations were actually made in experimental schools, but no more than the expected number of defects were found in relation to these examinations. The unanswered question here is why were more examinations conducted in experimental schools? We know that physicians did not spend additional time in experimental schools. However, with assistance from health office clerks, nurses in ex-

perimental schools had more freedom on "doctor day" to select children for examinations and to work directly with school physicians without numerous interruptions.

Early in the study, nurses with health office clerks stated that they did not need full-time clerical assistance. At the culmination of the study, these same nurses voluntarily stated that they needed clerical assistance, but only on a limited basis, e.g., at the beginning of each new semester, on "doctor day," and when children received new classroom assignments. It became a weekly challenge for them to plan assignments for health office clerks on a full-time basis. These reports from nurses in experimental schools are corroborated by Tipple, in New York State. She also stated that nurses found the supervision of an assistant an exhausting challenge.

Although health office clerks were oriented to their new role, nurses were not oriented to their new role either as givers of direct service or as supervisors of indirect service. It may be too much to assume that nurses already have developed the kind of supervisory skills and abilities needed to utilize effectively the services of clerks. We know that school nurses have traditionally worked alone in their health offices. Actually, nurses in experimental schools may have lost valuable follow-up time because they

* Within control schools, physicians examined 2,785 children and found 640 defects, whereas within experimental schools physicians examined 3,960 children and found 947 defects. This information was obtained by Harold Kravitz, M.D., Physician Supervisor, Los Angeles City Schools.

Table 2—Utilization of health office clerks as related to child's receipt of care*

Variable	Cases receiving attention				Level of significance
	Experimental schools†		Control schools		
	%	No.	%	No.	
Health office clerks	32.0	303	38.3	245	$P < 0.05‡$

* The relationship was tested by means of a 2 x 2 chi-square analysis. The total sample consisted of 1,587 cases with 947 children in experimental schools and 640 children in control schools.

† Experimental schools are defined as those schools utilizing health office clerks.

‡ This finding is in the opposite direction from our prediction.

did not know how to utilize effectively the services of their health office clerks.

It should be emphasized that we did not attempt to compare control-experimental schools on the basis of *all* referral activities performed. Neither did we attempt to compare control-experimental schools in terms of the *total* spectrum of daily activities in which nurses and in which nurses and clerks usually participated, e.g., readmissions, pupil conferences, first-aid, classroom observations, and so on.

Child's Receipt of Care

The success of this experiment was evaluated in terms of the child's receipt of care following referral from school health examinations conducted by physicians during the 1966-1967 school year. According to this measure of evaluation, children in control schools were more likely to receive care than were children in experimental schools. This unexpected finding cannot be explained by nurse-pupil ratios in control-experimental schools or by the number of defects physicians discovered through physical examinations in these schools. Perhaps this finding is best explained by the greater proportion of physical examinations conducted by physicians in experimental schools and by the lack of in-service training for nurses in the appropriate utilization of health office clerks.

Utilization of the Optimal Referral Pattern

In an earlier study by Cauffman, et al.,³ referral patterns utilized by school personnel were identified through combinative processing. On the basis of an effectiveness rating formula, an optimal referral pattern was selected—one written notice from a physician and one telephone call from a nurse. This pattern provided two essential elements, namely, the utilization of more than one notification and the employment of more

than one contact technic. Inherent in this pattern was the opportunity for personal interaction. Specifically the optimal referral pattern for this study was defined as two notifications with two different contact technics. Assuming that schools with health office clerks would have time for more parental contacts involving personal interaction, it was hypothesized that health personnel in experimental schools would be more likely to utilize the optimal referral pattern. However it was found that personnel in the control schools were more likely to a significant degree to use the optimal referral pattern than were personnel in the experimental schools ($P < 0.001$). As stated earlier, children in control schools were more likely to obtain care. Therefore it is not surprising that the optimal referral pattern was used more frequently in control schools.

Nurse Time Spent in Personal Contacts With Families

It was assumed that the nurses with health office clerks would have more time to spend in telephone conversations with parents and more time to spend in visits with parents. Regression analysis revealed, however, that neither of these assumptions was true.

School nurses made 512 telephone calls to parents whose children were found to have health defects. In 83 per cent of these cases, calls were made to parents who had already received at least one notification from school personnel indicating that their child had a health problem.

The number of telephone calls was almost equally divided among control and experimental schools with 263 calls being made in experimental schools as compared with 249 calls in control schools. Forty-three per cent of the calls were made to parents who had children with medical defects, whereas 30 per cent of the calls were for visual defects and 27

Table 3—Nurse time spent on telephone contacts

Description of variable	Average deviation in minutes*	Level of significance
Experimental school	0.42	NS
Visual defect	-0.45	NS
Dental defect	-1.07	NS
Low urgency ratings, 1 or 2	-1.31	P<0.05
Notifications, 2 to 8	0.42	NS

* Deviation from mean of 9.66 minutes representing the time spent on the first notification for those pupils in control schools having a medical defect with a high urgency rating (3 or 4).

per cent for dental defects. Most calls, 70 per cent, were made to parents whose children had defects which were given high urgency ratings by the school physician. The length of telephone calls ranged from two to 35 minutes with the mode being five minutes.

As shown in Table 3, there was no significant difference in the average amount of time nurses spent in telephone conversations—9.7 minutes in control schools versus 10.1 minutes in experimental schools. Likewise the type of defect (visual or dental) and subsequent notifications made no significant deviation in the average time nurses spent in communicating with families by phone. However the urgency rating of the defect was significantly related to the average amount of time nurses spent on the telephone. When nurses discussed with parents defects which had low urgency ratings, they spent on an average of 8.4 minutes or 1.3 minutes less than when they discussed with parents defects which had high urgency ratings ($P<0.05$). Although a significant difference existed between the urgency rating of the defect and the time the nurse spent on the telephone, one cannot accurately predict

the amount of time the nurse will spend in telephone conversations from variables used in our multiple regression analysis ($R=0.136$, $F(5,506)=1.895$).

School nurses made 144 visitations; 35 per cent of these visitations were in experimental schools and 65 per cent were in control schools. The visitations ranged from three to 45 minutes in length with the mode being ten minutes.

Of the total number of visitations, 69 involved children with medical defects, 40 and 35 involved children with visual and dental defects respectively. School physicians had given high urgency ratings to 75 per cent of the defects and 83 per cent of the parents had received at least one notification from school personnel prior to their visitation with the nurse. As shown in Table 4, there was no significant difference in the average visitation time of nurses in control schools (16.6 minutes) and in the average visitation time of nurses in experimental schools (17.7 minutes). Likewise the number of notifications (two to five), type of defect (visual), and urgency ratings (low) made no significant difference in the average visitation time.

However the amount of time nurses spent in parent visitations deviated significantly for those children with dental

Table 4—Nurse time spent on visitations

Description of variable	Average deviation in minutes*	Level of significance
Experimental schools	1.09	NS
Visual defect	-1.72	NS
Dental defect	-5.94	P<0.01
Low urgency rating	-0.72	NS
Notification, 2 to 5	-0.81	NS

* Deviation from mean of 16.56 minutes representing the time spent on the first notification for those pupils in control schools having a medical defect with a high urgency rating.

defects. Again, as presented in Table 4, nurses spent an average of six minutes less in discussing children's dental defects with their parents than in discussing children's medical defects with their parents ($P < 0.01$). One can predict, somewhat better than chance ($P < 0.05$), the length of the visitation from our multiple regression analysis ($R = 0.301$, $F(5,138) = 2.751$). This is primarily due to the dental defect variable since none of the other variables deviated significantly from the mean value.

Time Lag Between Initial Referrals and Child's Receipt of Care

Within our total sample of 1,587 children, 35 per cent received care, whereas 65 per cent did not receive care. Specifically, in terms of those children who received care, it was hypothesized that the time lag (in days) between initial referrals and receipt of health care in the experimental schools would be less than the time lag between initial referrals and receipt of health care in control schools. However, consistent with earlier findings, this hypothesis also was rejected.

The number of days between initial referrals and receipt of care ranged from 0-215 days with the median being 47 days. As shown in Table 4, no significant deviation occurred in the average time lag between control-experimental schools—39.6 days for experimental schools as compared with 38.9 days for control schools—a nominal difference of less than one day. Similarly 11 additional variables produced no significant deviations. In contrast, five variables deviated significantly from the average time lag (see Table 5). These included the number of notifications (two or more); social rank (high); nursing time (2.5 days) and type of defect (dental and visual).

As one would anticipate, the average time lag between initial referrals and

receipt of care was greater for children whose parents received two or more notifications than for children whose parents received only one notification ($P < 0.01$). Likewise, children who lived in lower social rank areas were more likely to have a greater average time lag between referrals and care than were children who lived in upper social rank areas ($P < 0.01$). Children from lower social

Table 5—Time lag between initial notification and care

Description of variable	Average deviation in days*	Level of significance
Experimental school	0.68	NS
Female	-4.62	NS
Grade 0†	3.19	NS
1	-1.90	NS
2	-9.11	NS
3	4.26	NS
5	4.05	NS
6	-10.37	NS
School enrollment (>1,000)	-9.99	NS
Notifications, 2 to 8	35.63	$P < 0.01$
High social rank	-25.08	$P < 0.01$
Nurse, part-time (2.5 days per week)	13.50	$P < 0.05$
Nurse, part-time (4 or 4.25 days per week)	-3.12	NS
No dental survey during school year	-3.19	NS
Visual defect	12.15	$P < 0.05$
Dental defect	28.61	$P < 0.01$
Low urgency rating	-19.99	NS

* Deviation from a mean of 38.88 days representing the time lag between the first notification and receipt of care for those male children who had a medical defect with a high urgency rating and were in the fourth grade of a control school with an enrollment of less than 1,000; the school was in a low social rank area and children attending this school received the services of a nurse (full time) and participated in a dental survey conducted during the 1966-1967 school year.

† Grade 0 represents kindergarten, preschool, and children's center.

rank areas received care on an average of 38.9 days after initial referrals and children from upper social rank areas received care on an average of 13.8 days after initial referrals—a striking difference of 25.1 days in favor of children in upper social rank areas.

Children who attended schools with a nurse part-time (two and a half days per week) were more likely to have a greater average time lag between initial referrals and receipt of care than were children with a nurse full-time (five days per week) ($P < 0.05$). For children with the nurse serving only two and a half days per week, the average number of days between initial referrals and receipt of care was 52.4 days, whereas for children with the nurse serving five days per week, the average number of days between initial referrals and care was 38.9 days or 13.5 days less. Perhaps this finding has some implications for the assignment of school nurses, particularly when one considers the relationship between nurse availability and subsequent health care.

Children with visual defects and children with dental defects were more likely to have a greater average time lag between initial referrals and receipt of care than were children with medical defects. The average time lag for visual defects was 12.1 days greater than the average time lag for medical defects ($P < 0.05$) and the average time lag for dental defects was 28.6 days greater ($P < 0.01$). Undoubtedly, the extended time lag for dental defects can be explained to a great extent by the lack of adequate dental resources in our study areas as well as in the Greater Los Angeles Area.

From our multiple regression analysis one can predict, at the 0.01 level, the time lag between initial referrals and receipt of care ($R = 0.505$, $F(17,530) = 10.718$). This finding is attributed primarily to five variables (namely, two or more notifications, high social rank,

nursing service for two and a half days per week, visual defects, and dental defects) since each of these variables deviated significantly from the mean value.

Summary

This study was designed to show whether relieving the nurse of certain duties by supplying clerical assistance in the health office would allow her more time to participate in follow-up activities that would result in a greater proportion of children receiving health care.

Twenty-two schools in the west elementary area were selected, eleven experimental and eleven control. Experimental schools were matched with control schools in terms of pupil enrollment, social rank, and nurse-time assigned. Eight health office clerks were assigned full or part time, depending on enrollment in the experimental school, while the control schools had no clerical time assigned. An inservice program for the health office clerks was undertaken before school opened, in order to orient them in health office practices.

All hypotheses were supported but in the opposite direction from our predictions. Children in the control schools were more likely to receive care than were children in experimental schools. Personnel in control schools were more likely to use the optimal referral pattern (two notices with two different techniques) than in the experimental schools. Optimal referral patterns identified in a former study were observed to result in a higher number of defects corrected. These patterns again were validated in this paper as being significant contributors to success in correction of defects.

Nurses with health office clerks did not spend more time in telephone contacts with parents than did nurses without health office clerks. Time spent in nurse visitations was not significantly greater in experimental than in control schools. The time lag between initial referrals and receipt of care in the experi-

mental schools was not less than in control schools.

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The Two Crabs*

A mother crab and her child were once strolling along the beach when the mother complained, "Why in the world, child, do you not walk as the other creatures do—forward instead of backward?" Whereupon replied the little crab, "Mother dear, do but set the example yourself, and I will follow you."

King's Moral: Set a good example. This we try to do by not selling tobacco of any kind. . . . We don't feel that the sale of tobacco is desirable when so many of our customers are young people who, for health reasons, should not use it. Thus it is part of our national policy not to sell tobacco nor permit our employees to smoke while on duty.

(Announcement noted in King's Food Host USA)

* Condensed from Aesop's Fables.