

A RETROSPECTIVE STUDY OF THE RELATIONSHIP  
BETWEEN TEN HOUR SHIFTS AND  
NURSING EMPLOYEE ABSENTEEISM

by

Ellen Marie Burns, B.S.N., R.N.

A Thesis

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APPROVED:

[REDACTED]

Christine A. Tanner, Ph.D., Associate Professor, Advisor

[REDACTED]

Linda Kaeser, Ph.D., Associate Professor, Reader

[REDACTED]

Dorothy Elhart, M.S., Associate Professor, Reader

[REDACTED]

Ca [REDACTED] School of Nursing

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## Chapter I

### INTRODUCTION

Ten hour shifts were first used as a management tool for oil company truck drivers in 1940 when company management wished to shorten the work week, increase employee leisure time and maintain productivity (Hedges, 1971; Hellriegel, 1972). The use of ten hour shifts in businesses of all types began to gain popularity in the 1960s. By 1971 an estimated 370 companies, some of them hospitals, were using ten hour shifts (Hellriegel, 1972). However, hospitals and industrial settings, where ten hour shifts have been used primarily, are divergent with respect to goals, types of workers and operations (Fenstermacher, 1974). Fenstermacher (1974) suggested that hospital management adopted the use of the ten hour shift expecting that the benefits reported in industrial settings could be realized in the hospital setting and probably because it was a popular trend.

#### Statement of the Problem and Purpose of the Study

Ten hour shifts are represented in the literature as a management tool that can be used to obtain specific outcomes. Ten hour shifts have been credited with both increasing and decreasing employee absenteeism, turnover, personnel costs, tardiness, job satisfaction and productivity (Hedges, 1971;

Hellriegel, 1972; Martin, 1971; Poor, 1973).

It was thought that the use of ten hour shifts would promote cost reduction and control if employee absenteeism was reduced.

Literature on the use and impact of ten hour shifts has reported conflicting findings. Literature specific to the impact of ten hour shifts on nursing personnel is scarce. Further study on the use and effects of ten hour shifts is needed so that nursing managers will be able to make decisions regarding the use of this staffing pattern based on reliable research findings.

The purpose of this study was to examine the relationship between ten hour shifts and nursing employee absenteeism. The following conceptual framework will identify the postulated relationship between ten hour shifts, job satisfaction and absenteeism. The review of the literature presents findings about the impact of ten hour shifts on hospital nursing personnel.

#### Conceptual Framework

The conceptual framework for this study was as follows: Ten hour shifts are a work factor that may increase employee job satisfaction thereby reducing employee absenteeism. Therefore, when ten hour shifts are used for nursing personnel, absenteeism may decrease.

Ten hour shifts are one work factor that may influence

the work environment and other work factors in several ways. Shift overlapping may cause: change in the work group composition; alter work content, shift work patterns, task delivery and work pace. The longer work day may allow staff a greater opportunity to participate in inservice. The staggered arrival and departure of staff and longer periods of time off may alter patterns of communication. Additionally, the contact between staff and patients may be longer every day due to the increased time for contact. While specific literature on how ten hour shifts as a work factor may effect other work factors and therefore job satisfaction is non-existent, some literature is available that identifies the relationship between some specific work factors and job satisfaction.

#### The Relationship of Work Factors to Job Satisfaction

Job satisfaction has been partially attributed to the employees' perceptions of their work conditions (Chadwick-Jones, Brown & Nicholson, 1973; Clark & Redfern, 1978; Felt, 1982; and Muchinsky, 1977). Slavitt, Stamps, Piedmont & Haase (1978) found that the job factors: autonomy, job status, pay, task requirements, interaction, and organizational requirements were rated by nurses in the order listed, as most to least important to nurse job satisfaction levels. These findings hold implications for the use of ten hour shifts because ten hour shifts can influence task structure and staff interaction due to the longer time at work and



the shift overlap.

Benton and White (1972) reported that 565 nurses rated adequate personnel per shift, job security, physical working conditions and appropriateness of hours worked per shift as those factors most important to job satisfaction. Ten hour shifts could influence opinions regarding adequate personnel per shift and appropriateness of hours worked per day if there was more staff present on overlap time and if the ten hour day was scheduled to coincide with demands for task delivery.

Longest (1974) reported that nurses rated achievement as most highly related to job satisfaction, followed by: interpersonal relationships, the work itself, policy and administration, responsibility, supervision, salary, working conditions, and recognition and advancement.

Simon and Olson (1960) reported that a chance to do interesting work and good patient care were rated by nurses to be linked with job satisfaction. Additionally, interpersonal relationships were identified as a primary contributing factor to job satisfaction (Everly & Falcione, 1976).

The literature presented supports the premise that nurses do perceive job factors to be related to their levels of job satisfaction. Additionally, from the literature it could be postulated that while employees may not judge their level of job satisfaction to be directly related to identifiable work factors such as pay, less tangible work factors such as opportunity for choice of work content, work environment milieu, hours, or feelings of integration with the work

environment may affect employee job satisfaction levels. This premise holds implications for the use of ten hour shifts because ten hour shifts can influence any one of many work factors.

### The Relationship of Job Satisfaction to Absenteeism

A large volume of literature has been written explaining the relationship between job satisfaction and absenteeism. The literature presented here simply represents the current state of the literature.

The relationship between job satisfaction and employee absence has been identified as a negative correlation (Muchinsky, 1977). Lower levels of job satisfaction have been linked with higher levels of employee absence (Clark & Redfern, 1978; Waters & Roach, 1971, 1973).

Overall satisfaction with the job itself has been linked with decreased levels of absence (Newman, 1974; Waters & Roach, 1971, 1973; Muchinsky, 1977). Additionally, Waters and Roach (1971) linked "satisfaction with coworkers" to lowered levels of absence.

One study found in the literature reported findings that differed from previous literature. Nicholson, Brown and Chadwick-Jones (1976) reported that overall job satisfaction was not significantly related to absenteeism in 1222 blue collar workers. However, nonrandomized selection of subjects and sample characteristics may explain the differing results.

The literature presented, with the exception of one study, supports the conceptual framework of this study. Job factors have been attributed with influencing levels of job satisfaction. Employees with a high level of job satisfaction will evidence a low rate of absenteeism while employees with a low level of job satisfaction will evidence a higher rate of absenteeism. These findings are of significance for the use of ten hour shifts because ten hour shifts may influence the employee's perception of the overall work and levels of job satisfaction by influencing several work factors in an accumulative fashion. The postulated relationship between ten hour shifts, job satisfaction and absenteeism is expressed in Figure 1.

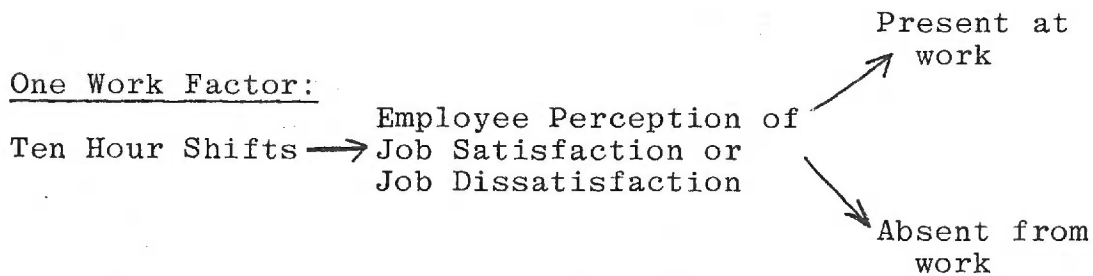


Figure 1: The Relationship Between Ten Hour Shifts, Job Satisfaction and Absenteeism

Ten hour shifts have been identified as one type of work factor that are a viable alternative to eight hour shifts. Ten hour shifts possibly may increase employee job satisfaction thereby decreasing absenteeism. The following literature review will examine prior research on the

relationship between ten hour shifts, employee job satisfaction and absenteeism.

### Review of the Literature

Bauer (1971), Price (1973) and Stevens (1972) anectdotally described the benefits and disadvantages of the ten hour work days for nursing staff. Cited benefits were: reduced absenteeism, turnover and overtime; reduced paper work for the head nurse; better completion of care plans; enthusiasm in the nursing staff, satisfied personnel; improved staff morale; decreased requests for days off; increased staff participation in educational inservice; better recruitment and better care for newly admitted patients due to the staff overlap. Cited disadvantages of ten hour days were: fatigue, less combined inservice for employees and staffing costs that either stayed the same or increased. Staff overlap time, scheduled to coincide with the high work demand times of the hospital, has also been cited as a useful benefit of ten hour shifts (Wittman & Johnson, 1973).

Colt and Corley (1974) reported on the results of a questionnaire that assessed the opinions of 301 nursing personnel employed in a 256 bed general hospital regarding ten hour shifts. The survey, while not rigorous, is one of the better attempts made by nurses to collect data on a large scale about the effect of ten hour shifts on nursing staff attitudes. A majority of the nursing staff thought ten hour

shifts were better than eight hour shifts overall, provided more time for family or home life and should be continued. A minority of the staff felt that ten hour days interfered with social life. The opinions of the staff were mixed regarding quality of patient care and fatigue on ten hour shifts.

Survey literature supports the idea that absenteeism is less or low on ten hour shifts while staff is satisfied. The findings have been attributed to the overlap and longer blocks of time off.

Kent (1972) reported from a survey of staff (4-40 plan) that on ten hour shifts a majority of staff thought that the work situation allowed them to give good patient care, work at their best level of ability and have sufficient time for discharge summaries, teaching plans and referrals. Fewer staff on ten hour shifts were fatigued and found it difficult to get motivated to come to work. Sick time and overtime, measured over a four-month time span were reduced for only RNs on ten hour shifts. LPN sick time and overtime did not significantly change on ten hour shifts. Quality of care measured by the Standard of Nursing Checklist was not significantly affected by ten hour shifts. Staff reported feeling more satisfied on ten hour shifts even though the work load was increased for each nurse.

Cleveland and Hutchins (1977, 1978) were the first researchers to report on the use of ten hour days (7-70 plan)

in a hospital that utilized the system from the day it opened. Employees worked seven ten hour shifts on consecutive days followed by one week off. The nursing administrators chose the 7-70 staffing pattern over other patterns in order to maximize: satisfaction of employees, communication, time off, continuity of care, patient follow through, staff consistency, patient teaching and inservice attendance.

No premeasures were available for comparative data analysis, because the hospital was newly opened, but the authors reported on data they collected in the first year of operation. The hospital averaged fewer sick days and lower turnover than the national average in the first year of operation. It is uncertain as to whether the findings in this study could be attributed to ten hour shifts or to multiple other factors in the institution which might have influenced absenteeism and turnover. However, it appeared that rates of absenteeism were low while staff satisfaction with the staffing pattern was high.

Sellars (1973) examined the influence of ten hour shifts (4-40 schedule) on regular hours worked, overtime, absenteeism, holiday and vacation time used on a surgical unit with two other units remaining on eight hour days as controls. These results differ from those of Kent (1972). Significant results on ten hour shifts were as follows: RN regular work hours were reduced; LPN overtime and absenteeism were reduced; aides had less overtime and regular work hours. No other

significant data were noted. Data may not be meaningful because staff were floated on and off the study unit during the experiment creating problems with statistical analysis and interpretation of data. Additionally, the control and experimental groups were not matched or comparable in any way. These confounding effects may explain why Sellars (1973) found that overtime and absence were not reduced while Kent (1972) found that these things were reduced for RNs only on ten hour shifts. Additionally, Sellars (1973) found LPNs to have reduced overtime and absence while Kent (1972) did not find LPN data to be significant.

Pierce, Hoffman and Pellitier (1974) conducted a study assessing the impact of ten hour shifts on nursing staff sicktime and overtime in an institution for the mentally retarded. These researchers improved over previously utilized research methods by using control groups that were more equitable than previous researchers and measuring data over a two-year period. Two nursing units were designated as experimental units and two nursing units were used as controls. The researchers compared sicktime and overtime data from a one year time period before and a one year time period after the change to ten hour shifts. The experimental units used significantly less sicktime and overtime than the control units after ten hour shifts began. However, the experimental groups used more sick days on ten hour shifts than when they were on eight hour shifts.

There are several variables that may have confounded the results of this study. A major reorganization of the nursing units occurred at the same time ten hour shifts began because nurses were allowed to choose whether or not they wished to participate in the study. Therefore, the results may have been the result of new staff with favorable attitudes, and not the ten hour days. Additionally, mortality of subjects was not addressed in the study. Those with high overtime and absence may have quit, thus confounding the results. In this study, one cannot be sure that the experimental and control groups are comparable. Therefore, the results may have been different had other units been used as controls.

Shaw (1978) reported a decrease in overtime on a 48 bed medical/surgical unit utilizing ten hour shifts. This finding supported findings of Kent (1972) and Pierce, Hoffman and Pelletier (1974). Quality of care, absenteeism, overtime and job satisfaction were monitored for change on ten hour shifts on one unit. Overtime decreased significantly for the experimental unit on ten hour shifts. No significant findings were reported for other variables. One possible explanation for no decrease in absenteeism on the experimental unit is that the absence rate had been only 4% on eight hour shifts, restricting the reduction that could occur. This study had the same problems with confounding variables encountered by previous researchers who have used nonrandomized groups in their studies.



### Summary of Ten Hour Shift Literature

Literature reporting on the influence of ten hour shifts for nursing personnel is generally anecdotal, scarce and not reliable due to poor methods. Attempts have been made by researchers to study and report on the impact of ten hour shifts for nursing personnel.

Staff absenteeism on ten hour shifts was found to be low or decreased by Cleveland and Hutchins (1978), Kent (1972) for RNs only, and Sellars (1973) for LPNs only. Absence was found to be more for the unit when the group was used as its own control and yet less than the control group on ten hour shifts (Pierce, Hoffman & Pellitier, 1974). Shaw (1978) noted no change in staff absence rates on ten hour shifts.

Staff overtime on ten hour shifts was found to be decreased by Kent (1972) for RNs only, Pierce, Hoffman and Pellitier (1974), Sellars (1973) for LPNs only and Shaw (1978). Kent (1972) noted no change in LPN overtime and Sellars (1973) noted no change in RN overtime on ten hour shifts.

Job satisfaction on ten hour shifts was noted to be increased by Kent (1972). No change in job satisfaction was noted by Shaw (1978). Cleveland and Hutchins (1977, 1978) noted their staff reported to be satisfied on ten hour shifts.

Quality of care was reportedly not influenced on ten hour shifts ( Kent, 1972; and Shaw, 1978). One additional finding on ten hour shifts reported by Sellars (1973) was that work hours were reduced on ten hour shifts for RNs while no change was noted for LPNs.

Current literature only begins to hint at the impact of ten hour shifts. Additionally, the relationship between ten hour shifts, job satisfaction and absence is vague. Results of studies have been confounded by problems with inequitable control groups, subject mortality, data collection, history, staff mix and group instability. Future study on the effects of ten hour shifts, addressing the previous drawbacks in methods, would enhance the current body of literature available on ten hour shifts.

#### Thesis Assumptions

The following assumptions for this study are implicit in the conceptual framework:

1. Ten hour shifts are representative of work factors which may influence the employees perception of job satisfaction.
2. Absenteeism is a proxy measure for job satisfaction.

#### Hypothesis

This study is designed to test the following hypothesis:  
Nursing staff working ten hour shifts will have a lower rate of absenteeism than nursing staff working eight

hour shifts when controls for mortality, group instability and RN percentage are utilized.

## Chapter II

### METHODS

In this chapter, design, setting, subjects, method of data collection, measures of the dependent variable, measures of the independent and control variables, limitations of the study, power and analysis of data are described.

#### Design

A retrospective time series design was utilized in order to study absence rates of nursing staff subjects who worked eight and ten hour shifts on a surgical unit in a metropolitan hospital and teacher center. Payroll records were audited for a 25 month period to accumulate absence data.

#### Setting and Sample

The hospital used for study had 424 beds. The actual number of nursing staff on the 32 bed study unit varied monthly depending on hires and terminations. The full time equivalents (FTE's) allotted by administration for nursing staff on the unit consisted of 17 FTE registered nurses, 15.4 FTE licensed practical nurses and 5 FTE nursing aides. Ninety-seven percent of the nursing subjects included in the study were female and three percent of the sample were male. Nursing

staff on the study unit provided preoperative and post-operative care to patients.

The nursing unit and subjects used in the study were an accessible sample. They were chosen for study because complete data were available via payroll records and all nursing staff were expected to change to ten hour shifts. The nursing staff had requested a trial of ten hour shifts. Subjects were defined as either an RN, LPN or aide who were working on the study unit in May of 1977. Although all nursing staff were expected to change to ten hour shifts, this was not the case. Based on data collected from payroll records, categories of subjects were identified. Subjects were classified in groups according to whether they had complete data or incomplete data for 25 months. Those with complete data were included in category I. Those with incomplete data were included in category II. Subscripts for each category identified the type of shifts worked after the change to ten hour shifts occurred, with subscript a representing ten hour shifts, subscript b representing eight hour shifts, subscript c representing combined eight and ten hour shifts and subscript d representing no identifiable schedule (Table 1).

#### Method of Data Collection

Data needed for the study was collected from existing payroll records dated May, 1977 through May, 1979, a time

Table 1  
Subject Groupings

Group Identification Number	Number of Subjects	Data Characteristics	Work Shift After the Change
I <sub>a</sub>	9	25 months of data	Ten hour shifts
I <sub>b</sub>	6	25 months of data	Eight hour shifts
I <sub>c</sub>	7	25 months of data	Eight and ten hour shifts
II <sub>a</sub>	9	Less than 25 months of data	Ten hour shifts
II <sub>b</sub>	7	Less than 25 months of data	Eight hour shifts
II <sub>c</sub>	10	Less than 25 months of data	Eight and ten hour shifts
II <sub>d</sub>	13	Less than 25 months of data	No identifiable work schedule

period of one year prior and one year after the institution of ten hour shifts on the study unit. Data was collected monthly, including: scheduled hours, sick hours, other absent hours, hire date, termination date, FTE's and employee classification (RN, LPN, aide). To insure confidentiality and anonymity of subjects, a code number was assigned to each employee's data.

#### Measures of the Dependent Variables

Rates of absenteeism were calculated bi-monthly for each subject and expressed as a percentage using the following formula:

$$\frac{\text{monthly total of the individual's sick hours}}{\text{monthly total of the individual's scheduled hours}} .$$

Rates of absenteeism were calculated bimonthly on each subject for a period of twelve months on eight hour shifts and 13 months on ten hour shifts.

#### Measures of the Independent and Control Variables

Data identifying whether the employee worked eight or ten hour shifts, was collected by identifying the pattern of work schedule for each subject from payroll records. All employees were working eight hour shifts for the first 12 months of the study. Employees worked a variety of work schedules after the change to ten hour shifts as previously identified in Table 1. The independent variable, work schedule, was not manipulated by the researcher. The change from eight to ten hour shifts was an event that occurred on the study unit.

Data for hires, terminations and FTE's were collected from payroll records by counting the actual bimonthly occurrences of these events. Data for RN percentage was collected from payroll records by counting the actual number of RNs, total staff and expressing this figure as a bimonthly percentage of RNs on the unit using the following formula:

$$\frac{\text{total number of RNs employed on the study unit}}{\text{total number of staff employed on the study unit}}$$

#### Limitations of the Study

Several threats to internal validity were relevant to this study. Effects of history, mortality, maturation,

and selection all deserved particular attention with respect to this study.

Threats to internal validity due to the effects of history were partially controlled for by measuring over a period of time. Problems due to the skewing of data that might have occurred if a measurement had been taken at only one point in time were addressed by measuring data monthly for a period of 12 months before and 13 months after ten hour shifts were instituted. The measurement periods were seasonally comparable. With the use of a time series design the researcher controlled for seasonal fluctuations in patient acuity, patient census, weather, RN/LPN ratio and/or other changes occurring on the study unit during the time of the study that may have in some way affected the absence rates.

A new head nurse came to the unit during the study. This event was accounted for by comparing her entrance graphically in relationship to absence rates. It must be noted here that other unknown effects of history may have eluded the investigator.

The effects of mortality were controlled for by identifying those members who did drop out of the study and analyzing their data separately.

The control group and experimental group utilized in this study were not the same group of subjects due to hirings and terminations. Thus, the groups before and



after may not have responded in the same manner to stimuli on the nursing unit confounding the realized effect of ten hour shifts.

There were no data available from this study to support the premise that the nursing unit and staff are truly representative of the hospital and nursing world at large. Although nursing service personnel considered the study unit to be a typical nursing unit, any generalizations of the findings must be made with caution.

In one portion of this study the sample size referred to time. The longer the period of time over which data were collected, the more likely it was that the data accurately reflected the effects of change and were not spurious. Data for this study were gathered for a time period of one year previous to ten hour shifts and one year after the institution of ten hour shifts. The time span was sufficient for detecting the "norm," relating to the change and for comparison to outcomes realized from the change.

#### Analysis of Data

The hypothesis was evaluated by using three major analyses. They were used because of the varied subject groupings found during data collection. The first analysis consisted of two t-tests. In the first t-test twelve months of absence data before the change were compared

a one tailed t-test ( $\alpha = .05$ ) for correlated measures. Those subjects missing all pre or post change data were eliminated from the analysis.

A third analysis used only descriptive statistics to further evaluate the ten hour shift. Bimonthly mean absence rates for a 25 month period were calculated and graphed for subjects in all groups with available data in order to observe the pattern of absence for the sample. Further analysis comparing bimonthly absence rates for subjects in groups Ia, b and c versus subjects in group IIa, b, c and d was carried out in order to determine if bimonthly mean absence rates for the groups differed. Category II subjects had all of the group instability and mortality while category I subjects had none of these two factors present. Additional analysis was carried out by identifying and plotting total bimonthly subject hires and terminations in order to identify if any possible patterns in these variables compared with any interesting findings in subject bimonthly absence data.

A fourth analysis was used to determine if RN subjects had absence rates that were different from LPN/aide subjects. It was assumed that this comparison would assist in the interpretation of data. All available monthly absence data for the RN groups were compared to all available LPN/aide absence data via a two tailed t-test for independent measures ( $\alpha = .05$ ). Three subjects who changed

their professional status during the course of the study were excluded from this analysis.

## Chapter III

### RESULTS

In this study the payroll records of 61 subjects were analyzed in order to determine if absenteeism decreased for subjects who changed their work schedules from eight hour to ten hour shifts. The hypothesis was tested via three major analyses and one control analysis.

#### Absence Rate Changes Pre-Post Change to Ten Hour Shifts

The first t-test in this analysis was done in order to determine if nine subjects in group Ia who had complete data for 12 months before the change and 13 months after the change to ten hour shifts demonstrated a significant decrease in absence rates. It was hypothesized that subjects would demonstrate lower absence rates after the change to ten hour shifts.

The mean absence rate for the nine subjects in group Ia on eight hour shifts (pre-data) equalled 4.2% with a standard deviation of 1.8%. On ten hour shifts (post-data) subjects in group Ia demonstrated a mean absence rate of 4.0% with a standard deviation of 2.1%. Mean absence rates for group Ia subjects were not significantly decreased on ten hour shifts when tested via a one tailed t-test for

correlated measures ( $\alpha = .05$ ) as depicted in Table 2.

The hypothesis was rejected.

Table 2  
Comparison of Mean Absence Rates for Nine  
Subjects in Group Ia With Complete Data  
Pre and Post Change to Ten Hour Shifts

	N	Mean Absence Rate	Standard Devia- tion	Degrees of Freedom	T-test Value	Proba- bility
Group Ia Pre Data (Eight Hour Shifts)	9	.042	.018			
				8	.36	NS
Group Ia Post Data (Ten Hour Shifts)	9	.040	.021			

The second t-test in the first analysis was performed in order to determine if a difference in absence rates on ten hour shifts was the result of the ten hour shift or due to the effect of subject's choice of work schedule. This analysis would have been helpful in analysis of data if a change in absence rates had been evident in group Ia. Without this second analysis, the researcher would have been unable to sort out whether a change was due to the ten hour shift or choice of work schedule. By comparing the pre-post difference in absence rates for those who worked

only ten hour shifts with those who worked either an eight or a combination of eight and ten hour shifts the researcher could have been more certain of results. Mean difference scores were obtained for group Ia and group Ib and c combined by subtracting thirteen months of post change data from twelve months of pre change data for each subject and calculating the mean for each subgroup (a, b and c). Group Ia subjects worked only ten hour shifts while groups Ib and c subjects worked a combination of eight and ten hour shifts after the change. A one tailed t-test ( $\alpha = .05$ ) for independent measures indicated no significant difference (Table 3).

Table 3  
Comparison of Difference Scores for Subjects in  
Group Ia and Group Ib and c Combined

	N	Mean of the Difference Scores	Standard Devia- tion	Degrees of Freedom	Value of T	Proba- bility
Group Ia (Ten Hour Shifts)	9	.002	.02			
				20	.27	NS
Group Ib and c Combined (Eight and Combined Eight and Ten Hour Shifts)	13	.007	.03			

Overall Pre-Post Change in Absence Rates

This analysis was conducted in order to determine if there was a significant decrease in absence rates due to the change itself for 39 subjects in groups Ia, b, c, and groups IIa, b and c. after they changed from eight to ten hour shifts. Twenty-two subjects who were missing all pre or all post data were excluded from the analysis.

The mean absence rate for subjects for twelve months on eight hour shifts was 5.1% with a standard deviation of 2.6%. After the unit schedule changed to ten hour shifts the mean absence rate on thirteen months of data for the group was 4.6% with a standard deviation of 2.2%. A one tailed t-test ( $\alpha = .05$ ) for correlated measures was performed. No significant decrease in absence rates was noted on ten hour shifts (Table 4).

Table 4

Comparison of Mean Absence Rates for 39 Subjects  
Pre and Post Change to Ten Hour Shifts

	N	Mean Absence Rates	Standard Devia- tion	Degrees of Freedom	Value of T	Proba- bility
Pre Data (Eight Hour Shifts)	39	.051	.026			
Post Data (Ten Hour Shifts)	39	.046	.022	38	.5	NS

### Bimonthly Fluctuations in Absence Rates

This analysis was conducted in order to identify and graph the bimonthly pattern of mean absence rates and standard deviations for all subjects with available data. The bimonthly mean absence rates for all subjects ranged from 3.2% with a standard deviation of 4.6% in July, 1978 to 6.9% with a standard deviation of 10.3% in May, 1977 as shown in Figure 2. It should be noted that the fluctuations in mean absence rates between the bimonthly intervals did not exceed the standard deviation around the mean absence rates for any given month.

Figure 3 demonstrates the bimonthly absence rates for subjects in groups Ia, b and c and groups IIa, b, c and d. Subjects in groups IIa, b, c and d had group instability and subject mortality while subjects in groups Ia, b, and c did not experience these. Subjects in Groups Ia, b and c had mean absence rates that ranged from 2.5% with a standard deviation of 3.2% in May, 1978 to 6.5% with a standard deviation of 6.5% in January, 1978. Subjects in groups IIa, b, c, and d had mean absence rates that ranged from 2.7% with a standard deviation of 4.0% in July, 1978 to 8.3% with a standard deviation of 13.3% in May, 1977. Bimonthly mean absence rates did not vary to any extent from month to month for subjects in Groups Ia, b, c and Groups IIa, b, c and d as depicted in Figure 3.



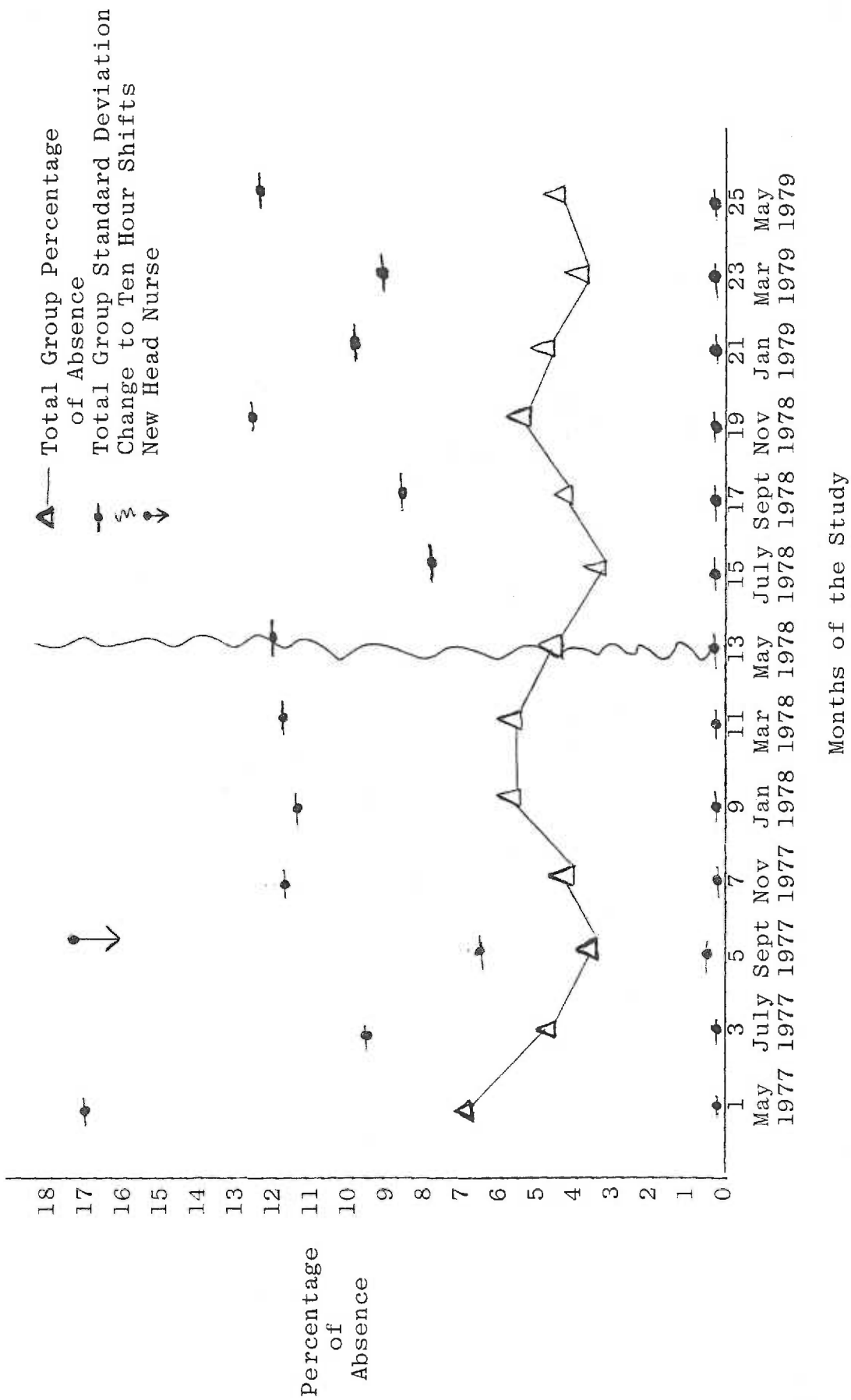


Figure 2. Bimonthly Percentage of Absence with Standard Deviation for all Subjects With Data

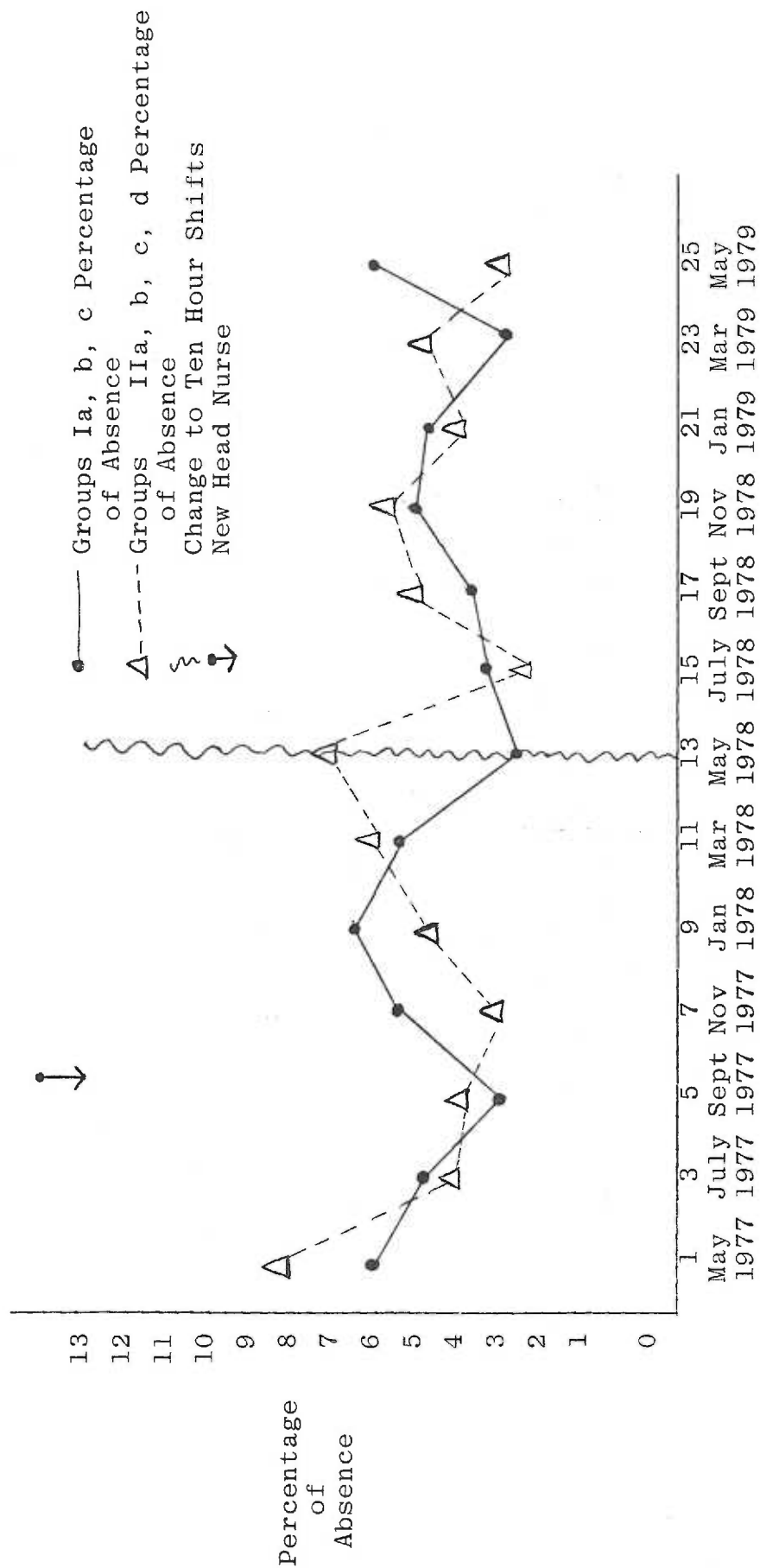


Figure 3. Bi-Monthly Percentages of Absence for Groups Ia, b, c, and Groups IIa, b, c and d

Finally, analysis was carried out in order to examine the bimonthly pattern of hires (group instability) and monthly terminations (subject mortality) in order to determine if a pattern in these variables could explain patterns in bimonthly absence percentages. Total bimonthly hires ranged from zero to three and total bimonthly terminations ranged from zero to two as demonstrated in Figure 4. No significant patterns between hires, terminations and bimonthly mean absence rates for the subjects were identified.

#### RN-LPN/Aide Absence Comparison

This control analysis was performed in order to determine if registered nurses had absence rates that were significantly different from licensed practical nurses and aides. The results of this analysis were compared to patterns in bimonthly subject absence rates. The twenty-five month mean absence rate for twenty-two registered nurses was 4.5% with a standard deviation of 2.2%. The 25 month mean absence rate for 11 licensed practical nurses and 4 aides was 5.2% with a standard deviation of 1.9%. A two tailed t-test for independent measures revealed no significant difference in RN and LPN/aide mean absence rates as shown in Table 5.

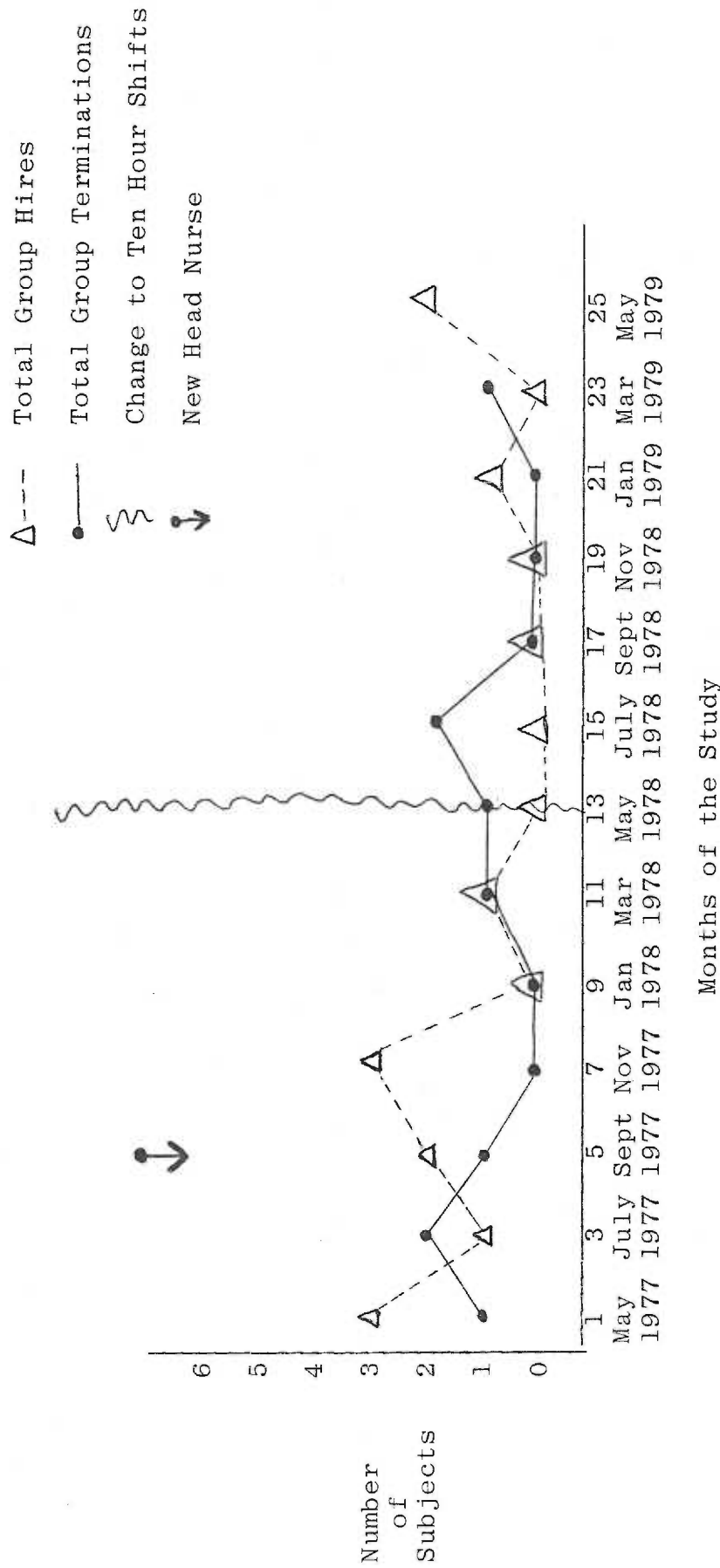


Figure 4. Bimonthly Total Group Hires and Terminations

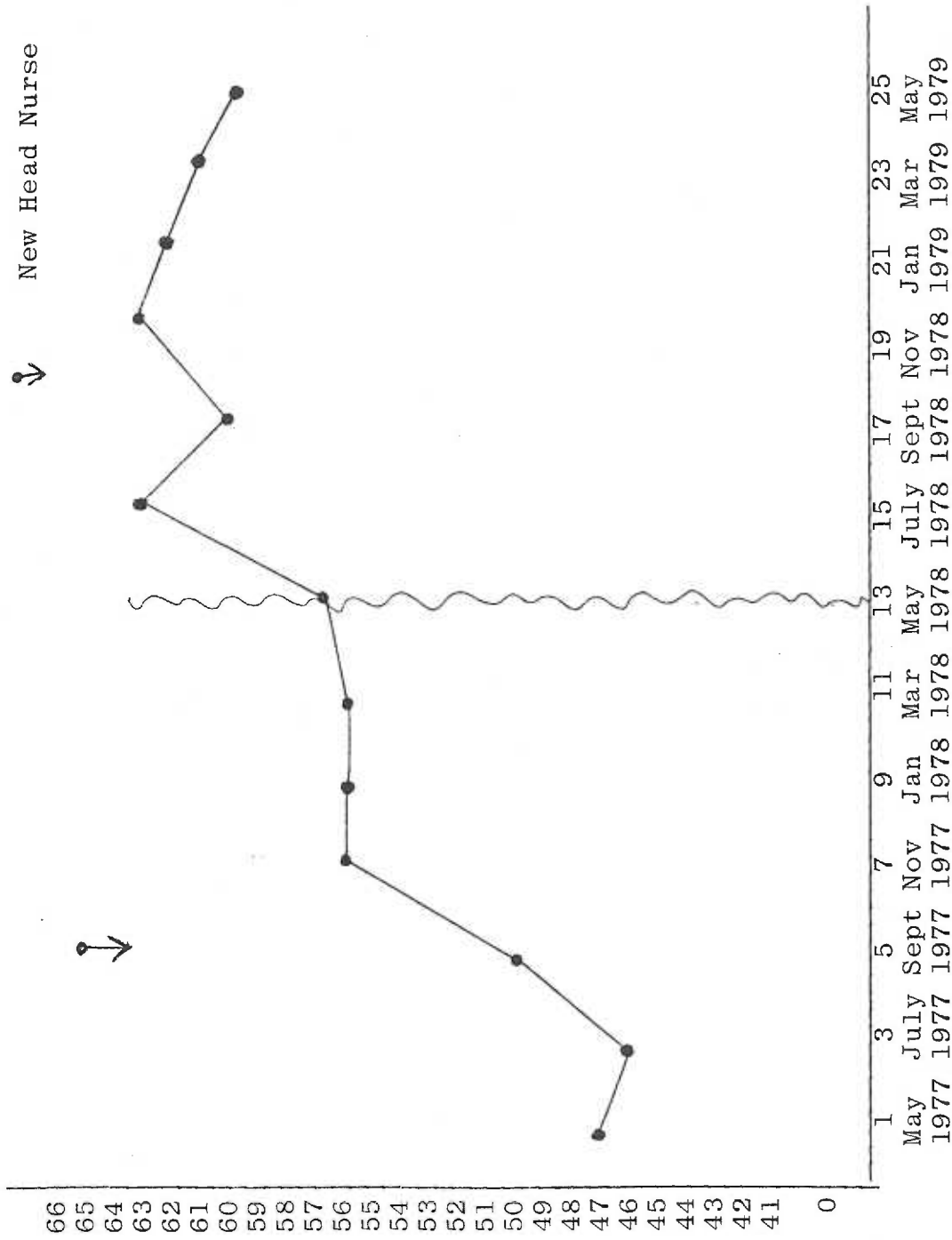
Table 5  
 Comparison of RN and LPN/Aide Mean Absence Rates  
 For 25 Months of Data

	N	Mean Absence Rates	Standard Devia- tion	Degrees of Freedom	Value of T	Proba- bility
RNs	22	.045	.022			
				35	.5	NS
LPN/Aides	15	.052	.019			

Further analysis of RN, LPN/aide data was done by determining the bimonthly percentage of staff who were RNs. The bimonthly percentage of RN staff on the unit increased from 46% for July, 1977 to 63% for July and November, 1978. The RN percentage increased during the study period as shown in Figure 5.

● — % of Staff Who Were RNs  
 ~ Change to Ten Hour Shifts  
 ↓ New Head Nurse

Percentage  
 of Staff  
 Who Were  
 RNs



Months of the Study

Figure 5. Bimonthly Percentage of Staff Who Were RNs

## Chapter IV

### DISCUSSION

The interpretation of this study's findings is presented in relationship to the following: 1) current theory as presented in the literature review, and 2) methodological considerations and limitations.

#### Theoretical Considerations

The hypothesis for this study was rejected. Absence rates did not significantly decrease when nursing staff changed from eight to ten hour shifts.

In the majority of the literature presented, ten hour shifts have generally been credited with reducing absence (Cleveland & Hutchins, 1978; Kent, 1972; Sellars, 1973; and Pierce, Hoffman & Pellitier, 1974). However, in one study absence rates were not found to be reduced on ten hour shifts (Shaw, 1978). This study also found absence rates did not decrease on ten hour shifts. Several possible explanations exist for why this study did not support the findings in the majority of the literature on ten hour shifts. Aside from methodological considerations several theoretical explanations exist.

It is possible that work factors (of which ten hour

shifts are one) may not be related to job satisfaction at all. Ten hour shifts may not have the capacity to decrease absenteeism. The findings of this study corroborate those of Nicholson, Brown and Chadwick-Jones (1976) when they reported that job factors, personal employee factors and overall job satisfaction were not significantly related to absenteeism. Other research has demonstrated that while specific individual job factors were not related to less absenteeism, the individual's perception of their overall job satisfaction was significantly related to less absence (Waters & Roach, 1971). Therefore, in this study it is possible that while employees on ten hour shifts may have been satisfied with this individual work factor, overall job satisfaction, based on a combination of several work factors, may have been low, thereby confounding the ability of ten hour shifts to affect a change in absenteeism.

Ten hour shifts may influence other work factors. The work schedule allows more time for staff contact, patient contact and work group interaction. If staff were dissatisfied with the interactions that are now longer each day, job satisfaction could be low and absence might not decrease. Waters and Roach (1971, 1973) support this line of reasoning with study findings demonstrating that employee satisfaction with co-workers was linked with less absenteeism.

Ten hour shifts influence many other facets of the overall job. Work pattern and content are shifted. Task



delivery, work pace, work group composition, fatigue and communication patterns are altered. While individual work factors may not be powerful enough by themselves to influence job satisfaction and thus absenteeism, the accumulative impact of several work factors upon job satisfaction has been supported (Newman, 1974; Waters & Roach, 1971, 1973). If the nursing staff in this study did not perceive the overall impact of ten hour shifts as positive, absence rates may not have changed as was true in this study. In support of this reasoning are findings by Colt and Corley (1974) who reported that nurses experienced more fatigue and mixed opinions about the impact of ten hour shifts.

Additionally, it must be mentioned that ten hour shifts may influence job satisfaction positively and decrease absenteeism as was predicted in this study, but given the small sample size and other confounding methodological problems this relationship was not demonstrated.

#### Methodological Considerations and Limitations

Characteristics of the sample itself may have confounded study results. Subject mortality was high. After 25 months of study only 9 of 61 original subjects had complete data and stayed on ten hour shifts. Study results are suspect due to the small sample size and should not be generalized to the nursing population at large. While some

subject mortality may be attributed to payroll procedures for holidays, other mortality may have been subject choice which is interesting because they petitioned to try the schedule in the first place.

Another characteristic of this sample may explain why absence was not found to be decreased on ten hour shifts. The subject absence rate in this study was low. Absence rates on eight hour shifts ranged from 3.7% to 6.9%. An absence rate of 3% has been considered a reasonable level with 2% being about as low as is possible (Hedges, 1977). It may have been that further reduction of an already low absence rate was not possible, thereby confounding the ability of ten hour shifts to cause a reduction in absence.

Further explanation for not finding reduced absence rates on ten hour shifts may be attributed to the effects of history. The researcher could not be sure that major events did not occur on the study unit. If unknown changes did occur, they may have impacted nursing staff absence rates in some unknown way confounding the ability of ten hour shifts to reduce absence. A new head nurse did come to the unit in September, 1977. However, no significant changes in the pattern of absence were noted on the study unit after the new head nurse came to the unit.

Group instability and a change in the percentage of the staff who were RNs may have in some way confounded the ability of ten hour shifts to decrease absence rates.

Unit hires for the length of the study ranged from 0-3/month. Unit terminations ranged from 0-2. (The subject group gained and/or lost members each month.) The RN percentage of staff in the first month of the study was 47%. In the last month of the study the amount of staff who were RNs equalled 60%. One might speculate that change in staff composition may have confounded the potential of ten hour shifts to decrease absence rates. This postulation is supported by previous study findings. Kent (1972) found absence on ten hour shifts to be reduced for RNs only while Sellars (1973) found absence to be reduced for LPNs only. Because the LPN population in this study decreased on ten hour shifts, while the RN population increased, the impact of ten hour shifts on absence rates possibly may have been confounded in some unknown way. However because there were no differences between RN and LPN/aide absence rates in this study, the change in composition probably had no effect on the results.

An additional characteristic of this sample must be taken into consideration when considering the results. Some of the nursing staff on the unit worked ten hour shifts while others worked eight hour shifts. It is possible that some interaction of this combined staffing pattern caused staff to not perceive their jobs as satisfying. Thus, absenteeism might not have been decreased.

## Chapter V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

Ten hour shifts have been used with increasing frequency in the hospital setting by nursing managers who are responsible for the management of staff and work conditions in a cost effective manner. Ten hour shifts have been credited with increasing employee job satisfaction and decreasing absenteeism. Literature suggests that the impact of ten hour shifts is related to the probability that this pattern of scheduling is a work factor that impacts and causes changes in other work factors such as staff contact time, fatigue levels, patient contact, work content, pace and other factors.

This study was undertaken in order to further the body of literature available on the use and influence of ten hour shifts. The additional information gained from this study will add to the body of knowledge available for use by nurse managers who are making decisions concerning the use of ten hour shifts. One hypothesis was tested. It was hypothesized that nursing staff on ten hour shifts would exhibit lower rates of absenteeism than nurses on eight hour shifts.

The findings of this study indicated that no significant decrease in absence rates occurred on ten hour shifts. The findings of this study differed from the majority of the literature available on this topic. It is possible that limitations of this study related to theoretical, basic assumptions and methodological considerations may explain why the hypothesis was not supported. It is possible that ten hour shifts as only one work factor were not strong enough by themselves to effect a change in absence rates. Additionally, ten hour shifts may have influenced other work factors in what staff may have considered to be a negative manner, causing general dissatisfaction with the job and no decrease in absence rates. The basic assumptions of the study may have been faulty and no relationship may exist between ten hour shifts, job satisfaction and absenteeism. Therefore, ten hour shifts may not have influenced absence in any way. Other limitations due to small sample size, specifics of the group, history, group instability and subject mortality may have in some unknown way caused results specific only to this sample and not generalizable to the population at large. It must be noted that ten hour shifts do impact the work environment in yet undetermined ways. Possibly in past studies the accumulative effect of several work factors, impacted by ten hour shifts in a positive manner, as perceived by staff, caused lowered absence and not the ten hour shifts alone.

### Conclusions

The strength of this study was the measure of absence over time. It is clear from the results, despite methodological concerns, that absence rates were not altered after the introduction of ten hour shifts. The administrator's decision to use ten rather than eight hour shifts should be based on reasons other than a desire to decrease or a fear of increased absence rates.

### Recommendations

In order to validate and further interpret the findings of this study the following recommendations for further study are suggested: 1) replicate the study in a larger population. Findings on a larger sample would allow for greater generalizability. 2) Test for job satisfaction levels in addition to absence rates before and after a change to ten hour shifts in order to examine the possible relationship between a work factor (ten hour shifts), job satisfaction and absenteeism. 3) In future studies, controls for the impact that ten hour shifts have on other work factors would be of benefit. Identifying these work factor changes and a survey of nurse opinion as to their favorability or lack of favorability to the changes on identified work factors would be helpful in beginning to determine if ten hour shifts in combination with changes in other work factors would impact job satisfaction and thus absenteeism in any particular manner. 4) Randomized

assignment of subjects would be helpful in future studies because in all past studies examined by this researcher, this has not been done. Subjects have been given a choice in past studies to participate or not participate in the studies. Past study results are suspect because subjects knew they were being studied, had a choice about participating or not and often had a vested interest in a favorable outcome to the studies. 5) A more meaningful method of measuring absence rates should be considered for use in future studies. Percentage rates may not capture the actual event accurately. Frequency measures of absence may demonstrate more effectively the event of employee absenteeism.

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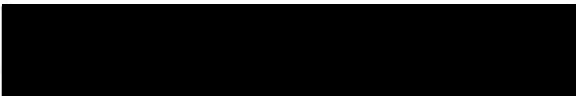
AN ABSTRACT OF THE THESIS OF

Ellen M. Burns

For the MASTER OF NURSING

Title: A Retrospective Study of the Relationship Between  
Ten Hour Shifts and Nursing Employee Absenteeism

Approved:

  
Christine A. Tanner, R.N., Ph.D., Thesis Advisor

The purpose of this study was to investigate the relationship between ten hour shifts and nursing employee absenteeism. Ten hour shifts have been credited with both increasing and decreasing absenteeism, turnover, overtime, tardiness, job satisfaction, personnel costs and work productivity (Hedges, 1971; Hellriegel, 1972; Martin, 1971; Poor, 1973).

Data was collected from the payroll files of 61 nursing personnel who worked on a 32 bed surgical unit in a 424 bed teaching hospital. The nursing personnel on the unit changed from eight hour shifts to ten hour shifts.

The hypothesis tested was: Nursing staff working ten hour shifts will have a lower rate of absenteeism than nursing staff working eight hour shifts when controls for mortality, group instability and RN percentage are used.

The study was a retrospective basic time series design. Data was analyzed as follows: Absence rates were calculated monthly for 12 months before and 13 months after the change to ten hour shifts. The mean and standard deviation of the 12 monthly absence rates before and the 13 monthly absence rates after the change to ten hour shifts were calculated for those subjects with complete data. A one tailed t-test was used to test the hypothesis. Further analysis via descriptive statistics allowed the researcher to control for the effects of group instability, mortality and percentage of RN staff on the unit.

No significant difference in absence rates were noted for staff on ten hour shifts. This finding differed from the majority of findings in the literature. Problems with study design, methods, characteristics of the sample, small sample size and theoretical drawbacks may explain the lack of significant findings. Further study is needed in order to test the hypothesis on a larger population and in order to begin to determine the relationship between ten hour shifts, other work factors, job satisfaction and absenteeism.