Enclosed Versus Open Nursing Stations in Adult Acute Care Psychiatric Settings: Does the Design Affect the Therapeutic Milieu?

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Southard, K., Jarrell, A., Shattell, M. M., McCoy, T. P., Bartlett, R. B., Judge, C. A. (2012). Enclosed versus open nursing stations in acute adult psychiatric care settings: Does nursing station design affect the therapeutic milieu? *Journal Psychosocial Nursing Mental Health Services, 50*(5), 28-34

Abstract:

Specific efforts by hospital accreditation organizations encourage renovation of nursing stations, so nurses can better see, attend, and care for their patients. The purpose of this study was to examine the effect of nursing station design on the therapeutic milieu in an adult acute care psychiatric unit. A repeated cross-sectional, pretest-posttest design was used. Data were collected from a convenience sample of 81 patients and 25 nursing staff members who completed the Ward Atmosphere Scale. Pretest data were collected when the unit had an enclosed nursing station, and posttest data were collected after renovations to the unit created an open nursing station. No statistically significant differences were found in patient or staff perceptions of the therapeutic milieu. No increase in aggression toward staff was found, given patients' ease of access to the nursing station. More research is needed about the impact of unit design in acute care psychiatric settings.

Keywords: Nursing | Mental Disorders | Patient Satisfaction | Hospitals

Article:

The National Alliance on Mental Illness ([2007]) estimates that 21% of all hospital beds at any given time are occupied by people with a mental illness. To better accommodate and care for these patients in acute care psychiatric settings, new initiatives have been set forth by hospital accreditation organizations, such as The Joint Commission ([TJC, 2009]) that recommend greater patient-centered care and higher health care quality. Specifically, one initiative addresses hospital design, with detailed reference to nursing stations ([TJC, 2009]). TJC ([2009]) suggests that reconstruction of nursing stations allows nurses to see, hear, and better attend to their patients'

needs. The aim of this article is to review the literature about the impact of nurses' physical presence and the perceived impact of nursing station design on the therapeutic milieu in acute care psychiatric settings, and to examine differences in the therapeutic milieu in one acute care psychiatric unit where a nursing station was renovated from an enclosed to an open design.

Literature Review

A review of the literature revealed a lack of quantitative research on the effect of nursing station design on the therapeutic milieu in acute inpatient psychiatric units. This review included a comprehensive search of relevant journal articles. The databases searched included CINAHL, MEDLINE via PubMed, PsycInfo, EBSCO Health and Nursing Database Family, and Health Source: Nursing/Academic Edition. Search terms included the following combinations: *nursing station, nurses station, nurse-patient interactions, ward design, unit design, hospital design, hospital geography, Ward Atmosphere Scale (WAS), patient interactions, physical environment, psychiatric hospital design, patient experience, psychiatric inpatient units,* and *ward regimes.* Articles were selected based on the relevance to nurse-patient interactions, overall ward design, the WAS, therapeutic milieu, and patient satisfaction related to nursing interactions. Sixteen articles met the study criteria. Two main themes were evident from these articles: patients' experiences related to nurse-patient interactions and nurses' physical presence, and the perceived impact of nursing station design in acute care psychiatric environments.

Patients' Experiences Related to Nurse-Patient Interactions and Nurses' Physical Presence

Six articles pertained to patients' emotions about their interactions with nurses. The time patients spent with nursing staff was an emotional touchstone that emerged in the literature. Henderson et al. (2007) pointed out that a parallel effect was created with patients feeling as though their nurses cared about them when nurses were readily available to these patients. Psychiatric patients described interactions with nurses as helpful (Koivisto, Janhonen, & Vaisanen, 2004), and Teising (2000) found that psychiatric-mental health nurses have the ability to "make the impossible possible, to keep up the distance and, at the same time, establish contact by having the right density at various moments" (p. 452).

Some studies reflected a different view. Alexander (2006) found that psychiatric patients expressed an overall theme of distress, alienation, and resentment due to the emotional unavailability of the nurses in inpatient settings. Henderson et al. (2007) reported similar findings, which associated patient dissatisfaction to the nurses not being readily available to respond to patients' requests. Moore (1998) found that patients reported that psychiatric-mental health nurses spent too much time in the nursing station, and Koivisto et al. (2004) suggested that nurses should engage with and be beside psychiatric patients more and verbally and nonverbally express their feelings of support.

Perceived Impact of Nursing Station Design in Acute Care Psychiatric Environments

Many standard environmental components in unit design can be unintentionally detrimental to patients and staff. Andes and Shattell ([2006]) discussed one such design factor in their study of space and place in acute psychiatric settings. An anti-shatter tempered glass-enclosed nursing station is a familiar design often seen in acute psychiatric settings in the United States. This wall encompassing the nursing station not only cuts off a patient's access to nurses, but also creates a theme of power via the glass barrier, with patients feeling powerless to the divide ([Andes & Shattell, 2006]). This barrier forces a patient to tap on the glass, wave, and essentially beg for nursing staff attention ([Andes & Shattell, 2006]). The glass also inflames patients' feelings of not being cared about, and they report feeling like objects, rather than people ([Forchuk & Reynolds, 2001]).

Interestingly, patients were not the only ones affected negatively by the glass divide; Shattell, Andes, and Thomas ([2008]) reported that nurses felt caged in and confined by the glass, and they yearned for more patient interaction. Tyson, Lambert, and Beattie ([1995]) indicated that psychiatric-mental health nurses only spend approximately one third of their days interacting with patients in acute care psychiatric settings. Glass barriers may contribute to staff member feelings of isolation and perhaps to less staff member interaction with patients.

Overall, there is a lack of quantitative research on the effect of nursing station design on the therapeutic milieu in acute inpatient psychiatric units. While many studies suggest that patients are dissatisfied, units are poorly designed, and the number of nurse-patient interactions is few, no research could be found that examined the effect of nursing station design on the therapeutic milieu. The study reported in this article fills this gap because our study examined one adult inpatient psychiatric unit when it had an enclosed nursing station and then again after reconstruction and renovation to an open nursing station design, to examine differences in perceptions (patients and nursing staff) of the therapeutic milieu.

Method

Design

A repeated cross-sectional study design (one cross-section before the nursing station enclosure was removed and one cross-section after) was used for this study. Institutional Review Boards at the hospital and university approved the study.

Setting and Sample

The setting is a public not-for-profit, freestanding, acute psychiatric hospital in a medium-sized city in the southeastern United States. The unit in the study has a total capacity of 50 adult patients. Patients on this unit are generally in the hospital for an average of 5 days and are diagnosed with one or more mood, anxiety, or substance use disorders. The unit is a T-shaped wing of the hospital and is composed of 25 semi-private patient rooms (two patients per room), two small medication rooms, three dayrooms, and two consultation rooms. The dayrooms are used for group meetings, staff-patient interactions, and for socialization purposes. The dayroom

has one couch, a television, and several tables and chairs. The staff has access to their break room and also to the nursing station. The staff break room is locked and contains a long table and chairs, as well as a refrigerator.

The nursing station is a large area centrally located on the unit that has several computers for charting and ample desk space with chairs. During the pretest time period of the study, the nursing station was entirely enclosed by anti-shatter tempered glass with a 4 mil ballistic film. There was a small window (that measured approximately 2 feet by 4 feet) in the middle of the station in front of the unit secretary's desk (i.e., a window the unit secretary could open to respond to patient requests). The back of the station was the work area for nurses and mental health technicians. During the posttest time period of the study, the nursing station was an open design: The glass had been removed, the unit secretary's desk had been moved to the back of the nursing station, and the nurses' and mental health technicians' areas were moved to the front of the station. Other renovations and upgrades to the station included new cabinets and countertops and freshly painted walls. The total square footage of the nursing station did not change (597 square feet plus a medication room that is 242 square feet). The medication room inside the nursing station is completely enclosed (both before and after renovation); it is embedded within the nursing station.

Potential study participants worked in the acute psychiatric hospital environment or were adult inpatients in the environment. A convenience sample of 81 patients and 25 nurses and mental health technicians was recruited. The patients in the pretest data collection group were different from the patients in the posttest data collection group. Only three staff members completed the WAS both before and after nursing station renovation. The remainder of the staff participants was different for each data set.

Timing of Construction

The renovation of the nursing station was originally scheduled to begin within 2 months of the pre-construction data collection. The project was expected to take 4 weeks, with post-construction data collection beginning 3 months after the renovation was completed. Due to unexpected building repairs that arose during this same time frame, the project was delayed because of budget constraints. As a result, there were 24 months between pretest and posttest data collection.

Staff Changes

During the time between data collection points, there was a change in nursing and physician leadership. Two psychiatrists who had been employed with the unit for a number of years left to work in private practice. Both psychiatrists worked well with unit staff members, who were saddened by the psychiatrists' departure. Staff had to adjust to the styles of the new psychiatrists.

Turnover also occurred in the unit director position. The new director implemented necessary changes related to staffing, unit rules, and accountability. Initially, these changes brought about discontent among many staff members.

Measurement

Therapeutic milieu was operationalized and measured using the WAS (Moos, 1974). The WAS was used to determine nurses', mental health technicians', and patients' perceptions of the therapeutic milieu. The WAS is a 100-item true/false questionnaire that is divided into three dimensions: Relationship Variables, Personal Development, and System Maintenance. The three dimensions can be subdivided into 10 categories (subscales): Involvement, Support, Spontaneity, Autonomy, Practical Orientation, Personal Problem Orientation, Anger and Aggression, Order and Organization, Program Clarity, and Staff Control. Total scores from the WAS can be converted into an established standard set of scores to be compared to a normative sample (Corey, Wallace, Harris, & Casey, 1986). WAS category scores were compared before and after removal of the nursing station glass enclosure to determine whether a change in the environmental milieu had occurred post renovation. The differing perceptions of unit milieu between staff members and patients were also compared.

The reliability and validity of the WAS was determined prior to the beginning of the study. The WAS has been in use since 1968 (Corey et al., 1986), and its reliability and validity were established by Moos (1974). Pertaining to reliability, Moos (1974) established subscales that calculate interclass correlations for test-retest intervals. Validity was ascertained via correlation with other established scales that measure ward milieu (Moos, 1974).

Data Collection

Written informed consent was obtained from all participants prior to their participation. No incentives were given for participation. Participants were informed that study participation was voluntary, that their identities would remain confidential, and that they could withdraw from the study at any time without penalty. The WAS was distributed to nurses, mental health technicians, and patients who were interested in participating in the study, both during the pre- and post-renovation time periods. Participants completed the questionnaires at a convenient and private location of their choice. Each participant took approximately 20 to 30 minutes to complete the self-administered paper-and-pencil questionnaire.

Data Analysis

The study compared cross-sectional data collected before and after renovation of the nursing station. The goals of the statistical analyses were to describe the sample of patients and staff before (pretest) and after (posttest) removal of the glass enclosure to create an open nursing station, and to identify any differences in the therapeutic milieu for patients and staff from pretest to posttest. To address the first goal, descriptive statistics such as mean and standard deviation

(*SD*) or frequency and percentage were estimated for patients and staff at pretest and posttest. Chi-square, Fisher's exact, or Cochran-Armitage trend tests were performed to test for differences in categorical characteristics, and *t* tests or Wilcoxon rank-sum tests were performed to test for differences in continuous characteristics.

To address the second goal, because differences in all 10 subscales of the WAS were of interest, a multivariate test of equal means (a Hotelling T^2 test) was first performed before any individual *t* tests. The null hypothesis of this test was that all 10 WAS subscale means were equal at pretest and posttest. Reliability via internal consistency was estimated by Kuder-Richardson Formula 20 (KR-20) coefficients. Analyses were performed separately for patients and staff members. Normality was assessed with Q-Q plots and normality testing. A two-sided *p* value <0.05 was considered to be statistically significant. All analyses were performed using SAS version 9.2 (SAS Institute, Cary, NC) and Stata version 11.2 (StataCorp, College Station, TX).

Results

Demographic Data

Eighty-one patients and 25 staff members participated in the study. Forty-one patients and 12 staff members responded at pretest (enclosed nursing station) and 40 patients and 13 staff members responded at posttest (open nursing station). The average age of the patients was 44 (*SD* = 14.8 years) at pretest and 41 (*SD* = 9.1 years) at posttest. The proportions of male and female patients were similar between time points. Regarding race, most patients were White (pretest: 71%; posttest: 65%). The most common self-reported patient diagnoses at pretest were depression (61%), substance abuse (49%), and bipolar disorder (32%); these three were also the most prevalent at posttest. Patients in the pretest sample spent an average of approximately 7 days (*SD* = 6.3) in the unit compared with approximately 5 days (*SD* = 4.5) among posttest sample patients, which was a significant difference (*p* = 0.0426).

All staff members in the posttest sample were women, as well as all but one (92%) in the pretest sample. Regarding race, most staff members were White (pretest: 75%; posttest: 54%). Most staff members were RNs (pretest: 83%; posttest: 54%) and had an average of approximately 4 years of work experience on the unit where data were collected (pretest: 5.1 years, *SD* = 3.85; posttest: 3.8 years, *SD* = 3.05). The pretest staff sample had more years of RN experience on average (27.3 compared with 18.3 at posttest) and psychiatric experience (16.6 compared with 11.5 at posttest) but not significantly more (*p* = 0.2046). Four of 12 staff members at pretest had their baccalaureate or master's degrees in nursing versus 2 of 16 at posttest.

Differences In WAS From Pre to Post Renovation

No statistically significant differences were found in WAS scores from pretest to posttest. For patients, four of the WAS subscales had KR-20 coefficients above 0.6 at pretest versus three at

posttest. For staff, three WAS subscales had KR-20 coefficients above 0.6 at pretest versus four at posttest. This could reflect some problems with reliability of these subscales.

Results for differences in WAS scores from pretest to posttest are presented in **Table 1** for patients and **Table 2** for staff. Multivariate tests for mean differences in any WAS subscales were not significant for patients ($p = 0.743$) or staff ($p = 0.710$) from pretest to posttest. Thus, the therapeutic milieu, as operationalized by the WAS, did not appear to be significantly different after removal of the glass enclosure to create an open nursing station. It may be important to note that for patients, while not statistically significant differences, 3 of the 10 WAS categories (spontaneity, autonomy, practical orientation) showed a mean difference trend in the desired direction. However, for staff members, mean difference trends in the desired direction were noted in 7 of the 10 categories (support, practical orientation, personal problem orientation, anger and aggression, order and organization, program clarity, staff control). Again, these differences were not significantly different. These subscale scores may be useful in future studies.

Discussion and Implications

The study findings showed no statistically significant difference in patient or staff perceptions of the therapeutic milieu from when the same inpatient psychiatric unit had an enclosed nursing station to an open nursing station. Although we had anticipated we would find an improvement in therapeutic milieu post renovations, it is important to note that patients' and staff members' perceptions of the milieu, as measured by the WAS, did not deteriorate or worsen. The open nursing station did not negatively impact perception of unit milieu.

Contrary to our findings, Corey et al. ([1986]) found statistically significant differences in WAS scores after unit renovation. The renovations noted in that study were extensive and included new furniture, flooring, paint, and wall hangings in both patient rooms and unit common areas. Renovations to the unit in our study were limited to the nursing station and included removal of the glass barrier, new countertops and cabinetry, and new paint. Although positive effects on the nurse-patient relationship were not quantified in our study, anecdotal evidence such as unsolicited patient comments suggest that patients appreciated having easier access to the nurses charged with their care.

Our findings suggest that psychiatric nurses and administrators might not be concerned about whether they have an enclosed or open nursing station, since our study showed no statistically significant difference in therapeutic milieu (as measured by the WAS) from before to after the removal of an enclosure around the nursing station in an adult psychiatric inpatient unit. In these difficult economic times, administrators could perhaps allocate scarce resources elsewhere (e.g., staffing), instead of nursing station redesign. However, if an enclosure around a nursing station is in the process of being removed, administrators might share the findings of this study with any staff members who are fearful of working in a nursing station without the safety of a glass enclosure. Our findings showed no increase in patient anger or aggression and, incidentally, no

increase in incidents of seclusion and restraint. Staff members in our study reported a trend toward decreased patient anger and aggression and better patient control after the renovations that created an open nursing station design. Open nursing stations will not necessarily lead to more patient aggression or more incidents of violence toward nurses, as some nursing staff fear, and there may be benefits to the open nursing station design as shown by the positive trends in several WAS subscales, and the decrease in seclusion and restraint on this unit after the nursing station became open. Although more research is needed, these desired trends could be related to nursing staff being more readily available to better meet patients' needs.

Limitations and Serendipitous Findings

This study had several limitations, one of which was a smaller than desired convenience sample, and another is the time period between the data collection periods. We anticipated that the renovation to an open nursing station would occur soon after the initial data set (pretest) were collected. However, due to budget constraints, the renovation was delayed for approximately 1 year. Thus, these data may not accurately represent differences in the milieu between pretest and posttest, given the time that had elapsed between the two data collection points. It may be that other factors affected the milieu in the intervening months. In addition, there was a change in nursing unit leadership and physician coverage on the unit during the time between pretest and posttest data collection. In a short period of time, the new nursing unit director initiated several changes that a number of staff members had difficulty adjusting to and accepting. According to Moos ([1974]), deterioration may be noted in the WAS during times of change. In the current study, these unit changes may have negatively affected posttest WAS scores, resulting in no statistically significant differences from pretest to posttest.

Another possible limitation was related to lower internal consistency for some WAS category subscales. However, the average KR-20 coefficients from normative data is only 0.66 for patients and 0.71 for staff. Also, with 10 items per subscale, the average phi coefficient would have to be 0.286 or greater for higher KR-20 (0.80) coefficients. This could be driven, in part, by the study sample size, so further studies with larger samples could be warranted.

Recommendations from health care sources, as well as the documented importance of the nurse-patient relationship, support the removal of physical barriers in acute care psychiatric nursing stations ([Shattell et al., 2008]). Further research using a qualitative approach may yield greater insight into the impact of an open nursing station on patients and staff. Suggestions for replication of this study include the involvement of multiple hospital units; decreasing the amount of time between data collection points; having the same staff members complete the WAS both at pretest and posttest so individual differences can be determined; and measuring additional outcomes such as patient satisfaction, work/job satisfaction, seclusion and restraint reports, incident reports, and number and quality of nurse-patient interactions--all of which may be correlated with measures of milieu quality.

Although not part of the original study, anecdotal evidence from nurses and mental health technicians suggest that no significant change in the therapeutic milieu can be viewed as positive, since some of these staff were extremely wary of the proposed renovations at pretest, and many predicted a worsening of the milieu at posttest. Some nurses feared increased aggression toward staff members, given patients' ease of access to the nursing station. At 12 months post renovations, there has been no increase in patient aggression on the psychiatric unit in this study. In fact, seclusion and restraint rates have dropped 26% from the prior year during the same 12-month period. Although a full review and discussion of unit safety on inpatient psychiatric units is beyond the scope of this article, we agree with Koivisto et al. ([2004]), who suggested that for everyone--staff members and patients--to feel safer, nurses (and other staff members) need to be with patients more. Open nursing stations may facilitate this.

Conclusions

This study examined patients', nurses', and mental health technicians' perceptions of the therapeutic milieu in the same unit at two different time points and with two different nursing station configurations (enclosed versus open). Although we anticipated a statistically significant positive change in the milieu, finding that there was no significant negative change in the milieu should not go unnoticed. In this study, an open nursing station did not negatively affect the milieu and may, in fact, have had benefits that the WAS was not able to capture. The renovated nursing station did not result in increased patient aggression or assault on staff members, as some staff had predicted. On the contrary, seclusion and restraint rates dropped during this time period. Psychiatric nurses who work in adult acute care settings with an enclosed nursing station should not necessarily be fearful of working in adult acute care settings that have an open nursing station design.

The authors thank Kathleen Delaney for her comments on the study and Jennifer Magnus for her help with manuscript preparation. They acknowledge their research participants who were patients, staff nurses, and mental health technicians on the unit described in the study. The authors also thank the administrators and nurses at the hospital, in particular Marianne McIver.

Table 1

Differences in Ward Atmosphere Scale (WAS) Subscale Scores from Pretest to Posttest for Patients ($N = 81$)

WAS Category	**Pretest ($n = 41$) Mean (SD)**	**Posttest ($n = 40$) Mean (SD)**	**Post -- Pre Mean (SD)**	**t Test p Value**
Involvement	6.39 (2.178)	5.95 (2.591)	-0.44 (2.391)	0.4099

Support	6.46 (1.951)	6.13 (1.828)	-0.34 (1.891)	0.4231
Spontaneity	4.85 (1.797)	5.03 (1.368)	0.17 (1.599)	0.6311
Autonomy	4.22 (1.710)	4.30 (1.652)	0.08 (1.682)	0.8300
Practical orientation	6.24 (1.280)	6.70 (1.667)	0.46 (1.484)	0.1706
Personal problem orientation	5.85 (1.824)	5.75 (1.878)	-0.10 (1.851)	0.8017
Anger and aggression	3.56 (1.937)	3.80 (2.174)	0.24 (2.058)	0.6027
Order and organization	7.22 (2.495)	6.90 (2.530)	-0.32 (2.512)	0.5688
Program clarity	5.95 (2.291)	5.83 (1.738)	-0.13 (2.037)	0.7811
Staff control	4.54 (1.976)	4.28 (1.724)	-0.26 (1.856)	0.5278

Note. Multivariate Hotelling T^2 *test for any mean differences:* $F(10,70) = 0.6761$, p *value = 0.7428.*

Table 2

Differences in Ward Atmosphere Scale (WAS) Subscale Scores from Pretest to Posttest for Staff ($N = 25$)

WAS Category	**Pretest (*n* = 12) Mean (*SD*)**	**Posttest (*n* = 13) Mean (*SD*)**	**Post -- Pre Mean (*SD*)**	***t* Test *p* Value**
Involvement	7.08 (2.065)	6.77 (2.455)	-0.31 (2.277)	0.7335
Support	6.58 (1.505)	7.38 (1.557)	0.80 (1.532)	0.2043
Spontaneity	6.25 (0.866)	6.00 (1.354)	-0.25 (1.147)	0.5913
Autonomy	4.75 (1.422)	4.31 (0.630)	-0.44 (1.084)	0.3374
Practical orientation	7.00 (1.206)	7.46 (1.450)	0.46 (1.339)	0.3981

Personal problem orientation	6.75 (1.138)	6.77 (1.092)	0.02 (1.114)	0.9660
Anger and aggression	4.83 (1.899)	4.69 (1.932)	-0.14 (1.916)	0.8557
Order and organization	5.67 (2.060)	5.92 (2.465)	0.26 (2.280)	0.7813
Program clarity	6.00 (1.595)	6.23 (2.127)	0.23 (1.892)	0.7633
Staff control	1.25 (1.138)	2.23 (1.423)	0.98 (1.295)	0.0711

Note. Multivariate Hotelling T^2 *test for any mean differences:* $F(10,14) = 0.7014$, p *value = 0.7099.*

Sidebar

Keypoints

1. This study examined the effect of nursing station design on therapeutic milieu in an adult acute care psychiatric unit.

2. Removal of the physical barrier around the nursing station showed no statistically significant differences in patient or staff member perception of the therapeutic milieu.

3. The open nursing station did not negatively impact the milieu and may in fact have benefits that were not captured in this study.

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Footnote

The authors disclose that they have no significant financial interests in any product or class of products discussed directly or indirectly in this activity, including research support.

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