Patient Perceptions of the Caring Environment

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Abstract

As technology at the point of care increases to ensure greater efficiency, effectiveness and patient safety, the impact of such technology needs to be explored for impact on patient perception of the caring environment. The evidence based practice pilot project based on the Iowa Model sought to answer if an ergonomic change in use surrounding technology improved patient perceptions of the caring environment.

Keywords: Caring; Computers; Patient perception; Nursing care; Caring environment

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Introduction

Grounded in the clinical relationship of the nurse patient dyad and patient perceptions of a caring environment, this proposed scholarly project sought to pilot evidence based practice protocol surrounding the patient perception of the caring environment. The Institute of Medicine's (IOM) standard for evidence based practice to guide policy at the point of care [1] along with findings of increased safety, quality and efficacy with mobilized computer workstations at the point of care were considered, compared and challenged by the interpersonal caring behavior associated with respect and authentic presencing of nurses [2].

Background

Although much is noted in the literature regarding nursing as a profession of caring, less is found on patient perceptions of that relationship of caring, and technological factors that influence it. Little was found in the literature search that combined perceptions of a caring environment, the nurse patient dyad and the variable use of a Mobile Computer Workstation (MCW) at the point of care. Current literature reveals investigation and documentation of increased efficient and effective nursing care delivery as well as increased patient safety with the incorporation of mobile computer workstations. This is both well established and accepted with gain of immediate access to medication, supply storage, and electronic documentation, requiring fewer detours to storage rooms and less interruption of time management. Fewer medication errors with the use of mobile electronic scanning are undeniable [3].

However, the writer notes assumptions that increased safety, efficiency and efficacy of nurse workflow equate greater amounts of time being spent at the patient bedside. This may not be the case. Nor should it be assumed that positive gain in the areas of safety, efficiency and efficacy by way of MCW use at the point of care has come at no cost associated with the loss in authentic human caring as perceived by the patient.

If, in the addition of technology at the point of care, a caring environment is lost or perceived to be lost, the way in which the same technology can and should be used must be reevaluated. Forward progress in the ergonomic use of healthcare informatics must improve quality and safety without undermining the caring relationship established within the nurse patient dyad. The writer concluded a moderate amount of evidence revealing need for pilot study to evidence for improved practice change with alternative techniques in the use of MCWs and patient perceptions of a caring environment.

Purpose

The purpose of this pilot project was to implement an evidence based practice change surrounding MCW ergonomic use at the point of care and to evaluate for improved patient perceptions of a caring environment. Objective of the pilot was to examine patient perceptions of a caring environment where MCWs are used at the point of care.

Problem statement

The importance of this topic is found in the importance of the patient [4]. If in fact healthcare is to be patient centered, the

perception of the patient must be understood and ways to maximize the patient perception of a caring environment without compromising the increased quality and safety that technology offers must be found. Key to the nurse patient dyad is the concept of a relationship of trust. If the patient does not perceive an environment of caring, trust may be inhibited and quality of care may suffer.

Timeliness of this evidence based practice project is remarkable as the IOM requirement for evidence to support practice and improve safety ignites the need for increased informatics and supportive technology. It is most relevant in this continual change environment of informatics technology adoption, that further study of not only the care but caring nature of the new environment and the patients' perceptions of that environment be accomplished to fully qualify this adoptive change as sustainable improvement.

Substantiation of MCWs as healthcare informatics technology at the point of care is well documented in the literature review from the quantitative perspective. Evidence noting a mismatch of nurse and patient perceptions of the caring environment and stymied delivery of humanistic needs in the presence of technology necessitates further research at the point of care [2]. This pilot study contributes to the overall body of knowledge surrounding patient perceptions of the caring environment where MCWs are used at the point of care.

Clinical question

Development of clinical question following the Patient-Intervention-Comparison-Outcome-Timeline (PICOT) format suggested by Mateo and Foreman [5] reveals clinical question central to the project: For medical surgical patients, will ergonomic use of the mobile computerized workstation improve patient perception of the caring environment? Additional clinical questions surrounding the pilot change include; 1) Is patient perception of the caring environment different per age group with ergonomic use of the MCW; 2) Is patient perception of the caring environment different per gender with ergonomic use of the MCW; 3) Is patient perception of the caring environment different per ethnicity with ergonomic use of the MCW; and 4) What is the second population, nurse perception of the intervention.

Design

The project was designed as an evidence-based practice project. The Iowa Model of Evidence Based Practice to Promote Quality Care [6] was used with permission from the University of Iowa. The project followed the Iowa Model flowchart [7]. Design was consistent with a pilot project and therefore utilized an unknown number of potential participants during a set thirty-day period.

Methodology

 Focusing on the phenomenon associated with the nurse-patient dyad and the caring environment, this evidence-based practice project followed a quasi-experimental methodology for data collection and analysis where outcome of interest concentrated on patient perception of the caring environment and the change MCW ergonomic use had on such patient perceptions. Objectives

of the study were to examine patient perceptions of the caring environment where the use of MCWs was modified at the point of care to determine if differences existed in patient perception of the caring environment.

This evidence based practice project piloted the implementation of an interventional ergonomic technique for nurse use with MCW surrounding adult patients admitted to acute medical surgical units and sought to answer if such ergonomic use improved patient perception of a caring environment. Project plan included implementation of ergonomic use of MCW at the point of care. The two ergonomic positions of use were defined as (1) Intervention of sitting at the patient bedside with MCW not physically coming between the nurse and the patient; (2) Control of standing with MCW physically between nurse and patient. Measurable outcome of primary population sample is identified as patient perception of the caring environment. Secondary population noted as nurses utilizing interventional ergonomic techniques with MCW use provided outcome data on nurse perception of intervention through end of pilot survey.

Target population consists of all adult medical surgical patients in acute care settings currently receiving care by providers who use MCWs at the point of care. Inclusion criteria for sample include patients admitted or transferred to medical surgical unit, 18 years of age or older, alert and oriented with ability for informed consent. Exclusion criteria on the basis of protection for patients, whose autonomy is diminished, consisted of nonuse of patients who are pregnant, or unable to give informed consent due to alteration in orientation. Those on air borne precaution use of negative pressure rooms will also be excluded [8].

Sample sites include two medical surgical units in two hospitals among a four hospital system. Sample sites where selected based on geographic proximity to each other, and inclusion of general, medical/surgical units. Protection of human subjects is noted in accordance with the Collaborative Institutional Training Initiative [9].

All nursing staff, unit managers, and volunteers of medical surgical units participating in the research study were advised of key principles associated with Collaborative Institutional Training Initiative (CITI) prior to start date to ensure risks to patients were minimized. Understanding of vulnerable population groups and the required respect, beneficence, and justice for each patient were introduced and reinforced during staff training that occurred as part of regularly scheduled unit meetings. No compensation was made to participants, data collectors, or project leader. Risk to participants of the pilot study was noted by the Institutional Review Board of record, as no greater than assumed in everyday life.

Setting

Two medical surgical units within two separate hospitals as part of a four-hospital system were setting for the evidence based practice pilot project. Populations within these two hospitals differ little geographically and little socioeconomically. Hospital system organizational strategic plan focused on the value of patient centered care with standards of behavior to include communicating with clarity and creating connection [10].

Tools

Primary population sample of medical surgical patients were measured for outcome of patient perception of the caring environment using a survey filled out by the patient anonymously, sealed in an envelope, and deposited in a locked box on the unit at time of discharge. Variables of the study concentrated on the nurse patient dyad with patient perception of a caring environment. With a focus on nursing as opposed to physician specific verbiage, and with dependent variable noted as patient perceptions of needs met through care of nursing, survey tool for proposed project instrumentation was the Patient Perception of Hospital Experience with Nursing (PPHEN). The tool is noted as a 15-question Likert scale and was used with obtained permission from its developer, Dr. Harriet Kitzman, University of Rochester, Rochester, NY, USA [11].

Appropriateness of the tool is remarkable with all 15 items of the survey directly associated with care provided by the nurse. Items four and 15 specify wording to include phrasing such as, "the nurses gave me their undivided attention while caring for me" and "the nurses actions made me feel cared for" [12]. Content of the survey is applicable and consistent with project aim and focus. Although content validity of the tool was not noted by Lynn et al. [13], internal consistency when items reduced from 125 to eventual 15 item instrument, "the PPHEN was found to be [one]-dimensional, reliable "=94 and have evidence of construct validity" based on Cronbach's alpha. Readability and interpretability was confirmed. According to Lynn et al., limitations to the PPHEN instrument include lack of large patient basis for generalization and its one-dimensional nature.

Survey asked the degree to which patients agree with statements surrounding nursing care. Survey answer choices will use a Likert scale ranging from 1-6 where 1: Agree; 2: Somewhat agree; 3: Undecided; 4: Somewhat disagree; 5: Strongly disagree; 6: Not applicable. Three demographic questions, separate from the PPHPEN, including age, gender and ethnicity were included in the survey. Waiver of signed informed consent was approved by the Institutional Review Board (IRB). Participants were provided an information sheet, consistent with parent organization Institutional Review Board template, containing all elements of consent form, signature line deferred [12].

Instrument was printed on color-coded paper to distinguish sample groups. Blue surveys were given to even room numbers as active control group and orange to odd room numbers participating in the intervention. Surveys with information sheet were given as part of the discharge packet, completed anonymously by the patient at discharge, sealed and given to discharge staff when exiting hospital unit. Discharge staff placed all surveys in a locked drop box at the unit nursing station. All surveys were collected by the project leader at the end of the data collection period.

Secondary population sample of nurses implementing interventional ergonomic use of MCW were measured for outcome of nurse perception of intervention using a simple survey filled out anonymously and submitted to project leader at staff meeting post intervention and data collection period.

Findings

Primary sample

With a total combined 380 patients discharged from the two units during the 30 day data collection period, 32% participated by handing in a survey with initial sample size N=122. **Table 1** reveals that 46.7% of patients surveyed were from hospital one and totaled fifty-six patients. Hospital two contributed 52.5% of patients surveyed and totaled sixty three patients. One survey was noted with missing PPHEN data, another was missing all data, and another with all variables noted as not applicable. Another survey was empty for control or intervention, turned in on white paper. Both the survey with all empty PPHEN and missing PPHEN data points were omitted.

The independent variable was defined as ergonomic use of MCW at the point of care. The two positions of use were defined as: (1) sitting at the patient bedside with MCW not physically positioned between the nurse and the patient, (2) standing with MCW physically between nurse and patient. These independent variables utilized nominal, dichotomous level measurement. Position one was noted as intervention. Position two as active control [5].

This random group assignment to the control group or intervention group is noted below in **Table 2** revealing 47.5% of sample as control and 51.7% as intervention.

Total number of sample is seen in **Table 3** with 120 valid participants, N=120 signifying omission of two surveys for missing PPHEN data. The number of valid participants in the control group equaled 57 and number of valid participants in the intervention group equaled 62. These combined equal one less than reported N due to one survey group assignment unknown.

Statistical Package for the Social Sciences [14] was used to analyze data and evaluate difference between groups. A

Table 1 Sample by hospital.

				Hospital	
		Frequency	**Percent**	**Valid percent**	**Cumulative percent**
Valid	Hospital one	56	46.7	47.1	47.1
	Hospital two	63	52.5	52.9	100.0
	Total	119	99.2	100.0	-
Missing	System	1	0.8	-	-
Total		120	100.0	-	-

Table 2 Sample by group assignment.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Control Group	57	47.5	47.9	47.9
	Intervention Group	62	51.7	52.1	100.0
	Total	119	99.2	100.0	-
Missing	System	1	0.8	-	-
Total		120	100.0	-	-

Table 3 Sample process summary.

	Group assignment	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Perception of Caring Environment	Control Group	56	98.2%	1	1.8%	57	100.0%
	Intervention Group	62	100.0%	0	0.0%	62	100.0%

statistician assisted with input, analysis, and reporting of all data. Generalization of the test results was limited as the normality of the scores combined revealed a positive skew questioning the normality assumption. Although scores would decrease in normality with greater number of test participants, Figure One histogram denotes remarkable question to the assumption of normality. However, the assumption of homogeneity of variance was assessed by the Levene test, F=0.427, p=0.515; p being>0.05 allowed equal variation to be assumed. The normality assumption was tenable. Therefore, the standard t test results were reported **(Figure 1)**.

Results for independent t test

An independent samples t test was completed using Statistical Package for the Social Sciences (SPSS) to measure whether mean Perception of Caring Environment differed significantly between the interventional group whose nurse sat at the patient bedside with MCW not physically coming between the nurse and the patient, and the control group, whose nurse stood with MCW physically between nurse and patient [14]. The assumption of homogeneity of variance was assessed by the Levene test, F=0.427, p=0.515; this showed no significant violation of the equal variance assumption. The mean Perception of Caring Environment did not differ significantly, t (116) =-0.395, p=0.694, two-tailed. The mean Perception of Caring Environment for the Intervention group (M=4.5083, SD=0.98618) was about 0.075850 higher than mean Perception of Caring Environment for the Control group (M=4.4325, SD=1.101792). The effect size, as indexed by $\eta 2$, was 0.001343236; this is a very small effect. The 95% CI for the difference between sample means had a lower bound of -0.456539 and an upper bound of 0.30484 [15]. This is noted in **Table 4** and revealed that while the intervention group rated their perception of the caring environment higher than the control group, the mean difference in Perception of Caring Environment was not statistically significant.

Multiple regression analysis

Age: To examine the effect of the demographic variables to the Perception of Caring Environment, three separate multiple regressions were conducted. Dummy coded variables were utilized and three separate regression analysis were conducted

to better demonstrate each level of the demographic variables. The variable of age is noted in **Table 5**. A total of 116 participants revealed their age. 33.6% of the sample was between the ages of 65 and 79, 23.3% were between 50 and 64 years old, 18.1% of the participants were between 18 and 34 years, 16.4% of participants were between 35, 49 years old, and the smallest percentage of the sample, 8.6% were 80 years old or older.

The bar graph seen in Figure Two allows visualization of the sample by age and further denotes the age group most represented being that of the 65-79 year old age group. The least represented age group, those 80 years and older **(Figure 2)**.

The overall regression equation with Age as predictors did not significantly predict Perception of Caring Environment; R=0.201, R2=0.040, adjusted R2=0.005, F (4, 110) =1.157, p=0.334. The following regression equation was generated where the constant term, 4.611, represents the mean Perception of Caring Environment of the group Age 80+. Each predictor term represents the b coefficients for their respective age groups: Perception of Caring Environment'=4.611-0.273 (Age 18-34) +0.118 (Age 35-49) -0.340 (Age 50-64) +0.062 (Age 65-79) [15].

Interpretations of each b coefficient for age revealed that if a patient is between ages 18-34, he/she is more likely to report a slightly lower score on Perception of Caring Environment when compared to the group of age 80+ but were not statistically significant, p=0.453. If a patient is between ages 35-49, he/she is more likely to report a slightly higher score on Perception of Caring Environment when compared to the group of age 80+ but were not statistically significant, p=0.749. If a patient is between ages 50-64, he/she is more likely to report a slightly lower score on Perception of Caring Environment when compared to the group of age 80+ but were not statistically significant, p=0.336. If a patient is between ages 65-79, he/she is more likely to report a slightly higher score on Perception of Caring Environment when compared to the group of age 80+ but were not statistically significant, p=0.854. If patient's age is 80+, he/she is more likely to score 4.611 on Perception of Caring Environment. The predictors for age only accounts for 4% of variance of Perception of Caring Environment, which indicates a small effect, size [15].

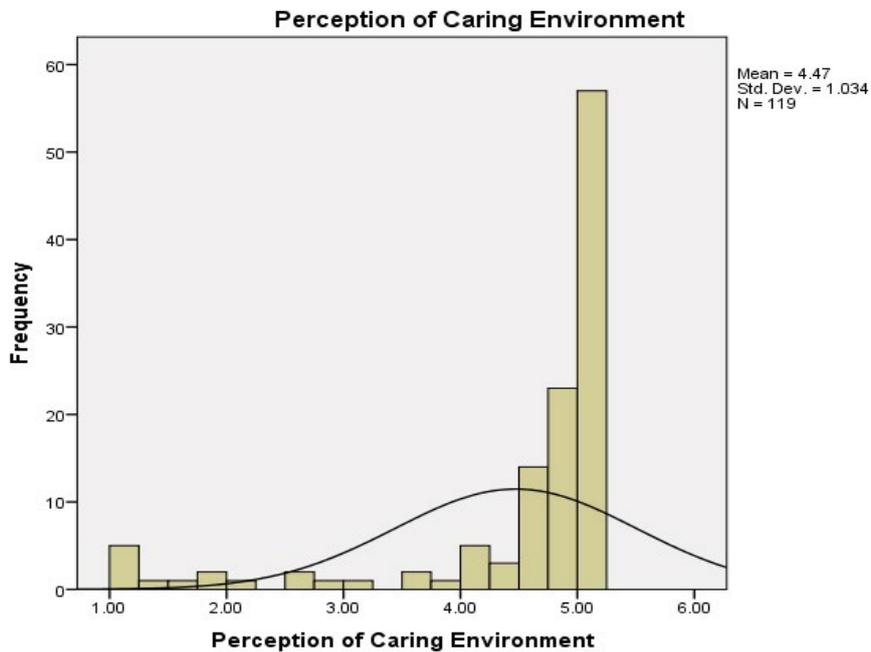**Gender:** Gender was reported by only 117 participants. **Table 6**

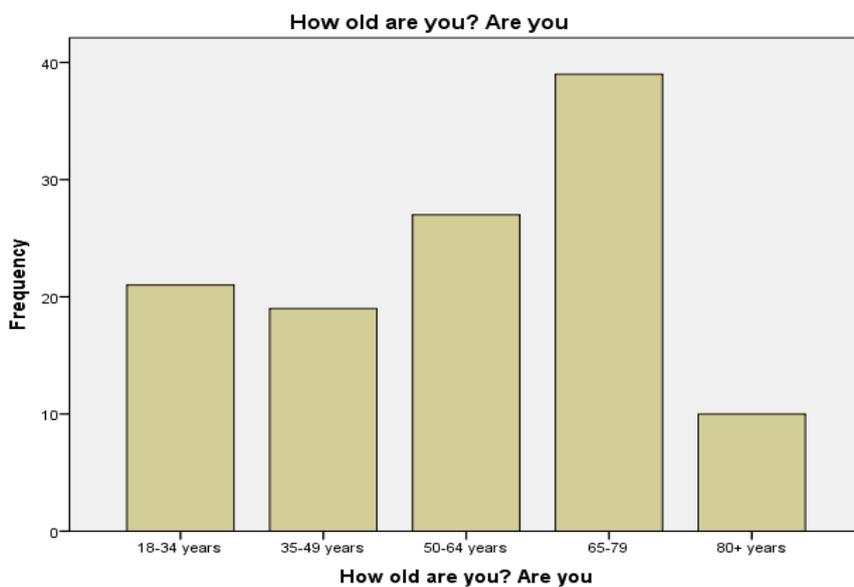**Figure 1**   Perception of caring environment.

Figure 2   Bar graph age of participants.

revealed 56.4% of participants as female, with 43.6% as male. This slightly higher female population was further depicted in the bar graph noted in **Figure 3**.

The overall regression equation with Male as a predictor did not significantly predict Perception of Caring Environment; R=0.076, R2=0.006, adjusted R2=-0.003, F (1, 114)=0.657, p=0.419. The following regression equation was generated. Perception of Caring Environment'=4.428+0.152 (Male). The constant term, 4.428, represents the mean Perception of Caring Environment of the female group. **Table 7** reveals that if a patient is male, he is more likely to report a slightly higher Perception of Caring

Environment than female but were not statistically significant, p=0.419. If a patient is female, she is more likely to score 4.428 on Perception of Caring Environment. The predictor for gender only accounts for 0.6% of variance of Perception of Caring Environment, which indicates a small effect size [15].

Ethnicity: The overall regression equation with Ethnicity groups as predictors did not significantly predict Perception of Caring Environment; R=0.104, R2=0.011, adjusted R2=-0.016, F (3, 112) =0.408, p=0.747. **Table 8** revealed descriptive statistics of 117 participants who reported their ethnicity. An overall 81.2% conveyed ethnicity of White/non-Hispanic, 13.7 percent reported as African American, 0.9% stated ethnicity as Native American,
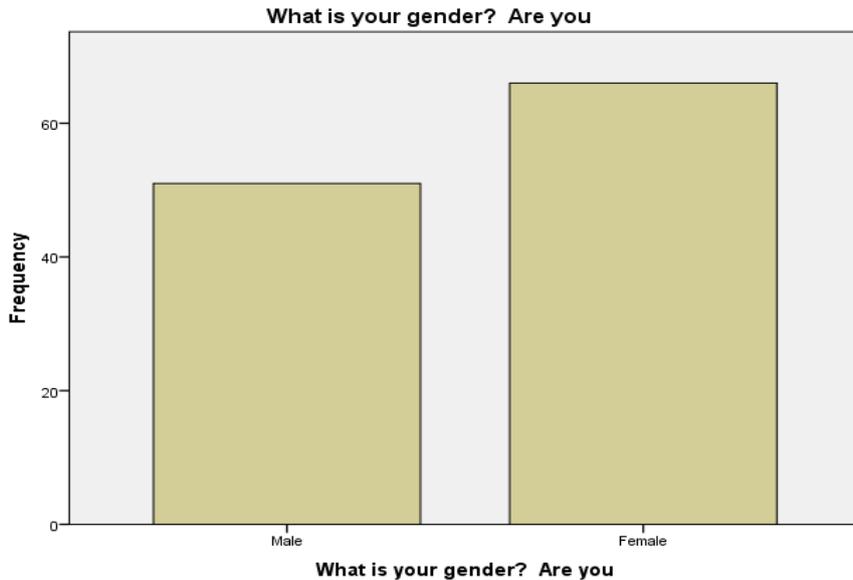
Figure 3 Bar graph of gender.

Table 4 Group statistics.

	Group assignment	N	Mean	Std. deviation	Std. error mean
	Control Group	56	4.4325	1.10179	0.14723
Perception of Caring Environment	Intervention Group	62	4.5083	0.98618	0.12525

Table 5 Age of patient participants.

		Frequency	Percent	Valid percent	Cumulative percent
	18-34 years	21	17.5	18.1	18.1
	35-49 years	19	15.8	16.4	34.5
Valid	50-64 years	27	22.5	23.3	57.8
	65-79	39	32.5	33.6	91.4
	80+ years	10	8.3	8.6	100.0
	Total	116	96.7	100.0	-
Missing system		4	3.3	-	-
Total		120	100.0	-	-

Table 6 Gender frequency.

		Frequency	Percent	Valid percent	Cumulative percent
	Male	51	42.5	43.6	43.6
Valid	Female	66	55.0	56.4	100.0
	Total	117	97.5	100.0	-
Missing system		3	2.5	-	-
Total		120	100.0	-	-

Table 7 Gender coefficients.

Co-efficients[a]									
Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Correlations		
		B	Std. error	Beta			Zero order	Partial	Part
1.	(Constant)	4.428	0.124	0.076	35.694	0.000			
2.	Male	0.152	0.187		0.81	0.419	0.076	0.076	0.076

[a]Dependent variable: perception of caring environment

and 4.3 reported as other. It is remarkable that there was no term or category represented for Asian and Pacific Islanders due to the fact that no one reported that option. SPSS automatically excluded that particular category.

Table 8 Ethnicity frequency.

	What is your ethnicity?			
		Frequency	Percent	Valid percent	Cumulative percent
Valid	White/non-Hispanic	95	79.2	81.2	81.2
	African American	16	13.3	13.7	94.9
	Native American	1	0.8	0.9	95.7
	Other	5	4.2	4.3	100.0
	Total	117	97.5	100.0	-
Missing system		3	2.5	-	-
Total		120	100.0	-	-

Frequencies for ethnicity were recognized as skewed and further displayed by the bar graph seen in **Figure 4**. The following regression equation was generated where the constant term, 4.923, represents the mean Perception of Caring Environment of the other group. Each predictor term represents the b coefficients for their respective ethnicity [15].

Perception of Caring Environment'=4.923-0.451 (White/non-Hispanic) -0.464 (African American) +0.077 (Native American).

Interpretations of each b coefficient is noted: If a patient was identified as a White/non-Hispanic, he/she is more likely to report a slightly lower score on Perception of Caring Environment when compared to the other group but were not statistically significant, p=0.331. If a patient was identified as an African American, he/she is more likely to report a slightly lower score on Perception of Caring Environment when compared to the other group but were not statistically significant, p=0.371. If a patient identifies as a Native American, he/she is more likely to report a slightly higher score on Perception of Caring Environment when compared to the group Other but were not statistically significant, p=0.944. If a patient was identified to the other group, he/she is more likely to score 4.923 on Perception of Caring Environment. This was seen as the constant on **Table 9**. The predictors for Ethnicity only account for 1.1% of variance of Perception of Caring Environment, which indicates a small effect size [15].

Secondary sample

Staff nurses were surveyed as secondary population data collectors. All twenty nurses attending the staff meetings post data collection period received a survey, and all nurses anonymously returned the survey. **Table 10** depicted the descriptive statistics for this sample where 50 % were noted from each participating hospital unit. Simple survey to nurse's post data collection period sought to understand the second sample perception of the intervention. Missing data from nurse survey did not equate omission of survey from sample. Each question was analyzed for frequency alone. Question one results were noted in **Table 11** revealing that 65% of the twenty nurses agreed that movement of the MCW to never physically come between the nurse and the patient alone increased communication between the dyad.

Question two outcomes revealed in **Table 12** show that 65% of nurses surveyed agreed that ergonomic positioning to lower themselves to eye level while not allowing the MCW physically between the nurse and the patient allowed for better connection among the dyad.

Question three of the nurse survey asked if altered ergonomic use of the MCW allowed for increase in patient-centered care. These results, depicted in **Table 13**, report 22.2% of the nurses remained undecided, while 61.1% agree that altered ergonomic use of the MCW allowed for increased patient-centered care.

Discussion of Implications and Significance

Policy that encourages individual actions of healthcare professionals surrounding ergonomic use of MCWs can be used to drive practice improvement that increases patient perception of the caring environment [16]. At the organization level, increased understanding of patient perceptions of the caring environment where mobile computer workstations are used at the point of care and increased knowledge of the difference between ergonomic use of a mobile computer workstation and patient perception of the caring now has the potential to positively affect patient satisfaction scorecard outcomes and reimbursement.

Increased understanding of gender, ethnicity and age demographics on perception of the caring environment where MCWs are utilized offers increased opportunity for patient centeredness in target population segments. Evidence based practice, disseminated and implemented at the point of care at little to no cost to the nurse or organization has increased understanding of patient perceptions that influence patient satisfaction surrounding organizational reimbursement [17].

A difference in fact exists and individual behavioral actions deliberate towards the preservation of perceived caring within the nurse patient dyad are documented in this pilot study results. Further studies are needed that allow for generalization of findings.

Limitations

Limitation is noted with only two hospitals participating. Notation is made that both hospitals were part of the same health system and demographics of participants were not greatly diverse. A small effect size of this pilot study is also noted as limitation. Uncontrolled variables of nurse personality, gender, and experience level are also noted confines of the study [15].
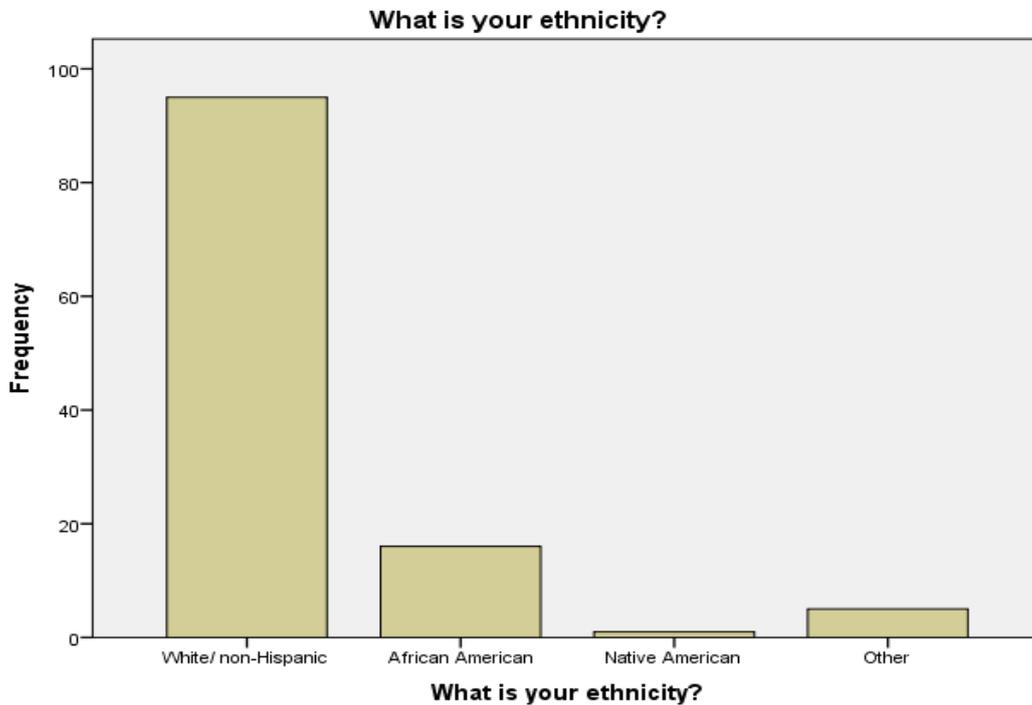
Figure 4 Bar graph of ethnicity.

Table 9 Ethnicity coefficients.

| Model | Co-efficients[a] | | | | | | | |
| | Unstandardized coefficients | | Standardized coefficients | | | Correlations | | |
	B	Std. error	Beta	t	Sig.	Zero order	Partial	Part
Constant	4.923	0.450		10.939	0.000			
White	-0.451	0.462	-0.178	-0.0977	0.331	-0.046	-0.092	-0.092
African_American	-0.464	0.516	-0.161	-0.0899	0.371	-0.014	-0.085	-0.084
Native_ American	0.077	1.102	0.007	0.070	0.070	-0.047	0.007	0.007

Note: a: Dependent variable: perception of caring environment.

Table 10 Nurses as secondary sample.

Hospital		Frequency	Percent	Valid percent	Cumulative percent
Valid	Hospital one	10	50.0	50.0	50.0
	Hospital two	10	50.0	50.0	100.0
	Total	20	100.0	100.0	-

Table 11 Nurse survey question one.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Agree	13	65.0	65.0	65.0
	Somewhat agree	2	10.0	10.0	75.0
	Undecided	3	15.0	15.0	90.0
	Strongly disagree	2	10.0	10.0	100.0
	Total	20	100.0	100.0	-

Table 12 Nurse survey question two.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Agree	13	65.0	65.0	65.0
	Somewhat agree	4	20.0	20.0	85.0
	Undecided	2	10.0	10.0	95.0
	Strongly disagree	1	5.0	5.0	100.0
	Total	20	100.0	100.0	-

Table 13 Nurse survey question three.

		Frequency	Percent	Valid percent	Cumulative percent
VaZlid	Agree	11	55.0	61.1	61.1
	Somewhat agree	2	10.0	11.1	72.2
	Undecided	4	20.0	22.2	94.4
	Somewhat disagree	1	5.0	5.6	100.0
	Total	18	90.0	100.0	-
Missing system		2	10.0	-	-
Total		20	100.0	-	-

Conclusion

Pilot project intervention increased patient perception of the caring environment. The perception of the caring environment was higher for those intervention patients whose nurse did not allow the MCW to physically come between them and their patient and who sat eyelevel with their patient. However, the improvement was not statistically significant in size. Age, gender and ethnicity were also noted as variables that affected patient perception. However, none of these measured demographics revealed statistically significant differences [15].

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