Caring And The Influence of Technology on the Caring Behaviors of Nurses: Perspectives of Patients and Nurses

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Abstract: **This study examined the caring behaviors of nurses as perceived by patients and nurses in Zamboanga City, Philippines. The influence of technology on the caring behavior was compared according to the demographic profile and work background of the nurses; and the demographic profile, hospital admission, and type in the case of patient-respondents.**

A descriptive-comparative design; validated questionnaires for the nurses and patient-respondents were utilized for data gathering. Data were analyzed with Descriptive and Inferential Statistics.

Nurses had experience on the use of hospital apparatus and equipment in the BSN curriculum. As registered nurses, 84 percent had technological exposures in the hospital. Meanwhile, 65 percent nurses were exposed to technology-based training during college and 77 percent had in the hospital.

The respondents agreed on the ideal caring behavior of nurses. Meanwhile, the perceptions of the nurses on health care technology and caring behavior do not significantly differ when compared to age group, gender, hospital position, and length of work experience but not according to their area of assignment. Similarly, the patients' responses do not significantly differ on the same questions.

The technological value in Locsin's theory was demonstrated in this study.

Finally, to enhance caring behaviors a development plan on techno- training was developed.

Keywords: **Caring, Caring Behaviors, Technology, Patients' and Nurses' Perspectives.**

1. INTRODUCTION

As early as the 1970s there were already recommendations for health care professionals to improve their knowledge and skills in computer literacy, information literacy and the use of information technologies . It has also been recommended that these competencies be integrated into the nursing curricula (Anderson, Gremy, and Pages, 1974; Ronald and Skiba, 1987; Staggers, Gassert, and Curran, 2002). Almost four decades have already passed but there is still very minimal implementation of these recommendations in the Philippines. This is the scenario despite that the country has increasingly become technological given the advancement of the Information Technology in the market which demands corresponding competencies in the labor force like among health care professionals.

Nevertheless, computer course as a subject was integrated into the Bachelor of Science in Nursing (BSN) Curriculum per CHED Memorandum Order (CMO) No. 30 series of 2001. Some years later, Nursing Informatics was also integrated into the curriculum per CMO No.5 series of 2008 and CMO No.14 series of 2009. The minimal developments in computing technology in the nursing curriculum have at least inspired some nurses to look into how they can use this tool in their work. But there are still some of them who remain uncertain as to the benefits of using information technology in nursing care and the delivery of health services.

Advancements in computer and information technology are expected to have significant contributions to the changes within the nursing profession and the overall health care system. It is imperative for nurses to adapt to technological

advancements in order to address complex health care issues and deliver optimal nursing care (Ross-Kerr, 2003). This is based on the argument that quality of care is greatly influenced by the ability of nurses to access accurate and comprehensive health information given available electronic technology. According to Curtis (2011), the transition from paper to electronic charting can facilitate this process that will greatly improve the quality of nursing documentation. This will also help a lot in the monitoring by doctors of the condition and progress of their patients. The use of health information technology is found to be safer, more cost-effective, and more patient-centered within a national health care system (National Research Council, 2001).

But whether or not the quality of health care delivery may be altered with the shift from direct to technologically-mediated services becomes an issue among health care professionals. The debate is anchored on the concept of caring which incidentally are not equally shared by nurses and patients. Papastavrou, Efstathiou, and Charalambous (2011) already observed that no congruent perceptions exist between patients and nurses as regards to which behaviors are considered caring. Moreover, technological competency is often viewed as the opposite of caring and may be resisted by both nurses and patients. Nevertheless, Locsin (1995, 1998) in his investigation had demonstrated the direct relationship between traditional caring and technological competency. He claimed that technological competency as a practice of nursing is an expression of caring. This also means that the quality of caring experienced by patients is not altered by the use of certain health technology.

It is, therefore, the focus of this study to examine the issue if technologically competent nurses are likewise perceived to be caring nurses. This specifically aims to explore the perceptions of registered nurses on what caring behavior means to them as nurses and if health technology has some influence on the caring behaviors of nurses in technologically-advancing hospitals such as those in Zamboanga City. Likewise, this intends to compare the perceptions of nurses with those of patients about their concept of caring and how certain technology has influenced the caring behaviors of nurses.

Incidentally, no local data are available that deal with these issues which this study would like to fill in so that ways can be recommended by which health care delivery and electronic technological advancement can be reconciled. The results of this study will become input to planning and decision making for hospital administrators and nursing service directors particularly in the complimentary acquisition and sharing of health care technology. Moreover, the relevant findings from this study will be useful in planning continuing educational programs for practicing nurses and for enhancing the nursing curriculum for students.

2. METHOD

This is a descriptive comparative study which employed quantitative techniques in data gathering and analysis to examine and compare the perceptions of caring behaviors of nurses and patients who were categorized according to their profiles.

This study was conducted in selected hospitals in Zamboanga City which included the Zamboanga City Medical Center, the Camp Navarro General Hospital, the Brent Hospital, Inc., and the Zamboanga Doctors' Hospital. The current hospital information system that is being utilized is the Biz box system and Med System.

The respondents of this study were registered nurses employed in the selected hospitals regardless of age, gender, position, and with at least one year of hospital service. These nurses were those assigned to either the General Ward, Special Unit, or at the OPD and were selected through a non-probability, convenience sampling design.

In order to represent reasonable estimates, a minimum of 20 percent of the total population served as the baseline to estimate the appropriate sample size (see Gay 1987). Because a total of 254 nurses consented to participate in the study, the sample size actually constituted about 60% of the qualified nurses which is higher than the prescribed minimum estimate.

Convenience sampling method was employed to get the 254 nurse-respondents, with the following inclusion criteria: employed in the selected hospitals for at least a year and assigned in either the General Ward (e.g., medical, surgical, obstetrics and pediatrics), Special Unit (e.g., dialysis, oncologic, intensive, burn), or Out-Patient Department, regardless of age, gender, and position. Nurses who were excluded were those newly hired or had less than one year experience in hospital service, were under the RN HEALS program; were on volunteer service or on-the-job training; and clinical instructors. However, only 235 questionnaires (93%) were finally retrieved at the end of the data gathering period.

Convenience sampling was also utilized to identify the 152 patient-respondents. This size also falls within the 20 percent of adult patient population confined in the selected hospitals at the time of the study. They aged at least 20 years old and

admitted for at least three days in a General Ward or Special Unit, regardless of gender and marital status, with an improved state of health or about to be discharged. They also included those regular patients at the Out-Patient Department and who voluntarily consented to be interviewed. But patients encountered with an unstable state of health were excluded.

Data were gathered using a questionnaire-checklist which was prepared in English and translated into Cebuano and Chavacano, the dominant dialects in the community. The questionnaire included sections on demographic profile and a five-point scale measure of the perceptions of respondents about "what caring is to him or her as a nurse or as a patient." It did not contain any degrading, discriminating, or any other unacceptable language that could be offensive to the respondents. It was designed to only collect information directly related to the objectives of the study.

Part I of the instrument measures the perception of caring of the respondents and has 24 items with four negative items. Part II measures their perception on the influence of technology on the caring behaviors of nurses has 15 items with seven negative items. A positive item gets a score of 5 for "strongly agree" and a score of 1 for "strongly disagree." The scores for the negative items were reversed. The instrument for the nurse-respondents was a self-administered questionnaire-checklist while it was a guided questionnaire-checklist for the patient-respondents.

Pilot testing of the questionnaire was first conducted to validate its content using groups composed of a convenience sample of ten nurses for the first focus group discussion and nine nurses for the second focus group discussion. Responses and comments that were obtained during the focus group discussion were transcribed and incorporated into the instrument. The results of the pilot tests enhanced the content validity of the questionnaire used in this study.

The translations of the statements or questions to local dialects were done by nurse educators who have excellent communication skills in both English and Chavacano, English and Tagalog, and Cebuano dialects.

The content validity of the revised questionnaire was confirmed by the dissertation adviser and other competent professional researchers. There were three evaluators who reviewed the contents of the questionnaire. They were asked to rate each item in terms of relevance or importance using the following scale: very relevant (3), relevant (2), quite relevant (1), and not relevant (0). Inter-raters reliability test (F-test or ANOVA) results revealed that there was no significant difference in the evaluation of the three raters.

The researcher sought permission from the chief or training officer of the hospitals where this study was conducted. After permission was granted, an orientation was given to the nurses and supervisors in the hospital's conference room. There was neither interruption in the duty of the nurses nor distraction in any hospital activities. But before the actual data gathering, ethics clearance was obtained from a registered Ethics Review Committee.

In the actual data gathering, informed consents were obtained from the respondents. They were provided with adequate background and information about the study before they voluntarily signed the consent form. They were also advised of their rights to withdraw from the study at any time they wish to. Anonymity, confidentiality, and the right to self-determination were generally observed and applied.

The data gathered were processed and analyzed with the use statistical tools such as frequency and percentage distribution, weighted item means, and group means, t-Test for independent samples, and One-way Analysis of Variance (ANOVA).

Fifty percent of the nurse-respondents claimed that during their Related Learning Experience (RLE) under the BSN curriculum, they were exposed to or had experienced the use of digital BP and thermometer (65.11%), nebulizer (65.11%), glucometer (65.11%) and suction machine (51.49%). Fifty percent were exposed to pulse oximeter while less than 50 percent had known the defibrillator (37.02%), ECG machine 36.60%), ventilator/respirator (34.04%), cardiac monitor and interpretation (27.66%) and cautery machine (25.53%). Senior nurses claimed that some of the apparatus and equipment were not available in the training hospitals when they were still students.

Interestingly, of the four hospital apparatus and equipment in the said list, less than 50 percent of the nurse-respondents were confident on how to operate them which include the defibrillator, ventilator/respirator, cardiac monitor and interpretation and cautery machine. This suggests that to some extent the exposure of students on how to use and operate health care technology while still in school may help on their confidence level when ask to use them in a real hospital setting. Nursing schools without the necessary and updated health care technology have to rethink on the acquisition of these learning resources to make their graduates more competitive in the field of health care delivery.

Table 1. The Concept of Caring Behaviors as Perceived by Nurses and Patients

Indicative Statements	Mean	Nurses' Verbal Description	Mean	Patients' Verbal Description
A. Practical Dimension				
Listens to the patient.	4.71	Strongly Agree	4.70	Strongly Agree
Speaks on behalf of the patient, in relation to their care.	4.67	Strongly Agree	4.51	Strongly Agree
Talks to the patient.	4.64	Strongly Agree	4.55	Strongly Agree
Documents care given to patients.	4.62	Strongly Agree	4.64	Strongly Agree
A caring nurse is to do his/her best, to make the patient comfortable in their surroundings.	4.62	Strongly Agree	4.60	Strongly Agree
Gives the patient explanations concerning his/her care/ Educating the patient about self-care	4.59	Strongly Agree	4.54	Strongly Agree
Allows the patient to express feelings.	4.57	Strongly Agree	4.58	Strongly Agree
Keeps the relatives informed about the patient as negotiated with the patient.	4.57	Strongly Agree	4.59	Strongly Agree
Works collaboratively with colleagues to ensure continuity of care.	4.56	Strongly Agree	4.59	Strongly Agree
Creates a sense of trust.	4.55	Strongly Agree	4.51	Strongly Agree
Provides the patient with encouragement.	4.51	Strongly Agree	4.39	Agree
Knows what to do in an emergency.	4.47	Agree	4.43	Agree
Prevents any anticipated problems/ dangers from occurring.	4.45	Agree	4.39	Agree
Help to make experiences more pleasant.	4.44	Agree	4.43	Agree
Touches the patient when comfort is needed.	4.39	Agree	4.43	Agree
Keeps the patient's information confidentially.	4.39	Agree	4.26	Agree
Expects the patient to do immediately what she/he tells him/her.	4.20	Disagree	4.07	Disagree
Gives priority to the needs of the hospital before the patient.	4.02	Disagree	3.53	Disagree
Does not involve the patient in the planning of their care.	4.01	Disagree	3.0	Uncertain
Does not give the patient all the information he/she needs.	3.90	Disagree	3.46	Disagree
B. Theoretical Dimension				
A caring nurse is prepared to work extra time.	4.69	Strongly Agree	4.67	Strongly Agree
Caring is a "joint effort" between the nurse and the patient.	4.63	Strongly Agree	4.65	Strongly Agree
Caring is acting, it is not just feeling.	4.61	Agree	4.62	Strongly Agree
Caring is a planned nurse activity designed to meet the patient's needs.	4.08	Agree	4.60	Strongly Agree
Overall Mean	**4.54**	**Strongly Agree**	**4.36**	**Agree**

The nurse-respondents and the patient-respondents have the same perspectives on the concept of caring. They both "agree to strongly agree" (mean ranges from 4.39 to 4.71) on items which define the caring behaviors of nurses. In this particular study, the nurses do not necessarily give more importance to the psychological or emotional aspect of caring as mentioned by Papastavrou et al. (2001). It does not also show in this study that patients rank physical care higher than nurses do similar to the findings of Essen and Sjoden (1993).

Table 2. Influence of Technology on the Caring Behavior of Nurses as Perceived by Nurses and Patients

Indicative Statements	Nurses		Patients	
	Mean	Verbal Description	Mean	Verbal Description
Technology has resulted in nurses becoming increasingly professionally competent nurses.	4.54	Strongly Agree	4.44	Agree
The practice of using technologies for the purpose of knowing persons as whole is caring in nursing.	4.44	Agree	4.67	Strongly Agree
Health information technology establishes better caring linkages among health care workers as information can be more easily shared.	4.44	Agree	4.43	Agree
The adoption of electronic health records (EHR's such as the use of computers) employed in health care institution ensures safe and quality care.	4.42	Agree	4.45	Agree
Technology enhances patient care and well-being.	4.32	Agree	4.74	Strongly Agree
Competent in the emergency nursing situation is an expression of caring.	4.10	Agree	4.35	Agree
Technology can help reduce nurses' physical workload.	4.06	Agree	4.36	Agree
Technologically competent nurses are caring nurses.	4.04	Agree	4.35	Agree
Nurses do not bother to check if the results or machine findings match the clinical appearance or clinical manifestations of the patients.	4.02	Disagree	3.90	Disagree
No tender Loving Care (TLC) due to lesser face-to-face interaction.	3.96	Disagree	2.78	Uncertain
Technology and the use of machines often interfere with providing nurse care.	3.92	Disagree	3.0	Uncertain
The use of technology frequently leads to errors (device-related problems) and which leads to altered caring behaviors of the nurses.	3.90	Disagree	2.91	Uncertain
Nurses are too dependent on machines and they do not bother to check the accuracy of the results/findings.	3.74	Disagree	3.90	Disagree
The increase in the technical task has downgraded the bedside nursing care.	3.74	Disagree	2.84	Uncertain
Technologically competent nurses give more value/priority to machines over patients.	3.68	Disagree	3.27	Uncertain
Overall Mean	**4.09**	**Agree**	**3.79**	**Agree**

3. RESULTS

The following results of statistical tests support the conclusion:

1. The t-Test result of 0.892 with a probability value of 0.377, which is greater than the 0.05 margin of error, shows that no significant difference exists between the mean scores of nurse-respondents and patient-respondents on what they perceived as the comprising caring behavior of nurses.

2. The t-Test result of 1.344 with a probability value of 0.190, which is greater than the 0.05 margin of error, shows that there is no significant difference between the mean scores of nurse-respondents and patient-respondents on the perceived influence of technology on the caring behavior of nurses.

3. The ANOVA result of 0.269 with a probability value of 0.848, which is greater than the 0.05 margin of error, shows that no significant differences exist among the mean scores of the nurse-respondents on the perceived influence of technology on the caring behavior of nurses when their responses were categorized by age group.

The t-Test result of 0.402 with a probability value of 0.690, which is greater than the 0.05 margin of error, shows that the nurse-respondents categorized by gender share similar views on what they perceived as the influence of technology on the caring behavior of nurses.

The ANOVA result of 0.351 with a probability value of 0.706, which is greater than the 0.05 margin of error, shows that no statistically significant differences exist among the mean scores of the nurse-respondents on the perceived influence of technology on the caring behavior of nurses when they are grouped according to their positions in the hospital.

The ANOVA result of 0.239 with a probability value of 0.869, which is greater than the 0.05 margin of error, shows that no significant difference exists among the mean scores of nurse-respondents on the perceived influence of technology on the caring behavior of nurses when they are grouped according to the number of years they work in the hospital.

The ANOVA result of 4.316 with a probability value of 0.020, which is lesser than the margin of error of 0.05, implies that significant differences exist among the mean scores of nurse-respondents on the perceived influence of technology on the caring behavior of nurses when they are grouped according to their area of assignment in the hospital. The Tukey Post Hoc test further shows that the mean score of nurse-respondents assigned in Special Units is highest which suggests that they agree more on the indicative statements of the influence of technology on the caring behavior of nurses if compared with the nurses in General Units and the OPD nurses.

4. The ANOVA result of 0.044 with a probability value of 0.988, which is greater than the 0.05 margin of error, shows that no significant difference exists among the mean scores of patient-respondents on the perceived influence of technology on the caring behavior of nurses when they are categorized according to different age groups.

 The t-Test result of 0.044 with a probability value of 0.997, which is greater than the 0.05 margin of error, shows that no significant difference exists between the mean scores of male and female patients on the perceived influence of technology on the caring behavior of nurses.

The ANOVA of 0.038 with a probability value of 0.963, which is greater than the 0.05 margin of error, shows that no significant difference exists among the mean scores of patient-respondents on the perceived influence of technology on the caring behavior of nurses when they are categorized in terms of hospital admission.

4.   CONCLUSION

Generally speaking, the nurse-respondents and patient-respondents do not significantly differ on their perceptions of what constitute caring behavior of nurses and how this is being influenced by health care technology. There may be certain indicative statements where they differ pertaining to their concept of caring and perceptions of technological influences on the caring behavior of nurses, they generally appear to share the same perspectives on the above health care delivery issues. Technologically competent nurses are caring nurses as viewed by both patients and nurses.

The few differences that were also noted may be attributed to the understanding of patients of what inherently or traditionally caring is by nurses, which they expect every time they are admitted to hospitals relative to their ailments. These contentions are related to the result which shows that nurses from different areas of assignment in the hospital significantly differ on what they perceived as the influences of health care technology on the caring behavior of nurses. But these have yet to be further explored in the future related investigation.

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