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THE IMPACT OF EMERGING TECHNOLOGY ON NURSES CARING BEHAVIOR DURING BLOOD PRESSURE MONITORING FOR ADULT PATIENTS AT GENERAL HOSPITALS, KUWAIT.

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THE IMPACT OF EMERGING TECHNOLOGY ON NURSES CARING BEHAVIOR DURING BLOOD PRESSURE MONITORING FOR ADULT PATIENTS AT GENERAL HOSPITALS, KUWAIT.

Abstract

Introduction: The nursing profession has advanced immensely from the onset. Remarkable changes in medical technology facilitated patients' survival and treatments which were unimaginable during the period of Florence Nightingale. Although, technology empowered the nurses to provide quality care to patients, some of these technologies can break the bond of therapeutic nurse - patient relationship and make it mechanical, instead. **Purpose:** The purpose of the study was to evaluate nurses caring behavior during blood pressure monitoring with manual and electronic devices. **Objective:** Compare the nurses caring behavior while monitoring blood pressure by electronic and manual devices. **Methods:** a descriptive comparative design was used in this study. The staff nurses (N=325) were selected randomly based on certain criteria from the medical wards of five governmental hospitals. Observations were done during blood pressure monitoring with manual and electronic devices using nursing caring behavior assessment tool. **Result:** Paired t-test was used to examine the differences in nurses caring behavior. There were significant differences in the mean scores between the manual BP monitoring and the electronic in terms of nursing caring behavior, $t(324) = -8.66, P > 0.001$. **Conclusion:** Nurses were able to give more humanistic caring behavior when they monitored blood pressure manually than when blood pressure was monitored electronically. **Recommendations:** Workshop sessions can be conducted for staff nurses to emphasize the importance of providing a humanistic approach while providing care for the patients when using the technology.

Keywords

Emerging Technology, Humanistic Caring Behaviour, Manual Monitoring, Electronic Monitoring, Nursing care.

1. INTRODUCTION:

The Nursing profession has advanced tremendously through the recent years. Remarkable changes in medical technology facilitated patients' survival and treatments which were unimaginable during the period of Florence Nightingale (Greger, 2012). Technology has improved nurses' skills to be more efficient, to perform the procedures less aggressively, more relaxed, and more profitable (Richie, 2012). Although, the technology empowered the nurses to provide quality patient care, some of these technologies can break the bond of therapeutic nurse - patient relationship and make it mechanical, instead (Greger, 2012). In nursing, the heart and the core values of nursing discipline is caring as it's considered as the "art" of nursing, that the nurses are implementing the human skills of caring in their practice (Papastavrou, Charalambous, & Efstathiou, 2011). Caring is conceptualized by Morse, et al (1990) as a human trait, a moral imperative, an effect, an interpersonal relationship & a therapeutic intervention (Morse, Solberg, Neander, Bottorff, & Johnson, 1990). Conversely, caring behaviors are "actions concerned with the well-being of a patient, such as sensitivity, comforting, attentive listening, honesty and non-judgmental acceptance" (Salimi & Zimpour, 2013). The interaction time between the nurse and the patient and the use of physical assessment skills have been compromised with the use of electronic devices. These devices can never replace the human aspects of sensory assessment skills which are owned only by a nurse (Chua & Liaw, 2016). The emerging technology has given nurses new devices which substitute the older method by automatically recording the measurements (Tysinger, 2014). These devices can make the nurses to concentrate more on the screens of the monitors than interacting with the patient which can endanger the holistic nursing care (Chua & Liaw, 2016). In order to prevent the shifting of "high-touch" to "high-tech" nursing profession, nurses in their practice should preserve caring behavior along with technology. An equilibrium must be maintained between technology and comprehensive nursing care to meet patients' demands (Richie, 2012; Schroeder, 2013). Many studies have been performed globally to assess the impact of technology on nursing care practices in a highly technical and competent setting. One of these studies done by Silva, Ferreira, and Apostolidis (2014) shows that there are both merits and demerits while using technology in nursing care. In spite of the improvement in professional actions with technology, there is a gap between the nurse and the patient due to preference given to the data (Silva, Ferreira, & Apostolidis, 2014). In addition, technology may dehumanize the provided nursing care to the patients. Adel, Mohamed, Ali, and Sobh (2014) conducted a study that aimed to assess the nurses' perception regarding the use of technological devices in the critical care units. Results showed that nurses agreed that "Using technological devices, loss of human sensitivity about patients by diminishing interest in emotional and psychosocial needs of patients" (Adel, Mohamed, Ali, & Sobh, 2014). Many theories have been developed on caring as it is an important aspect of nursing practice. Nevertheless, several issues have been raised nowadays on giving more importance to science and technology than caring (Hawthorne & Yurkovich, 1995). The current study was based on the theory of human caring which was developed by Jean Watson. This theory provides the nurses with the right techniques to develop caring behaviors in their practice. It keeps in the nurses' minds that caring is significant for the healing process. Moreover, Jean Watson's Theory of Human Caring emphasizes that nurses are totally accountable for sustaining their humanity and lives as well as the lives and humanity of their patients (Watson, 2008). In Kuwait, there were no previous studies that examined the impacts of technology on the nurses caring behavior. This study provided an insight about the nurses working in Kuwait Ministry of Health (MOH) Hospitals, regarding how to independently preserve the value of caring behavior and humanism as they incorporate technology into their practice to provide holistic nursing care. The aim of this study is to evaluate nurses caring behaviors during blood pressure monitoring with manual and electronic devices.

2. METHODOLOGY

2.1 Study Design

In this study, a descriptive comparative design was used to evaluate the nurses caring behaviors during blood pressure monitoring with manual and electronic devices. A cross-sectional comparative design allowed the researcher to access a wider sample as well as compare the views of the participants regarding the nursing modality at hand at one point of time (Olsen & George, 2004).

2.2 Sample and Sampling

Stratified sampling technique was used to determine the target population from 32 medical wards in five general hospitals for the proportionate allocation of. Thereafter, a systematic random sampling was performed for each strata to recruit the participants in this study. A total number of the participants was 325 nurses from the Kuwait MOH hospitals (Trost, 1986).

2.3 Nurses Eligibility Criteria

The inclusion criteria for the nurses in this study were: first, nurses who have completed a minimum of one year in service as medical wards nurses; second, nurses from different nationalities and qualifications.

2.4 Sample Size

The total sample size needed for the current study was 306 participants and the recruited number was 325 nurses in case of any attrition.

2.5 Setting of the Study

The study was conducted in 32 medical wards distributed in five general Hospitals and in five medical regions.

2.6 Ethical Consideration

Permission from the standing committee for coordination of health and medical research in the M.O.H was obtained before starting the data collection process. The informed consent forms were signed by the eligible nurses who agreed to participate in the study (IRB: 4-12-2016/1-84).

2.7 Instrumentation

The researchers developed the instruments of the current study after a thorough review of literature. This tool was divided into two parts:

Part (1) Demographic data of Nurses

It included the name of the hospital, ward number, and technique of blood pressure monitor that was used. Nurses' data includes: age, gender, nationality, qualification and years of experience.

Part (2) Nurses Caring Behavior Assessment Tool (NCBAT)

Nurses caring behaviors assessment tool was developed by the researchers specially to fit the purpose of the current study. It was used to observe nursing caring behaviors during blood pressure monitoring for adult patients in the medical wards with manual and electronic devices. This tool, which contains 13 items has been divided into 3 major domains, as follow: transpersonal caring relationship (with 4 items), carative factors (with 5 items) and caring moments (with 4 items), which were based on Jean Watson's theory of human caring (Watson, 2009). Each item was checked eight times: four times during manual method, and another four times during electronic methods. For each observation, "yes" or "no" was checked in front of each item. This was done according to the nurse's performance on that item. Then, the four observations for each item in either the manual or electronic method were rated on a scale of three scores:

- Rarely: if the nurse performed 0-1 time out of 4 observations.
- Occasionally: if the nurse performed 2-3times out of 4 observations.
- Frequently: if the nurse performed 4 times out of 4 observations.

The NCBAT was distributed among 4 research expertise in the field of nursing to determine the face validity. For this scale, the face and content validity assessments were performed with a review of the literature by a panel of six experts in nursing and one statistician. These experts assessed the clarity of the items, their suitability, relevance, format, and how the items represent their own domain; slight modifications were done to the items in order to increase their clarity of meanings. Moreover, the current assessment tool was tested for the internal consistency reliability and results revealed that Cronbach's alpha coefficient was 0.889.

2.8 Data Collection Procedures

Data was collected over a period of 12 weeks on regular working days during morning shift, excluding MOH holidays. After the permissions were gained from all the directors of the medical regions, hospitals and nursing directors as well, the process of data collection started. A professional clinical instructor (C.I) from each hospital was selected and trained to be a research assistant during the data collection process. Instructions were given to the seven C.Is at ones in three sections: first, Introduction about the study, aim, and explanations of the research questions; second, methodology, participants' informed consent forms, and how to collect and fill the data collection forms; third, how to respond to participants' concerns, and how to input and revise the data in the Statistical Packages for Social Science (SPSS) program. The selection for the nurses was done randomly. Duty arrangement was done for the participants with her/his head-nurses to keep the nurse on morning shift during the observational periods. Nurses were informed about the study, and the informed consent was obtained from each. At that point, each staff nurse was observed by well-trained assistant researcher using the checklist of NCBAT during blood pressure monitoring. The participating nurse was advised to measure blood pressure using two methods: manually and electronically; four observations (blood pressure readings) for each method. Observations were collected, and data were filled in the SPSS program.

3. RESULTS

The total participants in this study were 325 nurses. Out of six different nationalities, 279 (85.8%) were Indian, followed by 23 (7.1%) Filipino nurses. Almost two-thirds of the nurses were female ($n = 207$, 63.7%), and the participants' ages ranged between 22 to 52 years ($M = 33.59$, $SD = 5.15$). Additionally, the years of experience ranged from 1 to 30 years ($M = 6.75$, $SD = 4.66$), and around 203 (62.5%) of the participating nurses were bachelor degree holders, 121 (37%) were having diploma degree and only one nurse with certificate of nursing (0.3%). This study was done in five main hospitals situated in five different medical health regions, Al-Farwaniyah and Al-Adan constituted the majority of the selected nurses ($n=70$, 21.5%). Table 1 shows more details about the nurses' characteristics.

Table 1: Nurses Characteristics (N = 325)

Variables	Actual Range	*M (SD)	N	%
Nationalities				
• Indian			279	85.8
• Filipino			23	7.1
• Egyptian			4	1.2
• Jordanian			9	2.8
• Syrian			1	.3
• Indonesian			9	2.8
Age	22-52	33.59 (5.15)		
Gender				
• Male			118	36.3
• Female			207	63.7
Years of Experience	1-30	6.75 (4.66)		
Educational Attainment				
• Bachelor			203	62.5
• Diploma			121	37.2
• Certificate			1	0.3
Hospital Names				
• Al-Adan.			70	21.5
• Al-Amiri.			62	19.1
• Al-Farwaniyah.			70	21.5
• Al-Jahra.			62	19.1
• Mubarak Al-Kabeer.			61	18.8

*M = Mean, SD = Standard Deviation

The four observations in each question in the manual as well as the electronic methods were summed together, then the overall summation of the 13 questions were added together to get the total score. Variables were recoded as rarely, occasionally, and frequently (where the scores ranged from 0-52). Table 2 shows that nurses who were using the manual device were frequently performing the caring behavior tasks (79.1%) more than in the electronic device (62.3%).

Table 2: Comparison between Manual and Electronic Methods in Relation to their Performance Scores of Caring Behaviors.

Scores	Manual Device		Electronic Device	
	Frequency	%	Frequency	%
Rarely	0	0%	0	0%
Occasionally	68	20.9%	121	37.2%
Frequently	257	79.1%	204	62.3%

Paired *t*-test was used to examine the differences in nurses humanistic care behavior during the blood pressure (BP) monitoring between manual and electronic devices. The results illustrate that there were **significant differences in the mean scores** between the manual BP monitoring and the electronic in terms of nursing caring behavior, $t(324) = -8.66$, $P < 0.001$ (Table 3).

Table 3: Paired t-test for the Impact of Emerging Technology on Nurses Caring Behavior (N=325)

	Manual BP Monitoring M (SD)	Electronic BP Monitoring M (SD)	<i>t</i> -statistics	Significance (2-tailed)
Transpersonal Caring Relationship	77.25 (19.31)	72.23 (22.09)	-6.73	< 0.001
Carative Factors	87.08 (12.77)	81.52 (15.92)	-8.51	< 0.001
Caring Moments	80.54 (14.93)	76.92 (16.47)	-5.08	< 0.001
Overall Nursing Caring Behavior Assessment Tool	82.04 (11.96)	77.25 (14.87)	-8.66	< 0.001

*M = Mean, SD = Standard Deviation, $df = 324$.

4. DISCUSSION

The purpose of the current study was to identify the impact of emerging technology on nurses caring behavior during blood pressure monitoring for adult patients, in Kuwait Ministry of Health hospitals. The results of the present study showed that, the majority of the study sample based on nationalities were Indian. This elaborate the current nursing statistic of Kuwait MOH in 2020 (Nursing Dept. / MOH, 2019), which presented that the total number of nurses in Kuwait was 21798; out of that number 14979 were Indian nurses. The last number displayed that Indian nurses constituted the highest number of nurses compared to the other nationalities. Moreover, the results revealed that around two third of the participants were female. This may be attributed to the fact that, Kuwait is one of the Middle East countries, where the view of nursing profession is only for female. In addition, according to the Arabic culture and Islamic religion, female nurses can work in all the specialties, contrary to the male nurses, where they can only work in male wards/ units.

The results disclosed that the majority of the sample size had bachelor's degree. This elaborate two points: firstly; Kuwait MOH in the last years externally recruited the bachelor degree holders.

Secondly, the bachelor degree nurses are able to master the critical thinking process, assessing patient's condition and providing proper nursing intervention according to patient's individual unique needs. This result is supported by Noone & Seery (2018) who found that a person having higher educational level can think systematically, has ability to search for new knowledge and skills in the profession of nursing than the lower educational level.

With regards to caring behavior which involve three domains in this study, namely: the transpersonal caring relation, carative factors and caring moments, the results showed that the nurses who were using the manual device displayed the caring behavior more frequently in comparison to those using the electronic device. Adel, Mohamed, Ali, & Sobh, (2014) found that, technological devices dehumanized the nursing care for the patient by focusing on equipment and numbers and neglecting emotional and psychological needs of the patients. Their results were congruent with the current study results. Furthermore, Hawthorne & Yurkovich, (2008) addressed issues related to compatibility of science, technology, and caring. The authors believed that, due to an overemphasis on science and technology, nursing practice will become more concerned about efficiency than on the development of interpersonal relationships through caring.

In contrast, a study by Samaher (2011) found that nurses disagreed that the technology focused on equipment and technical skills only, which result in neglecting physical needs of patients. Montgomery et al., (2017) that, technology is not necessarily opposed to humanized care, but rather is often specifically and deliberately enrolled in the services of that care. In the same vein, Bagherian, Sabzevari, Mirzaei, and Ravari (2017) in their study examined the association between attitudes of critical care nurses about influences of technology and their caring attributes. The results showed that the technological influences were positively correlated with caring behaviors of nurses. Similarly, study of Wei et al., (2018) showed that technology help to improve work environment, make healthcare safer, more effective and improve quality care.

5. CONCLUSION

Technology plays a dynamic role in providing quality patient care, but sometimes this technology may breakdown the bond of therapeutic nurse-patient relationship. This study gave an insight of the nurses who are working in Kuwait MOH Hospitals, in terms of how they preserved the value of caring behavior and humanism with the use of technology in practice. The results showed that nurses who used the manual device were frequently performing the caring behavior tasks. So, this study clearly indicates that nurses were able to show more humanistic caring behavior when they monitored blood pressure manually than electronically.

6. RECOMMENDATION

Caring behavior is a significant element for nurses in their clinical practice. Therefore, nurses should have the skills on how to successfully incorporate caring behavior into the world of technology. Based on the results, this study suggests that from the practical side; caring behavior workshops should be conducted frequently for nurses in order to develop and maintain humanistic caring behaviors among staff nurses. Additionally, nursing administrators can do regular follow-up to monitor the nurses caring behavior at clinical settings. Staff development units in each hospital can include the topic of "nursing caring behavior and technology" in their orientation and rotation programs for the newly oriented nurses. From the educational perspective, the curriculum as well as the training arm for the nursing students need to focus on the new emerging issues in nursing field such as the influence of using technology on caring behavior in clinical practice. Lastly, from the perspective of research, this study recommends that, similar study can be conducted with other electronic devices used by staff nurses. Also, the effect of nurses' personal characteristics on nurses caring behavior while using technology can be assessed.

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