

The Use of Technology to Assist Nurses In Caring for Patients

*A Report of the Maryland Nursing Workforce Commission,
Technology Committee**

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* In January 2006, the Maryland Commission on the Crisis in Nursing was re-constituted as the Maryland Nursing Workforce Commission and the Workplace Issues and Technology Subcommittees were re-named the Workplace and Technology Committees.

Report of the Maryland Nursing Workforce Commission Technology Committee

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Executive Summary

The Maryland Commission on the Crisis in Nursing (the Commission) was established as an emergency measure during the 2000 legislative session to, among other responsibilities, determine the current extent and long term implications of the nursing shortage; and to develop recommendations and facilitate implementation of strategies to reverse the growing shortage of qualified nurses (House Bill 363, Legislative Session 2000). At its inception, the Workplace Issues Subcommittee of the Commission conducted a study of Maryland nurses to obtain information about the causes of job dissatisfaction among nurses that may be contributing to the shortage and to enable the subcommittee to identify strategies that would result in improved recruitment and retention. The study revealed that 87% of the nurses reported working extra hours beyond their twelve hour shifts due to insufficient staffing. In addition, 38% of the participants reported staying after their work shift ended to complete paper work that they felt kept them from spending time with their patients. Additionally, they reported spending more than 50% of their time documenting care.

As a result of these findings, the Workplace Issues Subcommittee recommended that a technology subcommittee be established to determine whether technology could be used to leverage the nursing workforce. In July 2002, the governor established the Taskforce to Study the Use of Technology to Assist Nurses in Caring for Patients.

In 2005, the Commission's Technology Subcommittee, which functions under the aegis of the Maryland Board of Nursing (BON), identified the need to conduct a survey to determine the use of technology in the workplace and its impact on work efficiency, quality of care, and the recruitment and retention of nurses. Maria V. Koszalka, MA, EdD, RN, Vice President of Patient Care Services at Johns Hopkins Bayview Medical Center was appointed chairperson of the Technology Subcommittee and Commissioner of Nursing Technology for Maryland. Susan K Newbold, PhD, RNBC, FAAN, FHIMSS, Associate Professor, Nursing Informatics, Vanderbilt University School of Nursing served as the Co-chairperson.

The subcommittee identified several issues related to the use of technology in the workplace based on input received during many discussions with staff nurses and presentations on cutting edge technology made to the Technology and the Workplace Subcommittees. These issues were:

1. The types of technology used by nurses have not been documented;
2. There is little emphasis in the workplace on the use of technology to enhance patient safety;

3. Nurses' attitudes regarding the use of technology are varied; and
4. The availability and use of technology in clinical practice is unevenly distributed.

A survey was conducted to identify technologies used by nurses licensed and employed in Maryland and to determine their perceptions of the effectiveness of technology use related to saving time, improving work efficiency, and improving quality of care. This study also responds to the Commission's request for data to validate anecdotal comments made by nurses regarding the usefulness of technology in the work environment. The results will contribute to the Commission's ability to prepare recommendations for improving the nurse's work environment and the quality of patient care through the use of technology. The subcommittee also wanted to determine if the availability of technology would assist employers in the recruitment and retention of nurses.

Data for this descriptive study were collected between November 2005 and February 2006, by the University of Maryland School of Nursing and the Maryland State Board of Nursing for the Commission's Technology Subcommittee. The primary investigators were Dr. Barbara Covington and Dr. Maria V. Koszalka.

The survey instrument was developed in consultation with the Technology Subcommittee and the Commission at-large, and pilot tested, revised, and piloted a second time. This was done to ensure that the questionnaire would closely reflect the clinical practice areas where technology was used and identify the specific types of technology that could impact the work environment and nursing shortage.

Prospective study participants were nurses randomly selected from the Board of Nursing's 2005 licensee database. A total of 5,994 nurses (3,129 RNs and 2,865 LPNs) who reported on their most recent license renewal application that they worked in Maryland, were selected for participation. Since the survey was conducted during a holiday period and at the same time that a second survey was being distributed, a low return rate was anticipated. Therefore, a sample size larger than needed was selected. A total of 916 questionnaires were returned. Following exclusion of individuals (n=11) who indicated they did not want to participate, the overall response rate was 15.1%. The response rate for RN's was 19.6%; for LPNs, it was 10%. Of the 905 participants, 82 indicated that they no longer worked in Maryland. Therefore, the data for these individuals was eliminated from the database, resulting in an analysis file of 823 records. Included were data contributed by 554 RNs (67.3%), 266 LPNs (32.3%) and three individuals (0.4%) who did not designate their level of licensure.

Significant findings:

1. Most nurses indicated they would be attracted to employment settings that use technology. This included 100% of nurses employed less than two years, 69.2% of those employed 2 to 5 years, and 79.5% of those employed 5 to 10 years. Supervisors and administrators also were highly attracted (79%) to employment settings that use of technology (Table 7).
2. Of the nurses using technology in the workplace, a majority agreed that technology improves nurse efficiency and contributes to improving the quality of patient care. The percentage of all nurse respondents agreeing that the use of a specific type of technology increased efficiency ranged from 63.7% to 86.4%; those agreeing that its use positively impacted quality ranged from 59.4% to 85.4% (Table 4).
3. The types of technology, other than the internet or local intranet, that nurses agreed had the greatest impact on improving nurse efficiency, were:
 - business management support systems and diagnostic, therapeutic, and clinical monitoring systems;
 - non-acute care specialty information systems that interconnect many functions within one department (example: behavioral health, pre-hospital, rehabilitation, long term care, outpatient, hospice, home health or research);
 - acute care specialty information systems that interconnect functions of the operating room, peri-operative and critical care areas or the obstetrics, peri-natal and emergency departments; and
 - healthcare information systems (Table 4).
4. The types of technologies, other than the internet or local intranet, that nurses agreed had the greatest impact on improving the quality of patient care were:
 - business management support systems;
 - non-acute care specialty information systems that interconnect many functions within one department;
 - acute care specialty information systems that interconnect many functions within one department;
 - robotics and dispensing systems; and
 - healthcare information systems.(Table 4).
5. Nurses working in home health care agencies reported the highest level of agreement (84.0%) with the statement: clinical documentation systems improve nurse efficiency; nurses employed in hospitals reported the second lowest level of agreement (55.2%) and those in long term care facilities, the lowest (53.7%) (Table 5)

6. Nurses working in colleges and universities or in home health care agencies (70.0% and 68.0%, respectively), reported the highest levels of agreement that the use of clinical documentation systems improve the quality of care; nurses employed in hospitals reported the lowest level of agreement (51.8%) (Table 5).
7. Nurses working in assisted living facilities and physician practices (100% and 93.7%, respectively) reported the highest level of agreement with the statement: medication, laboratory and order management systems improve nurse efficiency; nurses employed in hospitals reported the second lowest level of agreement (72.2%) and those in home health care agencies, the lowest (71.4%) (Table 6)
8. Nurses working in physician practices or in colleges and universities (93.7% and 80%, respectively), reported the highest levels of agreement that the use of medication, laboratory and order management systems improve the quality of care; nurses employed in hospitals and home health care agencies ((72.5% and 71.4%, respectively) reported the lowest levels of agreement (Table 6).
9. The most widely reported technologies used by nurses in their practice were, in order of frequency, the internet, intranet, and hospital information systems (Table 3).

Recommendations:

Based on the results of this study, the Technology Subcommittee recommends the following:

1. Information about technologies that can improve nurse efficiency and the quality of patient care should be shared with practicing nurses, executive leadership teams within health care organizations, and vendors.
2. Healthcare employers should consider increasing the use of technologies that nurses' report improves their work efficiency and improves patient safety and the quality of care.
3. Direct care nurses should have on-going and consistent input into the design, procurement and implementation of technology, and the requisite staff training in work settings where technology is used by nurses to support the delivery of nursing care.
4. Technology related training for direct care staff should be accomplished using a variety of methods, taking into account multiple learning styles, age, and previous experience using technology.
5. Nursing education programs should facilitate direct care nurses', nurse practitioners' and administrators' adoption of technologies by incorporating appropriate current or cutting edge technologies throughout nursing curriculums.

6. Chief nursing officers should be knowledgeable about the importance of promoting the seamless integration of information and clinical technologies that support practice efficiency and quality patient care into the workplace.
7. The information in this study should be disseminated to legislators and published widely in order to promote support for securing technologies that enhance the quality of care and increase nurse efficiency.
8. Grant funding should be obtained to support research and evaluation studies about technology systems that effectively enhance the quality of patient care and, increase nurse efficiency.
9. Health care delivery organizations should purchase technologies that have been shown to improve patient care quality and/or nurse work efficiency.
10. The technologies selected should be part of an integrated system rather than a stand alone entity.

Recommendations for Further Study:

1. Determine why nurses do not recommend the use of selected technology in the workplace.
2. Determine if the use of technologies most frequently recommended by nurses actually improve nurse efficiency and the quality of care.
3. Determine if the availability and use of technology improves the recruitment and retention of nurses in the workplace
4. Determine if there is a difference in recruitment and retention of nurses in different ethnic/racial, or gender groups based on the level and type of technology used in the workplace.
5. Determine if there is a difference in a health care employer's ability to obtain temporary or agency nursing staff based on the level and type of technology used in the workplace.
6. Determine why older nurses who are not attracted to technology remain in an organization that uses advanced technology.

Resources

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