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Research Article

Health Promotion and Eye Vision Health for Nurses

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Abstract

Eye vision is used each day as nurses are providing care in all health care environments. Nurses must be able to provide safe care to their patients in performing assessments, recording data for electronic medication records, dispensing medications, teaching at the individual patients' bedside or walking in the hallways or into rooms in the daylight, evening, and /or night lighting influencing vision. The purpose of this study was to: (1) assess nurses' understanding of their own health promotion and vision health, and (2) provide nurses with the education regarding eye care, vision screening and computer practice strategies for vision health. The results of the study support that nurses do recognize that vision and eye health is essential for patient care with vision screenings and eye exams with visual breaks at the computer station to reduce eye strain at work. Empowering nurses to address the preventive care strategies for self-care can promote wellness and lower the risk of health conditions that cause vision problems and support safety in practice.

Key words

Introduction

Vision is an essential part of the life for nurses who are providing care to patients across all clinical environments. The nurse must be able to provide safe care that is directed at: performing assessments, recording data for electronic medication records, dispensing medications, teaching at the individual patients' bedside or walking in the hallways or into rooms in the daylight, evening, and /or night lighting influencing eye vision. The researcher designed instrument was used to support self-care and further identify the knowledge and concerns that nurses have about their health and vision. The results of the survey support implications for nursing practice, policy development, and education of nurses advocating for vision health in the workplace. For their own health promotion and patient safety, nurses need to be able to maintain their personal eye vision health and support patient care in the technology-based work environment. Nurses are faced with many decisions to be made in using hand-held devices and using computers in the workplace while managing patient care. The demands of the nurses job requires many hours of computer use and increased stress in being able to focus on the computer for specific periods of time while maintaining an ergonomic position and less eye strain.

Although there are many contributions to the literature on the importance of maintaining health and wellness for nurses, there is little evidence that eye vision and health are linked to patient safety. Indeed, improper lighting, glare, work demands computer screen design, and the tasks of looking at various fonts and computer systems can cause eye strain. In nursing and medical literature, there have been no studies aimed at examining the possible role that health promotion and vision has on patient care. With nurses interfacing with technology there should be consistent support in the environment for the nurses to be reminded to practice the 20-20-20 rule: "Every 20 minutes, look up from what you are doing and focus 20 feet in front of you for 20 seconds." [1].

Additionally, nurses should be encouraged to use their health

insurance and vision plans for periodic assessment supporting the important goal for patient safety in nursing practice. Achieving this goal may be a challenge for the nurse working in an environment in which they also need to bring their glasses to work or get another prescription to see the print on the medication vials, or use some type of magnification in the clinical setting because of vision issues and health. It is an individual nurse's professional responsibility to practice safely and to maintain their personal health and eye vision should be included. There are patients and their families that are expecting the nurse to be able to provide safe and quality care-and the nurse must want this as well for their own health promotion. In observation in both acute care and clinical settings, it became evident to the researcher that nurses could benefit from using their glasses at work; make appointments for vision testing using their health vision plan, and practice good ergonomics in the work environment, while spending hours with input and interpretation on a computer screen. Overall, this study was designed to determine first how a small convenience sample of nurses in one California medical center responded to questions related to health promotion and vision health.

Nurses completed a survey about their own vision health and appointments for eye exams, their hours or computer usage on an average day in their practice, and their ability to practice safely whether enlarging the screen font size on their computer or making their vision a priority.

These studies report findings that nurses were aware of the importance of vision in their workplace and are not satisfied in how they took responsibility for their own vision health. The environment that a nurse works in requires patient safety that is optimal in an environment in which one wears one's personal eyeglasses and practices vision ergonomics. Promoting vision health for nurses can support patient safety.

Overview of Vision and Health Promotion

According to *Healthy People 2030*, the goal of the National Institutes of Health was to support improving visual health through prevention, early detection, treatment, and rehabilitation as key priorities. [2] Vision is an essential part of everyday life for all individuals of all ages as it affects learning, communicating, working, health, and quality of life. In the United States, an estimated 12 million adults 40 years or older in the United States had visual impairment: 1 million were blind, 3 million had uncorrectable visual impairment, and 8 million had visual impairment owing to uncorrected refractive errors. While an estimated 93 million adults in the United States are at high risk for serious vision loss, only half visited an eye doctor in the past 12 months. [3-7] Additionally, myopia, or nearsightedness, is a common condition in which images of distant objects are focused

in the front, instead of on, the retina and occurs in 25% of the population 12-54 years [7].

Nurses working in clinical environments need to be aware of how much time they are spending in front of a computer screen and consider vision health as part of safety in patient care. In clinical environments, the importance of making patient safety as a priority cannot be overstated. [9-10] The education of the health care provider, specifically the nurse, related to the delivery of care related to: daily patient care, computer use for patient records, electronic charting, preparing medications, and working in a technology-based environment and on units with daylight, evening, and night lighting in the personal work environment is important to be considered in overall support of quality patient care and safety. Additionally, aging and individual health issues are also important to be addressed; especially regarding vision in the workplace [5,8].

Review of Visual Health

According to the American Optometric Association (AOA), visual symptoms occur with computer usage, indicating visual problems. In the nursing profession today, charting is done on computers, which has a negative effect on one's visual system. The AOA states, "visual discomfort and related symptoms occurring in VDT [Video Display Terminals] must be recognized as a health problem" with health prevention guidelines. Furthermore, the AOA points out that there is a high percentage of computer users that have uncorrected vision problems that can be corrected with adjustment of the computer workspace, use of proper lighting, taking vision rest breaks, and maintaining proper posture [11].

The National Institutes of Health state that vision affects all aspects of our lives, including: development, learning, communicating, and working, in addition to the quality of life. According to the Center of Disease Control, "visual impairment is 1 of the 10 most frequent causes of disability in the United States." [2,12] More specifically, myopia occurs in 25% of the United States population with the recommendation for early intervention through regular vision exams. [7] The recommendation of routine eye exams includes an assessment of accommodative abilities, assessment of ocular coordination, determination of refraction for the required viewing distances at the computer work station, design of occupational lenses if required, and counseling regarding the visual environment at the workstation. In summary "many of the eye and vision problems users experience can be resolved by evaluation and improving the visual work environment" [1] (p.418).

Vitale, Sperduto, and Ferris (2009), aimed to compare the prevalence of myopia in the United States in 1971-1972 and 1999-2004. A total of 9,609 participants aged 12 to 54 years Participated in the study. During 1971-1972 the researchers found that myopia

was prevalent in 25% of people aged 12 to 54 years. In 1999- 2004, the researchers found a statistically significant higher prevalence of myopia: 41.6% compared to 25%, respectively. [8] This study proposes that environmental stressors may contribute to the increased prevalence of myopia. Environmental stressors include the increase of society's dependence on technology, including computers. [8] p.1632.

About 90% of Americans using computers for more than three hours a day experience symptoms of CVS in some way or another. [12-13] Pooja (2006) states that those who suffer from myopia that spends more than eight hours a day on a computer are 82% more likely to develop glaucoma along with computer vision syndrome.[p.2] This information indicates that computer users need some relief during their time at the computer screen. Pooja (2006) suggests utilizing the blink, breathe, and break method that involves "blinking 20 times per minute, breathing often to increase blood flow around the eye muscle, and after 20 minutes of non-stop work in front of the monitor, take a break for 20 seconds. This is also called the 20/20 rule (Dr. Jeffrey Anshel, shared, the blink, breathe, and break rule). [14] p.2. Other suggestions are marked to decrease symptoms associated with computer vision syndrome. The American Optometric Association (AOA) notes that the symptoms of CVS occur due to the visual demands of the task exceeding the visual abilities of the individual to comfortably perform with uncorrected vision problems can increase the severity of Computer Vision Syndrome (CVS) or digital eye strain symptoms. [15].

Research Design and Methods

Purpose

The purpose of this qualitative research study was to support self-care and further identify the knowledge and concerns that nurses have about their health and vision. Questionnaires were hand-delivered to each unit and their surveys were completed by the nurses on the unit and put in a sealed envelope in a designated box on the unit with no identifying name and/or unit when completed. The researcher personally picked up the surveys every other day during the month of the study. All nurses that completed the survey were anonymous and supported information on demographics, health and vision self-care, and nursing practice on the unit. There were no face-to-face interviews and just the completed survey was returned by the participating nurse.

This convenience sample was conducted at a medical center in a large metropolitan area in California. The participants, aged 25-70, were working on the various hospital units, offices, or clinics, which were part of the medical center nursing staff.

Recruitment of Participants

The units were all identified by the Nurse Educator at the Medical Center with the names of the nurse managers of the various units of the hospital were obtained for letters organized for each of the units. Informational meetings were scheduled with the Nurse Educator, Research Nurse, and Nursing Administration for five months prior to the study. The Nurse Educator informed all of the Nurse Managers by email and during the leadership team meetings prior to the study beginning. All materials were available for review prior to the study. Each unit manager was asked to participate and supported a designated place on the unit for the surveys. The researcher did not attend any staff meeting though all of the nurses were informed of the research study prior to the study. During this time, there was an informational meeting scheduled with two of the Chief Nursing Officers regarding the study. As thanks for their time and information, participants were given a Vision and Health Handout and the opportunity to be entered into a drawing for one of three dinners that were donated by a local restaurant. The research protocol was submitted, reviewed, and approved by the Institutional Board of the University of San Francisco and also the designated Institutional Board at the Medical Center.

Sample Size

A convenience sample of 111 nurses (17 males and 94 females) volunteered to participate in the study. The average age of the participants ranged from 45-50 years. The participants were representative of the racial and ethnic backgrounds. The nurses were predominantly bachelor prepared with 59.4% and 10.1% with a Masters or higher in educational expertise/ practice.

Instrumentation

Based on the information in the literature, the researcher developed the collection tool: Vision 20/20 Assessment Survey with a demographic section. The survey originally assessed both vision and hearing but it was recommended in the final review to concentrate on vision only for this survey. The survey contained 6 questions opened on demographics, 20 questions related to vision health and prevention, and 3 questions on nursing practice and safety and medication errors in practice. A panel of six experts in nursing education, 2 physicians, 3 hospital nursing administrators, and 3 nursing faculty reviewed the survey questions and demographic information for validity; the instrument was subsequently revised based on their recommendations.

Analysis

The data was analyzed by the researcher and identified themes in practice and coding the responses. The themes were

related to self-care and health promotion and the application to health promotion, computer usage in the work environment, and potential safety issues for clinical work.

Discussion

Each of the 111 nurses generated value and was supported in their nursing specialty, age, and vision plan (Table 1). There were 4 that did not respond to the initial question on the survey. Nurses in the study emphasized that because they were working full-time they were able to have the benefits of a medical health and vision plan and did seek care varying from 1-2 years or 3-5 years with an ophthalmologist or optometrist. A comment from one of the nurses noted: "I work per diem and not choosing a health plan at this time --I will consider in the future the medical and vision plan." Other nurses commented that they would review their current plan and seek an appointment as needed. Additionally, several nurses identified the following: "I have not been able to get the time to do this-it is always the last priority. "I know that I do have a vision plan and really should use it more." I have not had any problems lately but this reminds me to follow-up next year." The nurses were going to support further follow-up with their doctor but no time was given within the next month to six months. Health changes and having medical follow-up for hypertension, diabetes, weight changes, cancer screenings, and pregnancy which are individual and vision screening can be encouraged with the increased computer usage.
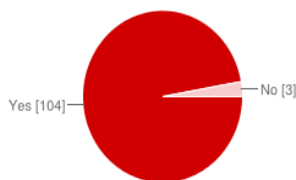
Are you working in an environment in which the computer or use of the electronic record is a part of your job?

Yes	**104**	**97%**
No	3	3%
No Response	4	——

Table 1: (Computer Use in Nursing for Patient Care).

Personal Health and Vision

Each of the nurses responded on how satisfied they were with their health on a scale of 1-10. Those nurses rating their health an 8 out of 10 were 30 nurses (28%), 9 out 10 were 33 nurses (31%), and 10 nurses were 17 (16%) for a total of 75% supporting healthy practices for physical exams, annual check-up, or follow-up for chronic health concern (diabetes, hypertension or cancer). These

nurses commented that the importance of an eye vision exam was as follows: 47 nurses (43%) went yearly for an eye exam while 36 nurses (33%) went for vision checks and new glasses every 1-2 years; 18 nurses (17%) went every 3-5 years; and the remaining 10 mentioned no follow-up due to lack of insurance or any changes needing follow-up. Additionally, there were 68 nurses (61%) and 25 nurses (22%) that identified they did need eye glasses, 6 nurses (5%) wearing contacts, and 13 (12%) having contacts and glasses. Fifty-two nurses (68%) were wearing their glasses to work all the time and 25 nurses (32%) only occasionally.

Workplace Environment -Technology and Nurse in Practice

Nurses are working in an environment that is technology based with safety in patient care and practice of premium importance. Additionally the acute care setting is using computerized systems for medication dispensing with safety in administration key in practice for the nurse. In this research study over 97% of the nurses responding are using the computer in patient care. Additionally, these same nurses are acknowledging that they spend from 1-8 hours in front of a computer screen to support patient care, charting, and follow-up with lab results/tests for patient care. The time in front of the computer screen was for 39 nurses (37%) to be 3-4 hours; 21 nurses (20%) to be 5-6 hours, and 21 nurses (20%) spending between 7-8 hours. The nurses on the units noted that 68 nurses (61%) wear their prescriptive glasses to work and 25 nurses (22%) did not need prescription glasses for reading and for work in the acute care setting. Of the nurses that had glasses 52 nurses (68%) would wear them all the time; 25 nurses (32%) occasionally wear them at work. Although, most nurses (79%) that responded wore glasses for reading and computer work and 21% of the nurses wore their glasses occasionally for reading and computer work.

One nurse stated that she had left her glasses at home and was able to borrow another nurse's reading glasses at work. Others left another pair of reading glasses in their locker /or on the unit. With the considerable amount of time for nurses in their job to be on the computer, there were 4 nurses that commented that they would be checking with their doctor to prescribe special computer lenses for the screens/ hand -held devices. Thirty-six nurses acknowledged that they were nearsighted (myopia) and twenty-five were farsighted (hyperopia) with twenty-five nurses acknowledging being both near/ farsighted. Forty nurses (37%) mentioned that they had trouble seeing the screen because it was too small and others 68 (63%) had no trouble seeing the screen. For those that had trouble seeing the computer two nurses changed the computer screen all the time and 31 nurses only occasionally.

Nursing Practice and Medication Administration on Unit

The overall standard for nursing practice supports safety in practice and at this time there has been no mention of nurses wearing their glasses consistently and or doing their
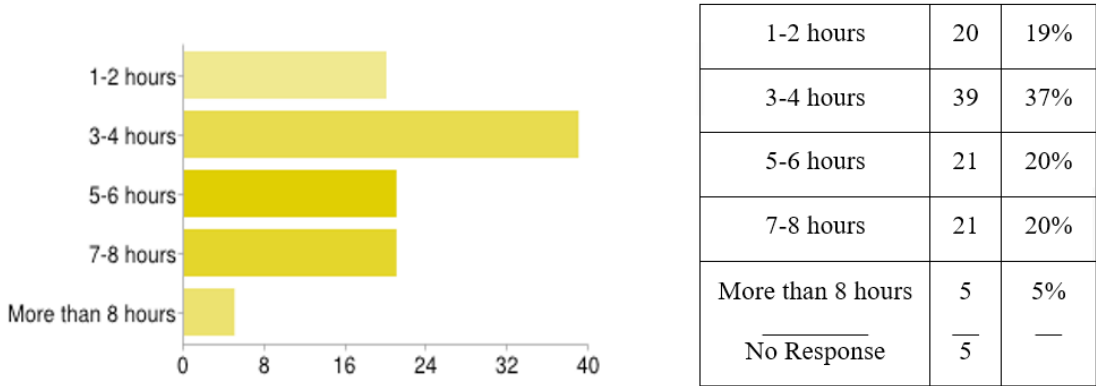
Eye exercises for vision health or advocacy amongst each other for health promotion and vision testing. Eighty nurses (75%) mentioned that they take extra care in preparing medications while 13 nurses (12%) take some care in preparing medications. These same nurses noted that they had observed nurses on their units taking special care in preparing medications on the unit (s). Each of these same nurses was given an opportunity to respond as well to their own errors in medication administration and there were 97% that acknowledged an error in medication administration due to a confusing order. The noted past error in administration of medications was commented on in the survey with acknowledgement that having the electronic record on the units were helpful in reading the medications including dosage and administration.

Following the study, a summary was sent to each of the floors in the hospital and reviewed. Additionally, the nurses were informed on their units with posted results on the communication board in each area with an emphasis on health promotion related to the following: medical follow-up with their personal doctor or practitioner as possible for their vision assessment and plan as a baseline, seeking opportunities for vision safety and following the 20/ 20 / 20 rule while on the unit, and wearing their eyeglasses for patient safety. There was a scheduled meeting following the study with the leadership team (Nursing Leadership Council and Chief Nursing Officer) on this research and support for health promotion.

Additionally this research was supported at a nursing and technology conference with a focus on the nurse's time spent on the computer while working, vision health, and workplace ergonomics. Overall, these results support that nurses should advocate for their own health promotion, bi-yearly vision screening, vision eye breaks, and workplace vision ergonomics on the hospital units. If there is a change in one's medical history more vision screening may be encouraged with your doctor. In this study, the fact that they were not seeking vision screening annually, and providing care with the use of technology and computer screens on the units for more than 4-6 hours (Table 2).

This researcher supports that the nurses need to be positively supported in eye and vision health and practicing self-care with discussions with their primary doctor or practitioner. These results further support implications for eye vision assessment in nursing, policy development in the profession, and self-care education on vision health in the workplace. Providing nurses with the knowledge that their own vision health is a personal responsibility for self-care that will influence patient care and vision health in a community of health care providers using technology on all levels of care.

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1-2 hours	20	19%
3-4 hours	39	37%
5-6 hours	21	20%
7-8 hours	21	20%
More than 8 hours	5	5%
No Response	5	—

Table 2: Hours of Computer Use for Patient and Charting.

Implications for Nurses

With the increasing number of nurses and individuals in health care providing care and validating health care records, it is important for nurses to support the standards of practice for eye vision health. In this study, it was noted that the standard eye care was an individual nurse's responsibility with 87% having the vision plan and yet only 53% not using the vision plan. As nurses are aging in their practice this also becomes a responsibility for increased frequency in vision testing and also monitoring one's personal health with a physical exam and lab work as medical health plan supports. It is the case that if the nurse cannot see the value on an instrument, the dosage number on a prescription, or a label on medication, a piece of equipment or instructions, patient safety is at risk. Based on this data and the nature of the practice setting, it is key that the next study needs to focus on (1) nurses' vision and (2) possibility to impact safety.

Implications for Nursing Practice and Policy for Nurses Health

At the conclusion of the research project, the nursing leadership was given a summary of the results and recommendations. The results of the research noted that the nurses with advocacy to support health promotion, yearly vision screening if changes are noted in medical health, and support for workplace vision ergonomics on the hospital units. Nurses identified that they are not seeking vision screening annually, accommodations in their use of technology and computer screens on the units for more than 8-12 hours. Table 3 though, there are many benefits to using computers in the workplace, nurses need to incorporate ergonomic factors into work settings to promote safe workplace environments [15].

Nearsighted (Myopia)	36	40%
Farsighted (Hyperopia)	25	27%
Both	30	33%
No Response	20	
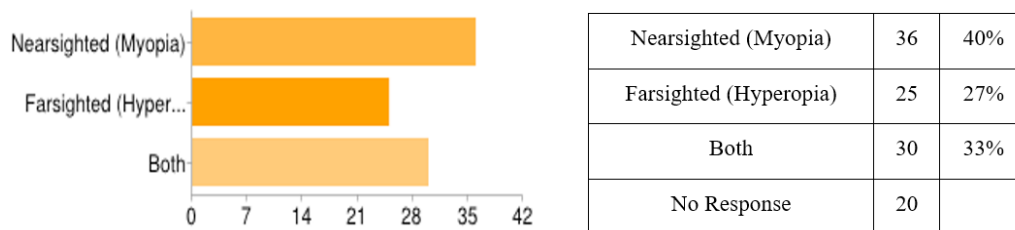
Table 3: Nurses Vision.

Conclusion with Professional Considerations

The increasing number of health professionals working with computers in clinical settings and for this study it has relevance to apply to others in the medical profession. Most importantly, standard eye care remains an individual responsibility. Nurses and other professions in the workforce are empowered to find time for their own self-care and health promotion as working professionals across the life span. With encouragement, nurses can be proactive about their preventive eye and vision benefits and communicate with health providers. Additionally, as part of the nurses professional competencies or continuing education units (CEU's)—adding vision screenings. In summary, for this research study, 97% of the nurses used the Electronic Health Record (EHR) as a part of their job, 81% of their time was centered on patient care, charting, and the unit responsibilities. There were 87% of the nurses that identified having a vision plan, yet only 53% used the vision plan for scheduled eye exams. Individual attitudes about eyesight and vision screenings can influence preventive eye care and communication with primary health care providers. [16] A nurse's health and wellness can begin with a routine eye exam or scheduled vision screening with the "checklist" to include: adjusting for proper use of computer workspace, enlarging the font size, using proper lighting, reminder to follow the 20-20-20 rule and blink, maintaining proper posture and wearing personal eyeglasses for patient care.

Acknowledgments

Conflicts of Interest Disclosure

The author declares no conflicts of interest.

References

1. Anshel JR (2007) Visual ergonomics in the workplace. AAOHN Journal: official Journal of the American Association of Occupational Health Nurses, 55: 414-422. doi:10.1177/216507990705501004.

2. Center for Disease Control and Prevention (June 9, 2020). Accessed on June 2, 2022.

3. The Eye Diseases Prevalence Research Group* (2004) Causes and prevalence of visual impairment among adults in the United States. Arch Ophthalmol. 122:477-485. doi:10.1001/archopht.122.4.477.

4. Congdon N, O'Colmain B, Klaver CCW, Klein R, Muñoz B, et al. (2004) Causes and prevalence of visual impairment among adults in the United States. Arch Ophthalmol 122 (4): 477-485. doi:10.1001/archopht.122.4.477.

5. Saydah SH, Gerzoff RB, Saaddine JB, Zhang X, Cotch MF (2020) Eye care among US adults at high risk for vision loss in the United States in 2002 and 2017. JAMA Ophthalmol 138(5): 479-489. doi:10.1001/jamaophthalmol.2020.0273.

6. National Eye Institute (2020). Published March 12, 2020. Accessed on June 2, 2022.

7. Center for Disease Control and Prevention (June 9, 2020). Accessed on June 2, 2022

8. Vitale S, Sperduto RD, Ferris FL (2009) Increased prevalence of myopia in the United States between 1971-1972 and 1999-2004. Arch Ophthalmol 127(12): 1632-1639. doi:10.1001/archophthalmol.2009.303.

9. Beyea SC (2008) Placing patient safety first. AORN Journal. 87(4): 829-831. https://doi.org/10.1016/j.aorn.2008.03.010.

10. Vaismoradi M, Tella S, Logan PA, Khakurel J, Vizcaya-Moreno F (2020) Nurses' adherence to patient safety principles: A systematic review. Int J Environ Res Public Health 17 (6): 2028. https://doi.org/10.3390/ijerph17062028.

11. American Optometric Association (2022) Computer Vision Syndrome (CVS). Retrieved May 30, 2022.

12. Center for Center for Disease Control and Prevention (June 9, 2020). Accessed on June 2, 2022.

13. Randolph SA (2017) Computer vision syndrome. Workplace Health Saf 65:328.

14. Pooja G (2006) Blink, breathe, and break. The Journal of Young Investigators.20: 1-3.

15. Nielsen K, Trinkoff A (2003) Applying ergonomics to nurse computer workstations: review and recommendations. Comput Inform Nurs 21: 150-157. doi: 10.1097/00024665-200305000-00012.

16. Alexander RL, Miller NA, Cotch MF, Janiszewski R (2008) Factors that influence the receipt of eye care. Am J Health Behav 32: 547-556.