JOURNAL OF NURSING SCHOLARSHIP

EDITORIAL

Print or Online Publishing: Changing Technology

How do you read nursing articles? Do you carry around journals that come in your mail? If you read in print, do you read the whole journal or do you tear out articles in which you have a particular interest? Perhaps you read online.

Do you regularly go to the Sigma Theta Tau International (STTI) website and look at each new issue of your membership journals, *Journal of Nursing Scholarship* (*JNS*) and *Worldviews on Evidence-Based Nursing*? Do you wait for electronic alerts to let you know that a new issue is available (this feature is available to you as a STTI member through Wiley Online Services)? Or do you read by topics and do your own online searches in your areas of interest? Each decision we make has advantages and disadvantages given all that technology has to offer.

I am not the first adopter of technologic change, but I have little tolerance for Luddites. Luddites were those English factory workers who destroyed machinery that they thought were threatening their factory jobs, and the name has come to mean anyone opposed to innovation or the adoption of new technology.

I am quicker to adopt a new technology if I can identify advantages of its use. I was among the first of my family and friends to own a cell phone even though I had to carry the battery around in a bag the size of a lunchbox. Clearly that was a disadvantage, but the advantage of not missing calls—especially with young children—was really important to me.

We had a microwave in our home so early that when my children were going to stay overnight at my parents' home my son was really worried about how he would eat because my parents did not yet own a microwave. My son could not imagine how one could make hot dogs or scrambled eggs (two favorites) without the use of microwave technology. Clearly, the time advantage of cooking with a microwave was one main reason why I adopted that then-new technology.

I still own a record player and occasionally play albums on that stereo. I think the sound is superior and I like the experience of listening to a set of songs that had something in common when an album was produced. Recently one of my children asked me to show them how to use the stereo and I quite proudly demonstrated all of the features I found so superior only to have that child tell me that it was ridiculous to listen all the way through an album to songs that weren't of interest. Why didn't I just listen to music on Spotify (or any other music service) and pick what I wanted to listen to instead of having to listen to all the songs on an album?

So when I think about how I want to read scholarly nursing articles and research, I have to stop and consider what advantages online publication brings me. Do I get better access like I did when I got my first cell phone? Does online publication save me time as my microwave oven did? And do I have more precision in my choices with online publishing like my children do with Spotify as opposed to my preference for my stereo? Or do I wind up with poorer quality (I don't think the sound of online music services is as good as my stereo) and less time because there are now so many articles available for me to read?

Publishing in the United States is rapidly moving to an online model. At STTI you now have access to STTI journals through a single-sign-on process. Once you have signed in to the STTI website, your login information allows you to access the Wiley Online Library, where you can access each article in a current issue. Are you using this new technology? We do hope that this is increasing your access to your member benefit journals.

There is now an app for your iPhone or tablet that you can easily download from the Itunes store. An app for Android is coming soon. Using your email address as your username and your member number as your password (member services can give you that number if you have misplaced it) gives you access to this application, which allows you to access either *JNS* or *Worldviews on Evidence-Based Nursing* anywhere in the world that you have cell phone coverage. Now you can read articles anytime that is convenient to you without worrying about carrying your journals (or articles from the journal) around with you. We hope that this is not only improving your access to scholarship but that these innovations are saving you time.

We know that publishing online results in more readers, reading on a wider variety of topics. Clearly that is an advantage. We know that a disadvantage of online reading is that it can result in readers who read more superficially, unless readers work on how to discriminate among all the choices online (Ollé & Borrego, 2010). Certainly, reading articles from high-impact journals like *JNS* helps

Journal of Nursing Scholarship, 2016; 48:1, 3–4.

you to know that you are reading quality research and helps your precision in selecting important new information to read.

So as the editor of *JNS* I want to ensure that it is easy for you to access *JNS* articles online in a timely fashion and that the articles you are easily accessing are exactly those that you wish to read. I am eager to hear from you about how the new technology available to support online reading is helping you or about suggestions for other innovations you would like to see. Send me an email at jns@stti.org. Meanwhile the team at STTI and Wiley Blackwell will continue to work on publication innovation. I look forward to hearing good ideas about how best to move forward in this increasingly digital age because your access, time, convenience, and precision in getting the information you need are all important to us.

Susan Gennaro
Editor

Reference

Ollé, C., & Borrego, A. (2010). A qualitative study on the impact of electronic journals on scholarly information behavior. *Library and Information Science Research*, *32*, 221–228.

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Faculty Performance on the Genomic Nursing Concept Inventory

Catherine Y. Read, PhD, RN[1], & Linda D. Ward, PhD, FNP-C[2]

1 *Alpha Chi*, Associate Professor, Boston College, William F. Connell School of Nursing, Chestnut Hill, MA, USA
2 *Delta Chi*, Assistant Professor, Washington State University, College of Nursing, Spokane, WA, USA

Key words
Concept inventory, education, faculty, genetic literacy, genomics, nursing

Correspondence
Dr. Catherine Y. Read, Boston College William F. Connell School of Nursing, 140 Commonwealth Avenue, Chestnut Hill, MA 02467. E-mail: catherine.read@bc.edu

Accepted: October 3, 2015

doi: 10.1111/jnu.12175

Abstract

Purpose: To use the newly developed Genomic Nursing Concept Inventory (GNCI) to evaluate faculty understanding of foundational genomic concepts, explore relative areas of strength and weakness, and compare the results with those of a student sample.

Design: An anonymous online survey instrument consisting of demographic or background items and the 31 multiple-choice questions that make up the GNCI was completed by 495 nursing faculty from across the United States in the fall of 2014.

Methods: Total GNCI score and scores on four subcategories (genome basics, mutations, inheritance, genomic health) were calculated. Relationships between demographic or background variables and total GNCI score were explored.

Findings: The mean score on the GNCI was 14.93 (*SD* = 5.31), or 48% correct; topical category scores were highest on the inheritance and genomic health items (59% and 58% correct, respectively), moderate on the mutations items (54% correct), and lowest on the genome basics items (33% correct). These results are strikingly similar to those of a recent study of nursing students. Factors associated with a higher total score on the GNCI included higher self-rated proficiency with genetic/genomic content, having a doctoral degree, having taken a genetics course for academic credit or continuing education, and having taught either a stand-alone genetic/genomic course or lecture content as part of nursing or related course. Self-rated proficiency with genetic/genomic content was fair or poor (70%), with only 7% rating their proficiency as very good or excellent.

Conclusions: Faculty knowledge of foundational genomic concepts is similar to that of the students they teach and weakest in the areas related to basic science information.

Clinical Relevance: Genomics is increasingly relevant in all areas of clinical nursing practice, and the faculty charged with educating the next generation of nurses must understand foundational concepts. Faculty need to be proactive in seeking out relevant educational programs that include basic genetic/genomic concepts.

A key to adequate preparation of future professional nurses in the genomic era is a well-prepared faculty workforce (Jenkins, Bednash, & Malone, 2010). Nursing education for genomics varies worldwide with the culture and characteristics of the country. The healthcare delivery system, relative burden of diseases, availability of resources, structure and accreditation requirements of higher education programs, scope of nursing practice, and efforts of nurse leaders to define guidelines and competencies all affect efforts to integrate genomic content into nursing curricula. In any case, successful integration of genomic content requires faculty to recognize the relevance of genomics to nursing practice and achieve a sufficient level of knowledge, confidence, and comfort with the underlying concepts.

Despite widespread agreement that knowledge of genomics is a priority for all healthcare professionals, evidence suggests that nurses and nurse faculty are not adequately prepared. Studies from multiple countries conclude that improvement of the genetic literacy of nurses and nursing faculty is an ongoing and global concern, even in countries with long-term strategies for delivering genomic nursing education (Calzone et al., 2013; De Sevo, 2013; Godino & Skirton, 2012; Jenkins & Calzone, 2012; Kirk, Tonkin, & Skirton, 2014; Skirton, O'Connor, & Humphreys, 2012; Thompson & Brooks, 2011). In a 10-country study of nursing regulation, clear progress toward defining a genomics competency framework to undergird integration of genomics into education and practice was evident in some countries but underdeveloped in others (Kirk, Calzone, Arimori, & Tonkin, 2011).

Although most studies of nurse and nurse faculty genomic competence have relied on perceived knowledge or confidence with content, a few have tested actual knowledge. Daack-Hirsch, Driessnack, Perkhounkova, Furukawa, and Ramirez (2012) used the Genetics Literacy Assessment Instrument (GLAI; Bowling et al., 2008) in faculty and student samples. Although this produced some interesting data, its value was limited, since the GLAI was developed for use with students in college science courses and not designed to measure concepts with specific relevance to nursing. De Sevo (2013) addressed this shortcoming by developing and administering a 15-item multiple-choice genetic/genomic knowledge test derived from competencies outlined in the Essentials of Baccalaureate Education for Professional Nursing Practice (American Association of Colleges of Nursing [AACN], 2008) and the Essentials of Genetic and Genomic Nursing: Competencies, Curricula Guidelines, and Outcome Indicators (Consensus Panel on Genetic/Genomic Nursing Competencies, 2009). De Sevo's study evaluated nursing faculty performance on questions about basic genetic/genomic definitions, inheritance patterns, referral actions, pedigree development, cultural issues, and insurance issues.

As a next step, Ward, Haberman, and Barbosa-Leiker (2014) used a rigorous concept inventory development strategy to create the Genomic Nursing Concept Inventory (GNCI). Concept inventories are theory- and research-based instruments designed to measure understanding of key concepts in a particular knowledge domain. Framed on Ausubel's Assimilation Theory and meaningful learning (Ausubel, Novak, & Hanesian, 1978), concept inventories are widely used in science, technology, engineering, and mathematics education. The GNCI is nursing's first concept inventory, developed to measure understanding of foundational genetic/genomic concepts most critical to nursing practice. Concepts were drawn from essential nursing genetic/genomic competencies (Consensus Panel, 2009). Each item maps to a specific concept, and item distractors (incorrect responses) reflect the most common misconceptions identified among baccalaureate nursing students. Therefore, GNCI data reveal not only whether individuals understand a particular concept, but also, in the event of misunderstanding, which alternate conception they believe to be true. The GNCI has been tested in large groups of nursing students throughout the United States (Ward, 2014; Ward et al., 2014) and was used in the current study to measure faculty understanding of foundational genomic concepts, explore relative areas of strength and weakness, and compare the results with those of a student sample.

Design, Recruitment, and Data Collection

Participants were recruited from publicly available email lists of deans and directors of nursing schools in the United States (including the American Association of Colleges of Nursing and the Accreditation Commission for Nursing Education). Deans and directors ($N =$ 1,461) were sent an introductory email with a link to the consent, institutional review board approval information, and survey, and asked to forward the email to their faculty. A reminder email was sent 3 weeks after the initial request, and the survey was closed 4 weeks after responses ceased.

Participants who clicked the survey link were asked to indicate their willingness to participate and not record or share the items by checking a box before the survey opened. The responses were collected using Qualtrics® (Provo, UT, USA), an online survey program, and exported into IBM SPSS version 22 (SPSS Inc., Armonk, NY, USA) for analysis. No time limit was imposed.

Study Instrument

The anonymous online survey instrument consisted of the demographic or background items in **Table 1** and the 31 multiple-choice questions that make up the GNCI (Ward, 2011). The GNCI consists of four topical categories: genome basics (12 items), mutations (3 items), inheritance (8 items), and genomic health (8 items). The GNCI was found to have acceptable internal consistency

Table 1. Characteristics of the Sample ($N = 495$)

Age in years Mean (*SD*) = 52.6 (10.0) Range 27–77		
Gender	Male	18 (3.6%)
	Female	477 (96.4%)
Number of years in nursing	0–10	58 (11.7%)
Mean (*SD*) = 27.5 (11.5),	11–20	93 (18.8%)
Range 0–56	21–30	121 (24.4%)
	>30	223 (45.1%)
Number of years as a faculty member teaching nursing students	0–10	288 (58.2%)
Mean (*SD*) = 12.0 (10.0),	11–20	118 (23.8%)
Range 0–53	21–30	58 (11.7%)
	>30	31 (6.3%)
Type of nursing program currently teaching in (more than one could be selected)	Associate degree or diploma	139 (28.1%)
	Bachelor's degree	295 (59.6%)
	Master's (advanced practice)	88 (17.8%)
	Master's (not for advanced practice)	56 (11.3%)
	PhD in nursing	14 (2.8%)
	Doctor of Nursing Practice	48 (9.7%)
Highest degree earned	Bachelor's in nursing	6 (1.2%)
	Master's in nursing	263 (53.1%)
	Master's in another field	13 (2.6%)
	Doctoral degree in nursing	148 (29.9%)
	Doctoral degree in another field	56 (11.3%)
	Other	9 (1.8%)
Ethnicity	Hispanic	10 (2.0%)
	Non-Hispanic	485 (98%)
Race	White	462 (93.3%)
	Black	13 (2.6%)
	Asian	7 (1.4%)
	American Indian or Alaskan Native	2 (0.4%)
	Native Hawaiian/other Pacific Islander	1 (0.2%)
	Multiracial or some other	10 (2.0%)
U.S. Census Bureau (2012) Divisions in which program is located	New England	19 (3.8%)
(42 states plus DC represented)	Mid-Atlantic	60 (12.1%)
	East north central	95 (19.2%)
	West north central	45 (9.1%)
	South Atlantic	63 (12.7%)
	East south central	56 (11.3%)
	West south central	44 (8.9%)
	Mountain	37 (7.5%)
	Pacific	74 (14.9%)
	Not specified	2 (0.2%)
Perceived level of proficiency with genetics/genomics content	Excellent	6 (1.2%)
	Very good	30 (6.1%)
	Good	115 (23.2%)
	Fair	208 (42%)
	Poor	136 (27.5%)
Have taught	Stand-alone genetic/genomic course	25 (5.1%)
(more than one could be selected)	Genetic/genomic lecture content as part of a nursing (or related) course	182 (36.8%)
	Genetic/genomic content incorporated into nursing clinical or simulation experiences	127 (25.7%)
Have taken/attended	Genetics course for academic credit	88 (17.8%)
(more than one could be selected)	Continuing education programs on genetic/genomic topics	163 (32.9%)

reliability (Cronbach's α 0.77) in a sample of 705 U.S. bachelor of science in nursing students; the overall discrimination index (calculated as a corrected item-total correlation) of 0.273 was judged to be adequate and suggests that the items can discriminate between those who score high and low on the entire inventory (Ward et al., 2014). Content validity of the GNCI was established during its development (Ward et al., 2014) and subsequently reaffirmed using Delphi methodology (Ward, 2015).

Data Analysis

Each of the 31 GNCI questions was scored as correct or incorrect and a total score (range 0–31) was calculated and converted to a percent score for each participant. Percent scores for the four topical categories were calculated after adding the number correct for the specified items in each category. A histogram was constructed to visually assess the normality of the distribution for the total GNCI scores; as a further assessment of normality, the skewness and kurtosis of the curve were calculated for comparison to an acceptable range of −2 to +2 (George & Mallery, 2011).

Relationships between demographic/background variables and total GNCI score were explored. Correlation analysis was used to examine the relationships between GNCI score and self-rated proficiency with genomic content, participant age, number of years in nursing, and number of years as nurse faculty. A t-test for two independent samples was used to evaluate differences in mean GNCI scores between (a) subgroups of genders; (b) participants with and without a doctoral degree; (c) participants who have taken a genetics course for academic credit or continuing education and those who have not; (d) participants who have taught a stand-alone genomics course and those who have not; and (e) participants who have taught lecture content as part of nursing or related course and those who have not. Two-tailed tests ($p < .05$) were used in all analyses to determine statistical significance.

Findings

It was not possible to track which deans and directors forwarded the survey link to their faculty; therefore, a response rate cannot be reported. The completion rate was 73%; of the 675 participants who began the survey, 495 finished the full 31-item GNCI and were included in the analyses. Nearly 100% of participants who dropped out did so after completing only the demographic items; possible reasons include a misunderstanding of the instructions to click the "continue" button or a lack of desire to devote the time it takes to answer multiple-choice test items.

The sample (see **Table 1**) consisted of predominantly White (93%), female (96%) nursing school faculty with a mean age of 53 years. The participants were geographically diverse within the United States, with 42 states and the District of Columbia represented. The mean number of years in nursing was 28, and the mean number of years teaching in a nursing program was 12. Forty-one percent had earned doctoral degrees in nursing or another field, and 60% reported teaching in baccalaureate nursing programs. Most faculty (70%) rated their proficiency with genetic/genomic content as fair or poor; the mean self-rating on the 1 (*poor*) to 5 (*excellent*) numerical rating scale was 2.1 ($SD = 0.92$). Only 7% rated their proficiency as very good or excellent. A small number (5%) reported having taught a stand-alone genetic/genomics course, but 37% had taught genetic/genomic lecture content and 26% had incorporated genetic/genomic content into clinical or simulation experiences. Eighteen percent reported having taken a genetics course for academic credit, and 33% had attended continuing education programs on genetic/genomic topics.

Faculty scores on the GNCI (**Table 2**) ranged from 4 to 31 (with 31 being the highest possible score) with a mean total score of 14.93 ($SD = 5.31$), or 48% correct. Item difficulty ranged from 20% to 91% correct. The bell-shaped histogram of the GNCI scores suggested that the scores are normally distributed; normality of the scores was also supported by acceptable skewness (0.515, $SE = 0.001$) and kurtosis (0.074, $SE = 0.219$). Item discrimination, measured as a corrected item-total correlation, ranged from .110 to .473 ($M = .293$, $SD = .105$). Cronbach's α was .79.

Table 2 also shows that the scores on the topical categories were highest on the inheritance and genomic health items (59% and 58% correct, respectively), moderate on the mutations items (54% correct), and lowest on the genome basics items (33% correct). A description of each item is provided in **Table 2**, along with the mean faculty score on each item and the corresponding student scores reported by Ward et al. (2014). An example of a genome basics question that yielded a low score (item 4) required the participant to identify which cells in the human body contain the insulin gene. Only 36% of faculty selected the correct answer ("all nucleated cells"), while 58% selected "pancreatic beta cells." An example of an item that yielded a high score (item number 12, 91% correct) required the participant to know that a patient with a mutation in a gene associated with warfarin response may have either an increased or decreased anticoagulation effect.

Table 2. GNCI Total Scores, Subscale Scores, and Item Scores for Faculty and Student Samples

	Faculty sample (*n* = 495)	Student sample (*n* = 705)[a]
Total score: mean (*SD*, range) out of 31 possible points	14.93 (5.31, 4–31)	14.45 (5.12, 2–31)
Mean total score as percent correct	48%	47%
Subscale scores: mean score as percent correct		
Genome basics (12 items)	33%	35%
Mutations (3 items)	54%	46%
Inheritance (8 items)	59%	56%
Genomic health (8 items)	58%	55%
Item scores: mean score as percent correct		
Item 1: gene function	36%	36%
Item 2: genome organization	42%	68%
Item 3: human genome homogeneity	44%	51%
Item 4: genome organization	36%	30%
Item 5: genome composition	44%	54%
Item 6: gene function	21%	31%
Item 7: genotype-phenotype association	27%	28%
Item 8: genome organization	35%	29%
Item 9: gene function	35%	31%
Item 10: dominance	50%	59%
Item 11: gene expression	22%	13%
Item 12: pharmacogenomics	91%	76%
Item 13: heterozygosity	20%	19%
Item 14: genetic screening tests	80%	64%
Item 15: autosomal recessive inheritance	71%	68%
Item 16: autosomal recessive inheritance	74%	66%
Item 17: X-linked inheritance	59%	53%
Item 18: germline/somatic mutations	55%	44%
Item 19: mutation heterogeneity	36%	33%
Item 20: cancer genotyping	23%	31%
Item 21: how mutations cause disease	70%	61%
Item 22: carrier testing	47%	48%
Item 23: family history—red flags	36%	25%
Item 24: inheritance of autosomal mutations	48%	24%
Item 25: genetics of multifactorial conditions	46%	46%
Item 26: benefit of family health history	81%	84%
Item 27: pharmacogenomics	45%	47%
Item 28: pharmacogenomics	60%	65%
Item 29: heterozygosity in autosomal dominant conditions	36%	35%
Item 30: autosomal dominant inheritance	54%	58%
Item 31: autosomal dominant inheritance	69%	72%

Note. GNCI = Genomic Nursing Concept Inventory. [a]Data from Ward, Haberman, & Barbosa-Leiker (2014).

As shown in **Table 3**, several factors were significantly associated with a higher total score on the GNCI. These included participants' higher self-rated proficiency with genetic/genomic content, having a doctoral degree, having taken a genetics course for academic credit or continuing education, and having taught either a stand-alone genetic/genomic course or lecture content as part of nursing or related course. Factors found not to have significant relationships to GNCI score included participant age, gender, number of years in nursing, number of years as nurse faculty, program type, or having incorporated genetic/genomic topics into clinical or simulation experiences.

Discussion

The mean age of this sample was 53 years. This is consistent with AACN data (AACN, 2015a), where the reported mean age of master's and doctorally prepared faculty in the United States is greater than 51 years. Thus, the majority of participants in this study received their initial college preparation prior to the beginning of the Human Genome Project in 1990 and would have needed to seek out information in order to learn many of the concepts tested in this study.

The majority of faculty (70%) rated their proficiency with genetic/genomic content as fair or poor. This is

Table 3. Factors Associated With Higher Score on GNCI

Factor	GNCI score mean (*SD*)	Significance
Higher self-rated proficiency with genetic/genomic content (on the 1–5 scale): mean = 2.1, *SD* = 0.92; *N* = 495	14.9 (5.3)	Pearson's $r = .395$ $p < .001$
5 Excellent (*n* = 6)	22.7 (8.0)	
4 Very good (*n* = 30)	18.9 (6.3)	
3 Good (*n* = 115)	17.0 (5.1)	
2 Fair (*n* = 208)	14.4 (4.8)	
1 Poor (*n* = 136)	12.7 (4.2)	
Participant has:		
A doctoral degree (*n* = 204)	16.1 (5.0)	$t = 4.333$, $p < .001$
No doctoral degree (*n* = 291)	14.1 (5.5)	
Taken a genetics course for academic credit		
Yes (*n* = 88; 17.8%)	18.6 (5.8)	$t = 7.502$, $p < .001$
No (*n* = 407; 82.2%)	14.1 (4.8)	
Attended continuing education on genetic/genomic topics		
Yes (*n* = 163; 32.9%)	16.5 (5.5)	$t = 4.759$, $p < .001$
No (*n* = 332; 67.1%)	14.2 (5.1)	
Taught or co-taught a stand-alone genetic/genomic course		
Yes (*n* = 25; 5.1%)	20.1 (7.1)	$t = 5.146$, $p < .001$
No (*n* = 470; 94.9%)	14.7 (5.1)	
Taught genetic/genomic lecture content as part of a nursing (or related) course		
Yes (*n* = 182; 36.8%)	17.0 (5.4)	$t = 7.088$, $p < .001$
No (*n* = 313; 63.2%)	13.7 (4.8)	

Note. GNCI = Genomic Nursing Concept Inventory.

consistent with the findings of Jenkins and Calzone (2012), who conducted a study at meetings of the AACN and Sigma Theta Tau International; of their 167 participants, 86% of whom were nursing faculty and 82% of whom had master's or doctoral degrees, 71% rated their personal genetic/genomic knowledge as low or very low. This, coupled with the fact that only 33% of the participants in this study had attended continuing education programs on genetic/genomic topics, suggests a pressing need for accessible educational materials targeted toward faculty. In addition, faculty must accept responsibility for updating their knowledge of genomics and integrating the information throughout the curriculum. Course content is powerfully influenced by the knowledge of the faculty member and the value he or she places on various topics. The training of a nursing workforce with genomic competency relies on educators who are not only knowledgeable, but who endorse the relevance of genomics to nursing practice.

Only 7% of the participants in this sample were non-White, similar to the AACN 2012 report (AACN, 2015b) that 13% of full-time U.S. nursing school faculty come from minority backgrounds. Given the U.S. Census Bureau report that individuals from ethnic and racial minority groups accounted for 37% of the U.S. population in 2012, progress needs to be made in the recruitment of minority faculty. The presence of minority nurse educators communicates to students that nursing values diversity (AACN, 2015b) and contributes to the delivery of inclusive genomic education and health care.

The mean faculty GNCI total score of 48% correct may seem low for a group of experienced nurse educators, but as a concept inventory, the GNCI intentionally measures understanding of difficult concepts and would not ordinarily result in high scores. Even faculty who had taught or co-taught a stand-alone genetic/genomics course (*n* = 25) or rated their knowledge of genetics as excellent or very good (*n* = 36) achieved mean GNCI scores of 20 (65% correct). Nevertheless, this study provides evidence that nursing faculty could benefit from additional education in genomics. That need was supported by De Sevo's 2013 study of nursing faculty performance on a different 15-item genetic/genomic knowledge test, where the mean score was 53%.

Faculty who report having taught genetic/genomic lecture content as part of a nursing or related course achieved a mean GNCI total score of 17 (55%). Although their scores were significantly higher than the overall mean faculty score of 15 (48%), this does suggest that students are being taught by faculty who may not have a good understanding of the basic concepts of genetics; such a situation may explain the low student scores (mean 47%) found by Ward et al. (2014).

The mean faculty GNCI total score of 48% correct was strikingly similar to the mean score of 47% found among baccalaureate nursing students (Ward et al., 2014). This is consistent with a study by Daack-Hirsch et al. (2012) using the Genetics Literacy Assessment Instrument, where no significant differences were found between scores of nursing students and faculty. One might expect students, who are younger and more recently educated in the sciences, to score higher on basic genetic concepts; on the other hand, the faculty have advanced degrees, many years of experience, and more homogeneity in terms of commitment to education. Of interest, a small study of practicing pediatric nurses ($N = 75$) yielded similar GNCI scores, with a mean of 44% correct responses (Ricciardi, McCabe, & Ward, 2012).

The faculty scored lowest on the genome basics items (see **Table 2**); examples of concepts in that category include the function of a gene, gene expression, genotype-phenotype association, and homozygosity or heterozygosity. Higher scores occurred on the inheritance and genomic health concepts, with items relating to Mendelian patterns, gene testing for cancer screening, pharmacogenomics, and family history. The students in the Ward et al. (2014) sample scored slightly higher than faculty (35% vs. 33%) on the 12 genome basics items, presumably because they had learned many of these concepts in high school or college biology courses. Faculty scores were slightly higher than those of the students on the items pertaining to mutations, inheritance, and genomic health, although it could not be determined whether those differences were statistically significant. In any case, these results suggest that faculty development programs should include basic genetic and genomic concepts as well as the more popular application-level genomic health topics.

As expected, a higher self-rated proficiency with genetic/genomic content correlated positively with GNCI score. Education beyond basic preparation, including a genetics course for academic credit or continuing education, was also predictive of a higher score; this is consistent with De Sevo's 2013 finding of higher genetics/genomics knowledge among faculty members who had taken a course in the specialized content in addition to college-level biology. Faculty with a doctoral degree and those with teaching responsibilities that include genomics had higher mean GNCI scores than those who did not. These data validate the need for continuing education programs that prepare nurse faculty to include genomic content and suggest the importance of highlighting basic genetic and genomic concepts in those programs.

In addition to measuring faculty knowledge, this study served to test the reliability of the GNCI among nursing faculty, a group in which it had not been previously tested. Concept inventories such as the GNCI have been described as "million dollar instruments" because they take years to develop and require the expertise of content experts, educators, and psychometricians (D'Avanzo, 2008). Since its development, the GNCI has been tested with more than 3,000 undergraduate and graduate nursing students and with a small number of practicing nurses. Psychometric analyses to examine inventory factor structure and apply item response theory to examine scale and item performance have been completed (Ward, French, Barbosa-Leiker, & Iverson, in press). Cognitive interviews and a Delphi study to re-examine content validity have also been completed. Measuring test-retest reliability is in process. Inventory revision based on those collective data will be undertaken at the completion of data analysis.

Strengths and Limitations

Comparisons to the Ward et al. (2014) study may be limited due to differences in examination administration; in that study, the paper-and-pencil proctored examination eliminated risks such as collaboration or looking up answers. However, similarities in faculty and student scores suggest that security was not a significant issue and provide evidence for the validity of the instrument for online administration.

Genomics is a rapidly changing field, so the GNCI is at risk for becoming outdated. Effort was made in the development phase to include only foundational concepts identified as critical to nursing practice; those concepts are unlikely to become obsolete. Newer concepts, however (e.g., epigenetic effects), were identified by an expert panel as not particularly relevant to nursing practice at the time the inventory was developed and are not tested in the current version (Ward, 2011).

In addition, the GNCI is based on the genetic/genomic competency framework developed and endorsed in the United States, and gaps exist among genomic nursing competency frameworks and clinical care across the world. However, nurses involved in the discovery, interpretation, application, and management of genomic information have benefited from the leadership of the International Society of Nurses in Genetics (www.isong.org) since 1988; this organization facilitates a strong network that fosters collaboration among nurses who develop competency frameworks, so gaps should continue to close in the future.

Implications for Nursing Research, Education, and Practice

The GNCI provides an efficient means to assess knowledge of foundational genetic/genomic concepts. It can be administered in 30 min as either a paper-and-pencil or Web-based test and scored electronically. Because each item maps to a particular concept, results indicate which concepts are understood and, when concepts are misunderstood, which alternate conceptions are thought to be true. Results therefore provide actionable information, allowing educators to target poorly understood concepts and directly reconcile misunderstandings. In this way, the GNCI supports education that is efficient, effective, and evidence based.

Whether the GNCI is used with faculty or students, it has utility for assessing pre-instructional genomic knowledge to inform the development of relevant curricula or continuing education programs. Pending validation of post-test reliability, it could be used to measure learning gains. An analysis of the most common misconceptions among faculty in this study is underway; this will facilitate the development of an evidence-based, relevant continuing education program. Because the content domain reflects foundational genetic/genomic concepts, the GNCI may have value as an instrument for measuring knowledge among students and faculty in other countries. The GNCI is currently being translated into Spanish, and it is our hope that it will be translated into other languages. Inquiries about obtaining the GNCI should be made to linda.ward@wsu.edu.

Conclusions

In order to achieve optimal health care of the world's people, the faculty charged with educating the next generation of nurses must understand the concepts essential to "thinking genomically" in all patient encounters. Study results indicate that faculty knowledge of foundational genomic concepts is similar to that of the students they teach, and weakest in the areas related to basic science information. Faculty need to be proactive in seeking out the many available educational programs about genomics, and course developers should not hesitate to incorporate information on basic genetic and genomic concepts. Genomics is increasingly important in all areas of clinical nursing practice, and the effectiveness of courses and curricula in developing genomic competence among students depends upon the knowledge of the faculty and the value they place on the content.

Acknowledgments

The authors would like to acknowledge the assistance of Emily Blake, an undergraduate research fellow at Boston College, who assisted with the recruitment and survey development.

Correction made after online publication November 2, 2015: Acknowledgments section has been updated.

Clinical Resources

- Genetics/Genomics Competency Center. Open source repository of curricular materials for health professionals. www.g-2-c-2.org
- National Health Service (United Kingdom) National Genomics Education Programme. A rich repository of information, links, and educational materials for health professionals. https://www.genomicseducation.hee.nhs.uk/
- National Human Genome Research Institute at the National Institutes of Health (United States). Resources related to genetics; links to basic information. www.nhgri.nih.gov/

References

American Association of Colleges of Nursing. (2008). *The essentials of baccalaureate education for professional nursing practice*. Washington, DC: Author.

American Association of Colleges of Nursing. (2015a). Nursing faculty shortage fact sheet. Retrieved from http://www.aacn.nche.edu/media-relations/FacultyShortageFS.pdf

American Association of Colleges of Nursing. (2015b). Enhancing diversity in the nursing workforce. Retrieved from http://www.aacn.nche.edu/media-relations/diversityFS.pdf

Ausubel, D. P., Novak, J. D., & Hanesian, H. (1978). *Educational psychology: A cognitive view* (2nd ed.). New York, NY: Holt, Rinehart and Winston.

Bowling, B. V., Acra, E. E., Wang, L., Myers, M. F., Dean, G. E., Markle, G. C., . . . Huether, C. A. (2008). Development and evaluation of a genetics literacy assessment instrument for undergraduates. *Genetics*, *178*(1), 15–22.

Calzone, K. A., Jenkins, J., Bakos, A. D., Cashion, A. K., Donaldson, N., Feero, W., . . . Webb, J. (2013). A blueprint for genomic nursing science. *Journal of Nursing Scholarship*, *45*(1), 99–104.

Consensus Panel on Genetic/Genomic Nursing Competencies. (2009). *Essentials of genetic and genomic nursing: Competencies, curricula guidelines, and outcome indicators* (2nd ed.). Silver Spring, MD: American Nurses Association. Retrieved from http://www.genome.gov/17517146

Daack-Hirsch, S., Driessnack, M., Perkhounkova, Y., Furukawa, R., & Ramirez, A. (2012). A practical first step to integrating genetics into the curriculum. *Journal of Nursing Education*, *51*(5), 294–298.

D'Avanzo, C. (2008). Biology concept inventories: Overview, status, and next steps. *BioScience*, *58*, 1079–1085.

De Sevo, M. R. (2013). Competency of nurse educators in genetics/genomics knowledge. *Journal of Nursing Education and Practice*, *3*(1), 123–129.

George, D., & Mallery, M. (2011). *SPSS for Windows step by step: A simple guide and reference, 18.0 update* (11th ed.). Boston, MA: Pearson.

Godino, L., & Skirton, H. (2012). A systematic review of nurses' knowledge of genetics. *Journal of Nursing Education and Practice*, *2*(3), 173–184.

Jenkins, J., Bednash, P., & Malone, B. (2010). Bridging the gap between genomics discoveries and clinical care: Nurse educators are key. *Journal of Nursing Scholarship*, *43*(1), 1–2.

Jenkins, J., & Calzone, K. (2012). Are nursing faculty ready to integrate genomic content into curricula? *Nurse Educator*, *37*(1), 25–29.

Kirk, M., Calzone, K., Arimori, N., & Tonkin, E. (2011). Genetics-genomics competencies and nursing regulation. *Journal of Nursing Scholarship*, *43*(2), 107–116.

Kirk, M., Tonkin, E., & Skirton, H. (2014). An iterative consensus-building approach to revising a genetics/genomics competency framework for nurse education in the UK. *Journal of Advanced Nursing*, *70*(2), 405–420.

Ricciardi, C., McCabe, M., & Ward, L. (2012, October). *Application of a genomic knowledge inventory to practicing pediatric nurses*. Poster presented at the meeting of the International Association of Clinical Research Nurses, Houston, TX.

Skirton, H., O'Connor, A., & Humphreys, A. (2012). Nurses' competence in genetics: A mixed methods systematic review. *Journal of Advanced Nursing*, *68*(11), 2387–2398.

Thompson, H. J., & Brooks, M. (2011). Genetics and genomics in nursing: Evaluating essentials implementation. *Nurse Education Today*, *31*(6), 623–627.

U.S. Census Bureau. (2012). *U.S. Census Bureau projections show a slower growing, older, more diverse nation a half century from now*. Retrieved from http://www.census.gov/newsroom/releases/archives/population/cb12-243.html

Ward, L., Haberman, M., & Barbosa-Leiker, C. (2014). Development and psychometric evaluation of the Genomic Nursing Concept Inventory (GNCI). *Journal of Nursing Education*, *53*(9), 511–518.

Ward, L. D. (2011). *Development of the Genomic Nursing Concept Inventory (GNCI)* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (3460449)

Ward, L. D. (2014, November). *Assessment of genomic literacy among baccalaureate nursing students in the United States*. Podium presentation at the annual congress of the International Society of Nurses in Genetics, Scottsdale, AZ.

Ward, L. D. (2015). *A Web-based Delphi study to evaluate the content validity of a genomics knowledge inventory for nurses*. Manuscript in preparation.

Ward, L. D., French, B. F., Barbosa-Leiker, C., & Iverson, A. E. F. (in press). Application of exploratory factor analysis and item response theory to validate the Genomic Nursing Concept Inventory. *Journal of Nursing Education*.

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

The Skin Safety Model: Reconceptualizing Skin Vulnerability in Older Patients

Jill L. Campbell, BAppSc (Nursing), RN, Grad. Dip (Wound Care)[1], Fiona M. Coyer, PhD, MSc (Nursing), RN, PGCEA[2], & Sonya R. Osborne, PhD, RN[3]

1 *Phi Delta-at-large*, Doctoral student, School of Nursing, Queensland University of Technology, and Clinical Nurse, Skin Integrity Service, Royal Brisbane and Women's Hospital, Herston, Queensland, Australia
2 *Phi Delta-at-large*, Professor of Nursing, School of Nursing, Queensland University of Technology, Royal Brisbane and Women's Hospital, Metro-North Hospital Health Service, Herston, Queensland, Australia
3 School of Nursing, Senior lecturer, Queensland University of Technology, Kelvin Grove; Joint appointment Royal Brisbane and Women's Hospital, Metro-North Hospital Health Service, Herston, Queensland, Australia

Key words
Acute care, incontinence-associated dermatitis, older adult, pressure ulcer, skin safety

Correspondence
Jill L. Campbell, Royal Brisbane and Women's Hospital, Butterfield St, Herston, Queensland, 4029. Australia.
E-mail: Jill.campbell@hdr.qut.edu.au

Accepted: October 5, 2015

doi: 10.1111/jnu.12176

Abstract

Purpose: To develop a unique skin safety model (SSM) that offers a new and unified perspective on the diverse yet interconnected antecedents that contribute to a spectrum of potential iatrogenic skin injuries in older hospitalized adults.
Organizing Construct: Discussion paper.
Methods: A literature search of electronic databases was conducted for published articles written in English addressing skin integrity and iatrogenic skin injury in elderly hospital patients between 1960 and 2014.
Findings: There is a multiplicity of literature outlining the etiology, prevention, and management of specific iatrogenic skin injuries. Complex and interrelated factors contribute to iatrogenic skin injury in the older adult, including multiple comorbidities, factors influencing healthcare delivery, and acute situational stressors. A range of injuries can result when these factors are complicated by skin irritants, pressure, shear, or friction; however, despite skin injuries sharing multiple antecedents, no unified overarching skin safety conceptual model has been published.
Conclusions: The SSM presented in this article offers a new, unified framework that encompasses the spectrum of antecedents to skin vulnerability as well as the spectrum of iatrogenic skin injuries that may be sustained by older acute care patients. Current skin integrity frameworks address prevention and management of specific skin injuries. In contrast, the SSM recognizes the complex interplay of patient and system factors that may result in a range of iatrogenic skin injuries. Skin safety is reconceptualized into a single model that has the potential for application at the individual patient level, as well as healthcare systems and governance levels.
Clinical Relevance: Skin safety is concerned with keeping skin safe from any iatrogenic skin injury, and remains an ongoing challenge for healthcare providers. A conceptual framework that encompasses all of the factors that may contribute to a range of iatrogenic skin injuries is essential, and guides the clinician in maintaining skin integrity in the vulnerable older patient.

Skin is the largest organ in the human body and is vulnerable to a multitude of threats. Within the acute care setting, older patients (those 65 years of age and older) are particularly vulnerable to skin integrity threats and subsequent skin injury (Carville, 2012). While the impact of pressure ulcers (PUs) in the acute setting is

Table 1. Skin Injuries—Definitions and Significance of the Problem

Term	Definition	Significance of the problem
Pressure ulcer	A localized injury to the skin and/or underlying tissue, usually over a bony prominence, resulting from sustained pressure (including pressure associated with shear; National Pressure Ulcer Advisory Panel et al., 2014).	6.3%–16.6% in acute care, with stage 1 and 2 pressure ulcers making up the majority of lesions (50%–55%; National Pressure Ulcer Advisory Panel et al., 2014).
Incontinence-associated dermatitis	Skin damage associated with exposure to urine or stool. It is a type of irritant dermatitis found in patients with urinary/and or fecal incontinence (Beeckman et al., 2015).	Prevalence data for general acute care is limited. Two studies in acute care range from 3.9% to 10% of overall samples, and from 20% to 42% of incontinent patients in the samples (Campbell, Coyer, & Osborne, 2014; Junkin & Selekof, 2007).
Intertriginous dermatitis (ITD)	An inflammatory dermatitis of opposing skin surfaces caused by moisture, commonly found in the inframammary, axillary, and inguinal skin folds (Black et al., 2011).	One hospital study of 1,162 female patients reported 11.2% had ITD beneath the breasts (McMahon, 1991). A survey of 100 obese individuals found 63% had more than one skin problem (Brown, Wimpenny, & Maughan, 2004).
Periwound dermatitis	Maceration of periwound skin caused by excess wound exudate. In some cases, it may extend beyond 4 cm from the wound edge (Colwell et al., 2011).	No prevalence data for this condition has been published.
Peristomal dermatitis	Inflammation and erosion of the skin related to moisture that begins at the stoma/skin junction and can extend outward in a radius (Colwell et al., 2011).	There is a wide range reported (10%–70%) due to variable definitions and assessment of peristomal skin conditions (Colwell et al., 2011).
Skin tear	A wound caused by shear, friction, and/or blunt force, resulting in separation of skin layers. A skin tear can be partial thickness (separation of the epidermis from the dermis) or full thickness (separation of both epidermis and dermis from underlying structures; LeBlanc & Baranoski, 2011).	Studies conducted in Western Australian hospitals between 2007 and 2011 found skin tear prevalence to range from 8% to 10%, with the majority of skin tears being hospital acquired (Carville, Leslie, Osseiran-Moisson, Newall, & Lewin, 2014).
Medical adhesive–related skin injury	Erythema and/or other manifestation of cutaneous abnormality (including, but not limited to, vesicle, bulla, erosion, or tear) that persists 30 min or more after removal of the adhesive (Aydin, Donaldson, Stotts, Fridman, & Brown, 2015).	Prevalence data are scarce. Skin stripping in the pediatric setting ranges from 8% to 17%, with prevalence of tension blisters ranging from 6% to 41% in an adult orthopedic setting (McNichol et al., 2013).

well understood, there are a range of potential iatrogenic skin injuries that are often regarded as an inevitable part of aging yet remain underappreciated, underreported, and somewhat invisible within this setting. Beyond PUs, other iatrogenic skin injuries include skin tears, medical adhesive–related skin injury (MARSI), incontinence-associated dermatitis (IAD), peristomal or periwound moisture-associated skin damage (MASD), and intertriginous dermatitis (ITD; **Table 1**). Skin integrity threats in older individuals arise from interactions between skin changes associated with aging; presence of multiple comorbidities; polypharmacy; changes in mobility, continence, and cognition; as well as the risks of acute illness and subsequent hospitalization. Maintaining skin integrity in the older acute care patient is an ever-present challenge for healthcare providers. These challenges are compounded by shrinking financial and clinical resources, a rapidly aging population, and the expectation that patients remain safe from harm.

For several decades, PU prevention has been the primary focus of maintaining skin integrity. Moreover, the terms pressure ulcer prevention and maintaining skin integrity have, to some extent, become interchangeable. However, like PUs, the prevalence of these other skin injuries is significant (see **Table 1**), yet unlike PUs, their impact in the acute care setting is underappreciated. These iatrogenic skin injuries have the potential to impact on morbidity, mortality, cost, and burden of care, in addition to causing pain, disfigurement, or disability. Importantly, any skin injury sustained in the delivery of health care should be classified as an adverse event. Further, research is emerging that strategies to prevent one iatrogenic injury can have positive effects on preventing other skin injuries (Coyer et al., 2015).

Historically, despite shared risk factors, skin injury prevention and management programs address a single skin injury (e.g., PU). For individuals, underappreciation of the complexity and scope of skin integrity risks can result in adverse skin integrity outcomes. For healthcare providers, this singular approach to skin injury prevention and management can result in fragmented, duplicated, inconsistent care that often takes place in silos. In response to the range of potential iatrogenic skin injuries, a multitude of injury-specific conceptual frameworks have been published (Beeckman et al., 2015; Black et al., 2011; LeBlanc & Baranoski, 2011; McNichol, Lund, Rosen, & Gray, 2013). However, to our knowledge, there is no framework that represents a unified, holistic paradigm for maintaining skin integrity. This gap represents an opportunity for an innovative paradigm shift. This article presents a framework that views skin as a complex organ, vulnerable to a multitude of threats and injuries. These diverse yet interrelated injuries can result from complex interactions between patient and systems factors as well as acute situational stressors. The framework draws together important concepts into a single unified paradigm, highlighting the interconnection of the spectrum of skin frailty antecedents and resultant skin injuries. This article argues that the imperative to prevent the diverse range of iatrogenic skin injuries in older hospitalized patients warrants a new skin safety conceptual framework.

Aim

The aim of this article is to develop a unique skin safety model (SSM) that offers a new and unified perspective on the diverse yet interconnected antecedents that contribute to a spectrum of potential iatrogenic skin injuries in older hospitalized adults.

Methods

A review of the literature was conducted to identify current frameworks, consensus documents, guidelines, or position statements in the area of maintaining skin integrity. Electronic databases including PubMed/Medline, Cumulative Index to Nursing and Allied Health Literature, PsycINFO, and Web of Science and Cochrane Library were searched for literature published between 1960 and December 2014. The year 1960 was chosen to capture seminal papers addressing PU etiology published in that decade. The search strategy was limited to human subjects and those published in English-speaking countries. The search was conducted using the following key words: skin integrity, skin injury, skin safety, iatrogenic skin injury, pressure sore, pressure ulcer, pressure injury, bedsore, decubitus ulcer, moisture lesion, perineal dermatitis, incontinence-associated dermatitis, moisture-associated skin damage, intertriginous dermatitis, skin tear, peri-stomal skin injury, peri-wound skin injury, medical adhesive-related skin injury, patient safety, and quality improvement, combined with additional key words conceptual, framework, model, theoretical, guideline, and consensus statement. Meta-analyses and systematic reviews (Level I), randomized controlled trials (Level II), pseudo-randomized controlled trials (Level III-1), and comparative studies with or without concurrent controls (Levels III-2 and III-3) exploring risk factors, etiology, prevention, treatment, or management of skin injury of any type regardless of outcomes were included using the National Health and Medical Research Council (NHMRC) hierarchy of evidence (NHMRC, 2000). The search also included searches of websites of relevant national and international organizations, government websites, and conference proceedings. A hand search of reference lists of relevant articles was undertaken.

Results

The search results yielded 2,980 records, and after excluding duplicates, 2,851 titles were screened. Two independent reviewers evaluated 179 potentially relevant abstracts, with 21 papers meeting the criteria for inclusion in this review. Papers included presented a conceptual framework, theory, model, consensus, guideline, or position statement related to skin integrity, iatrogenic skin injury, pressure sore, PU, pressure injury, bedsore, decubitus ulcer, moisture lesion, perineal dermatitis, IAD, MASD, ITD, skin tear, peristomal skin injury, periwound skin injury, or MARSI. Papers were excluded if they tested the effectiveness of a single intervention. A narrative synthesis was undertaken.

Narrative Synthesis of the Literature

Skin integrity risk is defined by the international nursing diagnosis group NANDA-I (Herdman, 2012) as a “patient being at risk for alteration in epidermis and/or dermis” (p. 437), and classifies skin integrity risk in the domain of safety or protection. Despite this broad definition, maintaining skin integrity has become a surrogate term in the literature for PU prevention. However, beyond PUs, older patients can be at risk for a range of iatrogenic skin injuries. Prevention of hospital-acquired pressure ulcers (HAPUs) has shaped policy, funding, and research agendas internationally, and has been the primary activity in maintaining skin integrity in the acute care setting. Multiple conceptual frameworks (Braden & Bergstrom, 1987; Coleman et al., 2014; DeFloor, 1999; National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, & Pan Pacific Pressure Injury Alliance, 2014) have been published that address PU risk factors and etiology. However, publication of a range of consensus documents has resulted in increased appreciation of other iatrogenic skin injuries (Beeckman et al., 2015; Black et al., 2011; LeBlanc & Baranoski, 2011; McNichol et al., 2013). These injuries include IAD (Beeckman et al., 2015), ITD, peristomal or periwound MASD (Black et al., 2011), skin tears (LeBlanc & Baranoski, 2011), and MARSI (McNichol et al., 2013; see **Table 1**).

A compelling argument in support of an integrated skin safety paradigm is an appreciation of the multiple contributing factors that many iatrogenic skin injuries share. A recent narrative synthesis of 54 published studies, with more than 34,000 participants, was conducted by Coleman and colleagues (2013) to identify PU risk factors. The most common PU risk factors identified were in the domains of mobility and activity, perfusion, PU status, skin moisture, age, hematological measures, and general health status. They concluded that a complex interplay of factors, rather than a single risk factor, increased the probability of PU development. It is noteworthy that these PU risk factors are also cited as risk factors for other iatrogenic skin injuries, such as skin tears or IAD (Beeckman et al., 2015; LeBlanc & Baranoski, 2014). However, apart from the work of García-Fernández, Agreda, Verdú, and Pancorbo-Hidalgo (2014), proposing the mechanism for dependence-related lesions, and the work of Campbell (2009), recognizing the association between PU and frailty, there is a general paucity of research exploring shared and synergistic factors contributing to iatrogenic skin injury in older adults.

While iatrogenic skin injuries share multiple contributing factors, prevention and management of these skin injuries is commonly undertaken in silos. This siloed approach can result in fragmented, duplicated, or inconsistent care, as well as a multitude of conceptual frameworks and consensus documents addressing individual skin integrity outcomes (Brown & Sears, 1993; Coleman et al., 2014; Doughty et al., 2012; LeBlanc & Baranoski, 2011). To our knowledge, there is no overarching skin integrity framework recognizing shared risk factors and acknowledging a variety of potential outcomes.

In the past three decades, several conceptual frameworks have been published that deal specifically with PU etiology. A seminal paper by Braden and Bergstrom (1987) identified tissue tolerance and pressure as critical determinants of PU development. Subsequently, the term tissue tolerance has been used throughout PU literature to denote the ability of the skin and supporting structures to endure the effects of pressure without adverse sequelae (Benoit & Mion, 2012; Coleman et al., 2014; DeFloor, 1999; National Pressure Ulcer Advisory Panel et al., 2014). Further, a central concept in these frameworks is the recognition that risk for PU development results from an interplay between multiple factors, including individual tissue tolerance and the influence of the type, intensity, and duration of an external force acting on the body. In addition to recognizing the influence of tissue tolerance and external forces acting on the body, Defloor's model (DeFloor, 1999) includes nursing and medical interventions as determinants of both pressure and shear, and ultimately PU development. The recent conceptual model proposed by García-Fernández et al. (2014) moves beyond considering only PU etiology to identify shared risk factors common to PUs and other dependence lesions, suggesting a growing appreciation of shared antecedents of iatrogenic skin injury.

Consensus documents dealing with skin injuries other than PUs reveal several common themes regarding skin injury contributing factors and etiology (Brown & Sears, 1993; Coleman et al., 2014; Doughty, 2012; LeBlanc & Baranoski, 2011). Firstly, the response to potentially harmful forces acting on skin is highly influenced by tissue tolerance and is unique to each individual. Secondly, that impaired tissue tolerance is a key etiological factor for any iatrogenic skin injury, not just PUs. Tissue tolerance is a construct that varies slightly between authors, but is consistently linked with an individual's advancing age, preexisting health status and comorbidities, nutrition, medications, perfusion, oxygenation, mobility, and sensory perception. Finally, elements that threaten skin integrity in vulnerable individuals are pressure, shear, friction, moisture, and trauma.

PU prevention strategies are well documented in the literature, and include nursing and medical interventions (such as skin assessment, repositioning and appropriate equipment selection; National Pressure Ulcer Advisory Panel et al., 2014). The impact of healthcare interventions on skin integrity outcomes is largely underappreciated in PU or other skin integrity conceptual frameworks. Defloor's (1999) insightful inclusion of the influence of healthcare systems factors (such as medical and nursing interventions) as PU risk factors demonstrates a comprehensive framework that moves beyond physiological and biomechanical causes of PU and recognizes broader threats to skin integrity.

Recognition of healthcare systems and processes as a potential component of a risk profile is echoed in the quality health outcomes model proposed by Mitchell, Ferketich, and Jennings (1998). This model proposed the existence of dynamic feedback between patients, healthcare interventions, and the system in which care was provided. Further, they asserted that patient characteristics directly affected the intervention outcome. Their model highlights the need for consideration of the influence of organizational or system factors on outcomes, and that interventions should be evaluated within the context of interactions and feedback between the patient

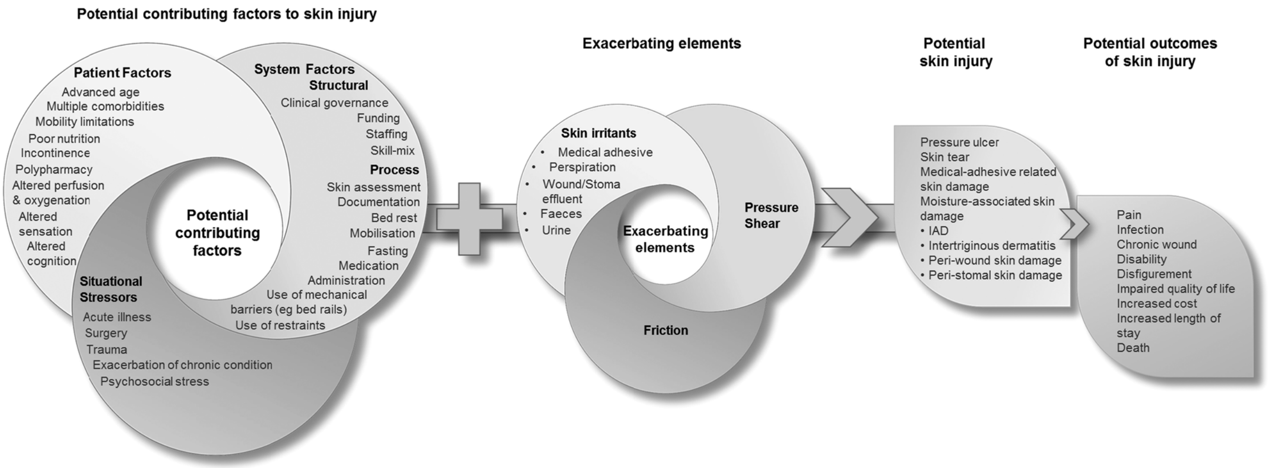

Figure 1. Skin safety model.

and the system (Mitchell et al., 1998). While not specifically dealing with PU or skin integrity, Mitchell and colleagues' model (Mitchell et al., 1998) supports Defloor's contention that systems and process elements (i.e., nursing and medical interventions) should be considered in care delivery and subsequent patient outcomes.

Overall, there is agreement in the literature that iatrogenic skin injuries result from complex, multifactorial, and interconnected threats. It is clear from the literature review that the phenomenon of skin safety or iatrogenic skin injury as a holistic concept is not represented. The term skin safety used in this article denotes the protection from possible alteration or injury to the epidermis or dermis in the older patient resulting from the interplay between multiple and complex threats to skin integrity. While there is a significant body of literature regarding PU etiology, prevention, and management, and, similarly, a growing body of research addressing other discrete iatrogenic skin injuries, a gap remains in the conceptualization of skin vulnerability to injury as an overarching phenomenon.

A Model for Skin Safety

In a single model, the SSM (**Figure 1**) guides clinicians in the recognition and consideration of diverse yet interrelated contributing factors in the etiology of a range of iatrogenic skin injuries and subsequent outcomes. The model consists of four domains or constructs: (a) potential contributing factors to skin injury, (b) exacerbating elements, (c) potential skin injury, and (d) potential outcomes of skin injury. Within each domain is a subset of determinants, which can be considered as dynamic or on a continuum. There are a myriad of combinations of these determinants, with varying severity, relevance, or impact for each individual. The determinants have the potential to change according to a specific situation, interaction with other domains, or the passage of time. The relationship between the potential contributing factors and exacerbating elements domains is represented by a plus symbol to indicate the cumulative or magnifying effect of the first domain on the second. The relationship between the exacerbating elements and potential skin injuries domains is represented by an arrow, indicating the potential range of consequences (i.e., skin injuries) that flow from interaction between the previous two domains. An arrow represents the direct relationship between the potential skin injury and the final domain, the range of potential outcomes as experienced by an individual.

Patient Factors

Patient factors in the SSM are determinants situated within the domain of potential contributing factors to skin injury. The determinants constituting patient factors are advanced age, multiple comorbidities, mobility limitations, poor nutrition, incontinence, factors affecting perfusion and oxygenation, polypharmacy, and alterations in sensation and cognition. Aging is associated with the presence of accumulating chronic illnesses, multimorbidity, and geriatric syndromes (Inouye, Studenski, Tinetti, & Kuchel, 2007; Lakhan et al., 2011). The term geriatric syndrome's refers to multifactorial health conditions that result from accumulated effects in multiple systems, and describes conditions in older people that are not categorized as discrete diseases, including incontinence, falls, PUs, delirium, and functional decline (Inouye et al., 2007). Multiple comorbidities add cost and complexity to health care due to disease interactions and the resultant complexity of the required care (Greene, Dasso, Ho, & Genaidy, 2014). It is clear that the presence of multiple disease states and geriatric syndromes influences all body systems, including skin.

System Factors

Systems factors are determinants also situated within the domain of potential contributing factors to skin injury. A system is defined as a set of things working together as parts of a mechanism or an interconnecting network to form a complex whole (Fowler, Fowler, & Crystal, 2011). The system represented in the SSM denotes the organized agency where care of the patient happens, specifically the hospital (McClellan et al., 2014; Mitchell et al., 1998). The domain of the system of care is conceptualized in the SSM as comprising both structural and process elements (Mitchell et al., 1998). Structural elements of the system can include clinical governance, safety culture, funding models, leadership, staffing, and skill mix (Mitchell et al., 1998; Youngberg, 2013). A process is defined as a series of actions or steps taken in order to achieve a particular end (Fowler et al., 2011). Process elements represented in the SSM refer to direct and indirect interventions and activities by which care is delivered (Mitchell et al., 1998; Youngberg, 2013). The process elements in the SSM refer to interventions and activities that influence skin integrity outcomes, for example, skin assessment, documentation, bed rest, mobilization, fasting, medication administration, use of mechanical barriers (such as restraints or bed rails), or tethers (such as catheters, drains, or intravenous lines; Bry, Buescher, & Sandrik, 2012; Montalvo, 2007; Youngberg, 2013). Ultimately, structural and process elements of the system interact to affect patient outcomes (Mitchell et al., 1998), in this case skin integrity outcomes.

The means by which a hospital receives its funding is integral to the system of care and has a profound influence on its structures and processes. Traditionally, many healthcare systems have been provider or supply driven, whereby separate elements of care are remunerated (McClellan et al., 2014). The goal of provider- or supply-driven funding models is to improve patient access to service and outcomes (Solomon, 2014). An example of the use of funding systems being used as leverage to influence skin integrity outcomes is seen in the reduction of reimbursement for treatment of HAPUs, or the introduction of financial incentives for HAPU prevention. It can be argued that funding disincentives for specific aspects of skin safety (i.e., PU prevention) may foster a narrow focus on a specific activity (to avoid financial penalty), while opportunities to provide broader overarching skin safety programs are potentially overlooked (McClellan et al., 2014).

The structure and process by which nursing care is delivered within the hospital system can influence skin integrity outcomes. Missed nursing care is seen as a systems error of omission (Kalisch, Landstrom, & Hinshaw, 2009) and may include missing scheduled repositioning, not undertaking a skin inspection, inappropriate management of incontinence, or missed feeding. These aspects of care all have a direct role in maintaining skin integrity; therefore, if any or all of these aspects of care are delayed, incomplete, or even omitted, skin injury may result (Kalisch et al., 2009). Predictors of missed care in a recent study (Blackman et al., 2014) include nursing resource allocation, workload intensity, and workload predictability. It can be seen that the structure and process by which nurses are able to provide care has a direct impact on PU risk and subsequent outcomes, and warrants consideration in the broader skin safety paradigm.

Situational Stressors

A situational stressor is a further determinant in the domain of potential contributing factors to skin injury. A situational stressor is conceptualized in the SSM as an acute event, illness, or trauma requiring a hospital admission for an older individual. A situational stressor may be a fall resulting in trauma, an acute infection, or an exacerbation of a preexisting condition. Increases in an individual's vulnerability to stressors such as infection, injury, surgery, or hospitalization can result in significant and sometimes fatal declines in health (Fried et al., 2001). The combination of multiple patient factors interacting with the complex hospital system, compounded by an individual's lack of capacity to respond to these stressors, can potentially lead to a multiplicity of adverse events, including iatrogenic skin injury.

Exacerbating Elements

The next domain in the SSM is exacerbating elements, conceptualized by the determinants pressure, shear, friction, or the presence of irritants on the skin. Exposure to one or a combination of these determinants can result in skin injury. These skin integrity threats have been well defined and conceptualized in the literature (Beeckman et al., 2015; Gefen, 2014; Gray, 2007; National Pressure Ulcer Advisory Panel et al., 2014; Oomens, Bader, Loerakker, & Baaijens, 2015; Shaked & Gefen, 2013).

Potential Skin Injuries

The fourth domain in the SSM is potential iatrogenic skin injuries, with the determinants being PU, skin tears, IAD, ITD, and MARSI. These injuries are the result of the interactions and convergence of the domains of potential contributing factors and exacerbating elements. For instance, an older person who is able to mobilize at home, but falls frequently, may be vulnerable to skin tears as a result. However, if a situational stressor is experienced (e.g., acute diarrhea requiring hospital admission), the same individual is likely to be at increased risk for PU and IAD, as well as concomitant skin tear. Due to the multiple shared contributing factors, older patients can be simultaneously at risk for a range of different skin injuries.

Potential Outcomes of a Skin Injury

Potential outcome of a skin injury constitutes the final domain of the SSM. Regardless of etiology, disruption to skin integrity can impact on well-being and predispose an individual to infection, pain, and increased morbidity and mortality, with the attendant increase in the demand on healthcare services (Carville, 2012). The experience of a skin injury is highly individual, can change over time, and can impinge on all domains of well-being (physical, mental, social, and spiritual/cultural) (Augustin et al., 2012). The inclusion of potential outcomes of skin injury in the SSM is unique. Rather than limiting the framework to identifying the skin injury, recognition of the patient's experience of iatrogenic skin injury is fundamental for delivery of holistic person-centered care.

Shifting the Paradigm From Prevention to Skin Safety

The SSM proposes a paradigm shift away from specific skin injury prevention towards a holistic patient-centered goal of maintaining skin integrity. Patient individuality in the context of multiple and shared risk factors is a central premise of the SSM, allowing numerous skin integrity outcomes to be accommodated in a single integrated framework. The SSM recognizes that dynamic and individual interactions between skin injury antecedents may result in different outcomes for each individual. Managing multiple individual risks separately may result in competing risk assessments, care pathways, systems demands, and priorities, ultimately resulting in fragmented or duplicated care. The SSM provides a single integrated framework to facilitate skin integrity management at the individual patient level.

Contemporary patient care is based on traditional biomedical models of disease that have a linear focus on etiology, pathological processes, and ultimately specific clinical outcomes (Chiarelli, Bower, Wilson, Attia, & Sibbritt, 2005). This specialized care delivery can result in the perception of the hospital being a series of departments or silos (with each concerned with their own budgets and performance indicators), delivering fragmented care, rather than being a fully integrated process or continuum of care (Shortell & Singer, 2008). The impact of the multifactorial complexity and individuality of the patient can be easily lost in the specialty silo (Denham, 2009; Inouye et al., 2007). Multiple narrow condition-focused care paradigms, with attendant narrow solutions, and the potential for duplication and inconsistency, are neither sustainable nor desirable in the modern healthcare environment. Improving care delivery and systems requires initiatives that address multiple problems across a continuum of care.

Vulnerability to iatrogenic skin injury in the older acute care patient results from the convergence of multiple complex factors. An appreciation of the complexity and diversity of all of these factors can create the circumstances whereby genuine holistic care can be planned and delivered, with the overall goal of care being skin safety and the prevention of iatrogenic skin injury. The SSM encompasses this complexity and offers a theoretical foundation for innovative skin injury prevention in the acute care environment.

Conclusions

Maintaining skin integrity in the older hospitalized adult is a priority for healthcare providers. Diverse antecedents interact synergistically to cause a range of possible iatrogenic skin injuries. These injuries have implications for patients and the healthcare system alike, including pain and suffering, as well as increased cost and length of hospital stay. This article has presented a model formulated from a review of the literature for conceptualizing skin safety in a unified way. The SSM moves beyond physiology and biomechanics to encompass and reconceptualize varied and complex factors that can converge, interact, and ultimately lead to skin injury in older patients. However, the SSM is not a risk assessment tool; rather, it is a framework to guide clinicians and healthcare providers in the recognition and consideration of the complexity of skin injury etiology. Further testing and validation of the SSM is required. Opportunities for further research include the development and validation of an integrated skin safety risk assessment tool. Research and quality activities, such as PU prevalence and incidence studies in the acute care setting, could be expanded to encompass data collection on any concurrent iatrogenic skin injury, rather than simply determining PU status. Reframing quality indicators to include an organization's response to skin risk rather than PU management and prevention may result in improved overall patient outcomes, as well as improved system efficiencies. The paradigm shift from focus on specific skin injury prevention to an appreciation of overarching skin integrity vulnerability in the older adult patient is timely in light of the challenges healthcare systems are facing. A comprehensive and innovative approach to skin safety is essential to deal with increasing patient age, acuity, and complexity; increasing fiscal challenges; and the fundamental expectation that health care is safe.

Acknowledgments

The corresponding author is a recipient of a Royal Brisbane and Women's Hospital (RBWH) Foundation Research Project Grant, RBWH Foundation Research Scholarship, and the Centaur Memorial Fund for Nurses Scholarship.

Clinical Resources

- European Wound Management Association: http://www.ewma.org/
- National Database of Nursing Quality Indicators, Pressure Ulcer Training: https://members.nursingquality.org/NDNQIPressureUlcerTraining/
- National Pressure Ulcer Advisory Panel: http://www.npuap.org/
- Patient Safety Network: https://psnet.ahrq.gov/
- WoundsWest Education: http://www.health.wa.gov.au/woundswest/education/

References

Augustin, M., Carville, K., Clark, M., Curran, J., Flour, M., Lindholm, C., . . . Price, P. (2012). International consensus: optimising wellbeing in people living with a wound. *Wounds International*. Retrieved from http://www.woundsinternational.com

Aydin, C., Donaldson, N., Stotts, N. A., Fridman, M., & Brown, D. S. (2015). Modeling hospital-acquired pressure ulcer prevalence on medical-surgical units: Nurse workload, expertise, and clinical processes of care. *Health Services Research*, *50*(2), 351–373.

Beeckman, D., Campbell, J., Campbell, K., Chimentão, D., Coyer, F., Domansky, R., . . . Wang, L. (2015). Proceedings of the Global IAD Expert Panel. Incontinence-associated dermatitis: Moving prevention forward. *Wounds International*. Retrieved from http://www.woundsinternational.com

Benoit, R., & Mion, L. (2012). Risk factors for pressure ulcer development in critically Ill patients: A conceptual model to guide research. *Research in Nursing & Health*, *35*(4), 340–362.

Black, J. M., Gray, M., Bliss, D. Z., Kennedy-Evans, K. L., Logan, S., Baharestani, M. M., . . . Ratliff, C. R. (2011). MASD part 2: Incontinence-associated dermatitis and intertriginous dermatitis: A consensus. *Journal of Wound, Ostomy & Continence Nursing*, *38*(4), 359–370.

Blackman, I., Henderson, J., Willis, E., Hamilton, P., Toffoli, L., Verrall, C., . . . Harvey, C. (2014). Factors influencing why nursing care is missed. *Journal of Clinical Nursing*, *24*, 47–56.

Braden, B., & Bergstrom, N. (1987). A conceptual schema for the study of the etiology of pressure sores. *Rehabilitation Nursing*, *25*(3), 105–109.

Brown, D., & Sears, M. (1993). Perineal dermatitis: A conceptual framework. *Ostomy Wound Management*, *39*(7), 20–22, 24–25.

Brown, J., Wimpenny, P., & Maughan, H. (2004). Skin problems in people with obesity. *Nursing Standard*, *18*(35), 38–42.

Bry, K. E., Buescher, D., & Sandrik, M. (2012). Never say never: A descriptive study of hospital-acquired pressure ulcers in a hospital setting. *Journal of Wound, Ostomy and Continence Nursing*, *39*(3), 274–281.

Campbell, J., Coyer, F., & Osborne, S. (2014). Incontinence associated dermatitis: A cross-sectional prevalence study in the Australian acute care hospital setting. Advance online publication. *International Wound Journal*. doi: 10.1111/iwj.12322

Campbell, K. E. (2009). A new model to identify shared risk factors for pressure ulcers and frailty in older adults. *Rehabilitation Nursing*, *34*(6), 242–247.

Carville, K. (2012). *Wound care manual* (6th ed.). Perth, Australia: Silver Chain Foundation.

Carville, K., Leslie, G., Osseiran-Moisson, R., Newall, N., & Lewin, G. (2014). The effectiveness of a twice-daily skin-moisturising regimen for reducing the incidence of skin tears. *International Wound Journal*, *11*(4), 446–453.

Chiarelli, P., Bower, W., Wilson, A., Attia, J., & Sibbritt, D. (2005). Estimating the prevalence of urinary and faecal incontinence in Australia: Systematic review. *Australasian Journal on Ageing*, *24*(1), 19–27.

Coleman, S., Gorecki, C., Nelson, E. A., Closs, S. J., Defloor, T., Halfens, R., . . . Nixon, J. (2013). Patient risk factors for pressure ulcer development: Systematic review. *International Journal of Nursing Studies*, *50*(7), 974–1003.

Coleman, S., Nixon, J., Keen, J., Wilson, L., McGinnis, E., Dealey, C., Nelson, E. A. (2014). A new pressure ulcer conceptual framework. *Journal of Advanced Nursing*, *70*(10), 2222–2234.

Colwell, J. C., Ratliff, C. R., Goldberg, M., Baharestani, M. M., Bliss, D. Z., Gray, M., . . . Black, J. M. (2011). MASD part 3: Peristomal moisture-associated dermatitis and periwound moisture-associated dermatitis: A consensus. *Journal of Wound, Ostomy & Continence Nursing*, *38*(5), 541–553.

Coyer, F., Gardner, A., Doubrovsky, A., Cole, R., Ryan, F. M., Allen, C., & McNamara, G. (2015). Reducing pressure injuries in critically ill patients by using a patient skin integrity care bundle (InSPiRE). *American Journal of Critical Care*, *24*(3), 199–209. doi:10.4037/ajcc2015930

DeFloor, T. (1999). The risk of pressure sores: A conceptual scheme. *Journal of Clinical Nursing*, *8*(2), 206–216.

Denham, C. R. (2009). The no outcome-no income tsunami is here: Are you a surfer, swimmer, or sinker? *JONA's Healthcare Law, Ethics, and Regulation*, *11*(2), 57–69.

Doughty, D. (2012). Differential assessment of trunk wounds: Pressure ulceration versus incontinence associated dermatitis versus intertriginous dermatitis. *Ostomy Wound Manage*, *58*(4), 20–22.

Doughty, D., Junkin, J., Kurz, P., Selekof, J., Gray, M., Fader, M., . . . Logan, S. (2012). Incontinence-associated dermatitis: Consensus statements, evidence-based guidelines for prevention and treatment, and current challenges. *Journal of Wound, Ostomy and Continence Nursing*, *39*(3), 303–315.

Fowler, H. W., Fowler, F. G., & Crystal, D. (2011). *The concise Oxford dictionary of current English*. Oxford, UK: Oxford University Press.

Fried, L. P., Tangen, C. M., Walston, J., Newman, A. B., Hirsch, C., Gottdiener, J., . . . McBurnie, M. A. (2001). Frailty in older adults: Evidence for a phenotype. *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, *56*(3), M146–M156.

García-Fernández, F. P., Agreda, J. J. S., Verdú, J., & Pancorbo-Hidalgo, P. L. (2014). A new theoretical model for the development of pressure ulcers and other dependence-related lesions. *Journal of Nursing Scholarship*, *46*(1), 28–38.

Gefen, A. (2014). From incontinence associated dermatitis to pressure ulcers. *Journal of Wound Care*, *23*(7), 345.

Gray, M. (2007). Incontinence-related skin damage: Essential knowledge. *Ostomy Wound Management*, *53*(12), 28–32.

Greene, R. A., Dasso, E., Ho, S., & Genaidy, A. M. (2014). A person-focused model of care for the twenty-first century: a system-of-systems perspective. *Population Health Management*, *17*(3), 166–171.

Herdman, T. (2012). *NANDA International nursing diagnoses: Definitions & classification, 2012–2014*. Oxford, UK: Wiley-Blackwell.

Inouye, S. K., Studenski, S., Tinetti, M. E., & Kuchel, G. A. (2007). Geriatric syndromes: Clinical, research, and policy implications of a core geriatric concept. *Journal of the American Geriatric Society*, *55*(5), 780–791.

Junkin, J., & Selekof, J. L. (2007). Prevalence of incontinence and associated skin injury in the acute care inpatient. *Journal of Wound, Ostomy & Continence Nursing*, *34*(3), 260–269.

Kalisch, B. J., Landstrom, G. L., & Hinshaw, A. S. (2009). Missed nursing care: A concept analysis. *Journal of Advanced Nursing*, *65*(7), 1509–1517.

Lakhan, P., Jones, M., Wilson, A., Courtney, M., Hirdes, J., & Gray, L. C. (2011). A prospective cohort study of geriatric syndromes among older medical patients admitted to acute care hospitals. *Journal of the American Geriatrics Society*, *59*(11), 2001–2008.

LeBlanc, K., & Baranoski, S. (2011). Skin tears: State of the science: Consensus statements for the prevention, prediction, assessment, and treatment of skin tears. *Advances in Skin & Wound Care*, *24*(9), 2–15.

LeBlanc, K., & Baranoski, S. (2014). Skin tears: The forgotten wound. *Nurse Manager*, *45*(12), 36–46.

McClellan, M., Kent, J., Beales, S. J., Cohen, S. I., Macdonnell, M., . . . Thoumi, A., Darzi, A. (2014). Accountable care around the world: A framework to guide reform strategies. *Health Affairs (Millwood)*, *33*(9), 1507–1515.

McNichol, L., Lund, C., Rosen, T., & Gray, M. (2013). Medical adhesives and patient safety: State of the science: Consensus statements for the assessment, prevention, and treatment of adhesive-related skin injuries. *Journal of Wound, Ostomy and Continence Nursing*, *40*(4), 365–380.

Mitchell, P. H., Ferketich, S., & Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Journal of Nursing Scholarship*, *30*(1), 43–46.

Montalvo, I. (2007). The National Database of Nursing Quality Indicators (NDNQI). *Online Journal of Issues in Nursing*, *12*(3). doi: 10.3912/OJIN.Vol12No03Man02

National Health Medical Research Council. (2000). *How to review the evidence: Systematic identification and review of the scientific literature*. Retrieved from http://www.nhmrc.gov.au/publications/synopses/_files/cp65.pdf

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, & Pan Pacific Pressure Injury Alliance. (2014). In E. Haesler (Ed.), *Prevention and treatment of pressure ulcers: Clinical practice guideline*. Perth, Australia: Cambridge Media.

Oomens, C. W., Bader, D. L., Loerakker, S., & Baaijens, F. (2015). Pressure induced deep tissue injury explained. *Annals of Biomedical Engineering*, *43*(2), 297–305.

Shaked, E., & Gefen, A. (2013). Modeling the effects of moisture-related skin-support friction on the risk for superficial pressure ulcers during patient repositioning in bed. *Frontiers in Bioengineering and Biotechnology*, *1*, 9. doi: 10.3389/fbioe.2013.00009

Shortell, S. M., & Singer, S. J. (2008). Improving patient safety by taking systems seriously. *Journal of the American Medical Association*, *299*(4), 445–447.

Solomon, S. (2014). Health reform and activity-based funding. *Medical Journal of Australia*, *200*(10), 564.

Youngberg, J. (2013). *Patient safety handbook* (2nd ed.). Burlington, MA: Jones and Bartlett Learning.

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Factors of Resilience in Emergency Department Nurses Who Have Experienced Workplace Violence in Taiwan

Hsiu-Fen Hsieh, MS, PhD, RN[1], Yu-Tung Hung, PhD[2], Hsiu-Hung Wang, PhD, RN, FAAN[3], Shu-Ching Ma, RN[4], & Shu-Chen Chang, RN[5]

1 Assistant Professor, College of Nursing, Kaohsiung Medical University, Kaohsiung, Taiwan.
2 Assistant Professor, Master degree program in Aging and Long-Term Care, College of Nursing, Kaohsiung Medical University, Kaohsiung, Taiwan
3 Dean and Professor, College of Nursing, Kaohsiung Medical University, Kaohsiung, Taiwan
4 Deputy Director; Nursing Department, Chi-Mei Medical Center, Tainan, Taiwan
5 Director and Assistant Professor, Department of Nursing, Changhua Christian Hospital, Changhua, Taiwan and Department of Nursing, Dayeh University, Changhua, Taiwan

Key words
Emergency department, nurses, resilience, social network integration, workplace violence

Correspondence
Prof. Hsiu-Hung Wang, 100 Shih-Chuan 1st Rd., Sanmin District, Kaohsiung, Taiwan 80708.
E-mail: hhwang@kmu.edu.tw

Accepted: October 7, 2015

doi: 10.1111/jnu.12177

Abstract

Purpose: This study investigated the relationship among personality traits, social network integration (SNI), and resilience in emergency department (ED) nurses who had suffered from physical or verbal violence by patients or their families.

Design and Methods: A cross-sectional study with convenience sampling was conducted for exploring the related factors of resilience on abused nurses. A total of 187 participants met our inclusion criteria and completed all questionnaires.

Findings: Higher degrees of extraversion and peer support were associated with greater resilience among all abused nurses, whereas neuroticism was inversely associated with their resilience.

Conclusions: Among all forms of SNI, only peer support was shown to enhance an individual's resilience. In addition, personality traits were associated with resilience, and religions did not play an important role in enhancing resilience among our participants.

Clinical Relevance: Through a clearer understanding of the role of peer support in resilience among ED nurses, healthcare managers should provide and enhance their peer support to intensify their resilience for prevention of consequences of workplace violence.

Workplace violence (WPV) is a serious and global health problem. It has been reported as a significant issue for healthcare providers, including nurses and other staff directly involved in patient care (World Health Organization [WHO], 2012). Emergency department (ED) healthcare providers are particularly at high risk for WPV worldwide, and WPV against nurses is a burning issue all over the world. The incidence of WPV is approximately 4.8% for general workers (National Institute for Occupational Safety and Health, 2005), whereas 8% to 38% of healthcare providers suffer from WPV. Even more nurses are threatened or exposed to verbal aggression (WHO, 2012), particularly nurses in EDs, with a rate of up to 65.1% (Choy et al., 2006). All forms of WPV are devastating, costly, and emotionally damaging events that can result in significant psychological consequences (Gong et al., 2014). The majority of people in the workplace experience different types of traumatic events in their lifetime, and most of them have good resilience to bounce back quickly without disruption or with only transient disruption in their occupational functioning (Nucifora, Langlieb, Siegal, Everly, & Kaminsky, 2007).

It was documented in U.S. studies that religious belief can have a positive effect on the resilience of victims of childhood trauma (Brewer-Smyth & Koenig, 2014), and religious support can enhance the resilience of victims of domestic violence (Anderson, Renner, & Danis, 2012). It was also found in Taiwanese studies that religious beliefs had a positive influence on the resilience of victims of divorced single mothers (Hsieh, 2008) and teenage girls in a residential setting (Pai, 2012). Therefore, religious belief was considered a factor contributing to enhanced resilience in the study.

Resilience has been defined as the capacity to withstand, regulate, and cope with ongoing life challenges and succeed in maintaining equilibrium despite negative effects (DiCorcia & Tronick, 2011; Schetter & Dolbier, 2011). A literature review indicated that resilience can be applied to build the personal strengths in abused nurses through strategies such as building and maintaining positive and professional relationships, enhancing emotional insight, achieving life balance and spirituality, and becoming more reflective (Jackson, Firtko, & Edenborough, 2007). The use of social network integration (SNI) was defined as individual participation in a wide range of social relationships, informal connections (e.g., family, peers, friends, and neighbors), and formal organizations (e.g., religious groups, jobs), etc. (Litwin & Stoeckel, 2013; Shutterstock, 2011).

Resilience and SNI are important elements for posttraumatic growth of victims of violence (Mace, 2012). Religious activity attendance was regarded as a potential protective factor that enhances resilience in high-risk youths in a previous study (Kasen, Wickramaratne, Gameroff, & Weissman, 2012). Some researchers have shown that resilience is associated with specific personality traits (Campbell-Sills, Cohan, & Stein, 2005; Eley et al., 2013), mainly neuroticism and extraversion. Thus, both SNI and personality traits are important variables on resilience among abused ED nurses experiencing WPV.

Resilience and Social Network Integration

Resilience can be regarded as a process of adaptation to adversity or stressful events, and it helps individuals cope with challenges in life and recover from setbacks or trauma (McAllister & McKinnon, 2009; Herrman et al., 2011). Resilience plays an important role as a protective factor that protects individuals from trauma, increases positive changes when coping with stressful situations, prevents disease, and promotes and maintains health (Dolbier, Jaggars, & Steinhardt, 2010; Kinman & Grant, 2011).

An individual's social relationships or social ties are correlated with his or her integration into social networks. Good SNI is one of the key factors in maintaining good physical and psychological health. It enhances an individual's capacity for stress management, promoting health and a sense of well-being (Burnett & Helm, 2013; Shutterstock, 2011; Yu et al., 2014). Both family support and peer support can enhance resilience to cope better with stress, reduce medical morbidity and mortality, and protect against developing mental disorders (Southwick, Vythilingam, & Charney, 2005). Social support can help people solve problems and relieve stress. There might be some people who have experienced or are dealing with issues similar to those that another is experiencing, and they may provide strategies as reference experiences (Rice, Bennett, & Billingsley, 2014).

Owing to cultural diversity, people in Taiwan have a variety of religious beliefs, with specific help-seeking behaviors that are different from those of people in Western countries. In Taiwan, the vast majority of people with religious beliefs adhere to folk religion, Buddhism, or Taoism, and a minority adhere to Christianity, Yiguandao, and so on. Buddhism and Taoism are expected to help people resolve their problems and explain the relationship between "people and God," "people and people," "people and objectives," and "people and me" (Chang, 2009). The processes of these customs or beliefs contain not only specific ritual behaviors but also the personal experience of spiritual power, personal communication, and something like an amulet for conferring blessing. Some Taiwanese seek help from religious beliefs, traditional folk beliefs, or folk medicine only when they have physical or psychological problems (Yee & Liu, 2004). People in Taiwan usually expect to relieve their distress or to clear up confusion with recourse from religious beliefs or specific rituals (Tsai, 2014). For example, Ji is an intermediary and can help believers to communicate with deities or Buddha for solving their problems and let the believers get peace of mind (Chang, 2009). Taoism encourages believers to recite and practice traditional moral law, which will accumulate individual achievements and virtue, and then will eliminate disasters and dissolve adversities (Chang, 2009). "Recovering lost souls" is a traditional way to help people who are frightened or terrified and help people who have trouble getting along with their families (Chang, 1996). "Drawing lots" and "casting moon blocks" are other choices for people facing difficulties to get suggestions or indications from the Gods (Anonymous, 1980). Both intrinsic and extrinsic Taiwanese traditional religious orientations have been positively associated with resilience (Chen, 2013), as have their influence on people's health-related attitudes and behaviors (Chang, 2009; Yee & Liu, 2004).

Resilience and Personality Traits

Neuroticism was documented to be strongly and negatively correlated with resilience. People with neuroticism tend to have negative emotions, such as anxiety and depression (Campbell-Sills et al., 2005; Gamez, Watson, & Doebbeling, 2007). In contrast, extraversion was positively correlated with resilience, and people with extraversion tend to experience more positive emotions, interact easily with others, seek out social resources, and have stronger self-efficacy and an adaptive manner to deal with stress or negative emotions (Campbell-Sills et al., 2005). The fields of psychiatry, psychology, and psychotherapy have also investigated the relationships between resilience and personality dimensions to understand what drives healthy coping styles and adaptive behaviors (Cloninger & Zohar, 2011). Some researchers have shown that resilience is associated with coping with prior trauma and health-promoting personality traits (Campbell-Sills et al., 2005). Thus, it is important to consider the key traits that drive or impair resilience when adopting strategies for enhancing it.

The literature showed that both SNI and personality traits could influence resilience; therefore, the objectives of this study were to examine and confirm that (a) two forms of SNI (social support and religious belief) affect individuals' resilience, and (b) personality traits are predictive factors for resilience in abused ED nurses. The hypotheses are: (a) abused nurses who have a higher level of social support have a higher level of resilience, (b) abused nurses who have religious beliefs have a higher level of resilience, and (c) abused nurses who have a lower tendency for neuroticism and a higher tendency for extraversion have a higher level of resilience.

Methods

Design and Participants

This cross-sectional survey was conducted with convenience sampling and structured questionnaires. A total of 265 participants were eligible for the study; they were from one medical center and three regional hospitals in Taiwan. Inclusion criteria for the participants were nurses who (a) had worked for at least 3 months in the ED and (b) had experienced verbal or physical violence in the workplace in the past 12 months. The exclusion criteria for the participants were nurses who (a) had any significantly stressful life event in the past 12 months and (b) had any pre-existing psychiatric disorders. Thirty-six participants refused to participate in this study and another 42 participants did not meet the inclusion criteria. Therefore, a total of 187 participants met our inclusion criteria and completed all questionnaires.

Ethical Considerations and Data Collection

This study was approved by the institutional review board (IRB No. 130612) of a general hospital before conducting this study. Data were collected from June 2013 to February 2014. The principal investigator approached eligible participants individually, invited them to participate, explained the purpose of the study, and asked them if they were willing to participate. Participants were also informed that their participation was voluntary and they had the right to terminate their participation at any time without any reason. All participants were assured of confidentiality and anonymity in the use of data. Written informed consent was obtained from every participant.

Instruments

Questionnaires were distributed, illustrated, and explained to every participant by the principal researcher. The participants' sociodemographic characteristics of age, educational attainment, married state, and seniority were obtained. In addition, the following instruments were used in the structured interviews and questionnaires: the Resilience Scale (RS), SNI (which included the Social Support Scale [SSS] and religious beliefs), and the Eysenck Personality Questionnaire (EPQ).

Measures

Resilience scale. The RS was developed by Friborg et al. (2006), and the Chinese version was established by Wang and Chen (2011) with satisfactory validity and reliability. The 29-item scale measures intrapersonal and interpersonal protective resources that facilitate tolerance and adaptability to stressors or negative life events. The RS consists of five dimensions, including personal strength, social competence, structured style, family cohesion, and social resources. Each item was scored on a 7-point semantic differential scale, with the positive differentials to the right for half of the items in order to reduce problems of acquiescence bias. The total scores of the RS range from 29 to 203, with higher scores indicating a higher level of resilience. A confirmatory factor analysis allowing all factors into correlation indicated a satisfactory fit. The 3- to 4-week test–retest reliability of intraclass correlation coefficient was 0.89 and Cronbach's alphas were 0.92, 0.85, 0.85, 0.83, and 0.87, respectively, for each dimension (Wang & Chen, 2011). In the present study, Cronbach's alpha of the RS was 0.88.

Social network integration. The foundations of social network research are rooted in Durkheim's study (1951). He discovered that those with a limitation of social network or social ties were more likely to commit suicide. Then the concept of SNI was created by Durkheim and expanded with the extent to which an individual participates in a broad range of formal organizational and social relationships (Durkheim, 1951).

SNI comprises three components and was divided into two measures of SSS for family support and peer support (first measure) and religious beliefs (second measure) in this study. The first measure is the 10-item SSS that was developed by Smilkstein (1978) with satisfactory validity and reliability. Cronbach's alpha was 0.87 (Smilkstein, Ashworth, & Montano, 1982). The Chinese version was established by Hung (2007), and its two dimensions (family and peer support) have been verified through factor analysis with Cronbach's alphas of 0.80 and 0.64, respectively. Each item comprises a Likert scale ranging from 1 to 5. A total score for the 10 items was obtained with a range from 10 to 50. Higher scores indicate a higher level of social support. Cronbach's alpha of the SSS is 0.93 in the present study.

The second measure was religious beliefs. All participants were categorized into either the religious group or nonreligious group according to their answering "yes" or "no" to the question "Do you have religious beliefs and attend religious activities, such as going to a church or temple for reading the Bible, recovering lost souls, drawing lots, casting moon blocks, praying, etc." This measure was scored 0 if the abused nurses expressed no religious beliefs and would not attend religious activities, or 1 if they expressed religious beliefs and would attend religious activities.

Eysenck personality questionnaire. The EPQ is a 25-item self-report questionnaire for assessing the personality traits of a person. It was developed by Eysenck and Eysenck (1975), and the Chinese version was established by Lu (1994). The EPQ contains 11 extraversion items measuring an individual's sociability and 14 neuroticism items measuring an individual's emotional dysfunction. The participants were asked to respond to each item by answering "yes" or "no," with scores of 0 and 1, respectively. Higher scores in the neuroticism or extraversion dimensions indicated that the participant was more neurotic or extraverted. Cronbach's alpha was 0.90 for the overall Chinese version, 0.83 for the extraversion dimension, and 0.80 for the neuroticism dimension (Lu, 1994). In the present study, Cronbach's alpha was 0.76 for the overall EPQ, 0.85 for the extraversion dimension, and 0.86 for the neuroticism dimension.

Data Analysis

Data analyses were performed with SPSS 19.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to describe the sociodemographic characteristics of the participants. All participants were divided into two groups by the presence or absence of religious beliefs; t tests were used for continuous variables, chi-square tests for dichotomous variables. The hypotheses were tested by multivariate hierarchical linear regression analyses. First, we controlled for the confounding variables, including age, educational attainment, marital status, and seniority. Second, we quantified the extent to which SNI (including family support, peer support, and religious beliefs) and personality traits (including extraversion and neuroticism) were entered into the multiple regression analysis to identify protective factors of resilience in abused ED nurses. In all tests, p values less than .05 were interpreted to be statistically significant.

Results

A total of 187 nurses met the inclusion criteria and completed the questionnaires. The mean age of the abused ED nurses was 30.53 ± 5.55 years, the majority had attained a 4-year bachelor's degree (67.9%, $n = 127$), and mean seniority of the abused ED nurses was 7.11 ± 5.12 years. Most participants were single (64.2%, $n = 102$). We compared the sociodemographic data between the religious group ($n = 78$, 41.71%) and nonreligious group ($n = 109$, 58.29%), and the results of t test or chi-square test showed that there were no statistically significant differences in the sociodemographic data of the two groups (**Table 1**). The scores of the measures of the participants are shown in **Table 2**.

A hierarchical linear regression analysis was used to examine the factors associated with resilience. The variables in the demographic characteristics, personality traits, and SNI were entered as predictors, and 46.3% of the variance in resilience could be explained by extraversion, neuroticism, and peer support (**Table 3**). Without a change in other variables, an increase of 1 in the extraversion score was equivalent to an increase of 1.929 in resilience ($\beta = 1.929$, $p < .001$); an increase of 1 in the neuroticism score was equivalent to a decrease of 2.762 in resilience ($\beta = -2.762$, $p < .001$); and an increase of 1 in the peer support score was equivalent to an increase of 1.738 in resilience ($\beta = 1.738$, $p < .001$).

Discussion

Religious beliefs might play an important role in enhancing resilience, and such outcomes were documented

Table 1. Comparison of the Sociodemographic Data, Social Support, Personality Traits, and Resilience Between Nonreligious and Religious Groups ($N = 18$)

Variables	Nonreligious belief $n = 109$ (58.29%)	Religious belief $n = 78$ (41.71%)	P
Age (mean years ± SD)	30.23 ± 5.62	30.92 ± 5.46	.401
Education			.666
Junior college, n (%)	40 (36.7)	20 (25.3)	
Above college, n (%)	69 (63.3)	58 (74.4)	
Marital status			.176
Single, n (%)	75 (68.8)	43 (31.2)	
Married, n (%)	34 (55.1)	35 (44.9)	
Seniority years ($M \pm SD$)	6.68 ± 5.15	7.71 ± 5.04	.176
Family support scores ($M \pm SD$)	14.17 ± 5.61	14.78 ± 3.89	.845
Peer support scores ($M \pm SD$)	14.35 ± 3.40	14.78 ± 3.66	.406
Extraversion scores ($M \pm SD$)	8.25 ± 3.68	9.00 ± 3.97	.190
Neuroticism scores ($M \pm SD$)	4.50 ± 3.45	4.86 ± 3.54	.491
Resilience scores ($M \pm SD$)	144.70 ± 24.17	146.76 ± 26.68	.589

in many studies (Bennett, Chepngeno-Langat, Evandrou, & Falkingham, 2015; Breno & Galupo, 2007; Hsieh, 2008; Pai, 2012). In this study, among all SNI, peer support enhanced the resilience of our participants, whereas religious beliefs and family support did not have the same effect, and this differed from our hypothesis. There are some possible explanations for these results. In this study, most of our participants were accidentally attacked or threatened verbally in the workplace; however, in other studies the participants were victims of physical violence or psychological trauma for a longer time (Bennett et al., 2015; Breno & Galupo, 2007). It might be that the accidental attack was less likely to seek help from religious beliefs than the long-term violence. Furthermore, based on face-to-face interviews, those abused ED nurses expressed that they needed more medical and legal support from hospital managers than support from religious beliefs, and this might be another reason that religious beliefs did not influence their resilience significantly. Finally, the measure of religious beliefs did not ask the level of practice of these beliefs and led to no significance between religious beliefs and resilience.

Table 2. Scores of the Measures of the Participants ($N = 187$)

Variables	Mean	SD	Actual range	Possible range
Resilience	145.56	25.20	63–202	29–203
Social network integration				
Family support	14.12	4.95	4–50	5–50
Peer support	14.53	3.51	5–20	5–50
Religious beliefs	0.42	0.49	0–1	0–1
Personality traits				
Extraversion	8.56	3.81	0–14	0–14
Neuroticism	4.65	3.43	0–11	0–11

Table 3. Multiple Regression Analyses for Predictive Factors of Resilience ($N = 187$)

	Step 1			Step 2		
Variables	β	p	95% CI	β	p	95% CI
Age	−0.40	.426	−1.40 to −0.59	0.18	.649	−0.59 to 0.94
Education	2.822	.477	−4.99 to 10.63	3.89	.204	−2.13 to 9.90
Marital status	5.60	.181	−0.214 to 13.83	−1.84	.573	−9.29 to 4.60
Seniority	0.85	.117	−0.21 to 1.911	0.50	.221	−0.31 to 1.31
Social network integration						
Family support				0.62	.070	−0.05 to 1.28
Peer support				1.74	.000*	0.78 to 2.70
Religious belief				0.10	.972	−5.61 to 5.82
Personality traits						
Neuroticism				1.93	.000*	−3.60 to −1.92
Extraversion				−2.76	.000*	1.14 to 2.72
R^2		.038			.463	
Adjusted R^2		.017			.436	

In addition, in this study, we found that abused nurses with higher levels of extraversion and lower levels of neuroticism had significantly higher resilience. These findings were similar to those of previous studies that personality traits were the important predictor of resilience. According to the study of Campbell-Sills et al. (2005), resilience was negatively correlated with neuroticism, but positively correlated with extraversion. People with neuroticism had more unexpected negative emotions with poorer work performance, and this neuroticism had a negative influence on mental health, job satisfaction, and resilience, whereas people with extraversion got along better with others, had better coping strategies and problem-solving skills, and were better able to seek resources (Cloninger & Zohar, 2011; Melnyk, Hrabe, & Szalacha, 2013). Results of this study support that assertion that highly extroverted people perceive themselves to be capable of coping with stress, whereas neurotic people need more help from others (Cloninger & Zohar, 2011; Melnyk et al., 2013). People with neuroticism are more vulnerable to the symptoms associated with burnout (Bakker, Van der Zee, Lewig, & Dollard, 2006). Fayombo (2010) found that a healthy personality beefs up and promotes resilience. Personality traits cannot be changed easily, but healthcare providers can provide interventions earlier to help improve resilience.

Finally, we found that for abused nurses, peer support can enhance their resilience, and this finding was similar to that in a previous study that higher peer support was associated with greater resilience (Howell & Miller-Graff, 2014). In another study, nurses reported that they felt supported by peers and were able to personally support group members, and got emotional resilience from peers (Rice, Bennett, & Billingsley, 2014). Therefore, peer support was the main elements of SNI contributing to abused nurses' resilience for relieving WPV-related distress and helplessness in Taiwan.

Study Limitations

A few eligible abused nurses did not participate in this study, and this may have led to the possibility of underestimating the violence rates in this study. Hospital managers should encourage ED nurses to report violent events, with administrative rewards or prizes. In addition, our study design was self-reporting and cross-sectional. In the future we will require the addition of a qualitative approach to gather more and deeper information, to understand what else abused nurses really need, and to follow up on their resilience and mental health in the long term.

Conclusions

Neurotic personality traits resulted in lower resilience in abused nurses; healthcare managers should help those abused nurses with higher levels of the neuroticism personality trait to acquire positive thoughts, teach them problem-solving skills, and provide them with peer support to enhance their resilience. Healthcare managers should provide more comprehensive disaster mental health services with both individual and environmental resources that build trust and satisfy the needs of abused nurses with minimal deterioration of their occupational function.

Clinical Resources

- National Institute for Occupational Safety and Health. (2005). Survey of workplace violence prevention. http://www.bls.gov/iif/oshwc/osch0033.pdf
- World Health Organization. (2012). Workplace violence. http://www.who.int/violence_injury_prevention/violence/workplace/en/

References

Anderson, K. M., Renner, L. M., & Danis, F. S. (2012). Recovery: Resilience and growth in the aftermath of domestic violence. *Violence Against Women*, *18*(11), 1279–1299.

Anonymous. (1980). Folk psychological counseling. *MinE*, *6*(6), 12–38.

Bakker, A. B., Van der, Z. KI., Lewig, K. A., & Dollard, M. F. (2006). The relationship between the big five personality factors and burnout: A study among volunteer counselors. *Journal of Social Psychology*, *146*(1), 31–50.

Bennett, R., Chepngeno-Langat, G., Evandrou, M., & Falkingham, J. (2015). Resilience in the face of post-election violence in Kenya: The mediating role of social networks on wellbeing among older people in the Korogocho informal settlement, Nairobi. *Social Science & Medicine*, *128*, 159–167.

Breno, A. L., & Galupo, M. P. (2007). Sexual abuse histories of young women in the U.S. child welfare system: A focus on trauma-related beliefs and resilience. *Journal of Child Sexual Abuse*, *16*(2), 97–113.

Brewer-Smyth, K., & Koenig, H. G. (2014). Could spirituality and religion promote stress resilience in survivors of childhood trauma? *Issues in Mental Health Nursing*, *35*(4), 251–256.

Burnett, H., & Helm Jr, H. W. (2013). Relationship between posttraumatic stress disorder, resilience, and religious orientation and practices among university student earthquake survivors in Haiti. *International Journal of Emergency Mental Health and Human Resilience*, *15*(2), 97–104.

Campbell-Sills, L., Cohan, S. L., & Stein, M. B. (2005). Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behaviour Research and Therapy*, *44*(4), 585–599.

Chang, C. L. (2009). *Folk belief, religious therapy and base on religious beliefs—Tsu Huei Temple's ritual of asking to gods*. Taipei, Taiwan: Lan Tai Press.

Chang, H. (1996). Folk medicine and culture bound syndrome. *Historical Monthly*, *1*, 50–54.

Chen, P. J. (2013). *The relationships between religiosity and resilience: With meaning in life as mediator* (Unpublished master's thesis). Chung Yuan Christian University, Taoyuan, Taiwan.

Choy, C. S., Chiou, H. Y., Chiu, W. T., Huang, Y. W., Cheah, K. P., Chen, Y. C., & Chou, H. T. (2006). A pilot study of violence on emergency department nurses in Taipei. *Journal of Emergency Medicine, Taiwan*, *8*, 126–133.

Cloninger, C. R., & Zohar, A. H. (2011). Personality and the perception of health and happiness. *Journal of Affective Disorders*, *128*, 24–32.

DiCorcia, J. A., & Tronick, E. (2011). Quotidian resilience: Exploring mechanisms that drive resilience from a perspective of everyday stress and coping. *Neuroscience & Biobehavioral Reviews*, *35*(7), 1593–1602.

Dolbier, C. L., Jaggars, S. S., & Steinhardt, M. A. (2010). Stress-related growth: Pre-intervention correlates and change following a resilience intervention. *Stress and Health*, *26*(2), 135–147.

Durkheim, E. (1951). *Suicide: A study in sociology* (J. A. Spaulding & G. Simpson, Trans.). New York: The Free Press.

Eley, D. S., Cloninger, C. R., Walters, L., Laurence, C., Synnott, R., & Wilkinson, D. (2013). The relationship between resilience and personality traits in doctors: Implications for enhancing well-being. *Peer Journal*, *1*, 1–16.

Eysenck, H. J., & Eysenck, S. B. G. (1975). *Manual for the Eysenck Personality Questionnaire*. London, England: Hodder and Stoughton.

Fayombo, A. G. (2010). The relationship between personality traits and psychological resilience among the Caribbean adolescents. *International Journal of Psychological Studies*, *2*(2), 105–116.

Friborg, O., Hjemdal, O., Rosenvinge, J. H., Martinussen, M., Aslaksen, P. M., & Flaten, M. A. (2006). Resilience as a moderator of pain and stress. *Journal of Psychosomatic Research*, *61*(2), 213–219.

Gamez, W., Watson, D., & Doebbeling, B. N. (2007). Abnormal personality and the mood and anxiety disorders: Implications for structural models of anxiety and depression. *Journal of Anxiety Disorders*, *21*(4), 526–539.

Gong, Y., Han, T., Yin, X., Yang, G., Zhuang, R., Chen, Y., & Lu, Z. (2014). Prevalence of depressive symptoms and work-related risk factors among nurses in public hospitals in southern China: A cross-sectional study. *Scientific Reports*, *7*(7), 1–7.

Herrman, H., Stewart, D. E., Diaz-Granados, N., Berger, E. L., Jackson, B., & Yuen, T. (2011). What is resilience? *Canadian Journal of Psychiatry*, *56*, 258–265.

Howell, K. H., & Miller-Graff, L. E. (2014). Protective factors associated with resilient functioning in young adulthood after childhood exposure to violence. *Child Abuse & Neglect*, *38*(12), 1985–1994.

Hsieh, M. O. (2008). Resilient experiences of divorced single mothers. *Soochow Journal of Social Work*, *18*, 1–33.

Hung, C. H. (2007). The psychosocial consequences for primiparas and multiparas. *Kaohsiung Journal of Medical Sciences*, *23*, 353–361.

Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing*, *60*(1), 1–9.

Kasen, S., Wickramaratne, P., Gameroff, M. J., & Weissman, M. M. (2012). Religiosity and resilience in persons at high risk for major depression. *Psychological Medicine*, *42*(3), 509–519.

Kinman, G., & Grant, L. (2011). Exploring stress resilience in trainee social workers: The role of emotional and social competencies. *British Journal of Social Work*, *41*(2), 261–275.

Litwin, H., & Stoeckel, K. J. (2013). Social networks and subjective wellbeing among older Europeans: Does age make a difference? *Ageing & Society*, *33*(7), 1263–1281.

Lu, L. (1994). University transition: Major and minor life stressors, personality characteristics and mental health. *Psychological Medicine*, *24*(1), 81–87.

Mace, K. (2012). Stress at work? Build resilience, renew your mind, be transformed. *Journal of Christian Nursing*, *29*(2), 106–109.

McAllister, M., & McKinnon, J. (2009). The importance of teaching and learning resilience in the health disciplines: A critical review of the literature. *Nurse Education Today*, *29*, 371–379.

Melnyk, B. M., Hrabe, D. P., & Szalacha, L. A. (2013). Relationships among work stress, job satisfaction, mental health, and healthy lifestyle behaviors in new graduate nurses attending the nurse athlete program: A call to action for nursing leaders. *Nursing Administration Quarterly*, *37*(4), 278–285.

National Institute for Occupational Safety and Health. (2005). *Survey of workplace violence preventio*n. Retrieved from http://www.bls.gov/iif/oshwc/osch0033.pdf

Nucifora, F. Jr., Langlieb, A. M., Siegal, E., Everly, G. S. Jr., & Kaminsky, M. (2007). Building resistance, resilience, and recovery in the wake of school and workplace violence. *Disaster Medicine and Public Health Preparedness*, *1*(1), S33–S37.

Pai, C. J. (2012). Action research of cultivating resilience of teenage girls in a residential setting. *National Taiwan University Social Work Review*, *25*, 103–155.

Rice, K. L., Bennett, M. J., & Billingsley, L. (2014). Using second life to facilitate peer storytelling for grieving oncology nurses. *Ochsner Journal*, *14*(4), 551–562.

Schetter, C. D., & Dolbier, C. (2011). Resilience in the context of chronic stress and health in adults. *Social and Personality Psychology Compass*, *5*(9), 634–652.

Shutterstock, J. (2011). *Linking health communication with social support. Mattson's Health as communication nexus*. Dubuque, IA: Kendall Hunt Publishing.

Smilkstein, G. (1978). The family APGAR: A proposal for a family function test and its use by physicians. *Journal of Family Practice*, *6*, 1231–1239.

Smilkstein, G., Ashworth, C., & Montano, D. (1982). Validity and reliability of the family APGAR as a test of family function. *Journal of Family Practice*, *15*, 303–311.

Southwick, S. M., Vythilingam, M., & Charney, D. S. (2005). The psychobiology of depression and resilience to stress: Implications for prevention and treatment. *Annual Review of Clinical Psychology*, *1*, 255–291.

Tsai, J. T. (2014). A experience of Taiwanese belief: A example of local temple in Taichung. *Taiwan Studies Literature and History*, *8*, 113–139.

Wang, S. Y., & Chen, S. H. (2011). *Associations of sense of self, resilience and posttraumatic stress symptoms among burn patients* (Unpublished master's thesis). National Taiwan University, Taipei, Taiwan.

World Health Organization. (2012). *Workplace violence*. Retrieved from http://www.who.int/violence_injury_prevention/injury/work9/en/print.html

Yee, D. H., & Liu, M. Y. (2004). The inspiration of conventional wisdom for the ethical/spiritual well-being in Taiwanese folk belief system. *New Century Religious Study*, *2*(4), 87–106.

Yu, Y., Peng, L., Chen, L., Long, L., He, W., Li, M., & Wang, T. (2014). Resilience and social support promote posttraumatic growth of women with infertility: The mediating role of positive coping. *Psychiatry Research*, *215*(2), 401–405.

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Centrality of Body and Embodiment in Nursing Care: A Scoping Study of the Italian Literature

Anna Marchetti, MSN, RN[1], Michela Piredda, PhD, MSN, RN[2], & Maria Grazia De Marinis, MEd, RN[3]

1 Doctoral student, Department of Biomedicine and Prevention, Tor Vergata University, Rome, Italy
2 Researcher in Nursing Science, Campus Bio Medico, University, Rome, Italy
3 Professor of Nursing, Campus Bio Medico University, Rome, Italy

Key words
Body, content analysis, embodiment, human body, Italian nursing, nursing care, nursing education, nursing, scoping study, theories

Correspondence
Anna Marchetti, Department of Biomedicine and Prevention, Tor Vergata University, Rome, Italy. E-mail: anna-marchetti@virgilio.it

Accepted: October 9, 2015

doi: 10.1111/jnu.12178

Abstract

Purpose: Nursing has based its practical work on contact and a relationship with the patient's body and embodiment; however, the international theoretical and empirical researches on these concepts are still neglected. The purpose of this scoping study is to map the breadth and depth with which body and embodiment are addressed in the Italian nursing literature, identifying the key concepts and the main sources and types of evidence available.

Organizing Construct: Scoping study with qualitative content analysis. It was conducted in accordance with the framework outlined by Arksey and O'Malley and following the recommendations by Levac, Colquhoun, and O'Brien. The qualitative content analysis process was conducted according to Elo and Kyngäs. Lincoln and Guba's technique was followed to ensure trustworthiness.

Methods: Searches were conducted within seven electronic databases of peer-reviewed literature, one electronic Italian database, six electronic database searches of grey literature, four free online nursing journals, four Internet search engines, and 10 key hard-copy Italian nursing journals.

Findings: Through these searches, 2,536 records were identified, from which 18 were selected for the final review. Three generic categories emerged from qualitative content analysis: the conceptual category, the nursing care category, and the education category, each including eight, seven, and two subcategories, respectively.

Conclusions: The central nursing concepts of body and embodiment definitely require greater and more continuous efforts of theoretical study and empirical research within the nursing discipline, both in Italy and internationally.

Clinical Relevance: A greater awareness of body and embodiment should guide nursing practice in caring for and supporting patients and also guide approaches to teaching and learning. Moreover, body and embodiment are concepts firmly rooted in nursing practice, and they are also ripe for future research and able to generate more holistic and complex ways of understanding patients.

Historically, the practical work of nursing has been based on a relationship and contact with the human body (Collière, 2001; Draper, 2014; Lawler, 2006; Pupulim & Sawada, 2005; Sakalys, 2006; Wolf, 2014). Nurses interact with the patient's body so frequently that they touch the patient more than other healthcare professionals do (McCann & McKenna, 1993; Melia, 2014; Ribeiro Souza & Ordones do Nascimento Brandao, 2013). The human body is nursing's "site of labor" (Wolkowitz, 2002, p. 497), and nursing benefits from "privileged access" to the body (Lawler, 2006, p. 11) in states, places, and circumstances in which the body has the same need: to be assisted (Melia, 2014; Twigg, Wolkowitz, Cohen, & Nettleton, 2011; Wilde, 2003).

In the literature, the human body is interpreted as a physical, concrete, and material entity to heal, treat, and medicate (body) and as a "lived body," which refers to the sensations, emotions, and feelings experienced through the body, in other words, a way of being and living "in," "with," and "through" one's own body (embodiment; Draper, 2014; James & Hockey, 2007; Lawler, 2006; Mariotti de Santana & Bessa Jorge, 2007; Moreno Altamirano, 2010; Sakalys, 2006; Wilde, 1999; Yakhlef, 2010).

Scientific reflection has embraced the Cartesian dualism that sees the body–object as a physical entity, the object of disease treatment, and the body–subject as a subjective experience of illness (Carnevale, 1995; Carr, 2000; Lakoff & Johnson, 1999; Sakalys, 2006; Wilde, 2003; Yakhlef, 2010). This perspective has been questioned by modern antireductionist and antipositivist perspectives, such as that of Merleau-Ponty (Benner, 2000; Thomas, 2005). He contended that a person is an indissoluble unity of the "I" who thinks, his or her body, and his or her embodiment; we do not "have" a body, "we are" a body (Merleau-Ponty, 1945). Consequently, the meanings that we give to body and embodiment are linked to social rules and cultural beliefs (Lawler, 2006; Vannini & Waskul, 2012).

However, dichotomous thinking has been strongly established in scientific research, creating a hierarchy in which the body has become the subject of detailed clinical studies, whereas embodiment has a marginal role (Holmes, 1994; Madjar, 1997). This is due to the biomedical model's preference for investigation methods applicable to the body and the objectively measurable knowledge that these methods generate, instead of patients' embodiment (Draper, 2014).

Despite the increase in scientific literature and the recognition of the importance of body and embodiment in nursing over the last two decades, international theoretical and empirical research of these concepts is still neglected (Draper, 2014). The terms body and embodiment, although conceptually different, are used interchangeably and are little known and developed within the nursing discipline; researchers in the nursing field have taken very sporadic theoretical interest in the concepts (Sakalys, 2006; Thomas, 2005). Furthermore, the recognition of people's embodiment in the body as an explicit focus of the care process is rare in nursing theories (Lawler, 2006; Sakalys, 2006). Consequently, nurses learn how to work on the body through medicine, science, and practice, but they receive little instruction about the meaning of the "lived body" and the privilege of caring for it (Draper, 2014). Although both concepts are understood and defined differently in various disciplines (philosophy, anthropology, sociology, etc.), the specific contribution of nursing science is missing. The nursing field could provide a coherent representation of body and embodiment as the fundamental conditions of a person, reflecting his or her multiple dimensions and levels of understanding (Sakalys, 2006).

Although body care and attention to embodiment are the central focus of nursing practice, these concepts have not yet been openly, explicitly, and theoretically accepted in the nursing discipline. The work performed on the body has long been invisible, surrounded by silence and designated as "dirty" (Lawler, 1991, 2006). Therefore, the concept of the body is also ignored by academia, putting nursing in a difficult relationship with the other sciences (Lawler, 1991, 2006; Wolf, 2014).

However, theoretical and empirical studies conducted within the past few decades suggest a desire to find a place for the concepts of body and embodiment within the nursing discipline (Carr, 2000; Dos Santos, Viana, Da Silva, Trezza, & Leite, 2010; Draper, 2014; Lawler, 2006; Melia, 2014; Ribeiro Souza & Ordones do Nascimento Brandao, 2013; Sakalys, 2006; Thomas, 2005; Wilde, 2003). Providing a nursing-centric meaning for both concepts is important for carrying out the practice of holistic nursing (Boswell, Cannon, & Miller, 2013; Mason, 2014) and for the development of the profession (Brown & Seddon, 1996; National Nursing Research Unit [NNRU], 2008).

It would be interesting to see whether the reflections about body and embodiment and their centrality in nursing emerging from the nursing literature are the same throughout the world or are related to specific cultures (context-dependent). In particular, a scoping study that assesses the scientific literature on the body and embodiment produced by Italian nurses at the national and international level should be conducted, in order to learn what has been written about these concepts, contribute to the debate, and address an area Italian nurses need to perfect in their practice (Agostino & Sansoni, 1985). A recent discussion paper (Draper, 2014) and other international articles (Carr, 2000; Sakalys, 2006; Twigg et al., 2011; Wilde, 2003) examined several sources of authoritative knowledge concerning the body and embodiment in which Italian culture was not discussed. Moreover, understanding different cultures' perspectives (Agostino & Sansoni, 1985; Van Dongen & Elema, 2001) on body and embodiment is important, to gain a more complete view of these concepts.

Therefore, the aim of this scoping study was to map the breadth and depth with which body and embodiment are treated in the Italian nursing literature, identifying the key concepts and the main sources and types of evidence available. The following research question guided the study: What, how much, and where have Italian nurses written about body and embodiment in nursing care?

Methods

The methodology of this study is based on the framework outlined by Arksey and O'Malley (2005) and followed Levac, Colquhoun, and O'Brien's (2010) recommendations. No universal scoping study definition exists. Davis, Drey, and Gould (2009) defined scoping as involving "the synthesis and analysis of a wide range of research and non-research material to provide greater conceptual clarity about a specific topic or field of evidence" (p. 1386). Discrepancies in nomenclature between "scoping reviews," "scoping studies," "scoping literature reviews," and "scoping exercises" may lead to confusion (Levac et al., 2010). In this article, "scoping study" was used for consistency with Arksey and O'Malley's original framework.

The study included the following key phases: (a) identifying the research question; (b) identifying relevant studies; (c) selecting the studies; (d) charting the data; and (e) collating, summarizing, and reporting the results. The optional consulting stakeholders phase (f) was excluded.

Identifying Relevant Studies

To identify relevant studies, a number of searches were conducted from April to October 2014, including electronic database searches of peer-reviewed and grey literature, searches of online nursing journals, Internet searches of grey literature, and manual searches of key journals. The software package Endnote X7 (Thomson Reuters) was used to manage bibliographies and references. Each search is explained in detail.

Electronic database and Internet searches. National and international peer-reviewed literature was searched within the following seven online databases: MEDLINE/PubMed, EBSCO/CINAHL, Cochrane Library, Psychology and Behavioral Sciences Collection, PubPsych, Ovid, and Scopus. The searches were conducted using Medical Subject Headings (MeSH) and free terms. National literature was also searched within the main Italian nursing database (ILISI), and the search was conducted using Thisi, an Italian thesaurus. National and international grey literature was searched in six free online databases: Central Library Guglielmo Marconi (National Research Council), OpenGREY, The New York Academy of Medicine (NYAM), the CoGPrints e-archive, the ERIC database, and Social Care online. All databases were searched without time and language restrictions. The following key words were used: body, embodiment, body care, nursing, nursing care, ethics, descriptive studies, qualitative research, empirical studies, philosophy, theories, and Italian. The key words were combined with the Boolean operators AND/OR, and truncation was used when appropriate.

Searches of four free online nursing journals were also conducted: *BioMed Central Nursing, Nursing Times, Online Journal of Issues in Nursing*, and *Journal of Community Nursing*.

Internet searches were carried out for relevant studies using the Google (including Google Scholar), Yahoo, and Bing Internet search engines. The same key words were used with no time restrictions. The following filters were used: "documents from Italy" within Google, Google Scholar, and Bing and "sites in Italian" within Yahoo.

Presidents and directors of Italian nursing degree programs (bachelor's degree, master's degree, and doctorate degree) were contacted to obtain the full text of theses found in abstracts on the Internet (authors' contact information was not available). Reference lists from each relevant paper were also scanned to identify additional papers.

Manual Searches. Once the online searches were completed, hand searches of key Italian nursing journals available in print or online at the library of the Professional Nursing Board of Rome were conducted with no time restrictions. The key Italian nursing journals searched were *Professioni Infermieristiche* (*Nursing Professions*; 1996–2014), *Rivista NEU* (*NEU Journal*; 2005–2012), *Scenario* (2000–2014), *Assistenza Infermieristica e Ricerca* (*Nursing Care and Research*; 1999–2014), *International Nursing Perspectives* (1999–2010), *Management Infermieristico* (*Nursing Management*; 1999–2009), *Nursing Oggi* (*Nursing Today*; 2000–2009), *Rivista Italiana di Cure Palliative* (*Italian Journal of Palliative Care*; 2004–2012), *L'Infermiere* (*The Nurse*; 1989–2014), *Confronto Professionale* (*Professional Debate*; 2006–2013), and *Rivista AICO* (*AICO Journal*; 2011–2012). The reference lists from relevant papers were also scanned for additional publications.

Selecting Studies. The inclusion criteria for the retrieved articles were high relevance to the topic and authorship. Only articles and documents written by Italian nurses and highly relevant to the topic (body and embodiment) under study were included. Post-hoc criteria were developed in order to exclude studies that did not address the research question.

The study selection process involved reading the titles and abstracts followed by careful integral reading of the documents by two researchers independently. Disagreements were resolved through discussion with a third researcher. A key difference between scoping studies and other types of reviews (in particular, systematic reviews) is that quality assessments are not typical of scoping studies due to differing conceptions of what quality means (Arksey & O'Malley, 2005). The purpose of this type of study is to address theoretical issues related to the concept and not to address methodology issues (Brien, Lorenzetti, Lewis, Kennedy, & Ghali, 2010). Therefore, the methodological quality of the documents was not assessed. Instead, quality was measured in terms of high relevance to the topic.

Data Charting

First, two researchers extracted data by using a standardized and shared data extraction tool consisting of quantitative (numbers and publication year) and qualitative aspects (publication and source type). Second, a descriptive analytical method was used: Two researchers independently categorized the key content of the articles and documents according to the qualitative content analysis process (Elo & Kyngäs, 2007).

Collating and Summarizing

The results were collated in three steps (Levac et al., 2010). For data analysis, an Excel spreadsheet (2013) was created that included the number of published records, the year of publication, and the publication and source type. Data were then analyzed with descriptive statistics (frequencies and percentages).

To collect the key content, two researchers separately read all articles line by line and inductively extracted generic categories and subcategories. This process included three main phases: open coding, creating categories, and abstraction (Elo & Kyngäs, 2007). Open coding involved writing notes and headings in the margins of texts during the reading to describe important aspects of relevant content. The headings and notes, constituting the codes, were then recorded on the coding sheet. The codes were then grouped according to similarity in meaning into subcategories. During the abstraction phase, based on semantic and conceptual similarity, subcategories were condensed into generic categories (Elo & Kyngäs, 2007).

Frequent peer debriefings were conducted between two researchers to confirm interpretations and coding decisions, including the development of categories, in order to ensure credibility (Lincoln & Guba, 1985). These meetings provided an opportunity for the researchers to test their development ideas and interpretations and to recognize their own biases, perspectives, and assumptions. Dependability and confirmability were ensured through use of the audit trail technique: A researcher not involved in the research process examined the process and the product of the study, and compared the categories with the original texts to determine internal consistency (Lincoln & Guba, 1985). To report results, figures and tables were generated. To apply meaning to the results, recommendations for practice, policy, and future research were developed.

Findings

The findings of the search strategy and the study selection process are presented following the PRISMA reporting guidelines for systematic reviews (Liberati et al., 2009). Of the 2,536 articles identified through the searches, 18 articles were selected for review (**Figure S1**, available with the online version of this article).

Table S1 (available with the online version of this article) shows the quantitative and qualitative aspects of the articles included in this study. From the analysis of the articles, three generic categories emerged: body and embodiment, body and embodiment in nursing care, and body and embodiment in nursing education. The body and embodiment category included eight subcategories: general body definitions, body or embodiment, integrated vision, relational dimension, touch and body contact, body and medical science, body experience in disease, and contact with the diseased body. The body and embodiment in nursing care category included seven subcategories: holistic view of the body in care, centrality of the body and embodiment in nursing care, body informs a helping relationship, the art and science of touch, contact as a therapeutic nursing tool, types of nursing contact, and difficulty and strategy in nursing body care. The body and embodiment in nursing education category included two subcategories: competencies to be acquired and nursing students' thoughts and experiences. **Tables S2, S3,** and **S4** (available with the online version of this article) present the generic categories, their subcategories, and significant original quotations to illustrate the categories and their content.

Discussion

The aim of this study was to map the breadth and the depth with which body and embodiment are treated in the Italian nursing literature, identifying the key concepts and the main sources and types of evidence available. Overall, the Italian literature was sparse, with a slight increase in the number of publications from 2004 to 2006. This may be related to the 2001 shift in Italian nursing education—from offering diplomas in nursing to offering bachelor's degrees in nursing—and the need to better reflect on the impact and social mandate of the nursing profession (Urli, 1999).

The literature mainly included discussion articles, which were indexed in a national database (ILISI). Therefore, most reflections on these topics were speculative and were only rarely supported by findings based on empirical or theoretical research. Italian nurses do not conceptualize and extend their knowledge about the concepts of body and embodiment (Marucci et al., 2013). Moreover, because the main sources of most articles were Italian nursing journals indexed in the national database, the available Italian literature tends to be self-referent and is not open to a broader international comparison.

From the qualitative analysis, three generic categories emerged: the concepts of body and embodiment category, which deals with the body and embodiment from the perspectives of other disciplines (anthropology, philosophy, etc.); the body and embodiment in nursing care category, which deals with body and embodiment contextualized in nursing practice; and the body and embodiment in nursing education category, which addresses these topics in terms of nursing students' competencies and experiences related to embodiment and caring for the body of the patient.

Similar to the international literature (Draper, 2014; Lawler, 2006; Sakalys, 2006; Wolf, 2014), in the Italian literature, body and embodiment represent the focus around which nursing care revolves (Aletto, 2002; Bonancini & Manzi, 2005; Cattanei, 2005; Giudici, 2005b; De Marinis & Berti, 2007; Mencattelli, Cristofori, Rega, Poddighe, & Galletti, 2011; Mencattelli, Galletti, Cristofori, Poddighe, & Rega, 2012; Nucchi & Trafna, 2004; Picco, Santoro, & Garrino, 2010). Similar to the international literature (Lawler, 2006; Sakalys, 2006), despite numerous general definitions of the human body proposed by other disciplines and referred to by Italian nurses (Giudici, 2005a; Fidanza, Fiorini, Lorè, & Rinaldi, 2007; Minuzzo & Guglielmi, 1996; Palladini & Masera, 2008), in the Italian nursing culture, the terms body and embodiment are often used as synonyms (De Marinis & Berti, 2007; Picco et al., 2010), except for some attempts to separately define the concepts (Giudici, 2005b).

In reaction to the reductionist approach of scientific thought, Italian nurses show a willingness to develop an approach that integrates both concepts (Mele, 2008), restoring to care the aspects that escape the scientific method but characterize the way in which people live in their own bodily dimension as an essential element of being human. Therefore, from the Italian and international literature emerged the suggestion that the nursing profession should be characterized by a deep and structured reflection on body and embodiment, not only to develop holistic care (Boswell et al., 2013; Mason, 2014; Tanzi, 2005) but also to ensure professional and disciplinary development (Brown & Seddon, 1996; Cattanei, 2005; Giudici, 2005b; NNRU, 2008).

The data analysis showed that Italian nurses are primarily interested in the relational dimension of the body and the experience of the body in a disease condition. In healthy conditions, the body is taken for granted, thus becoming a "silent partner" placed at the margins of our perceptions. However, in disease conditions, the body can become an "awkward presence" (Aletto, 2002; Tanzi, 2005), something that makes us "other" and monopolizes all of our existence (Fidanza et al., 2007). This means that by considering the body as solely embodiment, one can understand how the disease condition is primarily the experience of human beings living in the alienating situation of perceiving themselves as divided between a mind that seeks to control and explain changes and a body that becomes the object of continuous questioning, by the patient and by health professionals (De Marinis & Berti, 2007; Fidanza et al., 2007).

In particular, in the nurse–patient relationship, the body is the place and the "filter" of the helping relationship (Nucchi & Trafna, 2004, p. 15), and the ability to understand the body's language is a key point of patient care (Palladini & Masera, 2008), and thus the marked relational feature of the body, through which human beings begin and continue to express themselves and communicate with others (Mele, 2008; Tanzi, 2005). When the body is ill, relationships between the body and its environment become altered and complicated (Bonancini & Marzi, 2005), expressing the fragility and the sense of limitation associated with the human condition (De Marinis & Berti, 2007). In a disease condition, the external invasion of one's body is admitted and tolerated (Palladini & Masera, 2008); most care gestures are expressed through touch and body contact (Aletto, 2002; Bonancini & Marzi, 2005; Mencattelli et al., 2011). Nurses are one of few types of health professionals who carry out most of their working activity by touching patients (Aletto, 2002) and entering their personal space (Bonancini & Marzi, 2005; Palese, Brezil, & Coiz, 2010). This idea is also supported in the international literature (McCann & McKenna, 1993; Melia, 2014; Ribeiro Souza & Ordones do Nascimento Brandao, 2013).

Evidence based on nurses' statements from discussion and empirical research articles shows that touch is a total and totalitarian sense that completely surrounds the individual (De Luca & Papaleo, 2010; Palese et al., 2010), and in nursing care touch assumes meanings that may substantially influence the relationship and care processes (Minuzzo & Guglielmi, 1996; Palese et al., 2010). Touching an ill person with awareness allows the rediscovery of important aspects of nursing care (De Luca & Papaleo, 2010), including brave nursing gestures that focus on taking care of people even when there is little or no possibility of curing them (Nucchi & Trafna, 2004). Any contact with a patient's body (an injection, hygiene activities, a dressing, a caress) is transformed into an opportunity to recognize one's subjectivity (Mele, 2008) and open communication channels that allow another kind of listening to the patient (De Luca & Papaleo, 2010). The nurse performs a technical touch, often invasive (procedural touch), that becomes reassuring, noninvasive, and empathetic (nonprocedural touch) when it allows patients to guard the secrets of their body (Mele, 2008; Nucchi & Trafna, 2004; Palese et al., 2010). The right balance between affectivity and science gives a new face to nursing care (De Luca & Papaleo, 2010).

Although body and embodiment are the privileged fields in which nurses carry out their profession, in clinical practice these concepts are also critical elements with which nurses often encounter difficulties relating to (Picco et al., 2010; Urli, 1999). Examining this topic in depth revealed that the nursing profession is unattractive to society due to the profession's proximity to a patient's physicality (Mele, 2008), but nurses focus on technical aspects of care to overcome embarrassment (Picco et al., 2010) or separate patients' embodiment from the body to cope with a painful situation (Giudici, 2005b). This contributes to conflicts within nurses who see their profession as unjustly labeled and, at the same time, motivates them to want more specific training about relation to and contact with the diseased body (Bonancini & Marzi, 2005; Mele, 2008).

Findings from this study emphasize that how one learns to work with body and embodiment and how this is taught to new generations of nurses remains largely unexplored; only 1 study out of 18 covered student experiences with these concepts. In Italy, a nursing degree program provides immediate contact with patients during the first year, in which students denounce a discrepancy between theory and practice about body care, which seems to be resolved only with the passage of time (Mencattelli et al., 2011). The competencies that nurses want to improve are built through direct experience with patients during the training phase, but only through personal motivation and sensitivity (Mencattelli et al., 2011).

Conclusions

Body and embodiment are rooted in nursing practice and generate more holistic and complex ways of understanding patients. A greater awareness of body and embodiment could guide the nursing practice in caring for and supporting patients, and guide approaches to teaching and learning.

The central nursing concepts of body and embodiment require increased theoretical study and empirical research within the nursing discipline, in Italy and internationally. In particular, the educational field needs to be studied more extensively in terms of competencies to be acquired and of teaching methodologies.

The quality and quantity of Italian scientific literature are affected by international orientation (many of the concepts explored are interchangeable), but the Italian literature compares poorly with that written by the rest of the scientific community. Findings from this scoping study confirmed an ambivalent view of the body and embodiment within Italian nursing culture. This ambiguity of values unfortunately does not allow one to explore without prejudice the meaning, the value, and the "mystery" of the body during the care process.

Acknowledgments

We thank Jan Draper, Professor and Head of Nursing at The Open University (United Kingdom), and Marianne Bengtsson Agostino, Professor of Nursing at Tor Vergata University (Italy), for their comments that greatly improved the manuscript.

Clinical Resources

- The body of illness: Narrativity, embodiment and relationality in doctoring and nursing. http://www.academia.edu/12041678/The_Body_of_Illness_Narrativity_Embodiment_and_Relationality_in_Doctoring_and_Nursing.
- Embodiment resources: http://www.embodiment.org.uk/definition.htm
- The importance of holistic nursing care: How to completely care for your patients. http://www.practicalnursing.org/importance-holistic-nursing-care-how-completely-care-patients

References

Agostino, M. B., & Sansoni, J. (1985). *Illness: A time of stress involving the relationship between the individual personality and* *cultural background. Nursing law and ethics.* Heidelberg: Springer-Verlag.

Aletto, L. (2002). Il nursing e la corporeità [Nursing and the embodiment]. *Io Infermiere*, *3*, 45–49.

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*, 19–32.

Benner, P. (2000). The role of embodiment, emotion and life—World for rationality and agency in nursing practice. *Nursing Philosophy*, *1*(1), 5–19.

Bonancini, F., & Marzi, A. (2005). Il tocco come cura [Touch as a cure]. *Rivista Italiana di Cure Palliative*, *4*, 43–47.

Boswell, C., Cannon, S. B., & Miller, J. (2013). Students' perceptions of holistic nursing care. *Nursing Education Perspectives*, *34*(5), 329–333.

Brien, S. E., Lorenzetti, D. L., Lewis, S., Kennedy, J., & Ghali, W. A. (2010). Overview of a formal scoping review on health system report cards. *Implementation Science*, *5*(2), 1–12. doi: 10.1186/1748-5908-5-2

Brown, C., & Seddon, J. (1996). Nurses, doctors and the body of the patient: Medical dominance revisited. *Nursing Inquiry*, *3*(1), 30–35.

Carnevale, F. A. (1995). Nursing and the body. *Canadian Journal of Nursing Research*, *27*(4), 89–93.

Carr, J. (2000). Discuss and critique how the body may be problematic and how nurses may accommodate and respond to these issues. *Nuritinga Issue*, *3*, 1–6.

Cattanei, M. (2005). Il corpo nobile [The noble body]. *Infermiere*, *2*, 36–38.

Collière, M. F. (2001). *Soigner … Le premier art de la vie*. Paris, France: Masson.

Davis, K., Drey, N., & Gould, D. (2009). What are scoping studies? A review of the nursing literature. *International Journal of Nursing Studies*, *46*, 1386–1400.

De Luca, E., & Papaleo, L. (2010). Il nursing del contatto: l'esperienza del tocco e l'affettività nelle cure infermieristiche [Contact in nursing: the experience of touch and affectivity in nursing care]. *L'Infermiere*, *5–6*, 39–41.

De Marinis, M. G., & Berti, A. (2007). Body and nursing care: A relation to think about. *International Nursing Perspectives*, *7*(2–3), 21–23.

Dos Santos, R. M., Viana, I. R., Da Silva, J. R., Trezza, M. C., & Leite, J. L. (2010). The nurse and patient's nudity. *Revista Brasileira de Enfermagem*, *63*(6), 877–886.

Draper, J. (2014). Embodied practice: Rediscovering the "heart" of nursing. *Journal of Advanced Nursing*, *70*(19), 2235–2244.

Elo, S., & Kyngäs, H. (2007). The qualitative content analysis process. *Journal of Advanced Nursing*, *62*(1), 107–115.

Fidanza, A., Fiorini, A., Lorè, S., & Rinaldi, M. (2007). Uno sguardo antropologico sulla malattia [An anthropological perspective on disease]. *Infermiere Oggi*, *17*(1), 3–6.

Giudici, S. (2005a). Il corpo e la vergogna: teorie ed osservazioni per conoscerci meglio [The body and shame: Theories and observations to know us better]. *Infermiere*, *2*, 25–27.

Giudici, S. (2005b). Nursing e corporeità [Nursing and embodiment]. *Infermiere*, *2*, 23–24.

Holmes, C. (1994). Nursing's constructions of the body. *Annual Review of Health Social Science*, *4*(1), 104–120.

James, A., & Hockey, J. (2007). *Embodying health identities*. Houndsmill, UK: Palgrave Macmillan.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. New York, NY: Basic Books.

Lawler, J. (1991). *Behind the screens: Nursing, somology and the problem of the body*. Melbourne, Australia: Churchill Livingstone.

Lawler, J. (2006). *Behind the screens: Nursing, somology and the problem of the body*, 2nd ed. Sydney, Australia: Sydney University Press.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, *5*, 69–78.

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., … Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. *British Medical Journal*, *339*, b2700–b2727.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.

Madjar, I. (1997). The body in health, illness and pain. In J. Lawler (Ed.), *The body in nursing* (pp. 53–73). Melbourne, Australia: Churchill Livingstone.

Mariotti de Santana, M. T. B., & Bessa Jorge, M. S. (2007). The own body as a nurse's living experience on assisting others in their dying process. *Latino-am Enfermagem*, *15*(3), 466–473.

Marucci, A. R., De Caro, W., Rivoli, M., Trezza, T., Miriello, D., & Sansoni, J. (2013). The status of the art scientific articles in Italy between 2003–2009: An analysis of articles published by nursing Italian journals. *Professioni Infermieristiche*, *66*(2), 67–74.

Mason, D. M. (2014). Holism and embodiment in nursing: Using Goethean science to join 2 perspectives on patient care. *Holistic Nursing Practice*, *28*(1), 55–64.

McCann, K., & McKenna, H. P. (1993). An examination of touch between nurses and elderly patients in a continuing care setting in Northern Ireland. *Journal of Advanced Nursing*, *18*(5), 838–846.

Mele, C. (2008). Nell'assistenza infermieristica l'utilizzo del contatto fisico, tocco-massaggio può essere di aiuto per ridurre sintomi psicofisici nel malato? [Use of physical contact and touch-massage in nursing can help to reduce psychophysical symptoms in the patient?]. *Scenario*, *25*(1), 5–8.

Melia, K. M. (2014). When the body is past fixing: Caring for bodies, caring for people. *Journal of Clinical Nursing*, *23*(5–6), 616–622.

Mencattelli, F., Cristofori, E., Rega, M. L., Poddighe, P., & Galletti, C. (2011). Indagine conoscitiva su come gli studenti vivono e rielaborano il (con)tatto con il corpo [Survey on how students live and elaborate the contact with the body]. *Infermiere*, *4*, 12–15.

Mencattelli, F., Galletti, C., Cristofori, E., Poddighe, P., & Rega, M. L. (2012). L'importanza del corpo nelle cure infermieristiche: un contributo dalla letteratura [The importance of body in the nursing care: A contribution to the literature]. *Medicina e morale*, *1*, 75–93.

Merleau-Ponty, M. (1945). *Phénoménologie de la perception*. Paris, France: Gallimard.

Minuzzo, S., & Guglielmi, L. (1996). Il corpo e la corporeità. Riflessione dovuta per un operatore sanitario [The body and the embodiment. Due reflection for a health professional]. *Professioni Infermieristiche*, *49*(4), 27–30.

Moreno Altamirano, L. (2010). Disease, body and corporeity: An anthropological perspective. *Gaceta Médica de Mexico*, *146*(2), 150–156.

National Nursing Research Unit. (2008). *Moving to an all-degree nursing profession at registration: How might the nursing workforce and quality of care be affected*? Retrieved from http://www.kcl.ac.uk/nursing/research/nnru/policy/Policy-Plus-Issues-by-Theme/nurseeducationtraining/PolicyIssue14.pdf

Nucchi, M., & Trafna, R. (2004). L'infermiere e il suo toccare [The nurse and his touch]. *Io Infermiere*, *2*, 15–17.

Palese, A., Brezil, F., & Coiz, F. (2010). Interaction (and touch) between nurses and patients and between nurses' aides and patients in daily nursing practice: A comparative study. *International Nursing Perspective*, *10*(2–3), 45–50.

Palladini[JC15], S., & Masera, G. (2008). Il contatto corporeo nell'assistenza [The body contact in care]. *NEU*, *33*(4), 25–30.

Picco, E., Santoro, R., & Garrino, L. (2010). Dealing with the patient's body in nursing: Nurses' ambiguous experience in clinical practice. *Nursing Inquiry*, *17*(1), 38–45.

Pupulim, J. S. L., & Sawada, N. O. (2005). Exposição corporal do cliente no atendimento das necessidades básicas em UTI: Incidents críticos relatodos por enfermeiras. *Revista Latino–Americana de Enfermagem*, *13*(3), 388–396.

Ribeiro Souza, A. P., & Ordones do Nascimento Brandao, G. M. (2013). Body exposure difficulty faced by the client during assistance conducted by the nursing team in hospital. *Journal of Nursing*, *7*(11), 6415–6421.

Sakalys, J. A. (2006). Bringing bodies back in: Embodiment and caring science. *International Journal for Human Caring*, *10*(3), 17–21.

Tanzi, A. (2005). Il corpo e il nostro "essere nel mondo" [The body and our "being in the world"]. *Infermiere*, *2*, 4–7.

Thomas, S. P. (2005). Through the lens of Merleau-Ponty: Advancing the phenomenological approach to nursing research. *Nursing Philosophy*, *6*(1), 63–76.

Twigg, J., Wolkowitz, C., Cohen, R. L., & Nettleton, S. (2011). Conceptualising body work in health and social care. *Sociology of Health & Illness*, *33*(2), 171–188.

Urli, N. (1999). *L'ambiguità del corpo nelle cure infermieristiche* [*The ambiguity of the body in nursing care*]. Milan: Ed. Ambrosiana.

Van Dongen, E., & Elema, R. (2001). The art of touching: The culture of "body work" in nursing. *Anthropology & Medicine*, *8*(2/3), 149–162.

Vannini, P., & Waskul, D. (2012). *Body/embodiment: Symbolic interaction and the sociology of the body*. Burlington, VT: Ashgate Publishing.

Wilde, M. H. (1999). Why embodiment now? *Advances in Nursing Science*, *22*(2), 25–38.

Wilde, M. H. (2003). Embodied knowledge in chronic illness and injury. *Nursing Inquiry*, *10*(3), 170–176.

Wolf, K. A. (2014). Critical perspectives on nursing as bodywork. *Advances in Nursing Science*, *37*(2), 147–160.

Wolkowitz, C. (2002). The social relations of body work. *Work, Employment and Society*, *16*(3), 497–510.

Yakhlef, A. (2010). The corporeality of practice-based learning. *Organization Studies*, *31*(4), 409–430.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Figure S1. Search strategy and process of selection process results.

Table S1. General Characteristics of Articles in the Scoping Study.

Table S2. Body and Embodiment Category.

Table S3. Body and Embodiment in Nursing Care Category.

Table S4. Body and Embodiment in Nursing Education Category.

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Social Support and Women Living With Breast Cancer in the South of Thailand

Dusanee Suwankhong, PhD[1], & Pranee Liamputtong, PhD[2]

1 Lecturer, Department of Public Health, Faculty of Health and Sports Science, Thaksin University, Phatthalung, Thailand
2 Professor, School of Science and Health, Western Sydney University, New South Wales, Australia

Key words
Breast cancer, qualitative research, social support, Thai women, well-being

Correspondence
Dr. Dusanee Suwankhong, Department of Public Health, Faculty of Health and Sports Science, Thaksin University, Phatthalung, Thailand 93110. E-mail: dusanee.s@tsu.ac.th

Accepted: October 12, 2015

doi: 10.1111/jnu.12179

Abstract

Purpose: To discuss social support among women with breast cancer in rural communities in southern Thailand.
Design: Qualitative research that allowed researchers to understand the lived experiences of women living with breast cancer and social support.
Methods: In-depth interviewing and drawing methods were adopted with 20 women with breast cancer. Thematic analysis was employed to analyze the data.
Findings: Most women with breast cancer received three types of social support: emotional support, tangible support, and informational support. Most support came from family members and relatives. Religion was also a form of social support for women. Many women, however, received insufficient social support from healthcare providers. This reduced their capacity to manage their illness, thus impacting their well-being.
Conclusions: Various forms of support are essential for women with breast cancer so that they can better cope with their condition.
Clinical Relevance: Nurses and other health professionals are an important source of social support for women with breast cancer. Through having an understanding of and being sensitive to these women's experiences, culture, and challenges, nurses and healthcare professionals can provide more individualized support and care to women during a vulnerable period of their life. We contend that the cultural perspectives of patients are crucial in nursing science. Nurses need to appreciate the importance of culture for the support of patients with breast cancer.

Women living with breast cancer face many changes in their lives and encounter numerous traumatic experiences (Fernandes, Cruz, Moreira, Santos, & Silva, 2014; Sprung, Janotha, & Steckel, 2011). They have to deal with the traumatic physical and psychological experiences of the diagnosis of breast cancer and treatment, which disrupt their daily lives and often lead to a poor quality of life (Holland & Holahan, 2003; Liamputtong & Suwankhong, 2015). It has been demonstrated that women who are diagnosed with breast cancer are susceptible to many emotional debilities, including anxiety, fear of dying, depression, and negative and suicidal thoughts (Sprung et al., 2011; Taleghani, Yekta, & Nasrabadi, 2006). The long, and often traumatic, processes of breast cancer treatment have also affected the emotional and physical well-being of many women (Fernandes et al., 2014; Liamputtong & Suwankhong, 2015).

Social support has been an essential means of reducing distress among people living with breast cancer (Kavitha & Jayan, 2014). Social support refers to different types of help that people receive in time of difficulties. Social support assists individuals, who confront crises, to cope and manage their difficult lives better (Ell, Nishimoto, Mediansky, Mantell, & Hamovitch, 1992; Holland & Holahan, 2003; Kavitha & Jayan, 2014). Social support enhances human functioning and hence improves quality of life.

Many studies have confirmed that social support plays a vital role in promoting psychological health outcomes among individuals living with breast cancer (Kavitha & Jayan, 2014; Uchino, 2006; Yoo, Levine, Aviv, Ewing, & Au, 2010). Social support is linked with better health and quality of life for people living with breast cancer (Yoo et al., 2010). Specifically, social support helps to decrease the stress associated with the diagnosis of breast cancer among the women, improves their emotional well-being, and produces positive changes in their lives (Holland & Holahan, 2003). In contrast, women who have insufficient social support have a higher risk of psychosocial distress and depression, as well as the progression of their cancer (Drageset, Lindstrøm, Giske, & Underlid, 2012).

Qualitatively, little is known about social support among breast cancer survivors in southern Thailand's rural community. There are few quantitative studies that shed light on social support among this group (Anusasananun, Pothiban, Kasemkitwatana, Soivong, & Trakultivakorn, 2013; Lueboonthavatchai, 2007). In this article, we discuss social support among women living with breast cancer in southern Thailand. The article is based on qualitative research that examined the meanings and lived experiences of breast cancer among southern Thai women. We contend that it is important for nurses and healthcare providers to understand how these vulnerable women deal with the challenges resulting from breast cancer. This understanding can help healthcare providers, including nurses, to create ways that can help enhance the quality of life of these vulnerable women. The research questions were: What are their coping resources? How do these sources operate after the diagnosis of breast cancer? Do these support sources provide a way of coping with the distress of living with breast cancer?

Theoretical Orientation

We situate this article within the social support theory. Theoretically, according to Bloom, Stewart, Johnston, Banks, and Fobair (2001), there are two distinct concepts of social support that most researchers have agreed upon. First is "structural support" which refers to "the network of relationships" which is in place between individuals and others, including relatives, friends, neighbors, and so on (Bloom et al., 2001, p. 1513). The second aspect of social support is "functional support," and this includes tangible assistance, emotional support, and availability of information (Mbekenga, Christensson, Lugina, & Olsson, 2011). Tangible or instrumental support refers to the specific assistance that others provide to the individual, such as financial assistance, household chores, childcare, or the provision of transport to medical appointments. Emotional support includes messages that signify that the individual is cared for, loved, and valued. It has been suggested that the perception of the availability of tangible and emotional support is more critical than its actual occurrence (Drageset et al., 2012). Informational support means the provision of knowledge that is relevant to the situation that the individual is encountering (Bloom et al., 2001).

According to Cohen, Gottlieb, and Underwood (2000), each type of support has its own function, but they play integrative roles in meeting the needs of individuals. Different social support can be obtained from different sources and may become essentially important at different stages and trajectories of the person's illness. Landmark, Strandmark, and Wahl (2002) point to some typical sources of support that a person may have: from family members, close friends, peers, and healthcare professionals. They offer different levels of the social support needed.

Methods

Study Procedures and Methods

We employed a qualitative methodology in this study as it allowed us to learn about the lives, stories, and behavior of participants (Bryman, 2012; Liamputtong, 2013). We combined several methods, including in-depth interviews and drawing methods to obtain richer data. Additionally, our study was situated within the feminist framework (Campbell & Wasco, 2000; Kasper, 1994; Wilkinson, 2000). Within this methodology, women and their concerns are the focus of investigation. Feminist research intends to conduct research that is beneficial for women. The ultimate aim is to capture women's lived experiences in a respectful manner that legitimizes women's voices as sources of knowledge. Feminist research promotes qualitative inquiry that is less structured and more flexible than that adopted in positivist science (Liamputtong, 2013; Liamputtong & Suwanhong, 2015). It allows us to look deeply into the experiences of our participants through giving them a voice and allowing them to express themselves freely.

We used semistructured in-depth interviews and drawing methods. The interviews were carried out in the southern Thai language in order to maintain the meanings of participants' statements (Liamputtong, 2010; Liamputtong & Suwankhong, 2015). Semistructured interviews allowed us to be flexible when using words or asking questions, and offered the participants a wider scope for sharing their knowledge and experiences. The guideline questions included: If they had received any “help” since the diagnosis of breast cancer; What types of “help” they had received? Who was the main person who provided “help” during this period? How did they feel about this “help” and how this “help” impacted on their life?

It should be noted that we used the word help when we asked the women about social support because this term is better understood by Thai people. We did not provide any introduction about what we mean by social support to the women. Instead, we let the women tell us what they perceived to be “help” that they had received since the diagnosis of breast cancer.

Before the interviews, we contacted the women using the telephone to arrange a time and place that were convenient for them. The conversations and drawing took place at the women’s homes and at a time that was convenient for them. Individual participants were provided with 200 Thai baht as compensation for taking part in the study. Such compensation is essential for sensitive research because it is a way of showing that the research participants are respected for the time and knowledge they give.

We also used an innovative method involving drawing that was also situated within the feminist framework. Drawing is “about how people see the world in both its simplicities and its complexities” (Guillemin, 2004, p. 275). This drawing method is a form of visual imagery that has been widely employed in research with vulnerable people and for sensitive topics. The drawing method provides “a rich and insightful research method to explore how people make sense of their world” (Guillemin, 2004, p. 272). In our research, the drawing method was employed after in-depth interviews. We provided participants with a packet of 48 colored pens and white paper. We asked them to draw their understandings and experiences of breast cancer. Then they were asked to describe the image they had drawn. Their narratives were tape-recorded. Examples of the issues the questions addressed were: How did you feel when you were diagnosed with breast cancer? How did you manage and deal with all the changes and stresses? What are your social supports? How did these sources of social support work for you? The conversation and drawing took about 1½ hr, and were audio-taped for data analysis.

Participants

Thai women who had been diagnosed with breast cancer and living in rural communities in the south of Thailand comprised the participants of this study. We recruited the women through our personal connection who was a health provider at a local health center. Purposive sampling was applied to choose participants who met the study criteria, women who could provide rich data relevant to the aims of the study. The selection criteria included Thai women (a) who had been diagnosed with breast cancer, (b) who were reported to be in a healthy state and showed no signs of fatigue, (c) who were not hospitalized, and (d) who were willing to discuss their experiences of breast cancer.

Further participants were recruited through the snowball sampling technique (Liamputtong, 2013). This sampling technique requires the researchers to initially select a few research participants and ask them if they knew of others who might meet the criteria of the research and who might be interested in participating (Liamputtong, 2007, 2010). This technique is adopted widely when carrying out sensitive research with people who are difficult to locate or unlikely to take part without referral from others in their own network (Liamputtong, 2007, 2010). We included 20 women in this study. This number of participants was determined by a theoretical sampling technique whereby recruitment is stopped when little new data emerge (Liamputtong, 2013; Padgett, 2012).

Twenty women who had breast cancer participated in this study. Their sociodemographic data showed that most women were between 42 and 79 years old. The educational levels ranged from primary to postgraduate level. The women were predominantly married and were of a lower socioeconomic status. Most of the women had first stage breast cancer. Common treatments reported were mastectomy and chemotherapy. The majority of the women had no family history of breast cancer. The sociodemographic characteristics of these women are given in **Table 1**.

Ethical Considerations

Ethical clearance was obtained from the ethic committees of Thaksin University, Thailand, and La Trobe University, Australia.

Data Analysis

Thematic analysis was used to analyze the data from the interviews and narratives from the drawings (Braun & Clark, 2006). This method of data analysis is used to identify, analyze and report patterns or themes within the data. We first performed initial coding where codes were developed and named. Then, axial coding was adopted that was used to develop the final themes arising from the data. The codes we had developed from the data during open coding were reorganized in new ways by making connections between categories and subcategories.

Table 1. Sociodemographic Characteristics of the Participants ($N = 20$)

Sociodemographic characteristics	n	%
Age (years)		
40–49	5	25
50–59	6	30
60–69	3	15
70–79	6	30
Religion		
Buddhism	20	100
Education level		
Primary school	12	60
Secondary school	6	30
Bachelor's degree	1	5
Master's degree	1	5
Marital status		
Married	17	85
Divorced	2	10
Widowed	1	5
Occupation		
Housewife	3	15
Self-employed	13	65
Farmer	2	10
Government employee	2	10
Monthly income (Thai baht)		
<10,000	4	20
10,000–20,000	13	65
>30,000	3	15
Stage of breast cancer		
1	13	65
2	2	10
3	3	15
4	2	10
Diagnosed period (years)		
<5	8	40
5–10	5	25
>10	7	35
Genetic		
Yes	13	65
No	7	35

This resulted in themes. These themes were used to explain the lived experiences of the participants and are presented in the findings section. In presenting the women's verbatim responses, we used fictitious names to preserve confidentiality.

Results

Several themes regarding social support emerged from our data. These are presented in the following sections.

Kam Lang Jai (Emotional Strength): Emotional Support

Women living with breast cancer in our study described the powerful sources of emotional support they had received from their family members and relatives. These people provided their support from the time of the diagnosis of breast cancer and throughout all the treatment stages. They were willing to adjust their routines and seek ways of expressing sympathy, making themselves available to care for the women and sharing all responsibilities. In addition they provided special care when the women encountered emotional difficulties. For example, relatives would find time to visit the women regularly to encourage the women to deal with their breast cancer and treatment. This emotional support increased the kham lang jai (emotional strength) among the women, and this increased their hopes and strength to find ways to live with their illness. The emotional support received made the women feel good about their condition, and this motivated them to deal with breast cancer and to survive.

Buddhist beliefs and practice also provided moral support that helped to enhance good emotional well-being among the women. Although there were a number of Buddhist ways to manage emotional well-being, many women adhered to merit-making in their everyday life. In Thai culture, merit (referred to as boon) and merit-making (tham boon) are perceived to be good deeds that lead to a better life with less suffering. Thai people believe that good actions result in positive outcomes in life (Liamputtong & Suwankhong, 2015). The women in our study believed that merit-making would make them emotionally strong, give them strength to fight the disease, and stop the spread of their breast cancer.

> I go to the temple regularly, especially on the important religious days, to tham boon [make merit]. I believe that if I continue to do good things, good things will return to me. I feel that I have strength when doing it. So, I hope this way may help me to live longer too. (Nee)

Tham bun by providing almsgiving to monks was a common practice among many women participating in our study. In Thai culture, almsgiving refers to the provision of food to Buddhist monks early in the morning in their daily lives or on special religious days. The women in our study carried out this practice as part of their daily routine and believed that almsgiving could provide them with great merit. The great merit brings them relief from their illness. Nee performed almsgiving every day. She drew her almsgiving activity to explain her way of promoting emotional well-being (**Figure 1**).

Buddhist meditation practice was another means that could calm the side effect of treatment, and feelings of loss and grief. The women believed that this practice would help them have a more peaceful life. We found that all

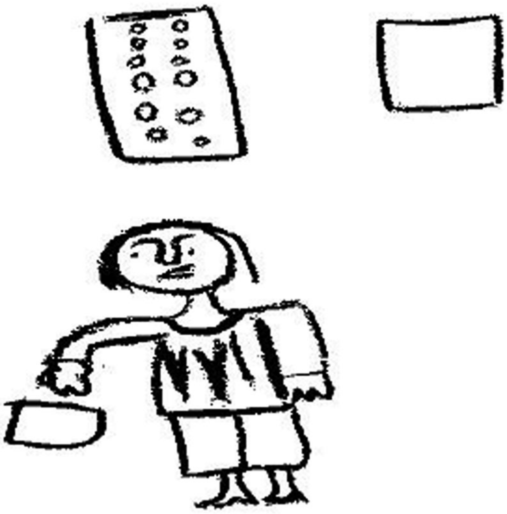

Figure 1. Almsgiving.

women in this study followed this technique to cope with their sufferings. Most women practiced meditation every day after they recovered from their treatment. Porn, who had been living with breast cancer for eight years, said that practicing mediation was a kind of Buddhist practice and it helped her to cope with her current condition:

> Nung samathi [meditation] makes me sabye jai [feeling relieved] with everything. Nung samathi and soud mon [praying] help me a lot, seriously. We are Buddhist, we can practice the Buddhist ways. [It] could stop the disease spreading out. I pray to the Budda to help me.

Most often, they went to a temple to do so. This provided an opportunity to meet other women living with breast cancer. Meeting with other women who were in a similar situation allowed the women to share their lived experiences and to discuss issues of concern that they were facing and thus learned how others dealt with difficulties. This in turn helped the women to cope better with their emotional well-being.

Tangible Support

Most women with breast cancer in this study received tangible support from their family members and close relatives. Husbands in particular were key persons who took over their household responsibilities. Their husbands were willing to help out with household chores because they were concerned about the well-being of their wives. They believed that women living with breast cancer should have sufficient rest and should not spend their energy in any rigorous work. Their help would reduce the negative effects of the treatments and the severity of the illness of their wives. Penpan told us that:

> My husband helps me with everything after I was diagnosed with breast cancer. If he goes out, he would come back home early to help with all housework. He does many things that he has never done before. I feel very supported, you know ... [I] am lucky in some ways.

Some received support in different forms:

> My relatives live in another province but they came to visit me regularly. They brought me healthy food every time they came and provided me with health information. They sometimes stayed overnight. This made me not feeling alone. They showed me that they did not rang keat [feeling of disgust] me. (Koi)

All women with breast cancer in our study required long-term treatment for breast cancer. Thus, they could not work to earn an income. The women also needed to travel a long distance to see their healthcare providers for treatment as most of the women in our study lived far away from health facilities. The costs incurred through traveling and visiting health providers was expensive for them. Some women could not travel alone and needed help from carers. The expense increased if they included the transport and living expenses of the carers who accompanied them. Because most healthcare facilities were located far from their local homes, some women had to rent a house near the hospital as this was more convenient and reduced traveling costs.

Due to the high treatment costs and their financial difficulties, many women received financial support from their family members, particularly their children. Mai proudly stated, “My children help me with everything ... especially when they provided money for me when I have to go to see the doctor.” Many women received free transport from their relatives when they visited hospitals for treatment. Kaewta told us, “My cousin, Yuth, has a car. He often gives me a ride when going for a medical appointment. I can save a lot of money.” All women in this study had one breast removed completely in order to reduce the high risk for breast cancer developing to an advanced stage. Their daughters-in-law and nieces made special attempts to find special bras and silicone jell to make the women appear “normal” as a woman. This helped the women to feel confident when going out of their homes and meeting other people in their communities.

Neighbors also provided tangible support to the women in our study. They often, suggested or even prepared traditional herbal medicines and healthy food products that the women could use alongside their medical treatment. From their experience and also beliefs about natural herbs and products, they believed that these herbs and food products could improve the health status of people living with cancer, and even prevent the breast cancer from developing further. The types of herbal medicine that neighbors introduced to the women with breast cancer included stewed herbal medicines, dried herbs, organic fruits and vegetables, and herbal tablets.

Informational Support

Women received supportive information from several sources: healthcare providers, relatives, and peers. The women mainly received information from healthcare professionals about the disease, prognosis, treatment, and basic health education for self-care. They received this sort of information when they attended their regular health check appointments. However, although many received health information on a regular basis, they were not given thorough explanations about relevant matters. The information provided tended to be from routine programs for breast cancer and its treatment. But the women needed further information that would help them understand their treatment and medications. Rangsima shared her experience: “No tablets today, the doctor said to me. I asked him why I wasn’t given tablets this time. He answered that it is not the same for everyone.” Most often, the women returned home having had unclear explanations, and this increased their anxieties about their health status.

People in the south of Thailand held the strong belief that women living with critical illnesses, including breast cancer, should not attend funerals. It is believed that attending a funeral would make the cancer develop into a more severe stage or reduce the chance of a complete recovery. All the women in our study were constantly reminded by their relatives, peers, and neighbors that they should not attend any funerals. This made the women feel encouraged because they sensed that others cared. Benja was always reminded by her relatives, peers, and neighbors:

> They all said the same that it is not good for this illness to attend a death ceremony. I should not participate in this kind of activity ... never, never! It will make the disease worse ... more suffering because of severe pain that followed after attending it. My wound can be infected. I felt good as they cared for me.

She also sketched her feeling of feeling cared for by people around her through drawing (**Figure 2**).

Nevertheless, some women in our study received insufficient health information from their professional health providers. When the women encountered the side effects of chemotherapies, for example, they had no one to whom they could express their thoughts or from whom they could receive clear explanations about how to manage their symptoms properly. This created feelings of isolation among the women. They had to live with their difficulties and tried to manage them on their own. The women expected that the doctors whom they met at the beginning of their diagnosis to continually provide care and deal with all the enquiries they had. In reality, these doctors were not always available to them and they had to meet other general practitioners who were on duty. Thus, their concerns were not responded to sufficiently or in time.

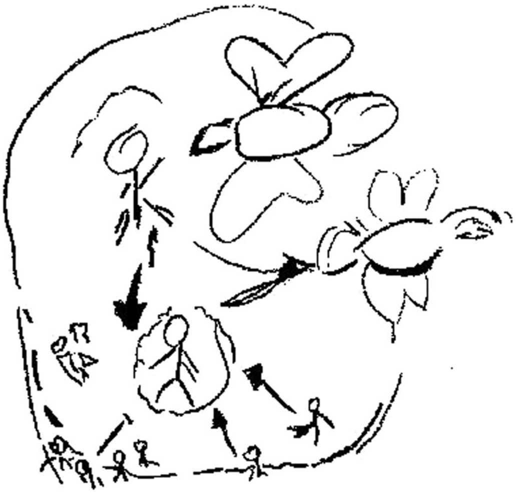

Figure 2. Receiving care from community members.

Discussion

Our data suggested that social support played a crucial role to help women dealing with their breast cancer. The main theme of our finding is on different types of social support that helped the women to live with their condition. This support included emotional, tangible, intangible, and informational support. Family members, their significant others, religion, and healthcare providers played a crucial role in providing tangible and emotional support for the women to be able to deal with their breast cancer. Social support has been recognized as an important factor that helps women living with breast cancer to improve their well-being and the quality of their lives (Holland & Holahan, 2003; Kavitha & Jayan, 2014; Manning-Walsh, 2005). Social support helps women to deal with their traumatic experiences more positively. It helps women to be able to return to their everyday lives after being diagnosed with breast cancer and after treatment (Holland & Holahan, 2003; Yoo et al., 2010). Social support could buffer against some of the negative effects of breast cancer by mitigating distress and enabling the women to gain sufficient resources for coping (Holland & Holahan, 2003; Uchino, 2006). On the other hand, the lack of there being insufficient support to meet individual needs puts individuals living with cancer at risk for experiencing psychological problems (Kavitha & Jayan, 2014). Kroenke, Kubzansky, Schernhammer, Holmes, and Kawachi (2006) even suggest that individuals who do not have support from close relatives, friends, or children have a higher risk for mortality from breast cancer.

As Bloom et al. (2001) theorized, women with breast cancer receive different types of social support from different groups of people. Most women in our study received three kinds of social support: emotional, tangible, and supportive information. To most women in our study, the availability of support from family members, friends, and healthcare professionals was essential for them to deal with their health issues (Alqaissi & Dickerson, 2010; Drageset et al., 2012; Fernandes et al., 2014; Yoo et al., 2010).

Our findings revealed that family members and relatives were an invaluable social support for helping them to deal with their illness. This is in line with Landmark et al. (2002), who suggested that active support from family members is crucial as they can provide valuable support which is relevant to the needs of women with breast cancer. This helps to increase their sense of security and well-being.

As Landmark et al. (2002, p. 219) have pointed out in their research, social support from the husband or partner is of "paramount importance" for women to deal with breast cancer. We also found that husbands were a major source of support for the women in our study (Alqaissi & Dickerson, 2010; Kagawa-Singer & Wellisch, 2003; Salonen, Rantanen, Kellokumpu-Lehtine, Huhtala, & Kaunonen, 2014). Our findings add strong evidence that reinforces the importance of the role of men in providing social support to women when they need it for reasons of health.

It is also of importance that we found in this study that religious beliefs and practices provided emotional support for the women to cope with breast cancer. Several researchers have shown that religious practices allow women with breast cancer to cope better, thus enhancing their emotional well-being (Burke, Villero, & Guerra, 2012; Cebeci, Yangın, & Tekeli, 2012; Drageset, Lindstrom, & Underlid, 2010; Harandy et al., 2010; Holt, 2009; Liamputtong & Suwankhong, 2015; Yoo et al., 2010). The women observed Buddhist principles in their lives as a means of dealing with their health condition. They practiced meditation to smooth the effects of breast cancer and also undertook almsgiving and doing good things to cultivate merit so that their lives would become better. According to Lopez-Class et al. (2011, p. 725), religious beliefs and practices have been shown to enhance the "social and functional well-being" of individuals living with breast cancer. We found that the women in our study gained similar benefits from their religious beliefs and practices.

There were "important others" who provided social support to the women in our study. These included friends, neighbors, and fellow patients who provided social support in different ways (Glanz & Lerman, 1992; Salonen et al., 2014). According to Glanz and Lerman (1992), the quality of social support received from important others is critical for the subjective well-being of women with breast cancer. It is notable that social support from others who have experienced or survived breast cancer is also a crucial factor that allows women to deal with their breast cancer and to maintain their well-being (Liamputtong & Suwankhong, 2015).

Nevertheless, not all women in our study received sufficient information from their healthcare providers. This was particularly so when they tried to deal with the negative side effects of breast cancer treatment. This creates more distress for individuals and this could be an additional traumatic experience for women living with breast cancer. Previous studies have also revealed the lack of support provided by health professionals (Drageset et al., 2012; Landmark et al., 2002). Landmark et al. (2002) contended that social support from healthcare professionals helps to enhance feelings of well-being and the ability to cope in women living with breast cancer.

Clinical Implications

Our findings have suggested that social, emotional, tangible, and informational support is crucial for the well-being of women with breast cancer. Social support associating with cultural contexts should be considered an important component in the provision of sensitive health care for these women and for women living with breast cancer in general. Although medical treatment is essential for breast cancer, Kim, Han, Shaw, McTavish, and Gustafson (2010, p. 550) argued that social support can enhance the effectiveness of treatment. Such support helps the women to have positive perspectives about the state of their health; it helps them to deal with their illness better.

Health professionals, including nurses, need to be aware of the importance of the social support that women with breast cancer receive from healthcare systems. Nurses should promote social support as a potential source for promoting good health for this group of women. It is important for nurses to understand their experiences so that they can provide appropriate support that will suit individual needs. This is essentially crucial for women living in rural areas where cultural practices are still important. We contend that the cultural perspectives of patients are crucial in nursing science. Nurses need to appreciate the importance of culture for the support of patients with breast cancer.

Apart from this, setting up breast cancer support groups that suit local ways of life will allow the women to share their concerns and worries with each other. These support groups have potential benefits for these women as they help them to better handle the difficult issues they encounter. As we have demonstrated, women need sufficient information from healthcare providers. Awareness of this need would help nurses and other health professionals to support women with breast cancer to deal with the state of their health more efficiently (Landmark et al., 2002).

Conclusions

Our findings showed that women who were diagnosed with breast cancer experienced great loss and had to deal with emotional and physical traumas. However, social support helped the women to live with their condition. This support included emotional, tangible, intangible, and informational support. Nurses and other health professionals are an important source of social support for women with breast cancer. Through having an understanding of and being sensitive to these women's experiences and challenges, nurses and healthcare professionals can provide more individualized support and care to women during a very vulnerable period of their lives.

Acknowledgments

The authors thank all participants who took part in this study. They also thank the Research and Development Institute of Thaksin University, Thailand, for providing funding for this project.

Clinical Resources

- Department of Disease Control, Ministry of Public Health Thailand. Good health starts here. http://www.ddc.moph.go.th/index.php
- National Cancer Institute Thailand. Hospital-based cancer registry annual report 2012. http://www.nci.go.th/th/cancer_record/cancer_rec1.html

References

Alqaissi, N. M., & Dickerson, S. S. (2010). Exploring common meanings of social support as experienced by Jordanian women with breast cancer. *Cancer Nursing*, *33*(5), 353–361. doi:10.1097/NCC.0b013e3181d55d33

Anusasananun, B., Pothiban, L., Kasemkitwatana, S., Soivong, P., & Trakultivakorn, H. (2013). Coping behaviors and predicting factors among breast cancer survivors during each phase of cancer survivorship. *Pacific Rim International Journal of Nursing Research*, *17*(2), 148–166.

Bloom, J. R., Stewart, S. L., Johnston, M., Banks, P., & Fobair, P. (2001). Sources of support and the physical and mental well-being of young women with breast cancer. *Social Science & Medicine*, *53*(11), 1513–1524. doi:10.1016/S0277-9536(00)00440-8

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. doi:10.1191/1478088706qp063oa

Bryman, A. (2012). *Social research methods* (4th ed.). Oxford, NY: Oxford University Press.

Burke, N. J., Villero, O., & Guerra, C. (2012). Passing through meanings of survivorship and support among Filipinas with breast cancer. *Qualitative Health Research*, *22*(2), 189–198. doi:10.1177/1049732311420577

Campbell, R., & Wasco, S. M. (2000). Feminist approaches to social sciences: Epistemological and methodological tenets. *American Journal of Community Psychology*, *28*(6), 773–791.

Cebeci, F., Yangın, H. B., & Tekeli, A. (2012). Life experiences of women with breast cancer in south western Turkey: A qualitative study. *European Journal of Oncology Nursing*, *16*(4), 406–412. doi:10.1016/j.ejon.2011.09.003

Cohen, S., Gottlieb, B., & Underwood, L. (2000). Social relationships and health. In S. Cohen, L. Underwood, & B. Gottlieb (Eds.), *Social support measurement and intervention* (pp. 3–28). New York, NY: Oxford University Press.

Drageset, S., Lindstrøm, T. C., Giske, T., & Underlid, K. (2012). "The support I need": Women's experiences of social support after having received breast cancer diagnosis and awaiting surgery. *Cancer Nursing*, *35*(6), E39–E47. doi:10.1097/NCC.0b013e31823634aa

Drageset, S., Lindstrom, T. C., & Underlid, K. (2010). Coping with breast cancer: Between diagnosis and surgery. *Journal of Advanced Nursing*, *66*(1), 149–158. doi:10.1111/j.1365-2648.2009.05210.x

Ell, K., Nishimoto, R., Mediansky, L., Mantell, J., & Hamovitch, M. (1992). Social relations, social support and survival among patients with cancer. *Journal of Psychosomatic Research*, *36*(6), 531–541.

Fernandes, A. F., Cruz, A., Moreira, C., Santos, M. C., & Silva, T. (2014). Social support provided to women undergoing breast cancer treatment: A study review. *Advances in Breast Cancer Research*, *3*(2), 47–53. doi:10.4236/abcr.2014.32007

Glanz, K., & Lerman, C. (1992). Psychological impact of breast cancer: A critical review. *Annuals of Behavioral Medicine*, *14*, 204–212.

Guillemin, M. (2004). Understanding illness: Using drawings as a research method. *Qualitative Health Research*, *14*(2), 272–289. doi:10.1177/1049732303260445

Harandy, T. F., Ghofranipour, F., Montazeri, A., Anoosheh, M., Bazargan, M., Mohammadi, E., … Niknamia, S. (2010). Muslim breast cancer survivor spirituality: Coping strategy or health seeking behavior hindrance? *Health Care for Women International*, *31*(1), 88–98. doi:10.1080/07399330903104516

Holland, K. D., & Holahan, C. K. (2003). The relation of social support and coping to positive adaptation to breast. *Psychology & Health*, *18*(1), 15–29. doi:10.1080/0887044031000080656

Holt, C. L., Caplan, L., Schulz, E., Blake, V., Southward, P., Buckner, A., & Lawrence, H. (2009). Role of religion in cancer coping among African Americans: A qualitative examination. *Journal of Psychosocial Oncology*, *27*(2), 248–273. doi:10.1080/07347330902776028

Kagawa-Singer, M., & Wellisch, D. (2003). Breast cancer patients' perception of their husbands, support in a cross-cultural context. *Psycho-Oncology*, *12*(1), 24–37. doi:10.1002/pon.619

Kasper, A. S. (1994). A feminist, qualitative methodology: A study of women with breast cancer. *Qualitative Sociology*, *17*(3), 263–281.

Kavitha, R., & Jayan, C. (2014). Role of social support on cancer distress among breast cancer patients. *Guru Journal of Behavioral and Social Sciences*, *2*(1), 247–251.

Kim, L., Han, J. Y., Shaw, B., McTavish, F., & Gustafson, D. (2010). The roles of social support and coping strategies in predicting breast cancer patients' emotional well-being: Testing mediation and moderation models. *Journal of Health Psychology*, *15*(4) 543–552. doi:10.1177/1359105309355338

Kroenke, C. H., Kubzansky, L. D., Schernhammer, E. S., Holmes, M. D., & Kawachi, I. (2006). Social networks, social support, and survival after breast cancer diagnosis. *Journal of Clinical Oncology*, *24*(7), 1105–1111. doi:10.1200/JCO.2005.04.2846

Landmark, B. T., Strandmark, M., & Wahl, A. (2002). Breast cancer and experiences of social support: In-depth interviews of 10 women with newly diagnosed breast cancer. *Scandinavian Journal of Caring Sciences*, *16*(3), 216–223. doi:10.1046/j.1471-6712.2002.00059.x

Liamputtong, P. (2007). *Researching the vulnerable: A guide to sensitive research methods*. London: Sage.

Liamputtong, P. (2010). *Performing qualitative cross-cultural research*. Cambridge: Cambridge University Press.

Liamputtong, P. (2013). *Qualitative research methods* (4th ed.). Melbourne: Oxford University Press.

Liamputtong, P., & Suwanhong, D. (2015). Breast cancer diagnosis: Biographical disruption, emotional experiences and strategic management in Thai women with breast cancer. *Sociology of Health & Illness*, *37*(7), 1086–1101.

Lopez-Class, M., Perret-Gentil, M., Kreling, B., Caicedo, L., Mandelblatt, J., & Graves, K. D. (2011). Quality of life among immigrant Latina breast cancer survivors: Realities of culture and enhancing cancer care. *Journal of Cancer Education*, *26*(4), 724–733. doi:10.1007/s13187-011-0249-4

Lueboonthavatchai, P. (2007). Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. *Journal of the Medical Association of Thailand*, *90*(10), 2164–2174.

Manning-Walsh, J. (2005). Social support as a mediator between symptom distress and quality of life in women with breast cancer. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *34*(4), 482–493. doi:10.1177/0884217505278310

Mbekenga, C. K., Christensson, K., Lugina, H., & Olsson, P. (2011). Joy, struggle and support: Postpartum experiences of first-time mothers in a Tanzanian suburb. *Women and Birth*, *24*(1), 24–31. doi:10.1016/j.wombi.2010.06.004

Padgett, D. K. (2012). *Qualitative and mixed methods in public health*. Thousand Oaks, CA: Sage.

Salonen, P., Rantanen, A., Kellokumpu-Lehtine, P-L., Huhtala, H., & Kaunonen, M. (2014). The quality of life and social support in significant others of patients with breast cancer—A longitudinal study. *European Journal of Cancer Care*, *23*(2), 274–283. doi:10.1111/ecc.12153

Sprung, B. R., Janotha, B. L., & Steckel, A. J. (2011). The lived experience of breast cancer patients and couple distress. *Journal of American Academy of Nurse Practitioners*, *23*(11), 619–627. doi: 10.1111/j.1745-7599.2011.00653.x

Taleghani, F., Yekta, Z. P., & Nasrabadi, A. N. (2006). Coping with breast cancer in newly diagnosed Iranian women. *Journal of Advanced Nursing*, *54*(3), 265–272.

Uchino, B. N. (2006). Social support and health: A review of psychological processes potentially underlying links to disease outcomes. *Journal of Behavioral Medicine*, *29*(4), 377–387. doi:10.1007/s10865-006-9056-5

Wilkinson, S. (2000). Feminist research traditions in health psychology: Breast cancer research. *Journal of Health Psychology*, *5*(3), 359–372.

Yoo, G. J., Levine, E. G., Aviv, C., Ewing, C., & Au, A. (2010). Older women, breast cancer, and social support. *Support Care Cancer*, *18*(12), 1521–1530. doi:10.1007/s00520-009-0774-4

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Correlates of Physical Activity Among Middle-Aged and Older Korean Americans at Risk for Diabetes

Benjamin H. Han, MD, MPH[1], Tina Sadarangani, MSN[2], Laura C. Wyatt, MPH[3], Jennifer M. Zanowiak, MA[4], Simona C. Kwon, DrPH[5], Chau Trinh-Shevrin, DrPH[6], Linda Lee, MSW[7], & Nadia S. Islam, PhD[8]

1 Instructor, NYU School of Medicine, Division of Geriatric Medicine and Palliative Care, New York, NY, USA
2 *Upsilon*, Doctoral Candidate, New York University College of Nursing, New York, NY, USA
3 Research Data Manager, NYU School of Medicine's Center for Health Equity, New York, NY, USA
4 Senior Research Coordinator, NYU School of Medicine's Center for Health Equity, New York, NY, USA
5 Assistant Professor, Departments of Population Health and Medicine at the NYU School of Medicine and the NYU Global Institute of Public Health, New York, NY, USA
6 Associate Professor, Departments of Population Health and Medicine in the NYU University School of Medicine, New York, NY, USA
7 Executive Director of Korean Community Services of Metropolitan New York, Inc., New York, NY, USA
8 Assistant Professor in the Department of Population Health, NYU School of Medicine, New York, NY, USA

Key words
Diabetes, minority health, gerontology/geriatrics, physical activity, Korean American

Correspondence
Dr. Benjamin H. Han, 550 First Avenue, BCD615, New York, NY 11109. E-mail: Benjamin.Han@nyumc.org

Accepted: October 24, 2015

doi: 10.1111/jnu.12180

Abstract

Purpose: To explore correlates of meeting recommended physical activity (PA) goals among middle-aged and older Korean Americans at risk for diabetes mellitus (DM).

Design and Methods: PA patterns and their correlates were assessed among 292 middle-aged and older Korean Americans at risk for DM living in New York City using cross-sectional design of baseline information from a diabetes prevention intervention. PA was assessed by self-report of moderate and vigorous activity, results were stratified by age group (45–64 and 65–75 years), and bivariate analyses compared individuals performing less than sufficient PA and individuals performing sufficient PA. Logistic regression was used to calculate adjusted odds ratios predicting sufficient PA.

Findings: After adjusting for sex, age group, years lived in the United States, marital status, health insurance, and body mass index (BMI), sufficient PA was associated with male sex, older age, lower BMI, eating vegetables daily, and many PA-specific questions (lack of barriers, confidence, and engagement). When stratified by age group, male sex and eating vegetables daily was no longer significant among Koreans 65 to 75 years of age, and BMI was not significant for either age group.

Conclusions: PA interventions targeting this population may be beneficial and should consider the roles of sex, age, physical and social environment, motivation, and self-efficacy.

Clinical Relevance: Clinical providers should understand the unique motivations for PA among Korean Americans and recognize the importance of culturally driven strategies to enable lifestyle changes and support successful aging for diverse populations.

Diabetes mellitus (DM) is among the most common chronic conditions found in older adults and is associated with macrovascular and microvascular complications such as heart disease, stroke, nephropathy, and retinopathy (American Diabetes Association [ADA], 2014). Complications from DM contribute to functional decline and disability as adults age (Kirkman et al., 2012). In 2010, DM affected 25.8 million people, or 8.3% of the U.S. population, with disproportionally higher rates among adults 65 years of age and older (26.9%; Centers for Disease Control and Prevention [CDC], 2011b). Racial and ethnic minorities also experience a greater burden of DM compared to Whites in the United States (Chow, Foster, Gonzalez, & Mciver, 2012). Nationally, Asian Americans are among the fastest growing racial groups (Pew Research Center, 2012) and are at increased risk for developing DM (King et al., 2012). Using proposed lower body mass index (BMI) cutoffs for obesity in Asian Americans (Yi, Kwon, Wyatt, Islam, & Trinh-Shevrin, 2015), nationally based DM prevalence rates adjusted for BMI show that Asian Americans have a 60% higher prevalence of DM compared to Whites (Mcneely & Boyko, 2003). However, Asian Americans represent a tremendously diverse group, both culturally and genetically, with varied risk for DM (Islam et al., 2012). This creates a need for studies to further explore and understand the specific risks facing different Asian American populations and to design culturally relevant DM prevention.

Studies have shown that intensive lifestyle modifications, including regular physical activity (PA) and structured PA interventions, reduce the rate of DM for those at risk (ADA, 2014). Through a lifestyle intervention that included PA and dietary components, the Diabetes Prevention Program (DPP) showed a 58% decrease in the incidence of type 2 DM among high-risk adults over a 2.8 years of follow-up (Diabetes Prevention Program Research Group, 2002). Regular PA has also been associated with improved physical function, reduced falls, and reduced risk for cognitive impairment among older adults (Chalé-Rush et al., 2010; Ku, Stevinson, & Chen, 2012; Mcdermott et al., 2002; Rejeski et al., 2011).

However, there is limited research on interventions to promote PA among adults of diverse racial and ethnic backgrounds in the United States, particularly those at risk for DM. Acculturation factors, including length of time in the United States, English proficiency, and ethnic identity, may play an influential role in PA, since health behaviors tend to change as individuals adapt to a new environment (National Research Council, 2004). Among a population-based sample of California adults who are ≥45 years old, racial and ethnic minorities engaged in less PA compared to Whites. In particular, Asian/Pacific Islanders were less likely to engage in vigorous PA compared to whites, especially individuals 45 to 64 years of age, regardless of English proficiency (August & Sorkin, 2010). Additionally, a small study in Chicago found that older Korean Americans with hypertension from health clinics were significantly less likely to self-report weight control or weight loss compared to age- and gender-matched hypertensive non-Hispanic Whites and Blacks taken from a national dataset (Kim, 2005). Data specific to Korean Americans in New York City (NYC) show an age-adjusted DM rate that is higher than the rate among non-Hispanic Whites in NYC (Islam et al., 2012; New York City Department of Health and Mental Hygiene, 2012). Few studies have been conducted among middle-aged and older Korean Americans at risk for DM, and there is a lack of research regarding older Korean Americans and PA (Lim, Kayser-Jones, Waters, & Yoo, 2007).

Given the importance of PA for older adults who are at risk for DM, identifying PA barriers and facilitators among specific populations can lead to targeted interventions that can help to prevent DM and its complications. The purpose of this study is to explore the patterns, influences, and correlates of recommended sufficient weekly PA among middle-aged and older, urban, community-dwelling Korean Americans at risk for DM living in NYC. This article presents baseline findings from Project RICE (Reaching Immigrants Through Community Empowerment), a community health worker (CHW) intervention designed to promote DM prevention and healthy lifestyle changes in a Korean American population at risk for DM (Islam et al., 2013).

Methods

Study Design and Data Collection

The data for this study were taken from a cross-sectional baseline survey for a CHW intervention program in the NYC Korean community (Islam et al., 2013). Baseline surveys were administered in Korean by a trained bilingual interviewer. Individuals were eligible to participate in the intervention if they (a) self-identified as Korean; (b) were between 18 and 75 years old; and (c) were identified as at-risk for DM using a translated American Diabetes Association Risk Test (ADA, 2012) that was translated into Korean and adapted to include Asian BMI and an additional question asking if they had been told by a doctor in the past 3 months that they had prediabetes. Individuals were ineligible to participate if they self-reported a DM diagnosis or were currently taking medication for diabetes, had serious health problems (including cancer, a cardiovascular event in the past 12 months, or end-stage renal disease), or had participated in a previous cardiovascular disease study. Participants were recruited for the study at various community-based venues such as health fairs and churches in the borough of Queens in NYC between May 2011 and March 2014.

Study population. The study population for this analysis included all individuals enrolled in the parent intervention that answered the weekly PA question on the baseline survey and were 45 years of age or older.

Measures. The survey questions and measures used were translated into Korean from previous surveys and scales described in the ensuing sections.

Physical activity. Current weekly PA was taken from the Behavioral Risk Factor Surveillance System (BRFSS; CDC, 2011a), and PA levels were based on the 2008 Physical Activity Guidelines for Americans, which recommend that all adults perform ≥150 min of moderate-intensity PA, ≥75 min of vigorous-intensity PA, or an equivalent combination each week (U.S. Department of Health and Human Services, 2008). Individuals were asked how many times in the past 7 days they performed both moderate and vigorous PAs, and the approximate minutes spent doing these types of activities each day. Weekly vigorous activity was multiplied by 2 and combined with weekly moderate activity. Once summed, a new PA variable represented sufficient PA (≥150 min per week) and insufficient PA (<150 min per week).

Demographic characteristics. Demographic questions were taken from the American Community Survey (U.S. Census Bureau, 2011) and the BRFSS (CDC, 2011a). The following characteristics were included: sex, age group, education level, household number, income, marital status, and years lived in the United States.

Acculturation. English-language proficiency and years of residency in the United States are indexes of acculturation (Lee, Nguyen, & Tsui, 2011). All respondents were asked about English-language fluency. Limited English proficiency (LEP) was defined as self-reporting speaking English “not well” or “not at all,” a cutoff frequently used in the literature (Sentell & Braun, 2012).

Individual health characteristics. Individual health characteristics were taken from the BRFSS. The following characteristics were included: self-reported general health, current cigarette smoking, health insurance, BMI (kg/m^2) calculated using height and weight taken by a CHW, a self-reported diagnosis of high cholesterol, and a self-reported diagnosis of high blood pressure. BMI was divided into normal (<25 kg/m^2) and overweight or obese (≥25 kg/m^2).

Barriers to exercise. Seven barriers to exercise were included, and were adapted from the Exercise Benefits and Barriers Scale (Sechrist, Walker, & Pender, 1987). Participants were asked if they agreed or disagreed with the following statements: (a) I don’t have enough time to exercise; (b) I am not motivated to exercise; (c) I don’t have a safe place to exercise; (d) Health problems prevent me from exercising; (e) I don’t like to exercise; (f) I need someone to exercise with but don’t have one; and (g) I don’t know what exercises to perform. Barriers to exercise were examined as a scale variable (scale of 0–7, where 7 = *greatest barriers to exercise*) and as individual questions.

PA social interaction. Social interaction was adapted from a previous intervention (Nothwehr, Dennis, & Wu, 2007). Four questions were asked: How often do you: (a) suggest doing something active when you get together with family members or friends, such as going for a walk, biking, or swimming; (b) set aside a special time to do PA; (c) ask a friend or relative to do some PA with you; and (d) talk to others about the benefits of PA? PA social interaction is examined as a scale variable using the mean of the four questions (scale of 1–4, where 4 = *highest PA social interaction*) and as individual questions.

PA self-efficacy. Self-efficacy questions related to exercise were adapted from the Bandura Self-Efficacy Scale (Bandura, 2006). Two questions were included: How sure do you feel that you will be able to: (a) know what exercises are healthy for you; and (b) exercise for at least 30 min five times each week in the future. PA self-efficacy is examined as a scale variable using the mean of the two questions (scale of 1–4, where 4 = *highest PA self-efficacy*) and as individual questions.

Nutrition. Fruit and vegetable intake was taken from the BRFSS. Individuals were asked “Over the past week, how often did you eat fruits (such as oranges, apples, pears, melon, berries, etc.)?” and “Over the past week, how often did you eat vegetables or greens (such as green onions, lettuce, mushrooms, peppers, broccoli, zucchini, cucumbers, spinach, etc.), but do not include potatoes?” If an individual answered one or more times per day, he or she was considered to eat fruits or vegetables at least daily.

Statistical analyses. Bivariate analyses were run by PA level for the overall sample, and by age strata (45–64 and 65–75 years). This stratification was chosen to facilitate understanding of differences between middle-aged and older adults in our study and has been used in other studies examining health behaviors (August & Sorkin, 2010). Chi-square tests and Fisher’s exact tests were run for categorical variables, and *t* tests were run for continuous variables; Fisher’s exact tests were employed when expected cell counts were less than five. Adjusted logistic regression models predicting sufficient PA were run separately for each variable, overall and stratified by age group, while adjusting for any demographic or health-related variables with a p value $< .10$ in bivariate analysis (overall or age stratified). Odds ratios (ORs), 95% confidence intervals (CIs), and p-values are presented. Significance was set at $p \leq .05$ for logistic regression. The study protocol was approved by the NYU School of Medicine Institutional Review Board.

Results

Characteristics of the study sample are presented in **Table 1**. Of the 292 participants included in the analysis, the mean age was 61.6 ± 7.5 years. The majority of participants were women (58.2%), married (85.2%), and educated beyond high school (52.9%). The average number of years lived in the United States was 22.5 ± 10.3 years, and the majority of participants (71.4%) reported LEP. Less than half of our sample (48.3%, $n = 141$) performed sufficient PA. Among individuals 45 to 64 years of age ($n = 186$), 42.5% performed sufficient weekly PA, while 58.5% of individuals 65 to 75 years of age ($n = 106$) performed sufficient PA. Age-stratified characteristics of the study population and bivariate analyses are also presented in **Table 1.**

Validity and reliability have not previously been assessed for the PA scales in the Korean American population. Preliminary analysis found Cronbach's alphas of 0.622 for the barriers scale, 0.562 for the self-efficacy scale, and 0.831 for the social interaction scale. We plan to further assess validity and reliability of these scales in future analyses.

Adjusted ORs for the associations of sufficient weekly PA with potential correlates of sufficient PA are presented in **Table 2**, and are stratified by age group. Several demographic variables were significantly associated with sufficient PA in the adjusted models. In the overall model, individuals 65 to 75 years of age were 2.7 times more likely than individuals 45 to 64 years of age to engage in sufficient PA ($p = .001$), and men were 1.7 times more likely than women to engage in sufficient PA ($p = 0.040$). Among individuals 45 to 64 years of age, men were 2.0 times more likely than women to engage in sufficient PA ($p = .037$). In the model, individuals with a BMI < 25 were 1.9 times more likely to engage in sufficient PA than individuals with a BMI > 25 ($p = 0.010$). There were no significant correlations with LEP or years lived in the United States and sufficient PA, even after stratifying by age. In all models, setting aside a special time and knowing what exercises are healthy were significantly associated with engaging in sufficient PA. Needing someone to exercise with and having time to exercise were only significant in the overall model. Being motivated, safe location, knowing what exercises to perform, and eating vegetables at least daily were significantly associated with recommended PA in the overall model and among individuals 45 to 64 years of age. Needing someone to exercise with was significant in the overall model and among individuals 65 to 75 years of age, and talking to others about the benefits of PA and liking exercise were only significant among individuals 65 to 75 years of age.

Discussion

Findings from this study indicate that in NYC, older Korean Americans are more likely than middle-aged Korean Americans to engage in sufficient PA. National prevalence rates for PA from BRFSS data show that approximately half of adults in both the 45 to 64 and ≥65 years age groups engage in sufficient PA (CDC, 2013), and NYC data found that 49% of adults 45 to 64 years of age and 38% of adults >65 years of age engage in sufficient PA (New York City Department of Health and Mental Hygiene, 2012). These data are consistent with the prevalence rate for Korean Americans 45 to 64 years of age (42.5%) in our sample, but diverge in our study for those ≥65 years of age (58.5%). Participants in our study also had higher rates of self-reported PA compared to other racial and ethnic minority groups, including Asian Americans in California (August & Sorkin, 2010). Higher levels of PA among middle-aged and older Korean Americans were associated with male sex, older age, lower BMI, eating vegetables daily, physical environment, having social support, and greater PA self-efficacy.

In general, older adults have been found to self-report less PA engagement compared to younger adults (National Research Council, 2004; New York City Department of Health and Mental Hygiene, 2012), and poor health and lack of energy have been found to deter older adults from diverse backgrounds from engaging exercise (Bird et al., 2009). However, older adults in our study were more likely to report adequate levels of PA when compared to their middle-aged counterparts. Possible explanations for this include more leisure time to engage in formal PA or motivation due to heightened risk for illness, which were noted in a study among older Mexican American women (Cantu & Fleuriet, 2008). Further research is needed to explore the reasons why older Korean Americans engaged in more self-reported PA compared to younger groups.

Table 1. Characteristics of the Study Population by Level of Physical Activity (PA), % ($N = 292$)

	Overall ($N = 292$)			45–64 years of age ($n = 186$)			65–75 years of age ($n = 106$)		
	< Sufficient PA ($n = 151$)	≥ Sufficient PA ($n = 141$)	p	< Sufficient PA ($n = 107$)	≥ Sufficient PA ($n = 79$)	p	< Sufficient PA ($n = 44$)	≥ Sufficient PA ($n = 62$)	p
Sex			**.017**			**.022**			.213
Female	64.9	51.1		66.4	50.6		61.4	51.6	
Age (years)			**.008**						
45–64	70.9	56.0		n/a	n/a		n/a	n/a	
65–75	29.1	44.0		n/a	n/a		n/a	n/a	
Years in United States			**.032**			**.042**			.235
≤10	15.9	12.1		16.8	13.9		13.6	9.7	
11–20	19.9	33.3		23.4	40.5		11.4	24.2	
>20	64.2	54.6		59.8	45.6		75.0	66.1	
Total household number (including self)			.928			.269			.541
Lives alone	11.3	10.7		12.1	6.3		9.1	16.4	
Lives with one person	41.7	40.0		34.6	30.4		59.1	52.5	
Lives with more than one person	47.0	49.3		53.3	63.3		31.8	31.1	
Marital status			**.042**			**.007**			.954
Married	81.5	89.3		81.3	94.9		81.8	82.3	
Unmarried/widowed/ divorced	18.5	10.7		18.7	5.1		18.2	17.7	
Education			.967			.326			.425
≤ High school	47.2	47.0		46.6	39.2		48.8	56.9	
Annual household income			.895			.515			.830
<\$20,000	22.5	21.3		17.8	11.4		34.1	33.9	
\$20,000–\$49,999	31.1	34.8		36.4	45.6		18.2	21	
≥\$50,000	21.9	19.1		28.0	25.3		6.8	11.3	
Skipped/refused/don't know	24.5	24.8		17.8	17.7		40.9	33.9	

Continued

Table 1. Continued

	Overall ($N = 292$)			45–64 years of age ($n = 186$)			65–75 years of age ($n = 106$)		
	< Sufficient PA ($n = 151$)	≥ Sufficient PA ($n = 141$)	*p*	< Sufficient PA ($n = 107$)	≥ Sufficient PA ($n = 79$)	*p*	< Sufficient PA ($n = 44$)	≥ Sufficient PA ($n = 62$)	*p*
English spoken fluency			.264			.909			.149
Very well/well	26.7	30.7		29.0	28.2		20.9	33.9	
Not well/not at all	73.3	69.3		71.0	71.8		79.1	66.1	
Health insurance			.363			**.025**			.695
Insured	55.3	50.0		45.8	29.5		79.1	75.8	
Self-reported health status			.770			.960			.442
Excellent/very good	9.3	11.3		11.3	12.7		4.5	9.7	
Good	36.7	38.3		37.7	36.7		34.1	40.3	
Fair/poor	54.0	50.4		50.9	50.6		61.4	50.0	
Body mass index			**.013**			.182			**.029**
Normal (<25)	45.0	59.6		45.8	55.7		43.2	64.5	
Overweight/obese (≥25)	55.0	40.4		54.2	44.3		56.8	35.5	
High cholesterol diagnosis			.566			.350			.607
Yes	30.2	27.1		29.2	23.1		53.5	48.4	
High blood pressure diagnosis			.728			.203			.695
Yes	36.2	34.3		30.2	21.8		30.2	33.9	
Fruits over the past week									
At least once a day	50.0	57.6	.198	50.9	58.4	.315	47.7	56.5	.375
Vegetables or greens over the past week									
At least once a day	50.3	67.9	**.002**	49.5	66.7	**.020**	52.3	69.4	.074
Barriers to exercise (scale of 1–7, 7 = greatest)									
Mean ± *SD*	1.9 ± 1.7	1.1 ± 1.3	**<.001**	2.0 ± 1.7	1.4 ± 1.4	**.010**	1.8 ± 1.6	0.7 ± 1.2	**.001**
PA social interaction (scale of 1–4, 4 = greatest)									
Mean ± *SD*	1.9 ± 0.7	2.3 ± 0.8	**<.001**	1.9 ± 0.7	2.1 ± 0.7	**.045**	1.8 ± 0.7	2.5 ± 0.8	**<.001**
PA self-efficacy (scale of 1–4, 4 = greatest)									
Mean ± *SD*	2.8 ± 0.7	3.2 ± 0.6	**<.001**	2.8 ± 0.7	3.1 ± 0.7	**.010**	2.8 ± 0.6	3.4 ± 0.5	**<.001**

Note. Boldfaced values signify statistical significance with a $p < .05$.

Table 2. Adjusted Associations of ≥ Recommended Weekly Physical Activity

	Overall ($n = 292$)		45-64 ($n = 186$)		65-75 ($n = 106$)	
	Adjusted OR (95% CI)[a]	p	Adjusted OR (95% CI)[b]	p	Adjusted OR (95% CI)[b]	p
Demographic characteristics						
Male (ref = female)	**1.7 (1.0–2.8)**	**.040**	**2.0 (1.0–3.8)**	**.037**	1.3 (0.6–3.1)	.510
Age 65–75 years (ref = 45–64)	**2.7 (1.6–4.9)**	**.001**	n/a		n/a	
11–20 years lived in United States (ref = <10 years)	2.2 (0.9–5.0)	.073	1.9 (0.7–5.0)	.227	2.4 (0.4–12.7)	.311
>20 years lived in United States (ref = <10 years)	1.0 (0.4–2.2)	.975	0.9 (0.3–2.2)	.781	1.0 (0.2–4.7)	.971
Married (ref = unmarried)	1.9 (0.9–3.9)	.088	3.1 (1.0–10.0)	.054	1.2 (0.4–3.4)	.784
Education > high school (ref = ≤ high school)	1.0 (0.6–1.7)	.908	1.3 (0.7–2.5)	.452	0.5 (0.2–1.3)	.167
Lives with one person (ref = lives alone)	1.0 (0.5–2.2)	.985	1.4 (0.3–6.0)	.638	0.4 (0.1–1.5)	.157
Lives with > one person (ref = lives alone)	1.1 (0.5–2.4)	.806	1.6 (0.4–6.7)	.501	0.5 (0.1–2.3)	.386
Speaks English very well/well	1.4 (0.8–2.5)	.239	1.2 (0.6–2.5)	.660	2.0 (0.8–5.4)	.151
Individual health						
Excellent/very good health (ref = fair/poor)	1.4 (0.6–3.3)	.436	1.0 (0.3–2.8)	.968	3.4 (0.6–19.6)	.173
Good health (ref = fair/poor)	1.1 (0.6–1.9)	.719	0.9 (0.4–1.9)	.789	1.6 (0.7–4.1)	.283
No current smoking (ref = current smoking)	1.7 (0.6–4.8)	.340	2.5 (0.7–9.0)	.172	0.5 (0.1–5.7)	.593
Has health insurance (ref = no insurance)	0.6 (0.3–1.1)	.099	0.5 (0.3–1.1)	.071	1.0 (0.3–3.2)	.978
BMI < 25 (ref = BMI ≥ 25)	**1.9 (1.2–3.1)**	**.010**	1.8 (0.9–3.4)	.072	2.2 (1.0–4.9)	.057
High cholesterol diagnosis (ref = no diagnosis)	1.1 (0.6–1.9)	.749	0.9 (0.4–2.0)	.882	1.4 (0.6–3.3)	.503
High BP diagnosis (ref = no diagnosis)	0.9 (0.5–1.6)	.759	1.0 (0.5–2.0)	.897	0.9 (0.4–2.0)	.735
Barriers to exercise (disagree, ref = agree)						
I don't have enough time to exercise	1.2 (0.6–2.5)	.545	1.1 (0.5–2.4)	.819	2.4 (0.5–10.5)	.259
I am not motivated to exercise	**3.8 (2.0–7.1)**	**<.001**	**4.9 (2.1–11.2)**	**<.001**	2.6 (0.9–7.1)	.072
I don't have a safe place to exercise	**2.2 (1.1–4.3)**	**.022**	**2.5 (1.1–5.8)**	**.025**	1.7 (0.5–6.2)	.410
Health problems prevent me from exercising	1.4 (0.7–2.8)	.307	1.2 (0.5–2.9)	.712	2.2 (0.7–7.0)	.206
I don't like to exercise	1.7 (1.0–3.1)	.059	1.4 (0.7–2.9)	.310	**3.1 (1.0–9.2)**	**.047**
I need someone to exercise with but don't have one	**2.7 (1.5–4.9)**	**.001**	2.0 (0.9–4.2)	.073	**4.8 (1.6–14.2)**	**.004**
I don't know what exercises to perform	**1.9 (1.0–3.4)**	**.038**	**2.1 (1.0–4.2)**	**.049**	1.5 (0.5–4.8)	.454
Feels somewhat/very sure that he/she . . . (ref = not at all sure/not very sure)						
Knows what exercises are healthy	**2.6 (1.3–5.1)**	**.006**	**2.3 (1.0–5.4)**	**.050**	**3.3 (1.0–10.4)**	**.044**
Will be able to exercise for at least 30 min five times each week in the future	**1.9 (1.0–3.6)**	**.044**	1.8 (0.8–3.8)	.142	2.2 (0.7–7.6)	.197
Physical activity engagement scale (almost always/always, ref = almost never/sometimes)						
Suggests doing something active when getting together with family members	1.6 (0.9–2.6)	.102	1.2 (0.6–2.4)	.589	2.5 (1.0–6.1)	.054
Sets aside a special time to do physical activity	**4.5 (2.6–8.0)**	**<.001**	**3.7 (1.8–7.8)**	**.001**	**8.2 (3.0–22.5)**	**<.001**
Asks a friend or relative to do some physical activity with him/her	1.4 (0.8–2.5)	.236	1.0 (0.4–2.0)	.895	2.6 (1.0–6.8)	.052
Talks to others about the benefits of physical activity	1.4 (0.8–2.3)	.211	1.0 (0.5–2.0)	.981	**2.5 (1.0–5.8)**	**.041**
Nutrition						
Fruits ≥ 1 time per day	1.5 (0.9–2.6)	.065	1.5 (0.8–2.9)	.184	1.5 (0.6–3.5)	.346
Vegetables ≥ 1 time per day	**2.0 (1.2–3.4)**	**.007**	**2.1 (1.1–4.1)**	**.024**	2.1 (0.9–4.7)	.094

Note. Boldfaced values signify statistical significance with a $p < .05$. BMI = body mass index; BP = blood pressure; CI = confidence interval; OR = odds ratio; ref = reference. [a]Adjusted for sex, age group, years lived in United States, marital status, health insurance, and BMI. [b]Adjusted for sex, years lived in United States, marital status, health insurance, and BMI.

Conversely, our finding that men were more likely to achieve sufficient levels of PA compared to women is consistent with the literature (Bird et al., 2009; Cantu & Fleuriet, 2008). Women typically report greater barriers that take priority over physical fitness, such as household and caregiving responsibilities (Cantu & Fleuriet, 2008). Moreover, exercise is often conceptualized by immigrant and minority groups as being deliberate; thus, house cleaning and other forms of nonsedentary activity may not be viewed as PA (Bird et al., 2009), and therefore may not have been fully captured in this study. This suggests that PA interventions should be incorporated into daily routines as opposed to formal practices that are undertaken outside the home. Future research should investigate how racial and ethnic groups define PA.

Having a safe location to exercise was significantly associated with PA among individuals 45 to 64 years of age. While adults may prefer to exercise and walk outdoors, determents to PA may include heavy traffic, inadequate lighting, and poor walking surfaces, which may be perceived as a threat to safety (Lee, Ory, Yoon, & Forjuoh, 2013). In addition, immigrant enclaves are likely to have reduced walkability and to be less conducive to exercise (Osypuk, Diez Roux, Hadley, & Kandula, 2009). Conversely, adults ≥50 years of age who perceive greater neighborhood safety have also been found to enjoy greater amounts of leisure-time PA (Tucker-Seeley, Subramanian, Li, & Sorensen, 2009). Interventions for older racial and ethnic minorities need to be designed with an understanding of their perceptions of safety, preferences, and behaviors regarding public parks and community-based recreational programs; this will inform how to better utilize existing infrastructures in urban settings, such as parks and recreational services, in order to increase opportunities for PA in this population. The majority of our sample resided in Flushing, Queens; the urban NYC location should be considered when designing interventions, as parks and recreational areas may not be easily accessible or available.

In our study, individuals who reported having someone to exercise with were much more likely to meet PA requirements, particularly among adults 65 to 75 years of age. This underscores the importance of the social environment for being physically active in this population, a concept that may be embedded in Korean culture (Lim et al., 2007). Thus, including social support and engagement in the form of group-based activities or providing a buddy-system model may be more effective intervention for this population. PA self-efficacy, including knowledge of exercise, was also strongly correlated with PA in both age groups; this emphasizes the need for targeted PA education among older Koreans, such as educational campaigns to raise awareness of PA and specific exercises. Finally, social interaction measures such as setting aside time for PA and nutrition measures such as eating vegetables were also associated with sufficient PA in our adjusted models. These behaviors are likely proxies for healthier lifestyles and behaviors overall, and should be further studied.

Some of our study findings run counter to existing literature on PA among Asian Americans, as well as among other immigrant populations in the United States. This indicates that U.S. immigrants tend to have healthier behaviors, but the longer they reside in the United States, the more unhealthy lifestyles are adopted (August & Sorkin, 2010). Level of acculturation based on English-language proficiency was not associated with PA in our sample. Additionally, years lived in the United States was not associated with sufficient PA in adjusted analyses, regardless of age group. Further study is needed to better explore how acculturation may or may not affect PA levels of older Korean Americans, which may include alternate ways of measuring acculturation in this specific population.

It is important to note several study limitations. First, this community-based sample may not allow for generalizability of the study findings. Furthermore, the findings based on our age stratification do not suggest how Korean ethnicity itself may play a role in PA. Future studies comparing Korean Americans to other ethnic groups, such as Hispanics, Non-Hispanic Whites, and other Asian populations, are needed to further explain the role of culture and ethnicity. Second, PA relies on patient self-report, which may have recall and social-desirability biases. Third, there is a lack of information regarding comorbidities and physical and cognitive function for this population. Physical limitations, such as mobility, may impact the effectiveness of PA for older adults at risk for DM; along with comorbidities, they must be considered when designing PA interventions for older adults. More studies are needed among older Korean American populations to further understand the prevalence and impact of comorbidities on physical and cognitive function and their effect on DM risk.

Conclusions

Our study identifies important correlates of PA among a sample of middle-aged and older Korean Americans at risk for DM living in an urban environment, including sex, age, physical and social environment, motivation, and self-efficacy. This serves as a foundation for future prospective and interventional studies that can better characterize the facilitators and barriers of performing recommended sufficient PA for this population, particularly for those at risk for DM.

Acknowledgments

This publication was made possible by Grant 1U48DP001904-01 (Centers for Disease Control and Prevention), Grants P60 MD000538 and R24MD001691 (National Institutes of Health National Institute for Minority Health and Health Disparities), Grant U58 DP001022 (Centers for Disease Control and Prevention REACH U.S. Program), and Grant UL1 TR000038 (National Center for Advancing Translational Sciences).

Clinical Resources

- Centers for Disease Control and Prevention. How much physical activity do older adults need? http://www.cdc.gov/physicalactivity/basics/older_adults/index.htm
- Centers for Disease Control and Prevention. Minority health Asian American populations. http://www.cdc.gov/minorityhealth/populations/REMP/asian.html
- World Health Organization. Physical activity and older adults. http://www.who.int/dietphysicalactivity/factsheet_olderadults/en/

References

American Diabetes Association. (2012). *American Diabetes Association unveils new diabetes risk test*. Retrieved from http://www.diabetes.org/for-media/2012/american-diabetes-association-new-risk-test.html

American Diabetes Association. (2014). Standards of medical care in diabetes—2015: Summary of revisions. *Diabetes Care*, *38*(Suppl. 1), S1–S93.

August, K., & Sorkin, D. (2010). Racial/ethnic disparities in exercise and dietary behaviors of middle-aged and older adults. *Journal of General Internal Medicine*, *26*(3), 245–250. doi:10.1007/s11606-010-1514-7

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents*. Greenwich, CT: Information Age Publishing.

Bird, S., Radermacher, H., Feldman, S., Sims, J., Kurowski, W., Browning, C., & Thomas, S. (2009). Factors influencing the physical activity levels of older people from culturally diverse communities: An Australian experience. *Ageing and Society*, *29*(Suppl. 8), 1275–1294. doi:10.1017/S0144686X09008617

Cantu, A. G., & Fleuriet, K. J. (2008). The sociocultural context of physical activity in older Mexican American women. *Hispanic Health Care International*, *6*(1), 27–40. doi:10.1891/1540-4153.6.1.27

Centers for Disease Control and Prevention. (2011a). *Behavioral risk factor surveillance*. Retrieved from http://www.cdc.gov/brfss/questionnaires/english.htm

Centers for Disease Control and Prevention. (2011b). *National diabetes fact sheet: National estimates and general information on diabetes and prediabetes in the United States*. Retrieved from http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf

Centers for Disease Control and Prevention. (2013). Adult participation in aerobic and muscle-strengthening physical activities—United States, 2011. *Morbidity & Mortality Weekly Report*, *62*(17), 326–330.

Chalé-Rush, A., Guralnik, J., Walkup, M., Miller, M., Rejeski, W., Katula, J., . . . Fielding, R. (2010). Relationship between physical functioning and physical activity in the Lifestyle Interventions and Independence for Elders pilot. *Journal of the American Geriatrics Society*, *58*(10), 1918–1924. doi:10.1111/j.1532-5415.2010.03008.x

Chow, E., Foster, H., Gonzalez, V., & Mciver, L. (2012). The disparate impact of diabetes on racial/ethnic minority populations. *Clinical Diabetes*, *30*, 130–133. doi:10.2337/diaclin.30.3.130

Diabetes Prevention Program Research Group. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or Metformin. *New England Journal of Medicine*, *346*, 393–403. doi:10.1056/NEJMoa012512

Islam, N., Wyatt, L., Kapadia, S., Rey, M., Trinh-Shevrin, C., & Kwon, S. (2012). Diabetes and associated risk factors among Asian American subgroups in New York City. *Diabetes Care*, *36*(1), e5–e5. doi:10.2337/dc12-1252

Islam, N., Zanowiak, J., Wyatt, L., Chun, K., Lee, L., Kwon, S., & Trinh-Shevrin, C. (2013). A randomized-controlled, pilot intervention on diabetes prevention and healthy lifestyles in the New York City Korean community. *Journal of Community Health*, *38*(6), 1030–1041. doi:10.1007/s10900-013-9711-z

Kim, M. (2005). Health disparities in lifestyle choices among hypertensive Korean Americans, non-Hispanic Whites, and Blacks. *Biological Research for Nursing*, 7(1), 67–74. doi:10.1177/1099800405276820

King, G., Mcneely, M., Thorpe, L., Mau, M., Ko, J., Liu, L., . . . Chow, E. (2012). Understanding and addressing unique needs of diabetes in Asian Americans, Native Hawaiians, and Pacific Islanders. *Diabetes Care*, *35*(5), 1181–1188. doi:10.2337/dc12-0210

Kirkman, M., Briscoe, V., Clark, N., Florez, H., Haas, L., Halter, J., . . . Swift, C. (2012). Diabetes in older adults: A consensus report. *Journal of the American Geriatrics Society*, *60*(12), 2342–2356. doi:10.1111/jgs.12035

Ku, P., Stevinson, C., & Chen, L. (2012). Prospective associations between leisure-time physical activity and cognitive performance among older adults across an 11-Year period. *Journal of Epidemiology*, *22*(3), 230–237. doi:10.2188/jea.JE20110084

Lee, C., Ory, M. G., Yoon, J., & Forjuoh, S. N. (2013). Neighborhood walking among overweight and obese adults: Age variations in barriers and motivators. *Journal of Community Health*, *38*(1), 12–22. doi:10.1007/s10900-012-9592-6

Lee, L., Nguyen, H., & Tsui, J. (2011). Interview language: A proxy measure for acculturation among Asian Americans in a population-based survey. *Journal of Immigrant and Minority Health*, *13*(2), 244–252. doi:10.1007/s10903-009-9278-z

Lim, K., Kayser-Jones, J., Waters, C., & Yoo, G. (2007). Aging, health, and physical activity in Korean Americans. *Geriatric Nursing*, *28*(2), 112–119. doi:10.1016/j.gerinurs.2006.10.004

Mcdermott, M., Greenland, P., Ferrucci, L., Criqui, M., Liu, K., Sharma, L., . . . Guralnik, J. (2002). Lower extremity performance is associated with daily life physical activity in individuals with and without peripheral arterial disease. *Journal of the American Geriatrics Society*, *50*, 247–255. doi:10.1046/j.1532-5415.2002.50055.x

Mcneely, M., & Boyko, E. (2003). Type 2 diabetes prevalence in Asian Americans: Results of a national health survey. *Diabetes Care*, *27*(1), 66–69. doi:10.2337/diacare.27.1.66

National Research Council. (2004). *Critical perspectives on racial and ethnic differences in health in late life*. Washington, DC: National Academies Press.

New York City Department of Health and Mental Hygiene. (2012). *Epiquery: NYC interactive health data system—Community health survey*. Retrieved from http://nyc.gov/health/epiquery

Nothwehr, F., Dennis, L., & Wu, H. (2007). Measurement of behavioral objectives for weight management. *Health Education & Behavior*, *34*(5), 793–809. doi:10.1177/1090198106288559

Osypuk, T. L., Diez Roux, A. V., Hadley, C., & Kandula, N. R. (2009). Are immigrant enclaves healthy places to live? The Multi-Ethnic Study of Atherosclerosis. *Social Science and Medicine*, *69*(1), 110–120. doi:10.1016/j.socscimed.2009.04.010

Pew Research Center. (2012). *The rise of Asian Americans*. Retrieved from http://www.pewsocialtrends.org/2012/06/19/the-rise-of-asian-americans/

Rejeski, W., Brubaker, P., Goff, D., Bearon, L., Mcclelland, J., Perri, M., & Ambrosius, W. (2011). Translating weight loss and physical activity programs into the community to preserve mobility in older, obese adults in poor cardiovascular health. *Archives of Internal Medicine*, *171*(10), 989–990. doi: 10.1001/archinternmed.2010.522

Sechrist, K. R., Walker, S. N., & Pender, N. J. (1987). Development and psychometric evaluation of the exercise benefits/barriers scale. *Research in Nursing Health*, *10*, 357–365.

Sentell, T., & Braun, K. (2012). Low health literacy, limited English proficiency, and health status in Asians, Latinos, and other racial/ethnic groups in California. *Journal of Health Communication*, *17*(Suppl. 3), 82–99. doi:10.1080/10810730.2012.712621

Tucker-Seeley, R. D., Subramanian, S. V., Li, Y., & Sorensen, G. (2009). Neighborhood safety, socioeconomic status, and physical activity in older adults. *American Journal of Preventive Medicine*, *37*(3), 207–213.

U.S. Census Bureau. (2011). *American Community Survey*. Retrieved from http://www.census.gov/acs/www/methodology/questionnaire_archive

U.S. Department of Health and Human Services. (2008). *Physical activity guidelines for Americans*. Retrieved from http://www.health.gov/paguidelines/pdf/paguide.pdf

Yi, S., Kwon, S., Wyatt, L., Islam, N., & Trinh-Shevrin, C. (2015). Weighing in on the hidden Asian American obesity epidemic. *Preventive Medicine*, *73*, 6–9. doi:10.1016/j.ypmed.2015.01.007

JOURNAL OF NURSING SCHOLARSHIP

CLINICAL SCHOLARSHIP

Xerostomia Among Older Adults With Low Income: Nuisance or Warning?

Young-Shin Lee, PhD, RN[1], Hee-Gerl Kim, PhD, RN[2], & Kim Moreno, PhD, RN[3]

1 Associate Professor, School of Nursing, San Diego State University, San Diego, CA, USA
2 Professor, School of Nursing, Gachon University, Seongnam-Si, Korea
3 Instructor, School of Nursing, San Diego State University, San Diego, CA, USA

Key words
Chronic disease, elderly, oral conditions, oral function, xerostomia

Correspondence
Dr. Hee-Gerl Kim, School of Nursing, Gachon University, 1342 SeongnamDaero, Seongnam-Si, Gyeonggi-Do, Korea, 461–701.
E-mail: hgkim@gachon.ac.kr

Accepted: October 29, 2015

doi: 10.1111/jnu.12185

Abstract

Purpose: The purpose of this study was to identify the prevalence of xerostomia and related factors among low-income older adults in South Korea.
Study Design: A cross-sectional, population-based study.
Methods: Using data from the Home Healthcare Service Project, a population-based interview survey with home healthcare service, a total of 9,840 adults 65 years of age and older were assessed for the presence of xerostomia in association with aspects of health lifestyles, chronic disease, oral conditions, and oral function.
Results: Overall, 40% of participants reported experiencing xerostomia. Multivariate regression analysis indicated xerostomia was more likely to be reported by women having symptoms of gingival bleeding/pain, having difficulty swallowing liquid or chewing solid food, and having multiple chronic diseases. Interestingly, older adults who live alone and drink alcohol (two or more times per week) reported fewer problems with xerostomia.
Conclusions: Increased focus on the detrimental health consequences of xerostomia would make treatment a higher priority. Improved assessment of at-risk populations, particularly among the elderly, could lead to earlier preventative interventions, lessening the negative impact on quality of life.
Clinical Relevance: Health professionals along with the general public need increased knowledge about the detrimental effects of xerostomia on overall health. There is a need for earlier assessment and treatment to facilitate optimal health promotion and disease prevention.

Xerostomia (dry mouth) is a commonly reported symptom among older adults even though it is not viewed as a natural part of the aging process (National Institute of Dental and Craniofacial Research, 2014). Xerostomia occurs when inconsistent amounts of saliva are produced or the total amount produced is not sufficient to keep the mouth wet (van Eijk, van Campen, van der Jagt, Beijnen, & Tulner, 2013). There are many studies identifying factors influencing xerostomia. These factors include people over 50 years of age, women, side effects of medications from hypertension or depression, Sjögren's syndrome (a chronic autoimmune disease), HIV/AIDS, and having fewer remaining teeth (Enoki et al., 2014; Gonsalves, Wrightson, & Henry, 2008; Samnieng et al., 2012; Villa et al., 2011). Studies indicate that xerostomia leads to impaired oral function with regard to chewing solid food, swallowing both liquids and solid food, speaking, and/or tasting (Huang et al., 2015; Napenas & Rouleau, 2014). These problems may result in systemic problems, including loss of appetite, poor nutrition, impaired interpersonal communication and social interactions, or depression. Any of these factors may result in lower quality of life for older adults (Enoki et al., 2014; Flink, Bergdahl, Tegelberg, Rosenblad, & Lagerlof, 2008; Foltyn, 2015; Gerdin, Einarson, Jonsson, Aronsson, & Johansson, 2005; Samnieng et al., 2012).

Journal of Nursing Scholarship, 2016; 48:1, 58–65.

Although xerostomia among older adults is recognized as a common problem with predictable precursors, the epidemiology of the problem among older adults has not been sufficiently studied (Folke, Fridlund, & Paulsson, 2008; Turner & Ship, 2007). An examination of several studies shows the prevalence ranging widely from 14.5% to 47%, with the literature regarding prevalence of xerostomia among older people remaining meager. One literature review of the epidemiology of oral health conditions indicated the presence of xerostomia in 20% of older people (Thomson, 2005). A study of Japanese older adults ($N = 894$) showed a prevalence of xerostomia of 34.8% (Ohara et al., 2013). In another study, using data from telephone interviews in Korea, 25.8% of older adults reported xerostomia (So, Chung, Kho, Kim, & Chung, 2010). A study of older adults in Thailand ($N = 612$) indicated a prevalence of 14.4% (Samnieng et al., 2012). The scale of these studies needs to be expanded to a population-based study for better understanding of the phenomena.

The objective of this study was to identify the prevalence of xerostomia and related health and oral conditions among low-income older adults living independently in the community. To reach this goal, the specific aims included (a) identifying the prevalence of xerostomia and characteristics of participants' demographics, health conditions (chronic conditions, smoking, and alcohol use), oral conditions (number of teeth, gingival pain or bleeding, and dentures), and oral functions (chewing, swallowing, and developed difficulty in chewing over the past 6 months); and (b) evaluating the association of xerostomia with related risk factors (health status, oral conditions, and oral function).

Methods

Design and Sample

This analytical observation study involved a secondary analysis of data from the Home Healthcare Service Project (HHCSP) 2012–2013, a population-based, prospective, repeated measures and care service, which included face-to-face interviews, blood pressure and body weight measurement, and laboratory tests. The HHCSP was developed to identify and improve the health status of this underserved population and managed by support from each local government as a part of a national project. The data were collected through interviews at participants' homes during two consecutive years between January 2012 and December 2013, and included two separate cohorts of the project. All the processes (interviews, care services, and data entry) were performed by registered nurses (RNs). The target population of the HHCSP included adults 19 years of age and older who had an annual income that was below 120% of the national poverty level in Korea, or who were paying the lowest possible premium for health insurance. As the premium charged for the universal healthcare plan offered to most residents in Korea is based on a proportion of individual annual income rather than a fixed premium, it is presumed to be a measure of lower income.

For the current study, the data were obtained from the Korea Health & Welfare Information Service after approval of the institutional review board of the university where researchers were affiliated and led the HHCSP in the city. The data included self-reported information (demographic information, health condition and behavior, and oral condition and function) and number of teeth. Ten percent of total residents in the suburban area were older, which was lower than the national proportion of 12.2% in 2013 (Statistics of Korea, 2015; Sungnam City, 2015). The current study included adults 65 years of age and older, which was 11.3% of the total older residents in one suburb near the capital of Seoul, Republic of Korea, and used data from the initial interview obtained when participants first joined the project. From a total of 11,493 registered adults 65 years of age and older, 9,840 older adults were selected. Participants who omitted or refused to answer the item asking about xerostomia were excluded.

Measures

Variables measured in the study included xerostomia as the dependent variable and health lifestyles, chronic health conditions, oral conditions, and oral function as the independent variables. Xerostomia was defined by a self-reported response (yes or no) to the question "Do you feel dry mouth which frequently bothers you?" Age was categorized into three groups: young-old (65–74 years), old (75–84 years), and old-old (85+ years). Living status among older adults was classified into "living alone" versus "living with others." The priorities of the project were categorized in the following manner: (a) those with low income and health problems and (b) those with health problems only. Care levels were divided into two groups: (a) intensive/regular care (6–10 RN visits per 2–3 months/more than once) and (b) self-care support/newly joined group (at least once per month). Smoking was categorized as currently smoking or nonsmoking. Alcohol drinking frequency was evaluated as (a) none to once a week or (b) two or more times a week. Chronic health status was assessed to determine "if the individual had hypertension, diabetes, stroke, arthritis, urinary incontinence, cancer, cardiac disease, and chronic pulmonary disease." The present health problems were summarized and categorized into two groups: (a) zero to two and (b) three or more chronic conditions.

Oral conditions were grouped into the following four conditions: gum bleeding or pain, having dentures, poor fit of dentures, and number of teeth. Each oral condition was dichotomized into yes or no by the following questions: (a) "Have you had any pain or bleeding in your mouth during the past year?" and (b) "Do you use dentures?" The number of teeth were counted by RNs and categorized into three divisions: (a) ≥20; (b) 10 to 19; and (c) <10 or no teeth at all. Oral function was assessed with three questions: (a) "Do you have any discomfort in your teeth, gum, or dentures while chewing food?" Responses were chosen from a 5-point Likert scale from significant discomfort to no discomfort and then categorized into two responses: uncomfortable versus average/comfortable. (b) "Do you have any difficulty in swallowing liquid food or beverages?" The response choices were "yes" or "no." (c) "Have you developed difficulty in chewing food over the past 6 months?" The responses were "yes" or "no."

Analysis

The data from two cohorts were merged into one data set, and all the data were reviewed, cleaned, and analyzed by using SPSS (PC version 22; SPSS Inc., Chicago, IL, USA). A descriptive analysis of all variables was executed and then bivariate analysis with a chi-square value was applied to compare the presence of xerostomia with each independent variable. In addition, multivariate logistic regression was applied to identify the association of presence of xerostomia with the variables of demographics (age, gender, priority of project, classification of project, living status), health conditions and behavior (smoking, alcohol use, number of chronic diseases), oral conditions (gum bleeding or pain, having dentures, and number of teeth), and oral function (chewing, having difficulty eating solid food, or swallowing liquids). Odds ratios (ORs) with a 95% confidence interval (CI) were yielded. All statistical significance was set at a value of .05.

Results

Participant Demographics

The characteristics of 9,840 participants are presented in **Table 1** 75% were women; 10% were in the old-old group (85+ years); 56.7% lived alone; 82% belonged to the low income and multiple illness group; 70% were categorized as requiring regular or frequent home care; 90.6% were currently not smoking; 94.1% were drinking alcohol less than once per week; and 58% suffered from three or more chronic diseases.

Oral Health Status and Xerostomia

Of the total participants, 29% experienced gum bleeding or pain during the past year; 48% had dentures and 43% of them complained of a poor fit of their dentures; and 40% had fewer than 10 teeth (see **Table 1**). Regarding oral function, 76% reported discomfort chewing due to dental or periodontal problems; 26% reported difficulty eating or chewing solid foods when compared to the previous 6 months; and 16% experienced difficulty in swallowing liquids.

Of the total participants, 40% reported experiencing xerostomia. Findings comparing the prevalence of xerostomia by the demographics, health conditions, oral conditions, and oral function are supplied in **Table 1**. Women reported a significantly higher prevalence of xerostomia (43% vs. 32%, $\chi^2 = 98.2$, $p < .001$); the old-old group (85+ years) had more symptoms than the young-old group (47% vs. 36%, $\chi^2 = 53.3$, $p < .001$); and the groups with low income and health problems had significantly higher levels of xerostomia (42% vs. 32%, $\chi^2 = 61.8$, $p < .001$). Regular or intense care groups had a higher prevalence of xerostomia than did the supportive care group (44% vs. 32%, $\chi^2 = 113.2$, $p < .001$). However, living status (alone or with others) was not significantly different in the presence of the symptom ($\chi^2 = .18$, $p = .673$). Among lifestyles, smokers and nonsmokers did not show any difference in the prevalence of xerostomia, while frequent alcohol drinkers (two or more per week) reported fewer symptoms of dry mouth than did less frequent drinkers (none or one per week; 29% vs. 41%, $\chi^2 = 34.4$, $p < .001$). The group with three or more chronic diseases had a higher prevalence of xerostomia than did those with two or fewer chronic diseases (46% vs. 32%, $\chi^2 = 187.7$, $p < .001$).

Regarding oral conditions, older adults experiencing bleeding gums or pain, having dentures, having poor fit of dentures, and having fewer teeth were found to have significantly higher rates of xerostomia than their counterparts ($p < .001$). With regard to oral function, those who had discomfort chewing due to dental or periodontal problems, decreasing chewing function compared to 6 months previously, and difficulty swallowing liquids had significantly higher rates of xerostomia (see **Table 1**).

Table 1. Demographic Characteristics of Participants and Prevalence of Xerostomia ($N = 9{,}840$)

	n (%)	Xerostomia, *n* (%)	χ2	*p*
Total sample	9,840 (100)	3,943 (40.1)		
Demographics				
Gender				
Men	2,438 (24.8)	769 (31.5)	98.17	.000*
Women	7,402 (75.2)	3,174 (42.9)		
Age (years)				
65–74	4,341 (44.1)	1,574 (36.3)	53.32	.000*
75–84	4,553 (46.3)	1,927 (42.3)		
≥85	946 (9.6)	442 (46.7)		
Living status				
Alone	4,262 (43.3)	1,718 (40.3)	.18	.673
With others	5,578 (56.7)	2,225 (39.9)		
Priority of the project				
Low income & health problems	8,105 (82.4)	3,394 (41.9)	61.81	.000*
Health problems	1,733 (17.6)	549 (31.7)		
Care level				
Intensive/regular visit	6,946 (70.6)	3,019 (43.5)	113.20	.000*
Supportive visit	2,894 (29.4)	924 (31.9)		
Health conditions and behavior				
Currently smoking				
Yes	922 (9.4)	355 (38.5)	1.04	.307
No	8,918 (90.6)	3,588 (40.2)		
Alcohol drinking				
0–1/wk	9,258 (94.1)	3,777 (40.8)	34.36	.000*
≥2/wk	582 (5.9)	166 (28.5)		
No. of chronic diseases				
0–2	4,155 (42.2)	1,336 (32.2)	187.72	.000*
≥3	5,685 (57.8)	2,607 (45.9)		
Oral condition				
Gum bleeding or pain				
Yes	2,756 (28.5)	1,299 (47.1)	80.22	.000*
No	6,929 (71.5)	2,581 (37.2)		
Having dentures				
Yes	4,725 (48.0)	2,044 (43.3)	38.47	.000*
No	5,115 (52.0)	1,899 (37.1)		
Poor fit of dentures				
Yes	2,047 (43.3)	1,038 (50.7)	81.65	.000*
No	2,678 (56.7)	1,006 (37.6)		
Number of teeth				
≥20	2,742 (27.9)	868 (31.7)		
10–19	3,137 (31.9)	1,312 (41.8)	117.36	.000*
<10	3,961 (40.3)	1,763 (44.5)		
Oral function				
Discomfort in chewing				
Uncomfortable	7,381 (76.3)	3,116 (42.2)	63.29	.000*
Comfortable	2,292 (23.7)	754 (32.9)		
Difficulty in swallowing liquids				
No	8,268 (84.1)	2,768 (33.5)	942.66	.000*
Yes	1,558 (15.9)	1,169 (75.0)		
Developed difficulty in chewing over the past 6 months				
No	7,245 (73.7)	2,383 (32.9)	588.91	.000*
Yes	2,588 (26.3)	1,556 (60.1)		

*$p < .001$.

Xerostomia and Related Risk Factors

Multivariate logistic regression analysis was applied to identify the risk factors of xerostomia. Among demographic information variables, older women (OR = 1.42, *p* < .001, 95% CI [1.26, 1.60]), members in the high-priority project (OR = 1.33, *p* < .001, 95% CI [1.17, 1.50]), and those in the intensive and regular care groups (OR = 1.34, *p* < .001, 95% CI [1.21, 1.49]) were more likely to have xerostomia (**Table 2**). On the other hand, older adults living alone were less likely to have xerostomia (OR = 0.85, *p* = .001, 95% CI [0.78, 0.93]).

Among lifestyle differences, frequent alcohol drinkers were less likely to have xerostomia (OR = 0.75, *p* = .004, 95% CI [0.60, 0.92]), while the smoking group was not significantly different from the nonsmoking group in the prevalence of xerostomia (OR = 1.13, *p* = .148, 95% CI [0.96, 1.32]). Older adults with more chronic disease were more likely to suffer from xerostomia than those with fewer chronic diseases (OR = 1.48, *p* < .001, 95% CI [1.35, 1.62]).

Regarding oral conditions, older adults who had experienced gum bleeding or pain (OR = 1.20, *p* < .001, 95% CI [1.09, 1.33]) and had 10 to 19 teeth were more likely to have xerostomia (OR = 1.22, p = 0.001, 95% CI [1.08, 1.38]). The xerostomia status of those with dentures was not significantly different from the status of those without dentures (OR = 1.10, *p* = 0.102, 95% CI [0.98, 1.24]). Regarding oral function, those who had developed difficulty in chewing solid food over the past 6 month (OR = 2.21, *p* < 0.001, 95% CI [2.00, 2.45]) or swallowing liquids (OR = 4.69, *p* < 0.001, 95% CI [4.12, 5.35]) were more likely to have xerostomia. However, there was no difference in the prevalence of xerostomia between older adults with or without oral discomfort in chewing food (OR = 1.10 vs. 1.0, *p* = 0.108, 95% CI [0.98, 1.23]), respectively. The study model including demographics, lifestyles, chronic health conditions, oral conditions, and oral function explained the symptoms of xerostomia with an accuracy of 69.5%.

Discussion

The current study was a population-based study that included 11.3% of the total older adults in a suburban area close to the capital. The participants included more women than men, those with health problems and financial deficits, and those with multiple chronic diseases. Additionally, more than half of older adults lived with family or others. Most participants, in fact, had healthy lifestyles, without smoking or frequent alcohol use.

Most significantly, in this study the prevalence of xerostomia (40.1%) was substantially higher than that in previous reports (Ohara et al., 2013; Samnieng et al., 2012; So et al., 2010). Previous reports showed xerostomia prevalence rates of 34.8% for adults (*N* = 894) 75 to 84 years of age in Japan (Ohara et al., 2013), 14.4% for older adults in Thailand (Samnieng et al., 2012), and 25.8% for older adults in Korea (So et al., 2010). A particular consideration may be that previous studies have not looked at economic status in association with xerostomia. And the higher prevalence of xerostomia in this study may have, in fact, resulted from the low incomes of the targeted participants from which the original study was drawn. Further studies are needed to clarify these findings. Commonly reported factors contributing to xerostomia among older adults also include systemic chronic disease, the side effects of medications related to chronic illnesses, and medical treatments such as radiation (Flink et al., 2008; Gonsalves et al., 2008; Samnieng et al., 2012; Turner & Ship, 2007; Villa et al., 2011). Increased knowledge and appreciation about how the production of saliva impacts the ability to swallow, chew, talk, and maintain healthy dentition is needed by both professionals and the public. This may aid understanding of how xerostomia effects physical comfort, nutritional intake and status, social interactions and subsequent relationships, and overall physical comfort and quality of life.

Xerostomia is a frequently preventable and always treatable condition that needs to be a higher priority in health assessment. With the increase in the aging population and the pervasiveness of chronic health conditions, the incidence of xerostomia can be expected to rise. Additionally, professional and public education about the risk factors and gradual onset and value of early identification will increase awareness of the need for improved assessment and regular checkups to maintain optimal oropharyngeal health (Gupta, Epstein, & Sroussi, 2006).

Multivariate analysis findings explain variations of the prevalence of xerostomia by demographic information, health behaviors, oral conditions, and oral functions. The biggest predicted ORs of xerostomia were 4.7 times higher in those with difficulty swallowing liquids than in their counterparts, and 2.2 times higher in those with difficulty chewing solid food in the previous 6 months. The findings imply that xerostomia is not just a comfort issue but more a functional issue. Strategies for early detection through improved assessment and treatment of xerostomia should be developed and implemented throughout the healthcare system, not only in dental care. Most variables were significantly different in subgroups of demographics, health status, and oral conditions, but the range of ORs showed small differences of 1.2 to 1.5 times. Women, who were a high priority in the project, and those with multiple chronic health conditions reported significantly more xerostomia,

Table 2. Factors Associated With Xerostomia on Selected Predictors[a] ($N = 9{,}542$)

	Presence of xerostomia			
		95% CI		
	OR	LL	UL	Significance
Demographics				
Age (years)				
65–74	1.00			
75–84	1.07	.97	1.18	.165
≥85	1.08	.92	1.28	.342
Gender				
Men	1.00			
Women	1.42	1.26	1.60	.000**
Priority of project				
Health problem	1.00			
Low income and health problem	1.33	1.17 1	500	.000**
Classification of project				
Self-care and new patient gr.	1.00			
Intensive/regular care gr.	1.34	1.21	1.49	.000**
Living status				
With others	1.00			
Alone	.85	.78	.93	.001*
Health conditions and behavior				
Currently smoking				
Yes	1.00			
No	1.13	.96	1.32	.148
Alcohol drinking				
0–1/wk	1.00			
≥2/wk	.75	.60	.92	.006*
No. of chronic diseases				
0–2	1.00			
≥3	1.48	1.35	1.62	.000**
Oral condition				
Self-reported gum bleeding or pain				
None	1.00			
Present	1.20	1.09	1.33	.000**
Having (usage of) dentures				
No	1.00			
Yes	1.10	.98	1.24	.102
No. of teeth				
≥20	1.00			
10–19	1.22	1.08	1.38	.001*
<10 or None	1.12	.97	1.30	.134
Oral function				
Discomfort in chewing				
Average/comfortable	1.00			
Uncomfortable	1.10	.98	1.23	.108
Difficulty in swallowing liquids				
No	1.00			
Yes	4.69	4.12	5.35	.000**
Developed difficulty in chewing over the past 6 months				
No	1.00			
Yes	2.21	2.00	2.45	.000**
Model significance		$\chi 2(16) = 1{,}534.27$, $p < .001$		
Model accuracy rate (%)	69.5			

Note. CI = confidence interval; LL = lower level; OR = odds ratio; UL = upper level.

[a] Numbers in cells are ORs and 95% CIs for the partial associations between each factor and the symptoms of xerostomia.

*$p < .05$; **$p < .001$.

which is consistent with the literature (Flink et al., 2008; Samnieng et al., 2012; Villa et al., 2011).

Age was not significantly associated with xerostomia, which is inconsistent with the literature (Flink et al., 2008; Villa et al., 2011). Even in the old-old age group, smoking habits, using dentures, chewing difficulty, and having fewer than 10 teeth were not likely to be different between groups with and without xerostomia. In the previous studies, age was categorized at 50+ years or younger than 50 years, an age marker that may not be representative of age-related changes. The current study targeted people 65 years of age and older. Therefore, having an age cutoff of being older than 50 years may be too broad to determine age-related changes.

Surprisingly, this study found no differences among those with healthy lifestyles. Smoking behavior was not associated with xerostomia, also a finding that is inconsistent with the literature (Gupta et al., 2006; Samnieng et al., 2012). In the current study, the proportion of smokers was low at 9%, which, perhaps, was too low to show the differences compared to a high prevalence (40%) of xerostomia. In terms of results, those who used alcohol more than twice a week (5.9%) were less likely to have xerostomia, which is inconsistent with clinical guidelines of oral care (Gupta et al., 2006; Samnieng et al., 2012). This might be confounded by measurement issues, which included only current smokers and frequency of alcohol drinking but not history or intensity of use. Comparison studies specifically targeting the amount of drinking and tobacco consumed with more specificity might provide better insight.

In the chi-square test, poor oral conditions (bleeding gums or pain, fewer remaining teeth, having dentures, and poorly fitted dentures) were significantly prevalent in the presence of xerostomia. The findings that having fewer teeth or having dentures is significantly higher in the presence of xerostomia are supported by the literature, but the associations of bleeding gums and pain and poorly fitting dentures with xerostomia are not. The findings from the multivariate logistic regression did show a significant association but only between bleeding gums or pain and xerostomia, and teeth numbering 10 to 19, but not between teeth numbering less than 10 or having dentures.

As the consequences of xerostomia indicate clinically, the current population-based study supports the clinical knowledge that there is a positive association between xerostomia and problems such as difficulty in swallowing liquids and chewing solid foods. To help those who have decreased oral functions (chewing and swallowing) with xerostomia, meal menus using vegetables or specially cooked recipes need to be developed and applied in the lunch programs provided in the community.

The current study had the following limitations: Further information about tobacco use, quantity or type of alcohol use, specific medication use, or consequences of xerostomia could provide a better understanding of xerostomia among older adults. Future studies should also explore more of the social aspects pertaining to the participants who live alone to shed light on the disparate results.

Conclusions

This population-based epidemiological study provided evidence for the high prevalence of xerostomia among older adults with low income living in a suburban area. Overall, the problem of xerostomia was reported to be higher than in previous reports. Older women and those with multiple chronic health problems, gingival problems, fewer remaining teeth, and high priority in the project were more likely to report xerostomia. Furthermore, those with xerostomia were more likely to have difficulty swallowing liquids as well as eating solid food. With the increase in the aging population, healthcare providers as well as the public need increased awareness of the consequences of xerostomia on oral and systemic health. Increased awareness could make improved assessment and earlier treatment a higher priority. Focus on at-risk populations, particularly the elderly, would promote health, prevent disease, and lessen the negative impact on quality of life. Additional population-based, regional studies will enhance the understanding of xerostomia among older adults.

Acknowledgments

Gachon University supported part of this study.

Clinical Resources

- Centers for Disease Control and Prevention. Oral health for older Americans: http://www.cdc.gov/oralhealth/publications/factsheets/adult_oral_health/adult_older.htm
- National Institute of Dental and Craniofacial Research. Dry mouth (xerostomia): http://www.nidcr.nih.gov/OralHealth/Topics/DryMouth/

References

Enoki, K., Matsuda, K. I., Ikebe, K., Murai, S., Yoshida, M., Maeda, Y., & Thomson, W. M. (2014). Influence of xerostomia on oral health-related quality of life in the elderly: A 5-year longitudinal study. *Oral Surgery, Oral*

Medicine, Oral Pathology, Oral Radiology, and Endodontology, *117*(6), 716–721. doi:10.1016/j.oooo.2014.03.001

Flink, H., Bergdahl, M., Tegelberg, A., Rosenblad, A., & Lagerlof, F. (2008). Prevalence of hyposalivation in relation to general health, body mass index and remaining teeth in different age groups of adults. *Community Dentistry and Oral Epidemiology*, *36*(6), 523–531. doi:10.1111/j.1600-0528.2008.00432.x

Folke, S., Fridlund, B., & Paulsson, G. (2008). Views of xerostomia among health care professionals: A qualitative study. *Journal of Clinical Nursing*, *18*(6), 791–798. doi:710.1111/j.1365-2702.2008.02455.x

Foltyn, P. (2015). Ageing, dementia and oral health. *Australian Dental Journal*, *60*(Suppl. 1), 86–94. doi:10.1111/adj.12287

Gerdin, E. W., Einarson, S., Jonsson, M., Aronsson, K., & Johansson, I. (2005). Impact of dry mouth conditions on oral health-related quality of life in older people. *Gerodontology*, *22*(4), 219–226.

Gonsalves, W. C., Wrightson, A. S., & Henry, R. G. (2008). Common oral conditions in older persons. *American Family Physician*, *78*(7), 845–852.

Gupta, A., Epstein, J. B., & Sroussi, H. (2006). Hyposalivation in elderly patients. *Journal of the Canadian Dental Association*, *72*(9), 841–846.

Huang, Y. C., Chu, C. L., Ho, C. S., Lan, S. J., Chen, W. Y., Liang, Y. W., & Hsieh, Y. P. (2015). Factors affecting institutionalized older peoples' self-perceived dry mouth. *Quality of Life Research*, *24*(3), 685–691. doi:10.1007/s11136-014-0792-7

Napenas, J. J., & Rouleau, T. S. (2014). Oral complications of Sjögren's syndrome. *Oral & Maxillofacial Surgery Clinics of North America*, *26*(1), 55–62. doi:10.1016/j.coms.2013.09.004

National Institute of Dental and Craniofacial Research. (2014). *Dry mouth*. Retrieved from http://www.nidcr.nih.gov/OralHealth/OralHealthInformation/OlderAdults/#dryMouth

Ohara, Y., Hirano, H., Yoshida, H., Obuchi, S., Ihara, K., Fujiwara, Y., & Mataki, S. (2013). Prevalence and factors associated with xerostomia and hyposalivation among community-dwelling older people in Japan. *Gerodontology*. Advance online publication. doi:10.1111/ger.12101

Samnieng, P., Ueno, M., Shinada, K., Zaitsu, T., Wright, F. A., & Kawaguchi, Y. (2012). Association of hyposalivation with oral function, nutrition and oral health in community-dwelling elderly Thai. *Community Dental Health*, *29*(1), 117–123.

So, J. S., Chung, S. C., Kho, H. S., Kim, Y. K., & Chung, J. W. (2010). Dry mouth among the elderly in Korea: A survey of prevalence, severity, and associated factors. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *110*(4), 475–483. doi:10.1016/j.tripleo.2010.05.004

Statistics of Korea. (2015). *2013 statistics on the aged*. Retrieved from http://kostat.go.kr/portal/english/news/1/23/2/index.board?bmode=read&aSeq=309840&pageNo=&rowNum=10&amSeq=&sTarget=&sTxt=

Sungnam City. (2015). *Social welfare for seniors*. Retrieved from http://www.seongnam.go.kr/city/1000240/10142/contents.do

Thomson, W. M. (2005). Issues in the epidemiological investigation of dry mouth. *Gerodontology*, *22*(2), 65–76.

Turner, M. D., & Ship, J. A. (2007). Dry mouth and its effects on the oral health of elderly people. *Journal of the American Dental Association*, *138*(Suppl.), 15S–20S.

van Eijk, J., van Campen, J. P., van der Jagt, H., Beijnen, J. H., & Tulner, L. R. (2013). Prevalence of xerostomia and its relationship with underlying diseases, medication, and nutrition: A descriptive observational study. *Journal of the American Geriatric Society*, *61*(10), 1836–1837.

Villa, A., Polimeni, A., Strohmenger, L., Cicciu, D., Gherlone, E., & Abati, S. (2011). Dental patients' self-reports of xerostomia and associated risk factors. *Journal of the American Dental Association*, *142*(7), 811–816.

JOURNAL OF NURSING SCHOLARSHIP

HEALTH POLICY AND SYSTEMS

The Influence of Work-Related Fatigue, Work Conditions, and Personal Characteristics on Intent to Leave Among New Nurses

Yi Liu, PhD, RN[1], Li-Min Wu, PhD, RN[1], Pi-Ling Chou, PhD, RN[1], Mei-Hsin Chen, MSN, RN[2], Li-Chien Yang, MSN, RN[3], & Hsin-Tien Hsu, PhD, RN[4]

1 Assistant Professor, School of Nursing, Kaohsiung Medical University, Kaohsiung, Taiwan
2 Director, Department of Nursing, Kaohsiung Medical University Chung-Ho Memorial Hospital, Kaohsiung, Taiwan
3 Head Nurse, Department of Nursing, Chi-Mei Medical Center, Tainan, Taiwan
4 Associate Professor, School of Nursing, Kaohsiung Medical University, Kaohsiung, Taiwan

Key words
Intent to leave, new nurses, structural equation modeling work conditions, work-related fatigue

Correspondence
Dr. Hsin-Tien Hsu, Associate Professor, School of Nursing, Kaohsiung Medical University, No. 100, Shih-Chuan 1st Rd, Kaohsiung 80708, Taiwan. E-mail: hthsu@kmu.edu.tw

Accepted: October 13, 2015

doi: 10.1111/jnu.12181

Abstract

Purpose: This study aimed to (a) test the fit of the hypothesized model for new nurses' intent to leave and (b) determine the extent to which personal characteristics, work conditions, and work-related fatigue predict intent to leave among new nurses.

Design and Methods: This study was a cross-sectional survey study. A total of 162 new nurses were recruited. A hypothesized model was proposed for model testing. Structural equation modelling was used for data analysis.

Findings: Work conditions only had an effect through work-related fatigue on new nurses' intent to leave. Personal characteristics did not have a significant effect on new nurses' intent to leave. The final model showed a good fit. Work-related fatigue, work conditions, and health explained 65% of the variance in new nurses' intent to leave.

Conclusions: Work-related fatigue was a major determinant of new nurses' intent to leave. More attention should be paid to fatigue reduction strategies among new nurses.

Clinical Relevance: Work-related fatigue should be monitored, particularly for new nurses who work more than 10 hr per day and who have greater workloads.

New nurses account for approximately 10% of the nursing workforce in acute care settings (Berkow, Virkstis, Stewart, & Conway, 2009). However, the turnover rate among new nurses is 30% within the first year of practice, increasing to 57% by the second year (Mills & Mullins, 2008). A recent study reported that about 17.5% of new nurses resigned within the first year of work (Kovner, Brewer, Fatehi, & Jun, 2014). In Taiwan, the mean turnover rate has been reported at 15.8%, but this figure rises to 30.7% for new nurses (Chen & Lin, 2013). The average turnover cost per nurse ranges from US$20,561 to US$48,790 across countries (Duffield, Roche, Homer, Buchan, & Dimitrelis, 2014). Hence, the turnover issue of new nurses is vital for stable staffing and cost efficiency.

One of the major reasons for new nurses' resignation within their first year after being hired is work-related fatigue (MacKusick & Minick, 2010). According to Winwood, Winefield, Dawson, and Lushington (2005), work-related fatigue can be classified as acute fatigue, recovery from exhaustion, and chronic fatigue. Acute fatigue is transient and is a state of energy depletion resulting from work activity that in turn leads to an inability to engage in normal tasks in nonwork time. Chronic fatigue results from long-term maladaptation to work stress or activities (McEwen, 2003). Nursing work requires higher psychological and physical demands, and thus, nurses are thought to have higher needs for recovery (Eriksen, Ihlebak, Jansen, & Burdorf, 2006). Only employees with adequate recovery from work demands and exhaustion can maintain adaptive responses. Insufficient recovery from work fatigue is an indicator of performance breakdown, health problems, sick leaves, psychological distress, and decision to leave (Jansen, Kant, & van den Brandt, 2002; Tei-Tominaga, 2013). New nurses with less knowledge and skills might have more difficulties adapting to a heavy workload, thereby developing chronic fatigue. According to Tei-Tominaga (2013), cumulative fatigue, which can be considered as chronic fatigue, is a risk factor for new nurses' intent to leave (ITL). Few nursing studies have examined the effect of work-related fatigue on ITL. Most studies have instead focused on the effect of burnout on nurses' ITL. However, burnout is a construct related to chronic emotional exhaustion and is not synonymous with chronic work-related fatigue (Winwood et al., 2005).

In addition to fatigue, work conditions, including work overtime and workload, have an important effect on nurses' ITL (Brewer, Kovner, Greene, Shuser, & Djukic, 2012). According to Hayes et al. (2012), excessive workload might cause physical, emotional, and mental exhaustion, which in turn lead to nurses' ITL. However, evidence in the literature has been inconsistent on this matter. Some studies have demonstrated that high workload and work overtime increase nurses' intention to stay, as nurses might receive monetary compensation to satisfy their family needs (Mustapha, Ahmad, Uli, & Idris, 2010). Alternatively, it could present an opportunity for professional challenge (Mohamed & Mohamed, 2013). Accordingly, there is a need for further exploration.

Previous studies have demonstrated that nurses' ITL is also influenced by personal characteristics, including age, education, work experience, and health status (Hayes et al., 2012). Younger, more experienced, and less healthy nurses are more likely to leave (Brewer et al., 2012; Hayes et al., 2012). It has also been found that more experienced nurses have more opportunities, and greater ITL (Tschannen, Kalisch, & Lee, 2010). However, inconsistent findings have been found regarding the relationship between education and ITL (Hayes et al., 2012). Studies have shown that the relationship between education and ITL could be positive (Brewer, Kovner, Greene, & Cheng, 2009), negative (Borkowski, Amann, Song, & Weiss, 2007), or null (Chan, Luk, Leong, Yeung, & Van, 2009).

Furthermore, work-related fatigue might also be influenced by personal characteristics and work conditions. Studies have shown that younger and less experienced individuals with a higher workload tend to have higher work-related fatigue (Akerstedt, Fredlund, Gillberg, & Jansson, 2002; Fang, Kunaviktikul, Olson, Chontawan, & Kaewthummanukul, 2008). New nurses, who are younger and less experienced, might therefore have greater fatigue in comparison to experienced nurses. Work-related fatigue, personal characteristics, work conditions, and ITL may indeed form a complex relationship with mutual influences. Accordingly, a hypothesized model is presented in **Figure 1**. The model identifies direct relations among personal characteristics, work conditions, work-related fatigue, and ITL. Model testing is carried out to examine the complex relations.

Aims

This study aimed to (a) test the fit of the hypothesized model for new nurses' ITL and (b) determine the extent to which personal characteristics, work conditions, and work-related fatigue predict ITL among new nurses.

Methods

Design and Setting

This study adopted a cross-sectional design using questionnaire survey methodology. Participants were recruited from two medical centers and three regional hospitals in southern Taiwan.

Participants

Participants were recruited using a convenience sampling method. The inclusion criteria were new nurses who (a) had worked for more than 1 month but not for more than 12 months, (b) had graduated within the preceding 1 year, and (c) were clinical frontline nurses.

According to an a priori sample size calculation by Soper (2015), given 10 observed variables and three latent variables, with an anticipated effect size at .10, probability at .05, and power level of .80, the minimum sample size for the model structure was 156. In this study, a total of 200 new nurses were contacted, and 171 met the inclusion criteria. After the exclusion of outliers and cases with missing data, a total of 162 cases were included in the final data analysis.

Measures

In the hypothesized model, three latent variables (personal characteristics, work conditions, and work-related fatigue) and one measurable variable (ITL) were included. Additionally, some basic information regarding the background of new nurses was also collected, including sex, marital status, work unit, and type of hospital.

Personal characteristics. New nurses were asked to provide their age, educational level, work experience,

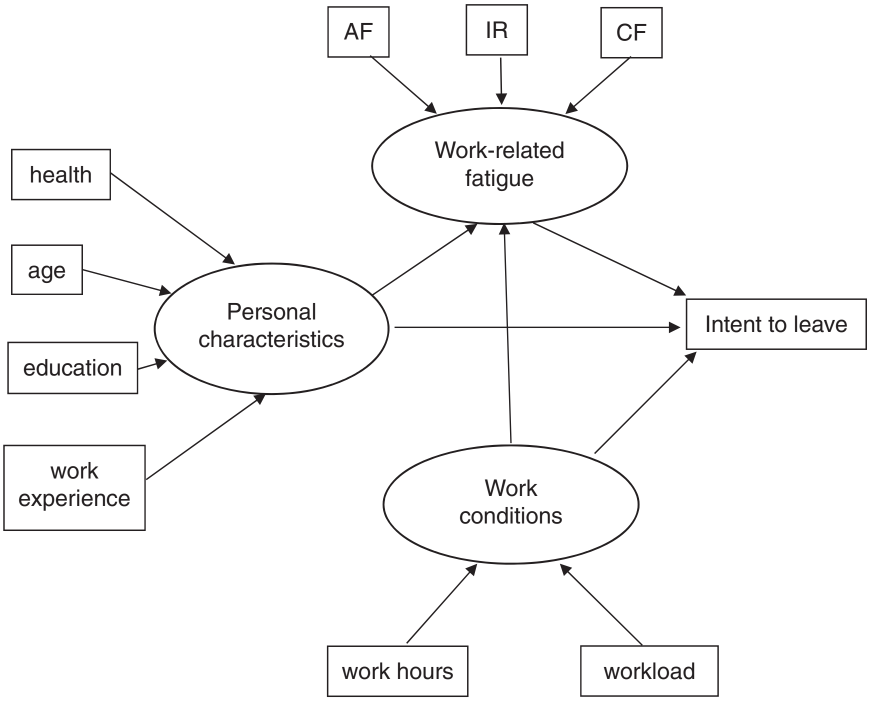

Figure 1. Conceptual framework of hypothesized model.
Note. AF = acute fatigue; IR = intershift recovery; CF = chronic fatigue; ⬭ = latent variable; ▭ = measured variable; → = unidirectional path.

and overall health status. Self-rated health status (SRHS) was measured using one item with a 5-point Likert scale, from 1 (*poor*) to 5 (*excellent*). This single-item measurement has good reliability and validity (DeSalvo et al., 2006) and has been widely used (Krause & Jay, 1994). The test-retest reliability was .92 (Lorig et al., 1996).

Work conditions. Work conditions included average working hours per working day in the past week and overall workload. The average working hours item was self-reported. Overall workload was measured using a 0–10 scale. Originally, the overall workload scale was measured on a 0–100 scale (Vidulich & Tsang, 1987) and was considered to be just as sensitive as the multidimensional scales (Hill et al., 1992). The test-retest reliability was 0.88 (Vidulich & Tsang, 1987). In this study, the scale was modified as a 0–10 scale for easy use and analysis. The higher the score, the higher the workload.

Work-related fatigue. Winwood et al.'s (2005) Occupational Fatigue Exhaustion Recovery scale, which contains three subscales—chronic fatigue (CF), acute fatigue (AF), and intershift recovery (IR)—was used. There are five items for each subscale. Each item is rated on a 7-point Likert scale from 0 (*strongly disagree*) to 6 (*strongly agree*). The sum of each subscale is divided by 30 and multiplied by 100 to produce comparable scores between 0 and 100 (Winwood, Dawson, Lushington, & Winefield, 2006). Among the three subscales, the highest one indicates the dominant type of work-related fatigue. This scale has been tested in different populations, has robust psychometric properties, and is not influenced by gender differences (Winwood et al., 2005). Cronbach's α for CF, AF, and IR in this study was 0.81, 0.83, and 0.73, respectively.

Intent to Leave scale. Leaving and ITL are very closely connected (Widerszal-Bazyl, Radkiewicz, Hasselhorn, Conway, & Heijden, 2008). In this study, researchers used three items to measure ITL, including "I am considering leaving this hospital," "I am considering leaving nursing," and "I want to keep doing my nursing work." The third question is a reversed item. Each item is rated on a 7-point Likert scale from 0 (*strongly disagree*) to 6 (*strongly agree*). Higher scores indicated greater ITL. Cronbach's α was 0.83.

Data Collection

After receiving approval from the Institutional Review Board (KMUH-IRB-20130169), the researchers contacted the nursing department in each hospital and explained the purpose of the study. The inclusion criteria for participation were provided to hospital personnel to gather the name list of new nurses. New nurses were selected using the convenience sampling method. Research personnel went to the units in which new nurses were present and explained the purpose of the study. Participation was voluntary. Upon obtaining consent for participation, each new nurse received a questionnaire package including an informed consent form, a questionnaire, and an envelope. Participants filled out the questionnaire at their convenience. Once the questionnaire was completed, it could be sealed in the envelope. Another large envelope was left in the unit. When participants completed the questionnaire, they called the research personnel to collect the questionnaires, or research personnel went to each unit to collect the questionnaires 1 to 2 weeks after distributing the questionnaires. Each participant received one small gift in appreciation of their participation. The data were collected from January to May 2014.

Data Analysis

All data were analyzed using SPSS version 19.0 for Windows (IBM Corp., Armonk, NY, USA) and AMOS version 21.0 (SPSS Inc., Chicago, IL, USA). Personal characteristics, work conditions, and work-related fatigue were described using descriptive statistics, including frequency, percentage, range, mean, and standard deviation. Bivariate correlations were used to examine relationships between variables. Structural equation modeling (SEM) was used to test model fit. The model fit was examined using chi-square (X^2), goodness-of-fit index (GFI), adjusted GFI (AGFI), Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). A good model fit is indicated by a nonsignificant X^2 value, GFI and AGFI greater than .90, TLI greater than .95, and RMSEA less than .05.

Results

Participant Characteristics

A total of 162 new nurses' data were used in the analysis, 99 from two medical centers and 63 from three regional hospitals. Participants' ages ranged from 20 to 35 years ($M = 22.97$, $SD = 1.29$). Most participants were female (96.3%), unmarried (99.4%), had graduated from college (90.1%), and worked on rotating shifts (74.1%). The average duration of work experience was 6.7 months. Regarding SRHS, about 67% of participants were at or above the fair level. Demographic data are shown in **Table 1**.

Table 1. Characteristics of Participants ($N = 162$)

Variable	*n* (%)	Variable	*n* (%)
Gender		Marriage	
Male	6 (3.7)	Single	161 (99.4)
Female	156 (96.3)	Divorced	1 (0.6)
Education		Schedule	
Junior college	9 (5.6)	Fixed shift	42 (25.9)
2-year diploma	6 (3.7)	Rotating shift	122 (74.1)
College	147 (90.7)	Age (years)	
Hospital type		Mean (*SD*)	22.97 (1.29)
Medical center	99 (61.1)	Range	20–35
Regional	63 (38.9)	Work experience (months)	
Present health		Mean (*SD*)	6.70 (2.04)
Excellent	0	Range	1.5–12
Very good	11 (6.8)	Working hours	
Good	42 (25.9)	Mean (*SD*)	9.74 (1.18)
Fair	94 (58.0)	Range	5–16
Poor	15 (9.3)		

Descriptive Statistics of Main Variables

For work conditions, the mean (SD) of overall workload and working hours was 6.55 (1.71) and 9.71 (1.17), respectively. This indicated that new nurses perceived a moderate to high workload, and usually worked about 2 hr overtime for an 8-hr shift. The mean (*SD*) of new nurses' CF, AF, and IR was 58.19 (18.04), 57.24 (18.52), and 47.88 (13.39), respectively. CF was higher than AF, although the difference was minor. CF was considered the dominant fatigue type among new nurses.

Preliminary Analysis

In order to simplify the model, correlational analysis was performed to find significantly related factors. New nurses' ITL was not significantly related to age ($r = -.07$, $p > .05$), education ($r = -.06$, $p > .05$), or work experience ($r = -.02$, $p > .05$). However, ITL was significantly related to CF ($r = .70$, $p < .001$), AF ($r = .60$, $p < .001$), IR ($r = -.60$, $p < .001$), overall workload ($r = .54$, $p < .001$), working hours ($r = .37$, $p < .001$), and SRHS ($r = -.33$, $p < .001$). We conducted further analyses to categorize work experience into four different groups in 3-month increments. There were no significant differences among the four groups in the level of CF, $F(3, 157) = .82$, $p = .48$; AF, $F(3, 157) = 1.75$, $p = .16$; IR, $F(3, 157) = 2.46$, $p = .07$; or ITL, $F(3, 157) = 1.05$, $p = .37$. Further, new nurses working more than 10 hr showed more acute, $t(160) = -5.11$, $p < .001$, and chronic fatigue, $t(160) = -4.43$, $p < .001$, and less recovery, $t(160) = 3.69$, $p < .001$ compared to those working less than 10 hr.

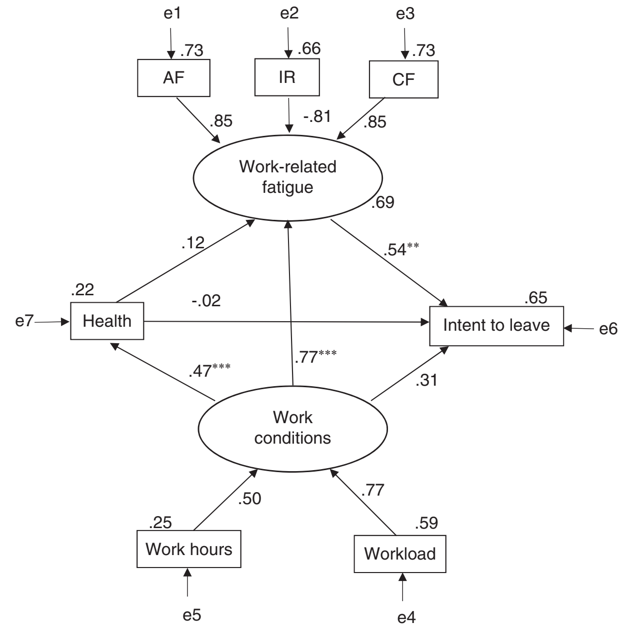

Figure 2. The final model with standardized estimates.
Note. AF = acute fatigue; IR = intershift recovery; CF = chronic fatigue; e = measurement errors; ⬭ = latent variable; □ = measured variable; → = unidirectional path; **: $p < .01$; ***: $p < .001$

As age, education, and work experience were not significantly correlated with ITL, all three factors were removed from the model. As health was significantly correlated with AF ($r = .41$, $p < .01$), CF ($r = .43$, $p < .01$), IR ($r = -.38$, $p < .01$), working hours ($r = .22$, $p < .01$), and workload ($r = .37$, $p < .01$), we added one additional path from work conditions to health. We used this modified model for model testing **(Figure 2)**. For other categorical variables, t-tests and Kruskal–Wallis tests were performed. ITL did not differ by hospital type, $t(160) = -.183$, $p > .05$; work unit, $X^2(2) = 6.07$, $p > .05$; or shift schedule, $t(160) = .303$, $p > .05$.

Structural Equation Model

The fit statistics of the model showed a good fit, $X^2(10) = 9.29$, $p > .05$, GFI = .98, AGFI = .95, CFI = 1.00, TLI = 1.00, RMSEA = .000. The structural relationships with standardized coefficients are presented in **Figure 2**. The paths from work conditions to fatigue ($\beta = .77$, $p < .001$) and from fatigue to ITL ($\beta = .54$, $p < .01$) were significant, but the path from work conditions to ITL was not significant ($\beta = .31$, $p > .05$). The standardized total effect of work-related fatigue on ITL was about .54, and the standardized direct effect was also .54. There was no indirect effect. The standardized total effect of work condition on ITL was about .75, with a standardized direct effect of .31 and an indirect effect of .44. This showed a mediating effect of work-related fatigue for the relationship between work conditions and ITL. The path from health to ITL was not significant ($\beta = -.02$, $p > .05$), indicating that new nurses' health status was not a significant determinant of ITL. In the final model, work-related fatigue, work conditions, and health explained 65% of variance in new nurses' ITL.

Discussion

The present study demonstrated how health, work conditions, and fatigue combined to affect new nurses' ITL. In the extant literature, it has been shown that work conditions (work overtime and workload) directly influence nurses' ITL. However, in this study, work conditions could only have a significant effect on ITL when they first led to work-related fatigue, which supported Hayes et al.'s (2012) statement that work conditions do not directly lead to ITL, and that other conditions must be present.

Two reasons were postulated for the mediating effect of work-related fatigue. First, in this study, new nurses' average working hours were almost 10 hr, and the highest reached 16 hr. Those working more than 10 hr had more acute fatigue, chronic fatigue, and less recovery compared to those working less than 10 hr. According to Barker and Nussbaum 2011, long working hours are associated with fatigue. Without adequate recovery, acute fatigue might progress into chronic fatigue (Winwood et al., 2005), and chronic fatigue would become a major risk factor for new nurses' ITL (Tei-Tominaga, 2013).

Second, nursing work is extremely demanding, both psychologically and physically, and thus, nurses are expected to have higher needs for recovery (Eriksen et al., 2006). In Taiwan, after work, most new nurses are still required to do homework and to review the literature or textbooks for problems they encountered or for questions that preceptors had asked. It seems that new nurses cannot withdraw from work for leisure time or adequate rest. An inability to withdraw from work obligations would further contribute to poorer recovery from work (Schwarz, 2011) and exacerbate fatigue levels. With less recovery time, new nurses might develop chronic fatigue (Barker & Nussbaum, 2011). In this study, chronic fatigue was the dominant fatigue type among new nurses, and might further lead to increased ITL.

Previous studies have shown that health status is associated with ITL (Brewer et al., 2012). In the preliminary analysis of this study, SRHS also had a significant negative relationship with ITL. However, in the final model, SRHS was not a significant determinant of ITL. This might be the case because, for instance, in Brewer et al.'s (2012) study, health status was indicated by injuries or sprains. Nurses with more sprains and strains showed greater turnover. In our study, participants were very young and tended to be healthy. Their SRHS was mainly above the fair level. The sample seemed homogeneous, and so the variance might not have been sufficient for differentiation. Further, in the final model, work-related fatigue had a stronger influence on ITL, which might share SRHS's contributions to the prediction of ITL, thereby producing a nonsignificant effect of SRHS on ITL. Moreover, the one-item measurement of overall health status may not be sensitive enough for healthy working individuals (Reineholm, Gustavsson, Liljegren, & Ekberg, 2012). The homogeneous sample issue might also explain why new nurses' age and education were not significantly related to ITL.

Regarding work experience, in this study, we assumed that new nurses with more working experience should have better adaptation strategies, less fatigue, and less ITL. However, the results showed that work experience was not significantly correlated with ITL. As mentioned in the preliminary analysis, fatigue level and ITL showed no significant differences among four different working experience groups (1–3, > 3–6, > 6–9, and > 9–12 months). This might be because new nurses at different time periods had different tasks for adaptation. In the first 3 to 6 months, they need to adapt to the work routines. Then, they need to take some core courses, get involved in case analysis, and go through the clinical nursing ladder system (Chen, Hwang, & Huang, 2014). For example, from nursing ladder N0 to N1, new nurses need to write a reading report and pass an examination. Hence, new nurses with more experience might perceive the workload to be similar in quantity, even though they are more familiar with routines.

There were several limitations in this study. First, this was a cross-sectional study. Fatigue level was measured at only one time point. It was impossible to determine how fatigue level changed and what the causes might be. Although SEM was used to test the model, it could not confirm directional causality. A longitudinal study is recommended for future research. Second, this study did not apply a random sampling method, and thus, the generalizability of the results might be limited. Third, the one-item SRHS scale might not be sensitive enough for healthy workers. Future research might consider increasing the sample size to improve power or choosing another health status instrument for healthy people. Finally, this study did not include certain organizational factors, such as co-worker support, leadership style, and so forth, which might further increase the amount of explained variance of ITL.

Conclusions and Implications

This study has extended the current knowledge in two ways. First, this model suggested that only work conditions and work-related fatigue affected new nurses' ITL. Personal characteristics did not affect new nurses' ITL. Second, the mediating effect of work-related fatigue was confirmed. Work conditions only affected new nurses' ITL through work-related fatigue. Work-related fatigue was a major determinant of ITL. Suggestions were made as follows. Nurse Managers should pay more attention to new nurses with long overtime hours or working hours. The level of workload and work-related fatigue should be evaluated regularly, especially for new nurses working more than 10 hr per day. The overall workload scale could be used as a quick screening tool. Then, new nurses' fatigue level, work-related difficulties, and adaptation strategies should be assessed by mentors. Strategies for fatigue reduction should be implemented for new nurses to enhance their intention to stay, such as increasing the number of breaks and support from mentors. Moreover, mentors could reevaluate the effect of the new nurses' training program on new nurses' fatigue level and make adjustments accordingly to fit individual needs. Future studies should focus on the longitudinal change of work-related fatigue so that a trend of fatigue changes can be observed and intervention strategies can be developed.

Acknowledgments

This study was funded by the Ministry of Science and Technology in Taiwan (NSC102-2314-B-037-001).

Clinical Resources

- International Council of Nurses fact sheets on Human Resources, Planning & Development: http://www.icn.ch/publications/fact-sheets/
- Medscape Nurses: http://search.medscape.com/search/?q=nurse%20turnover
- Nursing Times: http://www.nursingtimes.net/roles/nurse-managers/high-nurse-turnover-rates-hitting-care-home-sector/5087795.fullarticle

References

Akerstedt, T., Fredlund, P., Gillberg, M., & Jansson, B. (2002). Work load and work hours in relation to disturbed sleep and fatigue in a large representative sample. *Journal of Psychosomatic Research*, *53*, 585–588.

Barker, L. M., & Nussbaum, M. (2011). Fatigue, performance and the work environment: A survey of registered nurses. *Journal of Advanced Nursing*, *67*, 1370–1382.

Berkow, S., Virkstis, K., Stewart, J., & Conway, L. (2009). Assessing new graduate nurse performance. *Journal of Nursing Administration*, *38*, 468–474.

Borkowski, N., Amann, R., Song, S. H., & Weiss, C. (2007). Nurses' intent to leave the profession: Issues related to gender, ethnicity, and educational level. *Health Care Management Review*, *32*(2), 160–167.

Brewer, C. S., Kovner, C. T., Greene, W., & Cheng, Y. (2009). Predictors of RNs' intent to work and work decisions 1 year later in a U.S. national sample. *International Journal of Nursing Studies*, *46*(7), 940–956.

Brewer, C. S., Kovner, C. T., Greene, W., Shuser, M. T., & Djukic, M. (2012). Predictors of actual turnover in a national sample of newly licensed registered nurses employed in hospitals. *Journal of Advanced Nursing*, *68*(3), 521–538.

Chan, M. F., Luk, A. L., Leong, S. M., Yeung, S. M., & Van, I. K. (2009). Factors influencing Macao nurses' intention to leave current employment. *Journal of Clinical Nursing*, *18*(6), 893–901.

Chen, H.-L., Hwang, S.-L., & Huang, T.-Y. (2014). Issues and solutions for cultivating nursing professionals. *Leadership Nursing*, *15*(3), 14–24.

Chen, Y.-C., & Lin, C.-F. (2013). Nursing force in Taiwan hospitals. *Report of National Union of Nurses' Association*, *99*, 4–6.

DeSalvo, K. B., Fisher, W. P., Tran, K., Bloser, N., Merrill, W., & Peabody, J. (2006). Assessing measurement properties of two single-item general health measures. *Quality of Life Research*, *15*, 191–201.

Duffield, C. M., Roche, M. A., Homer, C., Buchan, J., & Dimitrelis, S. (2014). A comparative review of nurse turnover rates and costs across countries. *Journal of Advanced Nursing*, *70*(12), 2703–2712.

Eriksen, H. R., Ihlebak, C., Jansen, J. P., & Burdorf, A. (2006). The relations between psychosocial factors at work and health status among workers in home care organizations. *International Journal for Behavioral Medicine*, *13*(3), 183–192.

Fang, J., Kunaviktikul, W., Olson, K., Chontawan, R., & Kaewthummanukul, T. (2008). Factors influencing fatigue in Chinese nurses. *National and Health Sciences*, *10*(4), 291–299.

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., . . . North, N. (2012). Nurse turnover: A literature review—An update. *International Journal of Nursing Studies*, *49*(7), 887–905.

Hill, S. G., Lavecchia, H. P., Byers, J. C., Bittner, A. C., Zaklad, A. L., & Christ, R. E. (1992). Comparison of 4 subjective workload rating-scales. *Human Factors*, *34*(4), 429–439.

Jansen, N. W. H., Kant, I. J., & van den Brandt, P. A. (2002). Need for recovery in the working population: Description and associations with fatigue and psychological distress. *International Journal of Behavioral Medicine*, *9*(4), 322–340.

Kovner, C. T., Brewer, C. S., Fatehi, F., & Jun, J. (2014). What does nurse turnover rate mean and what is the rate? *Policy, Politics, & Nursing Practice*, *15*(3), 64–71.

Krause, N. M., & Jay, G. M. (1994). What do global self-rated health items measure? *Medical Care*, *32*(9), 930–942.

Lorig, K., Stewart, A., Ritter, P., González, V., Laurent, D., & Lynch, J. (1996). *Outcome measures for health education and other health care interventions*. Thousand Oaks, CA: Sage Publications.

MacKusick, C. I., & Minick, P. (2010). Why are nurses leaving? Findings from an initial qualitative study on nursing attrition. *Official Journal of the Academy of Medical-Surgical Nurses*, *19*(6), 335–340.

McEwen, B. S. (2003). Mood disorders and allostatic load. *Biological Psychiatry*, *54*(3), 200–207.

Mills, J. F., & Mullins, A. C. (2008). The California Nurse Mentor Project: Every nurse deserves a mentor. *Nursing Economics*, *26*(5), 310–315.

Mohamed, N. A., & Mohamed, S. A. (2013). Impact of job demand and control on nurses' intention to leave. *Life Science Journal*, *10*(2), 223–229.

Mustapha, N., Ahmad, A., Uli, J., & Idris, K. (2010). Job characteristics as antecedents of intention to stay and mediating effects of work family facilitation and family satisfaction among single mothers in Malaysia. *International Journal of Business and Social Science*, *1*(3), 66–68.

Reineholm, C., Gustavsson, M., Liljegren, M., & Ekberg, K. (2012). The importance of work conditions and health for voluntary job mobility: A two-year follow-up. *BMC Public Health*, *12*(1–7), 682. doi:10.1186/1471-2458-12-682

Schwarz, U. V. T. (2011). Inability to withdraw from work as related to poor next-day recovery and fatigue among women. *Applied Psychology*, *60*(3), 377–396.

Soper, D. S. (2015). *A-Priori Sample Size Calculator for Structural Equation Models* [Software]. Retrieved from http://www.danielsoper.com/statcalc

Tei-Tominaga, M. (2013). Factors related to the intention to leave and the decision to resign among newly graduated nurses: A complete survey in a selected prefecture in Japan. *Environmental Health*, *18*, 293–305.

Tschannen, D., Kalisch, B. J., & Lee, K. H. (2010). Missed nursing care: The impact on intention to leave and turnover. *Canadian Journal of Nursing Research*, *42*(4), 22–39.

Vidulich, M. A., & Tsang, P. S. (1987). Absolute magnitude estimation and relative judgment approaches to subjective workload assessment. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, *31*(9), 1057–1061.

Widerszal-Bazyl, M., Radkiewicz, P., Hasselhorn, H.-M., Conway, P. M., Heijden, B. V. D., & NEXT Study Group. (2008). The Demand-Control-Support Model and intent to leave across six European countries: The role of employment opportunities. *Work & Stress*, *22*(2), 166–184.

Winwood, P. C., Dawson, D., Lushington, K., & Winefield, A. H. (2006). Further development and validation of the Occupational Fatigue Exhaustion Recovery (OFER) Scale. *Journal of Occupational and Environmental Medicine*, *48*(4), 381–389.

Winwood, P. C., Winefield, A. H., Dawson, D., & Lushington, K. (2005). Development and validation of a scale to measure work-related fatigue and recovery: The Occupational Fatigue Exhaustion/Recovery Scale (OFER). *Journal of Occupational and Environmental Medicine*, *47*(6), 594–606.

JOURNAL OF NURSING SCHOLARSHIP

HEALTH POLICY AND SYSTEMS

The Relationships of Nurse Staffing Level and Work Environment With Patient Adverse Events

Eunhee Cho, PhD, RN[1], Dal Lae Chin, PhD, RN[2], Sinhye Kim, MSN, RN[3], & OiSaeng Hong, PhD, RN, FAAN, FAAOHN[4]

1 Associate Professor, College of Nursing & Mo-Im Kim Nursing Research Institute, Yonsei University, Seoul, South Korea
2 Postdoctoral Scholar, School of Nursing, University of California, San Francisco, San Francisco, CA, USA
3 Research Assistant, College of Nursing & Mo-Im Kim Nursing Research Institute, Yonsei University, Seoul, South Korea
4 Professor, School of Nursing, University of California, San Francisco, San Francisco, CA, USA

Key words
Korea, nurse staffing, patient adverse events, patient outcomes, work environment

Correspondence
Dr. Dal Lae Chin, University of California, San Francisco (UCSF) School of Nursing, 2 Koret Way, N531H, San Francisco, CA 94143-0608.
E-mail: dal.chin@ucsf.edu

Accepted: October 27, 2015

doi: 10.1111/jnu.12183

Abstract

Purpose: The purpose of this study was to examine the relationships of nurse staffing level and work environment with patient adverse events.

Design: This cross-sectional study used a combination of nurse survey data ($N = 4{,}864$ nurses), facility data ($N = 58$ hospitals), and patient hospital discharge data ($N = 113{,}426$ patients) in South Korea.

Methods: The three most commonly nurse-reported adverse events included administration of the wrong medication or dose to a patient, pressure ulcers, and injury from a fall after admission. Multilevel ordinal logistic regression was employed to explore the relationships of nurse staffing level (number of patients assigned to a nurse) and work environment (Practice Environment Scale of the Nursing Work Index) with patient adverse events after controlling for nurse, hospital, and patient characteristics.

Findings: A larger number of patients per nurse was significantly associated with a greater incidence of administration of the wrong medication or dose (odds ratio [OR] = 1.01, 95% confidence interval [CI] = 1.007–1.016), pressure ulcer (OR = 1.01, 95% CI = 1.007–1.016), and patient falls with injury (OR = 1.02, 95% CI = 1.013–1.022). A better work environment had a significant inverse relationship with adverse events; the odds of reporting a higher incidence of adverse events were 45% lower for administration of the wrong medication or dose (OR = 0.55, 95% CI = 0.400–0.758), followed by 39% lower for pressure ulcer (OR = 0.61, 95% CI = 0.449–0.834) and 32% lower for falls with injury after admission (OR = 0.68, 95% CI = 0.490–0.939).

Conclusions: This study found that a larger number of patients per nurse and poor work environment increase the incidence of patient adverse events, such as administration of the wrong medication or dose to a patient, pressure ulcers, and injury from falling after admission. The findings suggest that South Korean hospitals could prevent patient adverse events by improving nurse staffing and work environment.

Clinical Relevance: Healthcare strategies and efforts to modify adequate nurse staffing levels and better work environments for nurses are needed to improve patient outcomes.

South Korea is experiencing an increase in the incidence of chronic diseases due to the rapid growth of its aging population and higher rates of risky health behaviors, such as smoking and alcohol consumption (Organization for Economic Cooperation and Development [OECD], 2012). According to the OECD's Health Care Quality

Review, despite increased investments in hospitals, greater accessibility to hospital care, and advanced medical technologies, the Korean health system continues to deliver a relatively lower quality of health care than other OECD countries (OECD, 2012). For example, a study by Aiken, Sloane, et al. (2011) that used data from nearly 100,000 nurses in nine countries between 1999 and 2009 found that nurses in South Korea (68%) were more likely to report that the quality of patient care on their unit was only fair or poor (as opposed to good or excellent) than nurses in other countries (only 11% of nurses in Canada). Therefore, the quality of care in South Korea remains a considerable public health challenge.

The quality of health care is often evaluated using patient outcomes. Patient adverse events (including medication error, fall, urinary tract infection, pneumonia, and pressure ulcer) and patient mortality are frequently used to assess patient outcomes (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Lang, Hodge, Olson, Romano, & Kravitz, 2004; Stalpers, de Brouwer, Kaljouw, & Schuurmans, 2015). Because nurses represent the largest group of hospital employees who deliver most of the direct patient care, nurse care is one of the most important areas of quality of health care and patient safety (Institute of Medicine [IOM], 2011). Nurse staffing level (e.g., patient-to-nurse ratio) plays a significant role in the outcomes of hospital patients (Aiken et al., 2014). Much of the literature published in connection with studies conducted in the United States and Europe and reviews of the literature and meta-analyses have demonstrated the relationship among the level of nurse staffing in hospitals, patient mortality, and adverse patient events. Better patient-to-nurse staffing ratios have been significantly associated with lower rates of hospital mortality, failure to rescue, cardiac arrest, hospital-acquired pneumonia, patient fall, pressure ulcer, or other adverse events (Aiken, Sloane, et al., 2011; Cho et al., 2015; Kane et al., 2007; Needleman, Buerhaus, Stewart, Zelevinsky, & Mattke, 2006; Rafferty et al., 2007; Stalpers et al., 2015). Furthermore, previous studies suggest that a better nursing work environment is associated with higher levels of quality and patient safety and fewer patient adverse events (Aiken, Cimiotti, et al., 2011; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Aiken, Sloane, et al., 2011; Cho et al., 2015; Friese, Lake, Aiken, Silber, & Sochalski, 2008; IOM, 2004). Better work environments often include ardent nurse participation in hospital affairs, a solid nursing foundation for quality of care, strong nurse leadership, adequate resources, and good working relationships between doctors and nurses (Aiken, Cimiotti, et al., 2011; Lake, 2002). Thus, nurse staffing level and nurse work environment should be considered critical factors that influence adverse patient events in South Korea.

Although there is strong empirical evidence from several studies in the United States and Europe (Kane et al., 2007; Lang et al., 2004; Stalpers et al., 2015), little is known about whether the significant associations of patient outcome with nurse staffing and nurse work environment are also present in South Korean hospitals. Therefore, the purpose of this study was to examine the relationships of nurse staffing level and nurse work environment with patient adverse events. Numerous previous studies conducted in the United States (Aiken, Cimiotti, et al., 2011; Blegen, Goode, Park, Vaughn, & Spetz, 2013; Blegen, Goode, Spetz, Vaughn, & Park, 2011; Cho, Ketefian, Barkauskas, & Smith, 2003) and recently in nine European countries (Belgium, England, Finland, Ireland, the Netherlands, Norway, Spain, Sweden, and Switzerland; Aiken et al., 2014) have identified several nurse (e.g., nursing education, unit type), hospital (e.g., hospital size, teaching status), and patient characteristics (e.g., age, comorbidities) that affect patient outcomes, which were included here as covariates. Based on previous research evidence, the theoretical perspective for this study is that appropriate nurse staffing level and nurse work environment in hospitals may ensure the quality of health care they provide, and in turn affect the health outcomes of hospital patients. Patient outcomes in this study are measured by patient adverse events, including administration of the wrong medication or dose, pressure ulcer, and injury from falling after admission. We adjusted for other covariates, including nurse, hospital, and patient characteristics that are correlated with patient adverse events. We hypothesized positive relationships among a larger number of patients per nurse, poor work environment, and incidence of patient adverse events, after controlling for nurse, hospital, and patient characteristics.

Methods

Setting and Sample

This study was conducted with a combination of nurse survey data, facility data, and hospital discharge data from South Korea using a common research protocol and instruments established by Aiken and colleagues in the United States and other countries (Aiken, Cimiotti, et al., 2011; Aiken et al., 2014; Aiken, Sloane, et al., 2011). The nurse survey data were collected from 60 randomly selected hospitals out of all 295 acute hospitals with 100 or more beds in all seven metropolitan cities and all nine provinces in South Korea. In order to assure the representativeness of hospitals selected, these 60 hospitals were selected by a stratified random sampling method based on location (Seoul, other metropolitan areas, and provinces) and bed size (100–399, 400–699, 700–799, and 1,000 or above). Units were also randomly selected from the list of units at each hospital by using a random table. The number of nurses varied based on the number of beds of hospitals and types of units. Thus, we selected units in different proportions based on the number of beds of hospitals and types of units. Namely, in the hospitals with 100 to 699 beds, all units were included, while 50% from all general wards and one from each type of special unit (e.g., intensive care unit, perioperative unit, and emergency room) in hospitals with 700 to 999 beds were randomly selected, and 20% from all general wards and one from each type of special unit of units in hospitals with 1,000 or more beds were randomly selected. All nurses working in the selected units on the date of data collection were invited to complete the survey. The surveys were distributed to nurses at each hospital. Once the participating nurses completed the survey in private, the completed questionnaires were placed in sealed envelopes and dropped in locked boxes located in each unit at each participating hospital to ensure anonymity. The staff of the department of nursing at each participating hospital mailed the unopened boxes to the principal investigator.

The total of 5,103 registered nurses (RNs) from 60 hospitals were invited to participate in the study, and 4,910 completed the survey, a response rate of 96.2%. This study was able to achieve the high response rate because the design involved recruiting hospitals first and then sampling nurses directly from participating hospitals, which tends to achieve a higher response rate than recruiting individual nurses (Aiken et al., 2012; Aiken, Sloane, et al., 2011). In addition, as demonstrated in an earlier study (Aiken, Sloane, et al., 2011), a high response rate is often found in Asian countries. More detailed information on the nurse survey is published elsewhere (Aiken, Sloane, et al., 2011; Cho et al., 2013). The facility data and hospital discharge data were collected by the Health Insurance Review Agency (HIRA) in South Korea. The hospital discharge data of patients who underwent general, orthopedic, or vascular surgery in 2008 and who were between the ages of 19 and 89 years were included in the analysis. The hospital discharge data were aggregated to the hospital level in order to adjust the case mix of patients, which represents the difference in severity of illness and the characteristics of patients across hospitals. The hospital discharge data of 2 of the total 60 hospitals were not available. Therefore, this study analyzed the combined data of 58 hospitals, 113,426 patients, and 4,864 nurses. The study protocol was approved by the institutional review board of the authors' affiliated university.

Measures

Adverse events. Three nurse-reported adverse events were examined as outcome variables. Nurses were asked how often patients received the wrong medication or dose and how frequently patients experienced pressure ulcer or fall with injury after admission. Nurses rated the frequency of each adverse event on a 7-point Likert scale that ranged from never to every day. These nurse-reported adverse events have been used in many international studies and reported as reliable and valid measures (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2013; Ausserhofer et al., 2013; Cina-Tschumi, Schubert, Kressig, De Geest, & Schwendimann, 2009; Kelly, Kutney-Lee, Lake, & Aiken, 2013; Lucero, Lake, & Aiken, 2010; Van Bogaert et al., 2014).

Nurse staffing level and work environment. The nurse staffing level was assessed using a single self-report questionnaire regarding the number of patients each participating nurse had cared for on his or her last shift. The nurse work environment was measured using the Korean version of the Practice Environment Scale of the Nursing Work Index (PES-NWI), which has demonstrated good validity and reliability (Cho, Choi, Kim, Yoo, & Lee, 2011). The Korean version of the PES-NWI has 29 items with five subscales consisting of nine items regarding nurse participation in hospital affairs (e.g., opportunity for staff nurses to participate in policy decisions); nine items to assess nursing foundations for quality of care (e.g., written, up-to-date nursing care plans for all patients); four items for nurse manager ability, leadership, and support of nurses (e.g., a nurse manager who is a good manager and leader); four items that investigate the staffing and resource adequacy of a facility (e.g., enough RNs to provide quality patient care); and three items for collegial nurse–physician relations (e.g., physicians and nurses have a good working relationship). Each item was rated on a 4-point Likert scale, ranging from "1 = *strongly disagree*" to "4 = *strongly agree*," and a higher score indicated a more supportive work environment. Cronbach's alphas for the five subscales of the Korean version of the PES-NWI ranged from 0.80 to 0.93. To calculate the composite score, the subscale scores of individual nurses were aggregated to the hospital level mean, and the distance of the hospital level mean from the median for all hospitals on five subscales was determined; these values ranged from 0 to 5. Hospitals were categorized into three groups based upon these differences: zero or one subscale above the median were "poor," two or three subscales above the median were "mixed," and four or five subscales above the median were classified as "better" care environments (Lake, 2002).

Nurse, hospital, and patient characteristics. Nurse, hospital, and patient characteristics were included as covariates. Nurse characteristics collected from the nurse survey included education (3 years of nursing college vs. Bachelor of Science in Nursing [BSN] or higher), age, years worked as a nurse, gender, job status (part-time vs. full-time), job security (temporary vs. permanent job), unit type (medical and surgical, intensive care, operating and recovery room, or other), and the most recent shift or day worked (day, evening, night, or other). Each work shift of nurses in South Korea is usually 8 hr. Hospital characteristics included bed size (100–399, 400–699, 700–999, or ≥ 1,000), location (capital city of Seoul, other metropolitan area, or province), teaching hospital status (yes vs. no), and high-technology status (yes vs. no). Hospitals with postgraduate residents or interns were considered teaching hospitals, while hospitals that regularly conducted open-heart surgery or major organ transplantation were classified as high-technology hospitals. To control for differences in severity of illness and characteristics of patients across hospitals, the characteristics of patients who underwent common surgical procedures were controlled for. Common surgical procedures were selected because they are carried out in all hospitals and risk adjustment techniques have been well validated for these procedures (Aiken, Cimiotti, et al., 2011; Aiken et al., 2008; Aiken et al., 2014). The patient characteristics include the percentage of patients 65 years of age or over, transferred patients, emergency admissions, male patients, patients with major diagnostic categories (MDCs), and those with comorbidities (Elixhauser, Steiner, Harris, & Coffey, 1998). The percentage of patients with MDCs included diseases and disorders of the circulatory system (MDC 5); the digestive system (MDC 6); the hepatobiliary system (MDC 7); the musculoskeletal system (MDC 8); the skin, subcutaneous tissue, or breast (MDC 9); and endocrine, nutritional, or metabolic diseases and disorders (MDC 10). The risk adjustment of Elixhauser et al. (1998) was used, and HIV/AIDS, obesity, and drug abuse were excluded because they were extremely uncommon ($n \leq 10$ in all cases). In addition, three different types of cancer (lymphoma, metastatic cancer, and solid tumors without metastasis) were combined into one category.

Data Analysis

Analysis of descriptive statistics was conducted to examine the incidence of adverse events, nurse staffing level and work environment, and characteristics of nurses and hospitals including patient characteristics to represent the case mix of hospitals. The incidences of each adverse event (wrong medication or dose, pressure ulcers, and falls with injury after admission) were ordered from never to every day. Nurses were clustered at the hospital level. Thus, the structure of data in this study had two levels: the individual nurse level and hospital level. Patient characteristics were aggregated at the hospital level as the case mix of the hospitals. Multilevel ordinal logistic regression was employed to explore the relationships of nurse staffing level and work environment with adverse events while controlling for nurse and hospital characteristics including patient characteristics represented by the case mix at the hospital level. STATA version 13.1 software (StataCorp LP, College Station, TX, USA) was used for data analysis, and statistically significant findings were considered when $p < .05$.

Table 1. Nurse Characteristics ($N = 4,864$)

Variables	Mean ± *SD*
Age (years)	28.7 ± 5.7
Years worked as a nurse	6.2 ± 5.4
	n (%)
Gender	
Male	234 (4.8)
Female	4,617 (95.2)
Highest education level	
Three years of college	2,721 (56.2)
BSN or higher	2,124 (43.8)
Job status	
Part-time	24 (0.5)
Full-time	4,825 (99.5)
Job security	
Temporary job	185 (3.8)
Permanent job	4,663 (96.2)
Unit type	
Medical and surgical	1,401 (30.3)
Intensive care	625 (13.5)
Operating/recovery room	912 (19.7)
Other	1,689 (36.5)
Last shift/day worked	
Day	2,099 (44.1)
Evening	1,283 (27.0)
Night	1,291 (27.1)
Other	83 (1.7)

Note. BSN = Bachelor of Science in Nursing.

Results

Characteristics of Nurses, Hospitals, and Patients

A total of 4,864 RNs participated in this study. Nurse characteristics are summarized in **Table 1**. The participants were young (mean age 28.7 years), with an

Table 2. Hospital Characteristics (*N* = 58)

Variables	*n* (%)
Bed size (number of beds)	
100–399	29 (50.0)
400–699	15 (25.9)
700–999	7 (12.1)
≥1,000	7 (12.1)
Location	
Seoul (capital)	14 (24.1)
Other metropolitan area	17 (29.3)
Province	27 (46.6)
Teaching status	
No	16 (27.6)
Yes	42 (72.4)
High-technology status	
No	14 (24.1)
Yes	44 (75.9)

average of 6.2 years of work experience as an RN. The majority of participants were female ($n = 4{,}617$, 95.2%), and 43.8% ($n = 2{,}124$) had a bachelor's degree or higher in nursing. Almost all ($n = 4{,}825$, 99.5%) were full-time, while only 3.8% of RNs ($n = 185$) were in temporary positions. The most recent shift worked was day shift ($n = 2{,}099$, 44.1%), followed by evening shift ($n = 1{,}283$, 27.0%), night shift ($n = 1{,}291$, 27.1%), and other shifts ($n = 83$, 1.7%; see **Table 1**). Other shifts included pro re nata (PRN), double duty, or 24-hr shifts.

Table 2 provides information on the characteristics of the 58 participating hospitals. Half of the hospitals ($n = 29$) had 100 to 399 beds, while 12.1% ($n = 7$) had 1,000 beds or more. About 24.1% ($n = 14$) of the hospitals were located in Seoul (the capital city), and 46.6% ($n = 27$) were located in a province; 72.4% ($n = 42$) and 75.9% ($n = 44$) were teaching hospitals and high-technology hospitals, respectively.

The characteristics of patients ($N = 113{,}426$) are presented in **Table 3**. The mean age of patients was 53.9 years ($SD = 16.1$), and the percentage of male patients was 50.2%. A total of 5.5% of patients were transferred from other healthcare facilities, while approximately 24.7% were admitted through the emergency department. With regard to the distribution of MDCs, the two largest proportions of patient types were those with diseases and disorders of the musculoskeletal system (MDC 8; 32.9%) and diseases and disorders of the circulatory system (MDC 5; 17.0%). Among the patient comorbidities listed by Elixhauser et al. (1998), hypertension (21.9%) and diabetes mellitus (15.5%) were the most common.

Table 3. Patient Characteristics (*N* = 113,426)

Variables	N (%)
Age, mean years ± *SD*	53.9±16.1
Gender	
Male	56,934 (50.2)
Transfer status (transferred)	5,843(5.5)
Emergency admissions (yes)	26,145 (24.7)
MDCs	
General surgery	
Diseases and disorders of the digestive system (MDC 6)	18,563 (16.4)
Diseases and disorders of the hepatobiliary system (MDC 7)	16,495 (14.5)
Diseases and disorders of the skin, subcutaneous tissue, or breast (MDC 9)	13,334 (11.8)
Endocrine, nutritional, or metabolic diseases and disorders (MDC 10)	8,466 (7.5)
Orthopedic surgery	
Diseases and disorders of the musculoskeletal system (MDC 8)	37,297 (32.9)
Vascular surgery	
Diseases and disorders of the circulatory system (MDC 5)	19,271(17.0)
Comorbidities[a]	
Hypertension	24,833 (21.9)
Diabetes mellitus	17,630 (15.5)
Liver disease	10,729 (9.5)
Cancer	6,916 (6.1)
Peptic ulcer disease, no bleeding	7,880 (6.9)
Arrhythmia	6,312 (5.6)
Chronic obstructive pulmonary disease	6,168 (5.4)
Weight loss	3,681 (3.2)
Coagulopathy	2,417 (2.1)
Deficiency anemia	3,007 (2.7)
Fluid and electrolyte disorders	2,624 (2.3)
Hypothyroidism	2,441 (2.2)
Congestive heart failure	1,766 (1.6)
Peripheral vascular disorders	1,347 (1.2)
Aortic stenosis	1,106 (1.0)
Renal failure	998 (0.9)
Depression	1,128 (1.0)
Paralysis	387 (0.3)
Other neurodegenerative disorders	662 (0.6)
Alcohol abuse	411 (0.4)
Pulmonary circulation disorders	330 (0.3)
Rheumatoid arthritis/collagen vascular diseases	766 (0.7)
Psychoses	264 (0.2)
Blood loss anemia	200 (0.2)

Note. MDC = major diagnostic category.

[a] The comorbidities listed are from Elixhauser et al. (1998). HIV/AIDS, obesity, and drug abuse were excluded from our analyses and also from the table because they were extremely uncommon ($n \leq 10$ in all cases); Elixhauser's three cancer types (lymphoma, metastatic cancer, and solid tumors without metastasis) were combined into the category of cancer.

Nurse Staffing Level, Work Environment, and Patient Adverse Events

The nurse staffing level, work environment, and adverse events are presented in **Table 4**. On average, nurses reported that they had cared for more than 17 patients on their most recent shift. Approximately 40% (*n* = 1,966) of nurses worked in hospitals with better nursing practice environments (four or five subscales above the median on the PES-NWI), whereas 23.2% (*n* = 1,127) of nurses worked in hospitals with poor nursing practice environments (zero or one subscale above the median of PES-NWI). In terms of adverse events, 3.2% (*n* = 149) of nurses reported administering the wrong medication or dose a few times a month or more. Pressure ulcers and falls with injuries were reported to occur a few times a month or more by 4.7% (*n* = 216) and 2.3% (*n* = 103) of the nurses, respectively.

Relationships of Nurse Staffing Level and Work Environment With Patient Adverse Events

Table 5 reports the results of multilevel ordinal logistic regression for adverse events, which included administration of the wrong medication or dose, pressure ulcer, and falls with injury while controlling for nurse, hospital, and patient characteristics. The models separately examined the effect of each nurse staffing level and work environment on wrong medication or dose, pressure ulcer, and fall with injury separately. The results showed that both nurse staffing level and work environment are significantly associated with all three adverse events. A larger number of patients per RN was significantly associated with higher incidence of administration of the wrong medication or dose (odds ratio [OR] = 1.01, 95% confidence interval [CI] = 1.007–1.016), pressure ulcer (OR = 1.01, 95% CI = 1.007–1.016), and patient falls with injury (OR = 1.02, 95% CI = 1.013–1.022). In addition, compared with nurses in a poor work environment, those who had a better work environment reported that the incidence of adverse events was 45% lower for administration of the wrong medication or dose (OR = 0.55, 95% CI = 0.400–0.758), 39% lower for pressure ulcer (OR = 0.61, 95% CI = 0.449–0.834), and 32% lower for falls with injury after admission (OR = 0.68, 95% CI = 0.490–0.939).

Discussion

To our knowledge, this study is one of the first in South Korea to explore the relationships of nurse staffing level or nurse work environment with patient adverse events using 58 randomly selected hospitals. Our findings indicate that both nurse staffing level and nurse work environment are significantly associated with all three patient adverse events (administration of the wrong medication or dose, pressure ulcer, and falls with injury). The present study revealed a significant positive relationship between higher nurse workload and patient adverse events after controlling for nurse, hospital, and patient characteristics. Each increase of one patient per nurse on shift was associated with a 1% increase in likelihood of administering the wrong medication or dose, a 1% increase in pressure ulcer, and a 2% increase in falls with injury.

These findings were consistent with previous studies that reported an association between inadequate nurse staffing level and nurse-sensitive patient adverse events, such as medication errors, hospital-acquired pressure ulcers, and patient falls and injuries (Blegen, Goode, & Reed, 1998; Cho et al., 2003; Frith, Anderson, Tseng, & Fong, 2012; Kane et al., 2007; Lake, Shang, Klaus, & Dunton, 2010; Lucero et al., 2010). Maintaining an adequate nursing workforce to provide a good quality of patient outcome is a challenge for hospitals in South

Table 4. Nurse Staffing Level, Work Environment, and Adverse Events

Variables	Mean ± *SD*
Nurse staffing level	17.4 ± 18.3
	n (%)
Work environment	
Poor	1,127 (23.2)
Mixed	1,771 (36.4)
Better	1,966 (40.4)
Adverse events	
Administration of the wrong medication or dose	
Never	1,524 (33.1)
A few times a year or less	2,487 (53.9)
Once a month or less	451 (9.8)
A few times a month	91 (2.0)
Once a week	41 (0.9)
A few times a week	15 (0.3)
Every day	2 (0.0)
Pressure ulcer	
Never	1,817 (39.8)
A few times a year or less	1,949 (42.7)
Once a month or less	579 (12.7)
A few times a month	160 (3.5)
Once a week	47 (1.0)
A few times a week	9 (0.2)
Every day	0 (0.0)
Fall with injury	
Never	2,052 (45.4)
A few times a year or less	2,067 (45.8)
Once a month or less	293 (6.5)
A few times a month	71 (1.6)
Once a week	26 (0.6)
A few times a week	5 (0.1)
Every day	1 (0.0)

Table 5. Multilevel Ordinal Logistic Regression of Nurse Staffing Level and Work Environment on Wrong Medication or Dose, Pressure Ulcer, and Fall With Injury ($N = 4{,}864$)

	Wrong medication or dose Adjusted OR[a] (95% CI)	Pressure ulcer Adjusted OR[a] (95% CI)	Fall with injury Adjusted OR[a] (95% CI)
Nurse staffing level	1.01*** (1.007–1.016)	1.01*** (1.007–1.016)	1.02*** (1.013–1.022)
Work environment (ref. Poor)			
Mixed	0.71* (0.552–0.924)	0.98 (0.762–1.258)	0.90 (0.693–1.168)
Better	0.55*** (0.400–0.758)	0.61** (0.449–0.834)	0.68* (0.490–0.939)

Note. CI = confidence interval; OR = odds ratio; ref. = reference.

[a] The models examined each predictor variable (nurse staffing level and work environment) separately while controlling for nurse characteristics (education, age, years worked as a nurse, gender, job status, job security, unit type, and last shift/day worked) and hospital characteristics (bed size, location, teaching status, high-technology status, and case mix of patients).

*$p < .05$; **$p < .01$; ***$p < .001$.

Korea due to the relatively high nurse workloads. The present study found that nurses in South Korea reported caring for an average of 17.4 patients on their last shift, which is almost three times higher than number of patients per nurse in the United States (5.7 patients per nurse) and twice as high as the rate reported in European countries (8.3 patients per nurse; Aiken et al., 2013, 2014). Due to inadequate nurse staffing levels in South Korea, nurses might have more physically and psychologically demanding workdays that can result in errors in medication or dose and that also provide less time for meticulous patient care, the lack of which can lead to an increased rate of pressure ulcers. This study highlights the importance of improving inadequate patient-to-nurse staffing ratios in order to reduce patient adverse events in South Korea. A policy in South Korean hospitals to modify nurse staffing levels is needed to improve preventable patient outcomes.

The present study also revealed a significant association between nurse work environment and patient adverse events. Even after controlling for the effects of nurse, hospital, and patient characteristics, nurses in hospitals with better nurse work environments reported significantly (45%) lower rates of medication or dose error, 39% fewer pressure ulcer, and 32% fewer falls with injury after admission compared to nurses in poor work environments. Similarly, previous studies have found that healthy and better nurse work environments were also associated with lower patient adverse events (Flynn, Liang, Dickson, & Aiken, 2010; Flynn, Liang, Dickson, Xie, & Suh, 2012; Friese et al., 2008; Lucero et al., 2010). Employment in a hospital with a better work environment was also associated with positive nurse outcomes, such as lower rates of nurse burnout and job dissatisfaction (Aiken, Sloane, et al., 2011; Gabriel, Erickson, Moran, Diefendorff, & Bromley, 2013). In a study of 1,406 hospitals in nine countries, 60% of the nurses in South Korea reported high burnout, 36% were dissatisfied with their current job, and only a low percentage (28.8%) were employed in better work environments (Aiken, Sloane, et al., 2011). Additionally, the present study included predominantly younger (mean 28.7 years) and less experienced (mean 6.2 years) nurses, which may be due to high nurse turnover rates in South Korea. It is important to increase the retention of more experienced nurses in order to provide higher quality patient care. Therefore, the present study's findings suggest the need to improve the number of good nursing work environments, which could help decrease patient adverse outcomes and improve the quality of patient care. It is important to continue current efforts to develop healthcare strategies and policies to modify more supportive nursing practice environments.

Strengths and Limitations

The strengths of this study included its randomly selected data set with large sample sizes and a high response rate (96.2%). In addition, this study improved on previous evidence by controlling for nurse (education, age, years worked as a nurse, gender, job status, job security, unit type, and shift), hospital (bed size, location, teaching hospital status, and high-technology hospital status), and patient characteristics (age, gender, transfer and admission status, major diagnostic categories, and comorbidities) to reduce possible effects on patient adverse events.

Several limitations should be considered when interpreting these findings. First, the results of the present study were based on cross-sectional data; therefore, a causal relationship among patient adverse events, nursing staffing level, and nurse work environment cannot be determined. Second, this study included the use of a self-report survey for both outcomes and covariates. In particular, because adverse patient events were reported by nurses, there may have been a recall or reporting bias. Thus, compared to the actual incidence rates, the incidence rates of adverse events reported in this study might have been underestimated or overestimated. Further research will be needed to objectively measure patient adverse outcomes (patient medical records) and to confirm the findings in the present study. Third, adjustment for patient characteristics was based on hospital discharge data of surgical patents only. This adjustment therefore limits the generalizability of the study findings. Finally, this study did not consider other nurse characteristics, such as stress (burnout), fatigue, or poor sleep quality due to shift work, which might be significantly related to patient adverse events and could increase the possibility of confounding effects by unmeasured or unknown factors.

Conclusions

The present study found significant associations between nurse staffing level and work environment with patient adverse events. Specifically, our findings suggest that an adequate nurse staffing level (reducing the number of patients per nurse on each shift) and better nurse work environments can improve preventable patient outcomes. Further longitudinal research is needed to better understand the causal relationships among nurse staffing level, nurse work environments, and patient outcome. This study suggests the importance of the development of effective strategies and policies to improve the quality of health care and patient safety in South Korean hospitals and provides empirical evidence to further these efforts.

Acknowledgments

We would like to thank the nurse executives and staff nurses of the 60 hospitals we surveyed for their participation in our study. We are also grateful to the executives of the Korea Hospital Nurses Association for their many helpful suggestions during data collection. The authors also thank Dr. Bruce Cooper for his valuable advice regarding data analysis.

This work was supported by a National Research Foundation (NRF) grant funded by the government of the Republic of Korea (grant number: 2009–0068921, PI: Cho).

Clinical Resources

- Agency for Healthcare Research and Quality, Patient Safety & Medical Errors: http://www.ahrq.gov/professionals/quality-patient-safety/index.html
- U.S. Department of Health and Human Services, Hospital Compare: http://www.hospitalcompare.hhs.gov

References

Aiken, L. H., Cimiotti, J. P., Sloane, D. M., Smith, H. L., Flynn, L., & Neff, D. F. (2011). Effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Medical Care*, *49*(12), 1047–1053.

Aiken, L. H., Clarke, S. P., Sloane, D. M., Lake, E. T., & Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration*, *38*(5), 223–229.

Aiken, L. H., Sermeus, W., Van den Heede, K., Sloane, D. M., Busse, R., McKee, M., . . . Kutney-Lee, A. (2012). Patient safety, satisfaction, and quality of hospital care: Cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *British Medical Journal*, *344*, e1717. Retrieved from http://www.bmj.com/content/bmj/344/bmj.e1717.full.pdf. doi: http://dx.doi.org/10.1136/bmj.e1717

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R., . . . RN4CAST Consortium (2014). Nurse staffing and education and hospital mortality in nine European countries: A retrospective observational study. *Lancet*, *383*(9931), 1824–1830.

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., & Sermeus, W. (2013). Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. *International Journal of Nursing Studies*, *50*(2), 143–153.

Aiken, L. H., Sloane, D. M., Clarke, S., Poghosyan, L., Cho, E., You, L., . . . Aungsuroch, Y. (2011). Importance of work environments on hospital outcomes in nine countries. *International Journal for Quality in Health Care*, *23*(4), 357–364.

Ausserhofer, D., Schubert, M., Desmedt, M., Blegen, M. A., De Geest, S., & Schwendimann, R. (2013). The association of patient safety climate and nurse-related organizational factors with selected patient outcomes: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(2), 240–252.

Blegen, M. A., Goode, C. J., Park, S. H., Vaughn, T., & Spetz, J. (2013). Baccalaureate education in nursing and patient outcomes. *Journal of Nursing Administration*, *43*(2), 89–94.

Blegen, M. A., Goode, C. J., & Reed, L. (1998). Nurse staffing and patient outcomes. *Nursing Research*, *47*(1), 43–50.

Blegen, M. A., Goode, C. J., Spetz, J., Vaughn, T., & Park, S. H. (2011). Nurse staffing effects on patient outcomes: Safety-net and non-safety-net hospitals. *Medical Care*, *49*(4), 406–414.

Cho, E., Choi, M., Kim, E. Y., Yoo, I. Y., & Lee, N. J. (2011). Construct validity and reliability of the Korean version of the practice environment scale of nursing work index for Korean nurses. *Journal of Korean Academy of Nursing*, *41*(3), 325–332.

Cho, E., Lee, H., Choi, M., Park, S. H., Yoo, I. Y., & Aiken, L. H. (2013). Factors associated with needlestick and sharp injuries among hospital nurses: A cross-sectional questionnaire survey. *International Journal of Nursing Studies*, *50*(8), 1025–1032.

Cho, E., Sloane, D. M., Kim, E. Y., Kim, S., Choi, M., Yoo, I. Y., . . . Aiken, L. H. (2015). Effects of nurse staffing, work environments, and education on patient mortality: An observational study. *International Journal of Nursing Studies*, *52*(2), 535–542.

Cho, S. H., Ketefian, S., Barkauskas, V. H., & Smith, D. G. (2003). The effects of nurse staffing on adverse events, morbidity, mortality, and medical costs. *Nursing Research*, *52*(2), 71–79.

Cina-Tschumi, B., Schubert, M., Kressig, R. W., De Geest, S., & Schwendimann, R. (2009). Frequencies of falls in Swiss hospitals: Concordance between nurses' estimates and fall incident reports. *International Journal of Nursing Studies*, *46*(2), 164–171.

Elixhauser, A., Steiner, C., Harris, D. R., & Coffey, R. M. (1998). Comorbidity measures for use with administrative data. *Medical Care*, *36*(1), 8–27.

Flynn, L., Liang, Y., Dickson, G. L., & Aiken, L. H. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatrics Society*, *58*(12), 2401–2406.

Flynn, L., Liang, Y., Dickson, G. L., Xie, M., & Suh, D. C. (2012). Nurses' practice environments, error interception practices, and inpatient medication errors. *Journal of Nursing Scholarship*, *44*(2), 180–186.

Friese, C. R., Lake, E. T., Aiken, L. H., Silber, J. H., & Sochalski, J. (2008). Hospital nurse practice environments and outcomes for surgical oncology patients. *Health Services Research*, *43*(4), 1145–1163.

Frith, K. H., Anderson, E. F., Tseng, F., & Fong, E. A. (2012). Nurse staffing is an important strategy to prevent medication error in community hospitals. *Nursing Economics*, *30*(5), 288–294.

Gabriel, A. S., Erickson, R. J., Moran, C. M., Diefendorff, J. M., & Bromley, G. E. (2013). A multilevel analysis of the effects of the Practice Environment Scale of the Nursing Work Index on nurse outcomes. *Research in Nursing & Health*, *36*(6), 567–581.

Institute of Medicine. (2004). *Keeping patients safe: Transforming the work environment of nurses*. Washington, DC: National Academies Press.

Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health*. Washington, DC: National Academies Press.

Kane, R. L., Shamliyan, T. A., Mueller, C., Duval, S., & Wilt, T. J. (2007). The association of registered nurse staffing levels and patient outcomes: Systematic review and meta-analysis. *Medical Care*, *45*(12), 1195–1204.

Kelly, D., Kutney-Lee, A., Lake, E. T., & Aiken, L. H. (2013). The critical care work environment and nurse-reported health care-associated infections. *American Journal of Critical Care*, *22*(6), 482–488.

Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health*, *25*(3), 176–188.

Lake, E. T., Shang, J., Klaus, S., & Dunton, N. E. (2010). Patient falls: Association with hospital Magnet status and nursing unit staffing. *Research in Nursing & Health*, *33*(5), 413–425.

Lang, T. A., Hodge, M., Olson, V., Romano, P. S., & Kravitz, R. L. (2004). Nurse-patient ratios: A systematic review on the effects of nurse staffing on patient, nurse employee, and hospital outcomes. *Journal of Nursing Administration*, *34*(7–8), 326–337.

Lucero, R. J., Lake, E. T., & Aiken, L. H. (2010). Nursing care quality and adverse events in US hospitals. *Journal of Clinical Nursing*, *19*(15–16), 2185–2195.

Needleman, J., Buerhaus, P. I., Stewart, M., Zelevinsky, K., & Mattke, S. (2006). Nurse staffing in hospitals: Is there a business case for quality? *Health Affairs*, *25*(1), 204–211.

Organization for Economic Cooperation and Development. (2012). *OECD health care quality review: Korea. Assessment and recommendations*. Retrieved from http://www.oecd.org/korea/49818570.pdf

Rafferty, A. M., Clarke, S. P., Coles, J., Ball, J., James, P., McKee, M., & Aiken, L. H. (2007). Outcomes of variation in hospital nurse staffing in English hospitals: Cross-sectional analysis of survey data and discharge records. *International Journal of Nursing Studies*, *44*(2), 175–182.

Stalpers, D., de Brouwer, B. J., Kaljouw, M. J., & Schuurmans, M. J. (2015). Associations between characteristics of the nurse work environment and five nurse-sensitive patient outcomes in hospitals: A systematic review of literature. *International Journal of Nursing Studies*, *52*(4), 817–835.

Van Bogaert, P., Timmermans, O., Weeks, S. M., van Heusden, D., Wouters, K., & Franck, E. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events—A cross-sectional survey. *International Journal of Nursing Studies*, *51*(8), 1123–1134.

JOURNAL OF NURSING SCHOLARSHIP

HEALTH POLICY AND SYSTEMS

Nurse Burnout, Nurse-Reported Quality of Care, and Patient Outcomes in Thai Hospitals

Apiradee Nantsupawat, PhD, RN[1], Raymoul Nantsupawat, PhD, RN[2], Wipada Kunaviktikul, PhD, RN, FAAN[3], Sue Turale, DEd, RN, FACN, FACMHN[4], & Lusine Poghosyan, PhD, MPH, RN[5]

1 *Phi Omega*, Instructor, Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand
2 *Phi Omega*, Associate Professor, Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand
3 *Phi Omega*, Professor, Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand
4 *Tau Nu*, Professor, Faculty of Nursing, Chiang Mai University, Chiang Mai, Thailand
5 *Alpha Zeta*, Assistant Professor, Columbia University, School of Nursing, New York, NY, USA

[Correction made after online publication December 9, 2015: Author name has been updated.]

Key words
Nurse burnout, patient outcomes, quality of care, Thailand

Correspondence
Dr. Apiradee Nantsupawat, Faculty of Nursing, Chiang Mai University, 110/406 Inthawaroros Rd. Sriphum, Chiang Mai, 50200, Thailand.
E-mail: apiradee.n@cmu.ac.th

Accepted: October 29, 2015

doi: 10.1111/jnu.12187

Abstract

Purpose: The purpose of this study was to investigate the effect of nurse burnout on nurse-reported quality of care and patient adverse events and outcomes in Thai hospitals.

Methods: Cross-sectional analysis of data from 2,084 registered nurses working in 94 community hospitals across Thailand. Data were collected through survey questionnaire, including the Maslach Burnout Inventory (MBI), which measures of nurse perceived quality of care and patient outcomes. Multiple logistic regression modeling was performed to explore associations between nurse burnout on quality of care and patient outcomes.

Findings: Thirty-two percent of nurses reported high emotional exhaustion, 18% high depersonalization, and 35% low personal accomplishment. In addition, 16% of nurses rated quality of care on their work unit as fair or poor, 5% reported patient falls, 11% reported medication errors, and 14% reported infections. All three subscales of the MBI were associated with increased reporting of fair or poor quality of care, patient falls, medication errors, and infections. Every unit of increasing emotional exhaustion score was associated with a 2.63 times rise in reporting fair or poor quality of care, a 30% increase in patient falls, a 47% increase in medication errors, and a 32% increase in infection.

Conclusions: Findings clearly indicate that nurse burnout is associated with increased odds of reporting negative patient outcomes. Implementing interventions to reduce nurse burnout is critical to improving patient care in Thai hospitals.

Clinical Relevance: Hospital administrators, nurse managers, and health leaders urgently need to create favorable work environments supporting nursing practice in order to reduce burnout and improve quality of care.

Burnout is a prolonged psychological reaction to chronic emotional and interpersonal stressors on the job and is defined by three aspects: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach, 1982). Previous work has found a high prevalence of burnout among nurses globally (Poghosyan, Clarke, Finlayson, & Aiken, 2010), and various factors, including poor work environments and low staffing, have been reported to lead to burnout among nurses. For example, nurses often work long irregular hours, have high workload and work demand, and have traumatic experiences (Oulton, 2006; Sundin, Hochwalder, Bilt, &

Lisspers, 2007). Also, poor work environments and low staffing challenge nurses' ability to deliver care of the highest quality, which might further increase stress and burnout (Sundin et al., 2007). Studies demonstrate that nurse burnout has negative consequences not only for patient care and safety (Laschinger & Leiter, 2006; Teng, Shyu, Chiou, Fan, & Lam, 2010; You, Aiken, Sloane, Liu, & He, 2013), but can also affect the overall organization by decreasing the productivity of employees in terms of increased absenteeism, increased turnover, and reduced quality of services (Borritz et al., 2006). On the other hand, reducing nurse burnout has been found to have a positive impact on patient care, such as reducing patient infections by 30% (Cimiotti, Aiken, Sloane, & Wu, 2012).

As evidence is clear that nurse burnout has negative consequences for care, research has examined the relationships between burnout, quality of care (QoC), and patient outcomes in many countries; however, Thailand has been overlooked by the literature despite their experiencing a nursing shortage, which in other countries has created challenging work environments contributing to burnout (Almalki, FitzGerald, & Clark, 2011). Examining nurse burnout in Thailand can help identify practices that promote nurse work environment, improve patient safety and care, and improve quality of services. Furthermore, this research can advance health outcomes in Thai hospitals as well as the development of the nursing profession in Thailand. Here we examine the relationship between nurse burnout and patient outcomes in Thai community hospitals.

Background

Burnout was first defined by Freudenberger (1974) as a state of fatigue or frustration resulting from professional relationships that failed to produce expected rewards. Maslach (1982) later expressed burnout as a psychological syndrome characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment. Emotional exhaustion refers to a lack of energy and a feeling that one's emotional resources are used up due to excessive psychological demands. Depersonalization is regarded as the treatment of others as objects, rather than people, through cynical, callous, or uncaring attitudes and behaviors. Diminished personal accomplishment denotes a tendency to evaluate oneself negatively because of failure to produce results (Maslach, Jackson, & Leiter, 1996). Today, the Maslach Burnout Inventory is the most widely used tool to measure nurse burnout internationally (Poghosyan et al., 2010), and prior evidence indicates that nurses in hospitals experience high levels of job-related burnout (McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011), which may affect patient outcomes.

Patient outcomes are considered nurse sensitive if they improve because of increased levels of nursing care (American Nurses Association [ANA], 2010). Studies looking at nurse-sensitive patient outcomes particularly investigated patient falls, infections, and medication errors (Ausserhofer et al., 2013; Zhu et al., 2012). These outcomes are important indicators for care quality and are directly affected by nursing care. Medication errors can originate at various stages of patient care, including at dispensing or administering, and effective nursing care can prevent them. In addition, patient falls that are defined as an unplanned descent to the floor with or without injury to the patient (National Database of Nursing Quality Indicators, 2013), and hospital-acquired infections, which patients acquire during their hospital stay (World Health Organization, 2002), can be directly linked to nursing care. Moreover, patient falls and infections are included in the nursing care performance measures adopted by the National Quality Forum (2004, 2009) and ANA (2002, 2010). Previous work has investigated nurse burnout and its effect on patient outcomes. For example, the study of Laschinger and Leiter (2006) suggested that nurse burnout is related to self-reported adverse events. Other work has demonstrated an association between nurse burnout and patient falls, medication errors (Van Bogaert et al., 2014), and nosocomial infections (Cimiotti et al., 2012).

Researchers collect data about patient outcomes using various data sources; however, most nursing studies demonstrate that nurses are a reliable source of information regarding the QoC they deliver (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2012; You et al., 2013). Nurses perceive QoC as the degree to which patients' physical, psychosocial, and extra care needs are met (Williams, 1998), and they can provide valuable information about the QoC they deliver. Nurse ratings of QoC aggregated to the hospital level provide related yet distinct information about patient outcomes when compared with evidence derived from administrative databases (Aiken, Clarke, & Sloane, 2002). Nurses' assessments of overall quality have been used in a number of studies, and researchers found it to be strongly associated with patient outcomes (Aiken et al., 2012; Lucero, Lake, & Aiken, 2010; McHugh & Witkoski Stimpfel, 2012). Thus, in this study we focus on nurse-reported QoC and patient outcomes.

Prior studies have also examined the relationship between nurse burnout and QoC. For instance, Poghosyan et al. (2010) examined the relationship between nurse burnout and ratings of QoC in 53,846 nurses from six countries: Canada, Germany, Japan, New Zealand, the United Kingdom, and the United States. Findings indicated that across countries, higher levels of burnout were associated with poor QoC. Other work by Van Bogaert, Clarke, Roelant, Meulemans, and Van de Heyning (2010), Van Bogaert, Kowalski, Weeks, Van Heusden, and Clarke (2013), and Van Bogaert et al. (2014) corroborated these findings, reporting that QoC was associated with important dimensions of burnout, specifically emotional exhaustion and depersonalization.

A body of empirical literature has identified characteristics of practice environments that positively and negatively affect nurse burnout. For example, a number of studies have indicated that promoting nursing leadership, nursing foundations for QoC, nurse staffing and resources, and collegial nurse–physician relations, as well as enhancing nursing participation in management and decision making, may reduce nurse burnout (Kanai-Pak, Aiken, Sloane, & Poghosyan, 2008; Van Bogaert et al., 2013). On the other hand, high workloads and low staffing levels have been identified as antecedents of nursing burnout (Aiken et al., 2011; Doef, Mbazzi, & Verhoeven, 2012; Lang, Patrician, & Steele, 2012; Liu et al., 2012; Teng et al., 2010).

In Thailand, concern of burnout among nurses has grown due to nursing staff shortages, particularly in community hospitals. Most Thai hospitals are operated by the Ministry of Public Health and fall into one of three classifications: community, general, or regional hospitals (Bureau of Policy and Strategy, Ministry of Thai Public Health, 2014). Community hospitals, the settings for data collection in this study, are located at the district level and typically have a capacity of 10 to 150 beds. They provide general or specialized nonurgent and short-term care to patients and refer those patients in need of more advanced care to larger general or regional hospitals. Three years ago it was predicted that a further 10,446 replacement nurses would be required for these community hospitals (Division of Administration, Ministry of Public Health, 2011). A recent Thai study described that a nurse in community hospitals cared for approximately 11 patients and on average worked 55 hr per week (Nantsupawat, Nantsupawat, Kulnaviktikul, & McHugh, 2014). Extended nursing hours of work is a common issue in these hospitals since 80% of registered nurses (RNs) reported working 20 more hours beyond the usual 40 hr per week, and 82% of extended work hours had been assigned to nurses by their administrators on work-shift rotation (Supamanee, Kunaviktikul, & Keitlertnapha, 2014). Additionally, these extended hours were negatively correlated with nurses' work–life balance and adequacy of rest and sleep, which led to their physical impairment and burnout.

Although prior researchers have established an association between nurse burnout, QoC, and patient outcomes, this association has not been shown in Thailand. We argue that delivering high-quality care to all patients in healthcare settings is a priority. To ensure better patient outcomes and patient safety, it is vital to investigate factors promoting or hindering the delivery of QoC to identify measures to change the status quo, and keep nurses in nursing without feeling burnt out. Therefore, the aim of this study was to explore the effect of nurse burnout on nurse-reported QoC and patient adverse events and outcomes.

The conceptual framework for this study is based on the work of Donabedian 1988. Donabedian suggested that outcome is a result of structure and process. In this study, the structure variables are the characteristics of patient units and hospitals (e.g., organizational environment), while the process variables are defined as nursing care, and outcomes are patient outcomes (e.g., patient falls, infections, medication errors). The possible explanation is that burnout results from the gap between individuals' expectations to fulfill their professional roles and the failure of organizational structures (Leiter, 1991, 1992). When the organizational environment does not support nurse practice or allow nurses to deliver care according to nursing philosophy of care, nurses may feel emotionally overextended and exhausted, develop impersonal responses toward patients, and experience less competence and successful achievement in their work with patients. These feelings may contribute to adverse job performance, which may lead to adverse events such as patient falls, infections, and medication errors (outcomes).

Methods

Study Design and Sampling

Using a cross-sectional design, we surveyed nurses working in 92 community hospitals across Thailand. Administrators from every hospital with at least 90 beds were asked to distribute the survey instrument among their registered nursing staff. Nurses were eligible to participate in the study if they were RNs providing direct patient care in inpatient units and if they had worked in their positions for at least 1 year. Written explanation of the study was given along with the research instrument, and nurses choosing to participate gave written informed consent; 2,450 surveys were distributed. The nurses were surveyed between May and July 2012. Of 2,415 RNs who returned the survey via mail (the response rate was 98.6%), 2,084 met the inclusion criteria and returned fully completed forms. This study was approved by the Faculty of Nursing and the Institutional Review Board at Chiang Mai University and was endorsed by all participating hospitals. Confidentiality of data was maintained throughout the study.

Table 1. Percentages of Nurses Reporting Burnout

MBI-HSS Subscale	*n* (%)
High Emotional Exhaustion (EE score > 27)	671 (32.2)
High Depersonalization (DP score > 10)	371 (17.8)
Low Personal Accomplishment (PA score < 5)	729 (34.5)

Note. MBI-HSS = Maslach Burnout Inventory Human Service Survey.

Measurement

Burnout. The Maslach Burnout Inventory Human Service Survey (MBI-HSS; Maslach & Jackson, 1986) was used to measure nurse burnout. Mind Garden, Inc. translates and adapts the MBI-HSS to be used in research in Thailand. We used the Thai version of the MBI-HSS in this study. The 22-item tool measures burnout using three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Reduced Personal Accomplishment (PA). Each item asks respondents about the reports of job-related feelings (e.g., "I feel emotionally drained from my work," "I do not really care what happens to my patients," "I have accomplished many worthwhile things in this job"), and their feelings or experiences are rated on a 7-point scale ranging from 1 = "*never having them,*" to 7 = "*having them every day*." Levels of burnout are estimated separately for EE (nine items), DP (five items), and PA (eight items) by using numerical cutoffs listed on the scoring key (Maslach et al., 1996). EE scores equal to or higher than 27 indicate high emotional exhaustion, DP scores greater than or equal to 10 suggest high depersonalization, and PA scores less than 5 indicate low personal accomplishment. Mean scores of 19 to 26 on the EE subscale, 6 to 9 on the DP subscale, and 34 to 39 on the PA subscale demonstrate evidence of average burnout. Mean scores equal to or lower than 18 on the EE subscale, equal to or lower than 5 on the DP subscale, and equal to or higher than 40 on the PA subscale demonstrate evidence of low burnout. The MBI-HSS has high internal consistency reliability measured by Cronbach's alphas ranging from 0.71 to 0.90 (Maslach et al., 1996). Reliability coefficients (Cronbach's alphas) for the present study were 0.91 for the EE subscale, 0.77 for the DP subscale, and 0.84 for the PA subscale.

Quality of care and patient outcomes. Nurse-perceived QoC and patient outcomes were measured by question items with four response categories. RNs were asked to assess QoC during their last shift using a 4-point scale, with higher scores indicating poorer levels of quality (1 = "*very good,*" 2 = "*good,*" 3 = "*fair,*" 4 = "*poor*"). These questions are used widely in international research (Bruyneel, Van den Heede, Diya, Aiken, & Sermeus, 2009). The item measure of QoC has been presented to be strongly related to measures of patient outcomes (Laschinger, 2008; McHugh & Witkoski Stimpfel, 2012). A single question item also measured respondents' perception of patient outcomes on their unit. In this study, patient outcomes included patient falls, medication errors, and nosocomial infections. Respondents were asked to rate the degree to which these patient outcomes occurred using a 4-point scale (1 = "*never,*" 2 = "*rarely,*" 3 = "*sometimes,*" 4 = "*often*"). Previous research has demonstrated that nurses' reports of frequency of adverse events are associated with measures of care quality (Lucero et al., 2010). Demographic characteristics including age, sex, education, and number of years working as an RN were also collected.

Data Analysis

Descriptive statistics were used to calculate the means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Logistical regression models were used in both bivariate and multivariate analyses to obtain odds ratios for nurse-reported patient outcomes in relation to nurse burnout. First, the bivariate relationship between patient outcomes and each MBI-HSS subscale was examined. Next, multiple logistic regression models were built to study the relationship between each MBI-HSS subscale and the outcome variables. The models were adjusted for age, sex, education, and number of years working as an RN. All models used a generalized estimating equation to account for the clustering of nurses within hospitals. All analyses were completed using STATA 10.1 (STATA Corp., College Station, TX, USA). The statistical level was specified at $p < .05$.

Results

The participants in our study were predominantly female (82%), with an average age of 33 years. All nurses had baccalaureate degrees. The average length of work experience as RNs was 9 years, ranging from 1 to 36 years.

The proportion of RNs reporting burnout for the three dimensions of MBI-HSS are shown in **Table 1**. Approximately 32% of nurses had high emotional exhaustion, 18% had high depersonalization, and 35% had low personal accomplishment. **Table 2** describes nurses' reports on QoC and on occurrence of patient falls, medication errors, and infections on their units. Sixteen percent of nurses reported the QoC delivered on their units as poor or fair.

Table 3 displays odds ratios and corresponding confidence intervals (confidence level = 95%) from

Table 2. Nurses' Reports of Quality of Care and Patient Outcomes

Outcomes	*n*	%
Quality of care		
Poor/fair	339	16.3
Very good/good	1,744	83.7
Patient falls		
Sometimes/often	106	5.1
Never/rarely	1,978	94.9
Medication errors		
Sometimes/often	219	10.5
Never/rarely	1,865	89.5
Infection		
Sometimes/often	284	13.6
Never/rarely	1,800	86.4

unadjusted and adjusted models predicting nurses' ratings of patient outcomes from the three dimensions of burnout. After controlling for nurse characteristics (age, sex, education, years as an RN), high emotional exhaustion was associated with increased odds of reporting QoC as fair or poor (2.63 times) and increased odds of reporting medication errors and infections (1.47 and 1.32 times, respectively). High depersonalization was also associated with increased odds of reporting QoC as fair or poor (3.21 times) and increased odds of reporting medical errors and infections (1.83 and 1.74 times, respectively). In addition, high depersonalization showed an association with a 2.06 times increase in the odds of nurses reporting patient falls. Lastly, low personal accomplishment among nurses was associated with a 1.73 times increase in the odds of reporting QoC as fair or poor, a 1.61 times increase in the odds of reporting patient falls, and a 1.49 times increase in the odds of reporting medication errors.

Discussion

To our knowledge, this is the first study investigating nurse burnout in relation to patient outcomes in the context of community hospitals in Thailand. After controlling for nurse characteristics, results demonstrated an association between all three dimensions of burnout (emotional exhaustion, depersonalization, and personal accomplishment) and nurses' perceptions of adverse patient outcomes on their units. Specifically, high burnout increased the odds of RNs reporting poor QoC, patient falls, medication errors, and infections. The study results are consistent with previous research showing that high levels of burnout are associated with reduced QoC (Poghosyan et al., 2010; Van Bogaert et al., 2010, 2013, 2014), increased medication errors, increased patient falls (Van Bogaert et al., 2014), and increased infections (Cimiotti et al., 2012) and demonstrate a similar link between nurse burnout and patient outcomes in the Thai setting. The results also show that around one third of nurses report high emotional exhaustion and low personal accomplishment, and about two fifths experience high depersonalization. A possible explanation for these findings in this setting is that community hospitals, one type of

Table 3. Logistic Regression Models Testing the Relationship Between Nurse Burnout, Quality of Care, and Patient Outcomes

	Model 1		Model 2	
Patient outcomes	OR (95% CI)	*p*	OR (95% CI)	*p*
Poor/fair quality of care				
High emotional exhaustion	2.63 (2.05–3.37)***	.000	2.63 (2.07–3.34)***	.000
High depersonalization	3.19 (2.46–4.14)***	.000	3.21 (2.46–4.19)***	.000
Low personal accomplishment	1.72 (1.34–2.21)***	.000	1.73 (1.36–2.19)***	.000
Patient falls				
High emotional exhaustion	1.32 (0.82–2.11)	.245	1.31 (0.87–1.98)	.181
High depersonalization	2.07 (1.34–3.18)***	.001	2.06 (1.33–3.20)***	.001
Low personal accomplishment	1.61 (1.15–2.26)**	.005	1.61 (1.08–2.40)*	.017
Medication errors				
High emotional exhaustion	1.47 (1.05–2.07)**	.025	1.47 (1.10–1.97)**	.009
High depersonalization	1.83 (1.34–2.48)***	.000	1.83 (1.31–2.55)***	.000
Low personal accomplishment	1.49 (1.13–1.96)**	.004	1.49 (1.12–1.99)**	.006
Infections				
High emotional exhaustion	1.33 (1.00–1.75)*	.044	1.32 (1.02–1.72)*	.033
High depersonalization	1.75 (1.28–2.39)***	.000	1.74 (1.29–2.34)***	.000
Low personal accomplishment	1.22 (0.93–1.61)	.142	1.22 (0.94–1.58)	.121

Note. Model 1 = not controlling for nurse characteristics; Model 2 = controlling for nurse characteristics (age, sex, education, years as registered nurse). CI = confidence interval; OR = odds ratio. **p* ≤ .05; ***p* ≤ .01; ****p* ≤ .001.

public hospital, function as the front-line public hospital providing basic health care for the Thai population. Researchers in Thailand have indicated that high workload and working extended hours are common in community hospitals (Nantsupawat et al., 2014; Supamanee et al., 2014). This may explain nurses experiencing feelings of being overextended and depleted of their emotional and physical resources, having uncaring attitudes towards the recipients of one's service, and/or feelings of incompetence and a lack of achievement and productivity at work. Consequently, such feelings may affect nurses by decreasing the effective and efficient performance of work since their physical and mental wealth may be diminished. And this suboptimal performance may affect QoC and patient safety.

The results from this study support previous studies demonstrating that when nurses experience inadequate resources from practice environment or staffing. They may feel emotional exhaustion, depersonalization, and diminished personal accomplishment, and resulting negative attitudes and emotions towards their job, thereby reducing job performance and probably threatening patient outcomes.

One limitation of this study is its cross-sectional design, which does not confirm a causal link between variables. Future research should investigate this linkage, and longitudinal studies would probably generate more solid evidence. Another limitation is that the adverse patient outcomes were assessed from nurse-reported measures, which may increase the possibility of response bias. Thus, evaluating clinical outcomes from objective measurements should be considered, perhaps in a triangulated study design. Finally, the sample may not be generally representative of all Thai nurses because only inpatient unit nurses were participants.

Implications of the Study

Our study results show that nurse burnout was prevalent among nurses in Thai community hospitals, and that high levels of burnout were associated with negative outcomes for patients. The findings of this study provide insights for hospital managers, policy makers, and nursing administrators to take actions to reduce nurse burnout, and consequently promote patient safety. Thus, they need to take actions to improve working conditions for nurses who provide care at the bedside, such as promoting nurses' perceptions of being supported in their work settings, having a sense of accomplishment, and being satisfied with their work, empowering them to manage their own work, collaborate effectively in teams, and deliver high-quality care.

Conclusions

This study conducted a cross-sectional survey of nurses practicing in Thai community hospitals. The study found that burnout is high among these nurses and has a significant negative impact on quality of patient care, leading to higher patient falls and infections, all of which may threaten patient safety. Our findings add to global research that studies nurses around the world who are dealing with burnout. Results of this study also support previously published literature proposing the relationship between burnout and patient outcomes. Administrators and policy makers should take actions to improve the work environment of nurses in these hospitals, which subsequently will reduce nurse burnout and promote patient safety. Future research is needed to better understand how to promote patient safety behind the phenomena in this study.

Acknowledgments

This study was funded by Chiang Mai University, Thailand.

Clinical Resources

- Maslach Burnout Inventory: http://www.mindgarden.com/search?controller=search&orderby=position&orderway=desc&search_query=burnout
- Ministry of Public Health Thailand: http://eng.moph.go.th/

References

Aiken, L. H., Clarke, S. P., & Sloane, D. M. (2002). Hospital staffing, organization, and quality of care: Cross-national findings. *International Journal for Quality in Health Care, 14*(1), 5–13.

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., & Sermeus, W. (2012). Nurses' reports of working conditions and hospitals quality of care in 12 countries in Europe. *International Journal of Nursing Studies, 50*, 143–153.

Aiken, L. H., Sloane, D. M., Clarke, S., Poghosyan, L., Cho, E., You, L., . . . Aungsuroch, Y. (2011). Importance of work environment on hospital outcome in nine countries. *International Journal for Quality in Health Care, 23*(4), 357–364.

Almalki, M., FitzGerald, G., & Clark, M. (2011). The nursing profession in Saudi Arabia: An overview. *International Nursing Review, 58*(3), 304–311.

American Nurses Association. (2002). *Nursing-sensitive indica tors*. Retrieved from http://www.nursingworld.org/MainMenuCategories/ThePracticeofProfessionalNursing/PatientSafetyQuality/Research-Measurement/The-National-Database/Nursing-Sensitive-Indicators_1

American Nurses Association. (2010). *The national data base of nursing-sensitive indicators*. Retrieved from http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume122007/No3Sept07/NursingQualityIndicators.html

Ausserhofer, D., Schubert, M., Desmedt, M., Blegen, M. A., De Geest, S., & Schwendimann, R. (2013). The association of patient safety climate and nurse-related organizational factors with selected patient outcomes: A cross-sectional survey. *International Journal of Nursing Studies*, *50*, 240–252.

Borritz, M., Rugulies, R., Bjorner, J. B., Villadsen, E., Mikkelsen, O. A., & Kristensen, T. S. (2006). Burnout among employees in human service work: Design and baseline findings of the PUMA study. *Scandinavian Journal of Public Health*, *34*, 49–58.

Bruyneel, L., Van den Heede, K., Diya, L., Aiken, L., & Sermeus, W. (2009). Predictive validity of the international hospital outcomes study questionnaire: An RN4CAST pilot study. *Journal of Nursing Scholarship*, *41*(2), 202–210.

Bureau of Policy and Strategy, Ministry of Thai Public Health. (2014). *General information of health services*. Retrieved from http://bps.ops.moph.go.th/Healthinformation/index.htm

Cimiotti, J., Aiken, L. H., Sloane, D. M., & Wu, E. S. (2012). Nurse staffing, burnout, and health care-associated infection. *American Journal of Infection Control*, *40*, 486–490.

Division of Administration, Ministry of Thai Public Health. (2011). *Summary of health care workforce*. Nonthaburi, Thailand: Ministry of Thai Public Health.

Doef, M. V. D., Mbazzi, F. B., & Verhoeven, C. (2012). Job conditions, job satisfaction, somatic complaints and burnout among East African nurses. *Journal of Clinical Nursing*, *21*, 1763–1775.

Donabedian, A. (1988). The quality of care. *Journal of the American Medical Association*, *260*(12), 1743–1748.

Freudenberger, H. J. (1974). Staff burnout. *Journal of Social Issues*, *30*, 159–165.

Kanai-Pak, M., Aiken, L. H., Sloane, D. M., & Poghosyan, L. (2008). Poor work environments and nurse inexperience are associated with burnout, job dissatisfaction and quality deficits in Japanese hospitals. *Journal of Clinical Nursing*, *17*, 3324–3329.

Lang, G. M., Patrician, P., & Steele, N. (2012). Comparison of nurse burnout across army hospital practice. *Journal of Nursing Scholarship*, *44*(3), 274–283.

Laschinger, H. K., & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *Journal of Nursing Administration*, *36*(5), 259–267.

Laschinger, H. K. S. (2008). Effect of empowerment on professional practice environments, work satisfaction, and patient care quality: Further testing of the Nursing Worklife Model. *Journal of Nursing Care Quality*, *23*(4), 322–330.

Leiter, M. P. (1991). Coping patterns as predictors of burnout: The function of control and escapist coping patterns. *Journal of Organizational Behavior*, *12*, 123–144.

Leiter, M. P. (1992). Burnout as a crisis in professional role structures: Measurement and conceptual issues. *Anxiety, Stress, and Coping*, *5*(1), 79–93.

Liu, K., You, L. M., Chen, S. X., Hao, Y. T., Zhu, X. W., Zhang, L. F., & Aiken, L. H. (2012). The relationship between hospital work environment and nurse outcomes in Guangdong, China: A nurse questionnaire survey. *Journal of Clinical Nursing*, *21*, 1476–1485.

Lucero, R. J., Lake, E. T., & Aiken, L. H. (2010). Nursing care quality and adverse events in U.S. hospitals. *Journal of Clinical Nursing*, *19*(15–16), 2185–2195.

Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice-Hall.

Maslach, C., & Jackson, S. E. (1986). *Maslach Burnout Inventory* (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Jackson, S., & Leiter, M. (1996). *Maslach Burnout Inventory* (3rd ed). Mountain View, CA: Consulting Psychological Press.

McHugh, M., & Witkoski Stimpfel, A. (2012). Nurse reports of quality of care: A measure of hospital quality. *Research in Nursing and Health*, *35*(6), 561–679.

McHugh, M. D., Kutney-Lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs (Millwood)*, *30*, 202–210.

Nantsupawat, A., Nantsupawat, R., Kulnaviktikul, W., & McHugh, M. D. (2014). Relationship between nurse staffing levels and nurse outcomes in community hospitals, Thailand. *Nursing & Health Sciences*, *17*, 112–118.

National Database of Nursing Quality Indicators. (2013). Changes to NDNQI fall indicator coming for 2Q2013. *NDNQI Nursing Quality News*, *14*(1), 2. Retrieved from http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume122007/No3Sept07/NursingQualityIndicators.html

National Quality Forum. (2004). *National consensus standards for nursing-sensitive care: An initial performance measure set*. Washington, DC: Author.

National Quality Forum. (2009). *Nursing-sensitive care: Measure maintenance*. Retrieved from http://www.qualityforum.org/Projects/n-r/Nursing-Sensitive_Care_Measure_Maintencance/Nursing_Sensitive_Care_Measure_Maintenance.aspx

Oulton, J. A. (2006). The workplace is the issue—Isn't it obvious? *International Nursing Review*, *53*(2), 91. doi: 10.1111/j.1466-7657.2006.00499.x

Poghosyan, L., Clarke, S. P., Finlayson, M., & Aiken, L. H. (2010). Nurse burnout and quality of care: Cross-national investigation in six countries. *Research in Nursing & Health*, *33*, 288–298.

Sundin, L., Hochwalder, J., Bilt, C., & Lisspers, J. (2007). The relationship between different work-related sources of social support and burnout among registered and assistant nurses in Sweden: A questionnaire survey. *International Journal of Nursing Studies*, *44*, 758–769.

Supamanee, T., Kunaviktikul, W., & Keitlertnapha, P. (2014). Nurses' extended work hours and nurse outcomes in community hospitals. *Nursing Journal*, *40*, 48–58.

Teng, C. I., Shyu, Y. L., Chiou, W. K., Fan, H. C., & Lam, S. M. (2010). Interactive effects of nurse-experienced time pressure and burnout on patient safety: A cross-sectional survey. *International Journal of Nursing Studies*, *47*, 1442–1450.

Van Bogaert, P., Clarke, S., Roelant, E., Meulemans, H., & Van de Heyning, P. (2010). Impacts of unit-level nurse practice environment and burnout on nurse-reported outcomes: A multilevel modeling approach. *Journal of Clinical Nursing*, *19*, 1664–1674.

Van Bogaert, P., Kowalski, C., Weeks, S. M., Van Heusden, D., & Clarke, S. P. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies*, *50*, 1667–1677.

Van Bogaert, P., Timmermans, O., Weeks, S. M., Van Heusden, D., Wouters, K., & Franck, E. (2014). Nursing unit teams matter: Impact of unit-levels nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events—A cross-sectional survey. *International Journal of Nursing Studies*, *51*(8), 1123–1134.

Williams, A. M. (1998). The delivery of quality nursing care: A grounded theory study of the nurses' perspective. *Journal of Advanced Nursing*, *27*, 808–816.

World Health Organization. (2002). *Prevention of hospital-acquired infections: A practical guide*. Retrieved from http://www.who.int/csr/resources/publications/drugresist/en/whocdscsreph200212.pdf?ua=1

You, L. M., Aiken, L. H., Sloane, D. M., Liu, K., & He, G. P. (2013). Hospital nursing, care quality, and patient satisfaction: Cross-sectional surveys of nurses and patients in hospitals in China and Europe. *International Journal of Nursing Studies*, *50*, 154–161.

Zhu, X. W., You, L. M., Zheng, J., Liu, K., Fang, J. B., Hou, S. X., . . . Zhang, L. F. (2012). Nurse staffing levels make difference on patient outcomes: A multisite study in Chinese hospitals. *Journal of Nursing Scholarship*, *44*(3), 266–273.

JOURNAL OF NURSING SCHOLARSHIP

WORLD HEALTH

Public Understanding of the Role of Nurses During Ebola

Linda McGillis Hall, PhD, RN, FAAN, FCAHS[1], & Jordana Kashin, MPH, BScH, RN[2]

1 *Lambda Pi-at-Large*, Kathleen Russell Distinguished Professor, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, Toronto, ON, Canada
2 Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, Toronto, ON, Canada

Key words
Ebola, epidemics, health system preparedness, media portrayals, nurses, nursing

Correspondence
Dr. Linda McGillis Hall, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, 155 College Street, Suite 130, Toronto, Ontario M5T 1P8, Canada. E-mail: l.mcgillishall@utoronto.ca

Accepted: October 23, 2015

doi: 10.1111/jnu.12182

Abstract

Purpose: To examine media portrayals of nurses and their roles during the 2014–2015 Ebola epidemic in western Africa.
Methods: The study used document analysis and in-depth content analysis to review and assess literature on the Ebola epidemic. A total of 234 potentially relevant articles were identified; 109 were excluded and 125 were included in the analysis.
Findings: The analysis revealed a gap in system preparedness for global health events and a lack of public awareness of the critical role of nurses. Little attention was paid to nurses and their knowledge and expertise as they worked through the Ebola event. The perception of nurses evolved over the epidemic.
Conclusions: Portrayals of nurses and their work during the Ebola epidemic evolved over the epidemic, from positive to negative, and health systems were shown to be unprepared for a major epidemic.
Clinical Relevance: Media coverage of major health events can demonstrate system inadequacies, but inaccurate and misleading portrayals of nurses and the nursing profession can undermine and diminish the image of the nursing profession.

The image of nurses depicted to the public through print sources, media, television, movies, and more recently on the Internet has been of concern over the years. Close to three decades ago leading researchers in this area highlighted the need to move away from negative portrayals of nurses in the media to realistic and accurate accounts of what nurses do in their work (Fagin & Diers, 1983; Kalisch & Kalisch, 1983, 1987). Despite this, more recent studies have found nurses to be virtually absent or in the background in healthcare media stories (Summers & Jacobs, 2009; Sussman, 2000). One exception appears to be during times of an unprecedented public healthcare event, such as severe acute respiratory syndrome (SARS), where nurses have a major healthcare role (McGillis Hall et al., 2003).

During the outbreak of SARS in Toronto, Canada, in 2003 media coverage highlighted some of the challenges to traditional nursing practice roles that nurses experienced with working in circumstances of isolation (McGillis Hall et al., 2003). This included providing care while wearing cumbersome protective gowns, masks, caps, booties, and goggles, and the impact this had on forming relationships with patients through gloves, as well as blurred speech through masks, and limited understanding of facial expressions when only the eyes are visible. In addition, these nurses had limited access to family and colleagues as they were required to be in isolation during this period. While many of the media accounts that emerged during the SARS crisis depicted nurses as heroes and professionals, some paradoxical reports were noted within the community where family members and the nurses themselves were ostracized for being a "SARS nurse" (McGillis Hall, et al., 2003).

Throughout the past year the world has faced another threat to public health, with the emergence of Ebola virus disease (Ebola) in West Africa. This article presents the results of a document analysis of the international response to Ebola and the perspectives paid to the role of nurses that can influence public perceptions of nurses' work. This is of particular importance given the recent outbreak of the Middle East Respiratory Virus Syndrome virus in South Korea, less than a year after Ebola.

Background

Ebola was first identified in the Congo in 1976 and is a viral zoonotic disease that is spread through human-to-human transmission, causing severe and fatal illness (World Health Organization [WHO], 2015c). Several outbreaks have occurred over the years across East and Central Africa, but have been limited to rural areas and small villages. More recently, in March 2014 the largest outbreak of Ebola to date was identified in West Africa, devastating three nations and resulting in over 11,289 deaths to date, with close to 27,760 suspected, probable, and confirmed cases worldwide, the majority occurring in Guinea, Sierra Leone, and Liberia (Centers for Disease Control and Prevention [CDC], 2015a; WHO, 2015a). In August of 2014 the Ebola epidemic was declared a "public health emergency of international concern" by the WHO (2015c).

Since that time, one of the challenges with Ebola has been public understanding of the disease and its transmission. Those infected with the Ebola virus are not considered contagious until symptoms appear, which may be anywhere from 2 to 21 days after exposure to the virus, resulting in a 21-day incubation period for the virus (CDC, 2015b). Healthcare workers, including nurses who provide care for Ebola patients, as well as friends or family members in close contact with the Ebola patient, are at the highest risk for getting the virus through contact with infected blood and body fluids, or contaminated surfaces (CDC, 2015b).

Ebola reached North America in the fall of 2014, when two nurses who cared for an infected patient in a Texas hospital following his return from West Africa were infected with the virus. Similarly, a Spanish nurse became infected after working with an Ebola patient in Sierra Leone. All of these nurses later recovered from the disease, although the patients did not survive. In addition, Spanish authorities elected to euthanize the nurse's dog, rather than quarantine it, due to fear that it may have contracted Ebola. Quarantines were imposed by the United States and Canada on those who were returning from travel to West Africa, including nurses who had responded to the call for healthcare workers to work through this unprecedented global health crisis. These events prompted a great deal of media attention to Ebola internationally. This study examines media portrayals of nurses and their roles during the 2014–2015 Ebola epidemic.

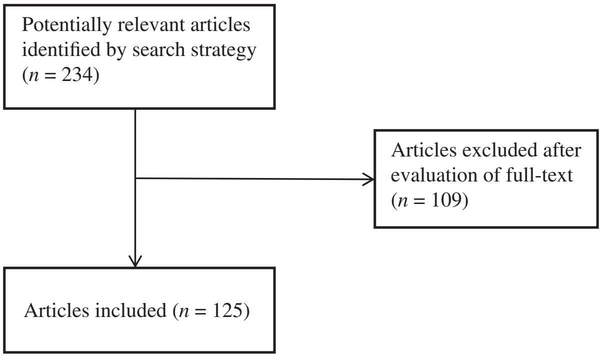

Figure 1. Document search strategy and outcomes.

Methods

Document analysis (Bowen, 2009) was the methodology used to review and assess the depictions of Ebola and the role of nurses in the Ebola epidemic portrayed in the media throughout the Ebola epidemic. Document analysis provides the opportunity for researchers to assess text and written words to provide a contextual understanding of a research topic (Bowen, 2009). The document search strategy aimed to find literature published on the recent Ebola epidemic with a focus on the role of healthcare workers, specifically nurses, in this event. Two databases were searched through Proquest and include CBCA Complete and Canadian Newsstand. The search terms for both databases included ALL (Nurse* OR ″Healthcare worker″ OR ″Health care worker″ OR ″Ebola nurse″) AND (Ebola OR Ebola outbreak).

Articles published in English between January 1, 2014, and December 31, 2014, were considered for inclusion in this review. The analysis included any articles that addressed the portrayal of and public's views or perception of nurses' work during the Ebola outbreak. The types of literature eligible for inclusion included audio and video works, blogs, podcasts and websites, conference papers and proceedings, dissertations and theses, government and official publications, magazines, newspapers, and reports. Using the search terms and after de-duplication, 234 articles were identified from the search strategy. After review of the full-text articles, 109 articles were rejected as not meeting the criteria for inclusion in the review, which left 125 articles for inclusion. **Figure 1** outlines the search strategy and outcomes.

Each of the documents was reviewed by the two study authors, including an initial examination of each of the articles, followed by a full reading by both authors of each article, and finally, an in-depth content analysis of the relevant documents that were selected for inclusion (Bowen, 2009). Initial descriptive coding of the documents was conducted in the iterative manner identified by Sandelowski (2000), and the texts were sorted into categories, emerging as themes. Within each of the thematic areas, further exploration of the data were conducted, including reflexively studying and re-reading of the texts by both authors, and interpreting the content of each of the documents (Bowen, 2009; Miles & Huberman, 2013).

Findings

The document analysis revealed two overarching themes: (a) gap in system preparedness for global public health events and (b) lack of public awareness of the critical role of nurses in these events. Within these broad categories a number of subthemes were also noted. Within the area of gaps in system preparedness, the subthemes included (a) paradoxical responses from government and other healthcare organizations and (b) quarantine awareness and management. A great deal of inconsistency emerged in the responses to Ebola by governments and international healthcare organizations. Differing views on the need for quarantine and the processes for implementing these quarantines were also evidenced. Within the broad theme relating to public awareness of the role of nurses in major public health events, the image and corresponding role of nurses were also found to vary, with a tendency toward reinforcing the traditional views of (a) nurses as war heroes or (b) nurses as villains. Little or no focus was paid to the voices of the nurses who worked through the Ebola event, and the knowledge and expertise they bring and role they have in global health.

Gap in System Preparedness for Global Public Health Events

Often evident from the headlines, the language used to describe Ebola in the media was extreme, emphasizing negative events, an approach to Ebola that was out of control and evoking fear in the reader.

Paradoxical responses from government and other health organizations. The texts of these accounts presented contradictory responses between governments, global health organizations, and professional groups on approaches to deal with Ebola, no doubt further contributing to the confusion conveyed to the public:

The United Nations has begged for more doctors and nurses to help contain Ebola in the region, where there have been more than 14,000 cases and at least 5,170 have died. Health care workers are most at risk (Rihouay, 2014, p. D.6). "I have never seen a health event threaten the very survival of societies and governments in already very poor countries," said WHO director-general Margaret Chen ("Ebola Victims Deserve Concern," 2014, p. A.10). "As the biggest-ever outbreak of Ebola continues to ravage West Africa, here are a few numbers to get a handle on the epidemic . . . WHO" (Cheng, 2014, p. A.15). "The latest in Ebola news saw Canada join Australia last week in denying visas to anyone who resides in—or has even recently passed through—any of the West African countries dealing with outbreaks of the virus" ("Another View: Don't Panic," 2014, p. A.8).

> We weren't the best prepared. We did not have extensive training. We did not have a level of feeling comfortable with putting on and taking off the protective equipment. We didn't have the time to practice it. There was not a lot of education done beforehand. (Shoichet, 2014)

Quarantine awareness and management. While a great deal of attention was focused on the events taking place in West Africa, the location of the Ebola crisis, much less consideration had been paid to the potential migration of the disease into other countries. Specifically, inconsistent approaches to the need for and implementation of quarantines emerged both within and between countries. In addition, lack of preparation at airports and local hospitals to manage people who were to be quarantined was also reported:

> The US government is ramping up its response to the Ebola crisis after a second [name of US state] nurse became ill and it was disclosed that she had been cleared to fly a day before her diagnosis. [Nurse] was being monitored closely since another nurse [name], also involved in Ebola victim's [name] care, was diagnosed with Ebola. A Centers for Disease Control official cleared [nurse] to board the [name] flight. [Nurse] was diagnosed with Ebola a day after the flight, news that sent airline stocks falling amid fears that it could dissuade people from flying. (Kuhnhenn, 2014, p. B.2)

> Defense Secretary Chuck Hagel ordered all US troops returning from Ebola-stricken West Africa to be held for 21 days for monitoring, adding to conflicting messages about the government's response. The Pentagon's policy runs counter to the message being delivered by President Barack Obama and the advice of the US Centers for Disease Control and Prevention, which has advocated against a blanket quarantine for those who don't show any symptoms of the deadly virus. (Lerman & Olorunnipa, 2014, p. A.5)

> The American Nurses Association opposes the mandatory quarantine of health care professionals who return to the United States from West African nations where Ebola is widespread. ANA supports registered nurse [name] in her challenge of a 21-day quarantine imposed by state officials in Maine. After testing negative twice for Ebola, [nurse] who continues to be symptom-free, poses no public threat. (Bayly & Farwell, 2014, p. B.3)

> After a short period isolated in a bathroom they are to be taken by medical staff wearing protective equipment to a decontamination area off the ambulance bay and if then deemed at high risk for Ebola, transported to the [name] hospital for specialist treatment. ("Keep the 'Care' While Being Careful," 2014, p. A.10)

> [Nurse] and other frontline workers run the risk of contracting the virus themselves, despite the full hazmat suits they wear. If that happens, [they] can't leave the country and risk spreading the outbreak. (Charlton, 2014, p. A.1)

> Meanwhile, the patient involved, along with an accompanying friend, say that without Ebola ever being mentioned, they were put into a bizarre five-hour "quarantine." They spent the first hour in a "dirty" single-stall public bathroom, which they were ordered not to use, followed by almost four hours in the hospital's main garage area, where there was medical waste on the ground and no bathroom. ("Keep the 'Care' While Being Careful," 2014, p. A.10)

Lack of Public Awareness of Critical Role of Nurses in Public Health Events

The image of nurses portrayed throughout the Ebola crisis followed much the same pattern that has been seen in past media depictions of the nurse as war hero or the nurse as a villain. Little attention was directed to describing the role of nurses, and the knowledge and expertise that nurses bring to solving public health emergencies.

Nurse as war hero. Initial media stories compared nurses to Florence Nightingale, emphasizing the traditional role image of nurses as heroes for providing care to Ebola patients, often using military language to situate and locate care (e.g., front lines):

> The nurses are humanitarian heroes, working with courage on the front lines of a health crisis. . . . Like Nightingale, these health-care heroes can find spiritual strength in their calling to aid others who are most in need. ("Ebola Nurses Labour in the Spirit of Nightingale," 2014, p. A.12)

> Sadly, the problems expressed by the heroic [hospital name] RNs was predictable in our fragmented, uncoordinated private healthcare system, and it mirrors concerns we've heard from nurses across the US. They are our first line of defense. We would not send soldiers to the battlefield without armor and weapons. ("As News Breaks," 2014)

Nurse as villain. As the Ebola crisis evolved over time, by the fall of 2014 as Ebola moved outside of the African continent, media stories began to cast nurses as the villain, often at a time when nurses were failing to fit the traditional images from the past. Perhaps as a result of the inconsistent media messaging, public response to nurses working with Ebola patients reflected fear and anger:

> Selfish. Unprofessional. Irresponsible. . . . These accusations have been aimed at two American health workers who recently volunteered for the Ebola outbreak in West Africa. One, [doctor], enjoyed a night out with friends in New York before being diagnosed with the virus; the other, [nurse], won a victory Friday in her fight against a quarantine imposed by the state of Maine, even though she is healthy and has tested negative for the virus. Both observed the protocols they were given . . . but this does little to reassure an increasingly fearful public. (Yang, 2014, p. A.20)

> One letter-writer said he hoped she'd get Ebola and die. (Panetta, 2014)

> "[Nurse] has Ebola!" her neighbours chanted as they gathered at her front door after they learned that two patients at the clinic where she worked in the Malian capital, Bamako, died of the disease. . . . The neighbours and some kids came after me and threw stones and handfuls of sand. (Rihouay, 2014, p. D.6)

> Caregivers who initially treated [patient] were not properly dressed. They initially wore simple masks that left their head and necks exposed. They also did not wear full body suits, leaving their legs partially exposed. . . . after a few days of treatment the caregivers began layering on protective clothing and using tape to secure it, which also violated procedures. (Marsden, 2014)

Nurses working with Ebola. In contrast, the voices of individual nurses who worked with Ebola patients received little attention in the press, despite being markedly different. Nurses identify a range of factors that influence their decisions to work in these circumstances, everything from instinctual to acknowledgment of the need for the advanced knowledge and skill that nurses bring to this work. Some recognize this work as rewarding and extending their own learning. In addition, nurses emerged as the whistleblowers, challenging the system's preparation and knowledge management by politicians related to dealing with this significant public health event: "[Nurse] appreciates the opportunity to broaden her horizon and said it's humbling to be part of the work being done by multiple medical and charity organizations"(Charlton, 2014, p. A.1). "For me, awareness is a responsibility. I have the skills and training and the needs are so high on the ground" (Yang, 2014, p. A.20). "I wanted to go immediately. The more I heard, the more excited I got. We work really hard here, the hours are long and the work is physically and emotionally tiring" (Mulrooney, Kovack, & Kongelf, 2014). "Her reasons are instinctive, from the gut. You feel driven to do this or you don't. The thinking comes later" (Hartocollis, 2015, p. MB.1).

At the same time, the perceptions of nurses who made the choice to assist during Ebola identify some of the most poignant policy perspectives that bear consideration for the future:

> It's just incredibly disappointing to be doing the work you love—and then come back and because politicians want to gain some votes, they make this into a re-election campaign issue instead of what it should be—which is a real public-health debate. (Panetta, 2014)

Discussion

The emergence and handling of Ebola over the past year has brought to the forefront the need for clarity on both the treatment and management of global health issues in the future. Recently, the WHO has publicly acknowledged that it "failed" in how it handled Ebola and promises reforms aimed at improving responses in the future ("Ebola: World Health Organization Admits Failings in Tackling Crisis," 2015). A month later, in May 2015, they announced that the EBOLA outbreak was over in Liberia (WHO, 2015b). What is most concerning is the lack of any concerted development of global standards and approaches to public health events of this nature since that time. At the same time, new cases of Ebola have since been identified along with survivor health issues. Most recently, a U.K. nurse who had the disease during the outbreak became reinfected with the virus, requiring hospitalization and treatment for meningitis believed to have developed after the Ebola virus remained dormant in her brain and spinal fluid over the past months ("Ebola Caused Meningitis in Nurse Pauling Cafferkey," 2015).

Following a preliminary report issued by the WHO identifying that nurses and nurses' aides comprised 80% of the 815 healthcare workers infected with the Ebola virus since this epidemic began, the International Council of Nurses (ICN) called for greater supports and safer work environments for nurses (ICN, 2015). This follows a declaration issued following the ICN World Summit on Nursing and the Ebola Virus held in October 2014 that reinforced the need for nurses to have safe work environments, adequate training and education, protective equipment, and participation in policy making related to prevention and care of patients. However, this document analysis emphasizes the need to move beyond these recommendations to accentuating the important role of nurses in major public health events, and the necessity for enhanced public understanding of these roles.

The perspectives identified in this study highlight the key role that initiatives like the Global Advisory Panel on the Future of Nursing (GAPFON), developed by Sigma Theta Tau International in 2013, will play in ensuring that a voice and vision for nursing exists in advancing global health (Klopper & Hill, 2015). Benton (2015, p. 144) calls for nursing to rise to the challenge and opportunities that come with the role, highlighting our ability to "deliver solutions in places that others do not reach" as a discipline with such a broad base that crosses "all levels of the health system." GAPFON provides a venue to ensure that nurses have the opportunity to shape health at both the policy and practice levels (Klopper & Hill, 2015) and at the same time promote the practice component of nursing that is lacking in many narratives that currently exist.

Implications

Media coverage and portrayal of nurses and nursing practice can influence the public's perception of healthcare delivery, especially during infectious disease outbreaks of international concern (McGillis Hall et al., 2003). Studies have shown that the quality of media coverage, especially during the early stages of an outbreak, can impact and potentially delay the peak of an infectious disease outbreak by days or weeks. This delay buys time for public health agencies to respond appropriately (Semeniuk, 2015). Moreover, the media has a huge impact on both quelling or perpetuating fear and stigma in the general population. The public relies heavily on the media, as well as government and global health and professional organizations, to provide accurate and complete information during health crisis situations. When the messages and images that are provided to the public about nursing fail to capture the full scope of the role that nurses have in health care, the profession will no doubt continue to struggle with its image.

This document analysis highlights the need for the profession to clarify public information on the role of nurses generally and in particular with major health events like Ebola, to dispel the myths that exist and create a new image for nursing. For many new and emerging infectious diseases of global health concern like Ebola, there is no standardized cure, and the care being provided to patients is predominantly supportive nursing care (Robert Wood Johnson Foundation, 2014). Thus, nurses have a paramount role in these public health crises and in educating the public about them.

Traditionally nurses have little or no media training and have not been front and center in the media. As evidenced in this analysis, a public health event of this nature provides a unique opportunity for individual nurses to personally speak to the media, clarify information, and reframe the public's understanding of expert role of the professional nurse in health care globally.

Clinical Resources

- American Nurses Association: Ebola: What do Nurses Need to Know? http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Work-Environment/DPR/Ebola-Information/Ebola-Preparedness
- World Health Organization. Ebola virus disease outbreak. http://www.who.int/csr/disease/ebola/en/

References

Another view: Don't panic [Editorial]. (2014, November 7). *Waterloo Region Record*, p. A.8.

As news breaks that second health worker in Dallas tests positive for Ebola national nurses call on President Obama to issue executive order directing hospitals to follow highest standards for beating Ebola [Editorial]. (2014, October 15). *PR Newswire*. Retrieved from http://www.prnewswire.com/news-releases/as-news-breaks-that-second-health-worker-in-dallas-tests-positive-for-ebola-national-nurses-call-on-president-obama-to-issue-executive-order-directing-hospitals-to-follow-highest-standards-for-beating-ebola-279370172.html

Bayly, J., & Farwell, J. (2014, October 31). Maine nurse lands in middle of Ebola debate. *The Daily Gleaner*, p. B.3.

Benton, D. C. (2015). Health and nursing in all policies. *International Nursing Review*, *62*(2), 144.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40.

Bray, M., & Chertow, D. S. (2015). *Epidemiology and pathogenesis of Ebola virus disease*. Retrieved from http://www.uptodate.com/contents/epidemiology-and-pathogenesis-of-ebola-virus-disease

Centers for Disease Control and Prevention. (2015a). *2014 Ebola Outbreak in West Africa*. Retrieved from http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/

Centers for Disease Control and Prevention. (2015b). *Ebola (Ebola virus disease) fact sheet*. Retrieved from http://www.cdc.gov/vhf/ebola/pdf/ebola-factsheet.pdf

Charlton, J. (2014, July 28). Nurse to treat Ebola victims. *Regina Leader Post*, p. A.1.

Cheng, M. (2014, November 8). Numbers chronicle worst-ever Ebola crisis. *The St. Louis Post Dispatch*, p. A.15.

Darbyshire, P. (2010). Heroines, hookers and harridans: Exploring popular images and representations of nurses and nursing. In J. Daly, S. Speedy, & D. Jackson (Eds.), *Contexts of nursing* (3rd ed., pp. 51–64). Chatswood, New South Wales, Australia: Elsevier Australia.

Ebola caused meningitis in nurse Pauling Cafferkey. (2015, October 21). *BBC.com*. Retrieved from http://www.bbc.com/news/uk-scotland-glasgow-west-34592132

Ebola nurses labour in the spirit of Nightingale [Editorial]. (2014, August 29). *The Spectator*, p. A.12.

Ebola victims deserve concern [Editorial]. (2014, October 15). *Times-Colonist*, p. A.10.

Ebola: World Health Organization admits failings in tackling crisis. (2015, April 19). *Thomson Reuters*. Retrieved from http://www.cbc.ca/news/world/ebola-world-health-organization-admits-failings-in-tackling-crisis-1.3039864

Fagin, C. F., & Diers, D. (1983). Nursing as metaphor. *New England Journal of Medicine*, *309*(2), 116–117.

Hartocollis, A. (2015, January 16). Heading to the Ebola zone. *The New York Times*, p. MB.1.

International Council of Nurses. (2015, May 21). *Ebola: Protect our nurses! International Council of Nurses calls for greater support for frontline healthcare workers*. Retrieved from http://www.icn.ch/images/stories/documents/news/press_releases/2015_PR_11_Ebola_WHO_report.pdf

Kalisch, B. J., & Kalisch, P. A. (1983). Improving the image of nursing. *American Journal of Nursing*, *83*(1), 48–53.

Kalisch, P. A., & Kalisch, B. J. (1987). *The changing image of the nurse*. Menlo Park, CA: Addison-Wesley Publishing Company.

Keep the 'care' while being careful: Incident indicates Ebola procedures need review [Editorial]. (2014, November 1). *Leader Post*, p. A.10.

Klopper, H. C., & Hill, M. (2015). Global advisory panel on the future of nursing (GAPFON) and global health. *Journal of Nursing Scholarship*, *47*(1), 3–4.

Kuhnhenn, J. (2014, October 17). Centre cleared Dallas nurse for flight a day before Ebola diagnosis. *The Daily Gleaner*, p. B.2.

Lerman, D., & Olorunnipa, T. (2014, October 30). U.S. Ebola isolation plan grows. *Waterloo Region Record*, p. A.5.

Marsden, W. (2014, October 15). U.S. investigates Ebola spread: Serious breaks in protocols at Dallas hospital. *Postmedia News*. Retrieved from http://o.canada.com/news/world/u-s-investigates-ebola-spread-serious-breaks-in-protocols-at-dallas-hospital

McGillis Hall, L., Angus, J., Peter, E., O'Brien Pallas, L., Wynn, F., & Donner, G. (2003). Media portrayal of nurses' perspectives and concerns in the SARS crisis in Toronto. *Journal of Nursing Scholarship*, *35*(3), 211–216.

Miles, M. B., & Huberman, A. M. (2013). *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Mulrooney, B., Kovack, S. E., & Kongelf, A. (2014, October 13). "A teenage girl bled to death over two days": Ebola nurses describe life and death on the frontline. *The Guardian*. Retrieved from http://www.theguardian.com/world/2014/oct/13/ebola-nurses-describe-life-death-on-frontline-liberia-sierra-leone.

Panetta, A. (2014, November 16). U.S.'s quarantine-fighting nurse clubs Canada's Ebola policy. *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/news/national/uss-quarantine-fighting-nurse-rips-canadas-ebola-policy/article21604909/

Rihouay, F. (2014, November 20). Malian nurse braves stoning by neighbours to work in Ebola clinic; United Nations begs for more nurses, doctors. *The Windsor Star*, p. D.6.

Robert Wood Johnson Foundation. (2014, November 10). *Ebola care is nursing care*. Retrieved from http://www.rwjf.org/en/library/articles-and-news/2014/11/_ebola-care-is-nursing-care.html

Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, *23*(3), 246–255.

Semeniuk, I. (2015, January 19). Media can help slow spread of disease, study finds. *The Globe and Mail*, p. A.9.

Shoichet, C. E. (2014, November 6). How did nurse Amber Vinson get Ebola? "It is a mystery to me," she tells CNN. *CNNHealth*. Retrieved from http://www.cnn.com/2014/11/06/health/amber-vinson-ebola-nurse-interview/

Summers, S., & Jacobs, H. (2009). *Saving lives: Why the media's portrayal of nurse puts us all at risk*. New York, NY: Kaplan Publishing.

Sussman, D. (2000, October 23). Image overhaul: Media still are off target portraying nurses. *Nurse Week*.

World Health Organization. (2015a). *2014 West African Ebola outbreak: Feature map*. Retrieved from http://www.who.int/features/ebola/storymap/en/

World Health Organization. (2015b). *The Ebola outbreak in Liberia is over*. Retrieved from http://www.who.int/mediacentre/news/statements/2015/liberia-ends-ebola/en/

World Health Organization. (2015c). *Ebola virus disease. Fact sheet No. 103. Updated April 2015*. Retrieved from http://www.who.int/mediacentre/factsheets/fs103/en/

Yang, Y. (2014, November 1). Behind the choice to fight Ebola. *Toronto Star*, p. A.20.

JOURNAL OF NURSING SCHOLARSHIP

WORLD HEALTH

Disaster Preparedness in Philippine Nurses

Leodoro J. Labrague, MAN, RN[1], Begonia C. Yboa, MAN, RN[2], Denise M. McEnroe–Petitte, PhD, MSN, AS, RN[3], Ledwin R. Lobrino, BSN (student)[4], & Mary Geronima B. Brennan, BSN (student)[4]

1 *Phi Gamma*, Lecturer, Department of Fundamentals and Administration, College of Nursing, Stultan Qaboos University, Muscat, Sultanate of Oman
2 Instructor, Samar State University, College of Nursing and Health Sciences, Catbalogan City, Samar, Philippines
3 *Delta Xi*, Associate Professor, Kent State University, Tuscarawas, Kent, OH, USA
4 Student, Samar State University, College of Nursing and Health Sciences, Catbalogan City, Samar, Philippines

Key words
Calamity, disaster, disaster preparedness, Philippine nurses

Correspondence
Leodoro J. Labrague, Sultan Qaboos University, College of Nursing, Department of Fundamentals and Administration, Al Khoudh, Muscat, Oman. E-mail: leodoroj@squ.edu.om

Accepted: November 2, 2015

doi: 10.1111/jnu.12186

Abstract

Purpose: This study examined the perceived level of disaster preparedness in Philippine nurses.
Design: A descriptive, cross-sectional research design was used in this study.
Methods: Two hundred nurses were invited to participate in the study, with 170 responses (105 hospital nurses and 65 community nurses) or an 85% response rate, during the months of April 2014 through July 2014. Data collection was based on interviews using a standardized instrument, the Disaster Preparedness Questionnaire. Descriptive statistics such as frequencies, means, percentages, and standard deviations were utilized to quantify the responses.
Results: Three fourths of the respondents ($n = 136$, 80%) indicated that they were not fully prepared to respond to disasters, while only 20% ($n = 34$) acknowledged that they felt they were adequately prepared. Respondents believed that they could function in the primary roles of educator ($n = 107$, 62.94%), caregiver ($n = 104$, 61.17%), and counselor ($n = 82$, 48.24%). More than half of the respondents ($n = 98$, 57.7%) were not aware of existing protocols of disaster management in the workplace. Courses taken in such areas as first aid ($n = 79$, 46.4%), field triage ($n = 43$, 25.29%), and basic cardiac life support ($n = 57$, 33.53%) were cited as important in preparing for disasters.
Conclusions: Nurses in the study revealed that they were not sufficiently prepared for disasters nor were they aware of disaster management protocols in the workplace.
Clinical Relevance: Hospital administrators should consider the development and formulation of disaster management protocols and provide appropriate disaster nursing education and training. Nursing curricula should incorporate basic principles of disaster management into nursing courses as a framework for addressing this critical deficit.

Disasters occur at an average of one per week around the globe, detrimentally impacting individuals', families', and communities' health and well-being (Landesman & Veenema, 2007; World Health Organization [WHO], 2009). In 2013, Asia was the region considered to be the most often hit by natural disasters, accounting for 90.13% of worldwide disaster victims (Guha-Sapir, Vos, & Below, 2013). The Philippines is one of the top five high-risk countries in the world that experiences natural disasters such as earthquakes, flash floods, mudslides, typhoons, and volcanic eruptions, together with China, the United States, and Indonesia (Guha-Sapir et al., 2013). The Philippines is also considered to be one of the most storm-exposed areas on Earth. On average, 18 to 20 tropical storms enter Philippine waters each year, with 8 or 9 of those storms making landfall (Kubota & Chan, 2009). In 2013, Typhoon Haiyan, considered to be one of the most powerful storms ever recorded,

Journal of Nursing Scholarship, 2016; 48:1, 98–105.

hit the Philippines, wiping out villages, displacing 4 million people, and causing nearly 10,000 deaths. In the same year, another deadly earthquake hit the country, leaving hundreds dead and injured (Guha-Sapir et al., 2013; National Disaster Risk Reduction and Management Council [NDRRMC], 2014). Moreover, the Philippines is situated on the "Ring of Fire" and has a number of active volcanoes that periodically threaten their immediate vicinities (Oppenheimer, 1991).

Disaster is defined as any occurrence upsetting the normal conditions of existence and causing a level of suffering that exceeds the capacity of adjustment of the affected community (WHO, 2007, 2009). According to experts, disasters are of two kinds: natural and manmade. Manmade disasters are those caused by human actions such as negligence and problems or failure of a system (Eshghi & Larson, 2008). This includes chemical, biological, and radiological accidents. Conversely, a natural disaster includes storms, volcanic eruptions, earthquakes, landslides, tsunamis, pandemics, and famines (Leon Abbott, 2005; WHO, 2009). While disasters are inevitable, their detrimental health effects can be significantly reduced and prevented if both national and local authorities, including surrounding communities, are well equipped and able to reduce the level of their vulnerabilities and health risks (WHO, 2007). Internationally, the Pan American Health Organization (PAHO, 2001) and WHO (2009) have issued a call for countries to formulate and carry out strategies for the different components of emergency and disaster preparedness planning and to make their health facilities resilient during emergencies. This includes a safety assessment of healthcare facilities and hospitals, capacity building among health workers during emergencies, emergency response planning, designing and building of resilient hospitals, and implementing national policies and programs for safe hospitals and other healthcare facilities.

Background

Disaster preparedness is essential for reducing the damaging effects of emergencies and disasters, since it is vital to meet the needs to deliver effective and immediate responses reflecting the health needs of affected people (Baack & Alfred, 2013; Fung, Loke, & Lai, 2008). It is critical for nurses and other health workers to be ready to assume their roles and help maintain the stability of the communities. Disaster-related roles of nurses may include responding to emergencies, detecting threats, giving direct nursing care to patients, managing healthcare teams and facilities, reducing or eliminating injuries and deaths, developing healthcare policies, conducting research, and working in collaboration with other organizations, including the military (Perron, Rudge, Blais, & Holmes, 2010; WHO, 2009). Nurses also undertake various roles such as clinician, commander, logistical coordinator, and administrator (Ranse, Lenson, & Aimers, 2010).

Nurses, as prime respondents during disasters, should have adequate skills and knowledge related to disasters and disaster management (Baack & Alfred, 2013; Duong, 2009; Fung et al., 2008; Ibrahim, 2014; Lim, Lim, & Vasu, 2013; Natan, Nigel, Yevdayev, Qadan, & Dudkiewicz, 2014). This information can play a key role in helping health and social agencies, government agencies, and nongovernment sectors, as well as the community, in times of disasters. The delivery of health care in disaster situations will only be successful when nurses are able to effectively respond (PAHO, 2001; Veenema, 2006; WHO, 2009). The International Council of Nurses (2009) suggests that efficient delivery of health care in disastrous situations is only possible if nurses have the fundamental disaster competencies to rapidly and effectively respond.

Nurses' Disaster Preparedness

Evidence suggests that awareness in disaster preparation among healthcare workers has grown exponentially around the globe in the past decade. With that being said, the majority of nurses are not yet adequately prepared to respond. Despite the many initiatives that have been made locally and internationally, knowledge and skills to effectively respond to disasters remain inadequate among nurses (Baack & Alfred, 2013; Duong, 2009; Fung et al., 2008; Ibrahim, 2014; Lim et al., 2013; Natan et al., 2014; Yan, Turale, Stone, & Petrini, 2015).

To date, only a few studies on nurses' disaster preparedness exist, and most of the results clearly suggest that nurses are not yet ready to step into a disaster response role. For instance, in a study conducted by Fung et al. (2008) among practicing nurses in Hong Kong in 2007, the majority of nurses knew that there was a protocol in disaster management at their workplace. However, most of them considered themselves to be not sufficiently ready to respond to disasters correctly. In a more recent survey on disaster management and preparedness conducted by Lim et al. (2013) among professional health workers in Singapore, only 36.4% felt they were sufficiently ready to take part in a disaster response team. Furthermore, it was revealed that positive perceptions of an individual's readiness for disaster response was higher in nurses than in medical and other allied health staff members.

Ibrahim (2014) examined nurses' knowledge, attitudes, practices, and familiarity regarding disaster and emergency preparedness in Saudi Arabia. Findings revealed that the level of knowledge and practice in disaster scenarios was below average, with acceptable levels of attitudes regarding disaster preparedness. However, the nurses' level of awareness on emergency preparedness was found to be moderate. Ibrahim recommended conducting hospital disaster preparedness with hospital-based employees. In another study among hospital-based nurses in the United States, nurses had a somewhat low perceived competence regarding their familiarity with disasters, and the majority indicated unpreparedness and lack of confidence in their capacities to effectively respond in a disaster situation (Baack & Alfred, 2013). In another study, Duong (2009) examined Australian nurses' knowledge and their understanding of disaster response in the healthcare setting. A significant proportion of nurses (45%) expressed a limited preparedness to respond to disaster situations, and more than half reported they had never been involved in any disaster response in their professional career as a nurse.

Undoubtedly, the typhoon in November 2013 in the Central Philippines aroused a great number of concerns among nursing professionals and other organizations in the Philippines regarding disaster preparedness. However, to date there is limited research on nurses' understanding of disaster preparedness and other related concepts in this country. Exploring and understanding nurses' perceptions on disaster preparedness and their roles during disasters will provide sound and valuable information, providing for direction in the areas of healthcare education and research development for disaster preparedness in the Philippines.

Disaster Courses in Philippine Nursing Curricula

In most countries, education specific to disasters is only provided in nursing curricula by identifying the need for basic knowledge and responses by the nurse. In Asia, about 86% to 90% of disaster courses are integrated into university curricula (Mayumi et al., 2009). Hence, since 2009, future nurses in the Philippines have begun integrating disaster preparedness into nursing courses. The course instructs nurses on techniques and principles of nursing care of individuals during emergency and disaster events (Philippine Board of Nursing, 2009). However, to date there is no evidence showing the effectiveness of disaster education in preparing future nurses.

Aim

This study determined the perceived level of disaster preparedness in Philippine nurses. Further, their perceived roles during disasters were ascertained.

Methods

Research Design

This study employed a descriptive, cross-sectional research approach. The research design was deemed appropriate for this study since the study goal was to describe Philippine nurses' knowledge with respect to disaster planning and management at this time.

Samples and Settings

Research data were collected using a self-reporting questionnaire from a convenience sample of nurses in the Central Philippines. The Central Philippines is considered a disaster-prone area. It is geographically situated in an area that has been struck by a number of major storms, including the latest Haiyan typhoon in 2013. In the island province of Bohol, situated in the Central Philippines, the area was disrupted by one of the deadliest earthquake in the Philippines, causing hundreds of deaths and injuries (NDRRMC, 2014).

Over a period of 4 months (April 2014 through July 2014), 200 nurses were invited to participate in the investigation and 170 nurses responded (105 hospital nurses and 65 community nurses), an 85% response rate. Nurses were personally approached in their workplaces and were asked if they were willing to participate in the study. To be eligible to participate, nurses were required to be (a) regular or full-time nurses; (b) working in a healthcare institution, either a hospital or other healthcare unit; and (c) sufficiently informed about the study, having signed a consent form.

Instruments

Self-report questionnaires consisted of two parts: (a) demographic information and (b) the Disaster Preparedness Questionnaire.

Demographic Information

General information included age, sex, marital status, years of experience in the healthcare profession, highest level of qualification, and current area employed.

Disaster Preparedness Questionnaire

The questionnaire was developed by Fung et al. (2008) and was based on an extensive review of the related literature on disaster preparedness. The 26-item instrument was divided into four sections and was developed to assess nurses' preparedness during disasters. Permission was obtained from the original author to use and make minimal item modifications so that it would be appropriate for the healthcare worker population. The modified questionnaire was divided into four sections. Section one asked for demographic data and working experience of the participants; section two examined the degree of preparedness to respond to a disaster and the presence of disaster protocols in hospitals and healthcare facilities; section three consisted of questions about relevant agencies or public services that should be involved during disasters; and section four asked nurses to determine the educational needs and materials that they considered useful to better equip them during disasters.

The modified questionnaire was previously validated by a panel of experts in the field of health care: six nurses with expertise in emergency nursing (two from critical care, two public health nurses, and two community health nurses). The Content Validity Index of the instrument was 0.94, as reported in a previous study (Fung et al., 2008). In the present study, the Content Validity Index was 0.90. Its Cronbach's alpha coefficient reliability score was tested and found to be 0.81.

Data Collection Protocol

Before the actual distribution of the questionnaire, a pilot study was undertaken to test the reliability and score distribution. The final distribution of the questionnaire was conducted after incorporating the modifications from the pilot study into the main study questionnaire. Letters of invitation with complete information about the study protocol were sent to nurses in the selected institutions. After identifying potential study participants based on the eligibility criteria, signed consent was obtained from the participants and data collection was carried out.

Ethical Clearance

The study protocol was reviewed and approved by the Health Ethics Committee of Samar State University. Nurses' rights were maintained through disclosure of the nature, benefits, and lack of known risk of the study. After the informed consent form was signed, the researchers dispersed the questionnaires at the respective sites and collected them in a sealed envelope upon completion. To maintain the confidentiality and anonymity of the nurses, code numbers, instead of their names, were used in the questionnaire. Data were collected over a period of 4 months, from April 2014 through July 2014.

Table 1. Respondents' Characteristics

Variable	*n*	%
Age (years)		
18–25	52	30.6
26–35	46	27.1
36–45	39	22.9
46–60	33	19.4
Gender		
Female	122	71.8
Male	48	28.8
Marital status		
Not married	88	51.8
Married	82	48.2
Years of experience in healthcare profession		
<1	30	17.6
1–5	66	38.8
6–10	13	7.6
11–15	43	25.3
>15	18	10.6
Highest qualification		
Bachelor's degree	156	91.7
Master's degree	14	8.3
Current profession		
Hospital nurse	105	61.8
Community nurse	65	38.2

Data Management and Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 16 (SPSS Inc., Chicago, IL, USA) for descriptive and inferential statistics. Descriptive statistics such as frequencies, means, percentages, and standard deviations were utilized to quantify the responses of the respondents.

Participants' Characteristics

Table 1 identifies the demographic characteristics of the respondents. During the 4-month period, a total of 170 nurses were recruited to participate in the study. The majority of the participants were hospital nurses ($n = 105$, 61.8%), and the remaining participants were community nurses ($n = 65$, 38.2%). A majority of the respondents were female ($n = 122$, 71.8%) and not married ($n = 88$, 51.8%). More than half of the respondents ($n = 98$, 57.7%) were 18 to 35 years of age. More than half of the respondents had been in the healthcare profession for

Table 2. Nurses' Preparedness for Disaster

	n	%
Organizations considered most involved in disastrous situations by healthcare workers		
Red Cross	125	73.53
National Disaster Risk Reduction Management Council	108	63.53
Department of Social Welfare and Development	99	58.24
Department of Health	99	58.24
Provincial Government	88	51.76
Philippine National Police	81	47.65
Philippine Army	80	47.06
City Government	80	47.06
Bureau of Fire Protection	63	37.06
Awareness of available protocol of disaster management at workplace		
Yes	72	42.4
No	60	35.3
Don't know	38	22.4
Participation in an activity in accordance with disaster management at workplace		
Yes	53	31.2
No	117	68.8

1 to 5 years, and about 91.7% (*n* = 156) had a bachelor's degree in nursing as the highest level of education.

Nurses' Preparedness for Disasters

Respondents were asked to indicate which organization they considered to be most involved during disasters. Approximately three fourths (*n* = 125, 73.53%) of the respondents quoted the involvement of the Philippines National Red Cross. Apart from the Red Cross, participants also recognized the NDRRMC (*n* = 108, 63.53%), the Department of Social Welfare and Development (*n* = 99, 58.24%), and the Department of Health (*n* = 99, 58.24%) as being involved in disaster response. More than half of the respondents (*n* = 98, 57.7%) were not aware of an existing protocol for disaster management in the workplace (**Table 2**).

Nurses' Perceived Level of Preparedness and Roles During Disasters

More than three fourths of the respondents (*n* = 136, 80%) admitted that they were not fully prepared for a disaster, while only 20% (*n* = 34) acknowledged that they were adequately prepared. When respondents were asked about the perception of their roles during disaster preparedness, the majority of them believed that their primary roles were as educator (*n* = 107, 62.94%), caregiver (*n* = 104, 61.17%), and counselor (*n* = 82, 48.24%; **Table 3**).

Table 3. Perceived Own Preparedness and Role During Disaster Preparedness

	n	%
Nurses' perception of their own preparedness		
Totally unprepared	23	13.5
Somewhat unprepared	32	18.8
Somewhat prepared	81	47.6
Fully prepared	34	20.0
Nurses' perception of their role during disaster preparedness[a]		
Educator	107	62.94
Caregiver	104	61.17
Counselor	82	48.24
Coordinator	71	41.76
Manager	58	34.12
Researcher	49	28.82

[a] Respondents answered more than once.

Learning Needs for Disaster Preparedness

Table 4 shows the responses of the respondents in relation to their learning needs regarding disaster preparedness. When asked about what materials and activities related to disaster preparedness should be developed to enable healthcare workers to prepare for disasters, the majority cited specific practice drills and scenarios (*n* = 110, 64.71%), development and implementation of disaster management protocols (*n* = 96, 56.47%), and completion of a disaster management course (*n* = 88, 51.76%) as important.

Participants were also asked to indicate what kind of educational courses should be taken to prepare for disasters. First aid (*n* = 79, 46.4%), field triage (*n* = 43, 25.29%), basic cardiac life support (*n* = 57, 33.53%), advanced cardiac life support (*n* = 37, 21.76%), and prehospital life support (*n* = 11, 6.47%) were cited as the most essential courses to be taken to prepare them sufficiently.

Study Limitations

While the results of this study are important, since it is the first study of its kind conducted in the country, it nevertheless has some limitations that need to be addressed. First, although the response rate in this study is worthy, the use of convenience sampling may have weakened the generalization of the study. Second, the study could be duplicated in other healthcare settings to recruit more representative samples, so as to represent worthy generalizations. Third, data were collected from only one country (the Philippines); thus, caution should be observed when interpreting or comparing the results with other countries.

Table 4. Learning Needs in Relation to Disaster Preparedness

	n	%
Materials needed for disaster preparedness[a]		
Drills	110	64.71
Disaster management protocol	96	56.47
Disaster management course	88	51.76
Informational website	77	45.29
Onsite visit	70	41.18
Information pamphlets	54	31.76
Educational courses that should be taken in preparing for disaster[a]		
First aid	79	46.47
Field triage	43	25.29
Basic life support	57	33.53
Advanced cardiovascular life support	37	21.76
Prehospital trauma life support	11	6.47
Advanced trauma care for nurses	4	2.35
Advanced trauma life support	7	4.12
Infection control	22	12.94
Peritrauma counseling	23	13.53
Post-traumatic psychological care	6	3.53

[a]Respondents answered more than once.

Discussion

Currently there is an international call for all nurses to be ready and prepared in the areas of disaster preparedness and management so they can better respond to the health needs of the victims. In this study, the perceptions reflect the perceived role in only Philippine nurses.

Healthcare institutions such as hospitals and health units are among the first institutions to be affected after a disaster occurs, and nurses are among the first individuals to manage these consequences (Arbon et al., 2006). Thus, it is imperative that hospitals and healthcare facilities be prepared to handle such unusual work demands because of the unanticipated, emotional, and substantial loads placed on their services at the time of a disaster. It is therefore necessary that a well-documented and tested disaster management plan or protocol be in place (Mehta, 2006). In one study among nurses in Hong Kong, the majority of the participants knew of the existing protocol in their workplace, but when asked if they had read the protocol, only 61% reported to have read it. About 15.2% of nurses did not know if there was such a protocol (Fung et al., 2008). In one study, 58% of Jordanian nurses were not familiar with the disaster protocol in their workplace. The majority of those who were aware of disaster plans reported having no confidence in carrying out the plan (Al Khalaileh, Bond, & Alasad, 2012). In Australia, 87% of nurses knew that a disaster plan existed in their institution, but 42% reported they had not read it at all (Duong, 2009). In the current study, more than half of the respondents were not aware of disaster management protocols in the workplace, although most of them agreed that disaster management protocols and disaster management courses should be developed, implemented, and practiced. This identified the need for the development of a disaster management plan that would incorporate various issues relevant to disasters, such as the establishment of care sites, clinician training in the management of exposure to chemicals and nuclear materials, drills on various aspects of the response plans, and knowledge of special disaster equipment and supplies. This also should include collaboration activities with external agencies such as national and local health institutions, emergency medical services, fire departments, and law enforcement agencies (Natan et al., 2014; Mehta, 2006).

The United Nations (2004) posts that nurses should also assist and participate in the development of disaster preparedness programs and explore their role in raising community awareness with regard to disaster management. This study explored nurses' perceptions of disaster preparedness, and they agreed that their role as educators is seen as a primary role. Apart from their role as educators, nurses in this study believed that they also have the role of caregivers. When disasters happen, nurses actively participate in giving immediate care to the victims and others who are affected, assign on-site triage, and support and protect others from potential health hazards. In one study, apart from giving direct care to victims, nurses performed other roles, such as educating, solving a problem, and even coordinating activities (Yang, Xiao, Cheng, Zhu, & Arbon, 2010). In another study conducted in Australia, nurses performed various roles during disasters, such as clinician, commander, logistical coordinator, and administrator (Ranse et al., 2010). In a more recent study, in addition to their clinical care role, nurses performed psychosocial support, coordinated care and resources, and were problem solvers (Ranse & Lenson, 2012). However, this finding differs from that of a study conducted in Israel. Nurses in that study were found to have little knowledge of their roles during emergencies and disasters (Melnikov, Itzhaki, & Kagan, 2014).

It is worth noting that 80% of the nurses in the present study were not fully prepared for disasters. This finding agrees with previous study findings (Al Khalaileh et al., 2012; Fung et al., 2008; Jiang et al., 2015). For example, in the study by Fung et al. (2008), the vast majority of the respondents (94%) reported that they were not adequately prepared for disasters and that they lacked confidence in responding appropriately. In another study conducted among Jordanian nurses, 65% of respondents felt that they were unprepared for disasters. Specifically, Jordanian nurses considered themselves deficient in such areas as health assessment related to biological or chemical agents, organizational logistics and roles, and addressing biological weapons (Al Khalaileh et al., 2012). The same results were also noted in a study among nurses in China, where these nurses had a basic understanding of disaster knowledge. However, with regard to typhoon disaster relief work, nurses possessed good attitudes and competence. Additionally, nurses all agreed that they needed supplementary training, such as drills in order to increase their level of preparedness (Jiang et al., 2015).

For nurses to be better prepared for disasters, this highly visible and productive group of healthcare providers should be equipped with the necessary knowledge and skills. As front liners, they need to be ready and prepared to respond to disasters immediately. This can be accomplished through provision of training for nurses during nonemergency periods and during initial healthcare education. According to Veenema (2006), nurses can play an important role and cope more effectively when a disaster occurs if they are prepared and trained. Conversely, nurses who lack knowledge and preparedness will have difficulty providing adequate care and support to disaster victims and their families (Natan et al., 2014).

Preparedness for disasters is a tedious process. In addition to having a disaster management plan, it is also necessary for hospitals and other healthcare agencies to have regular updates and drills to test their preparedness for any type of disaster. Evidence suggests that holding mock disaster drills is one of the best and most preferred strategies for training nurses and healthcare workers to fulfill their obligations in disaster relief (Chaput, Deluhery, Stake, Martens, & Cichon, 2007). The drills may be hospital disaster drills, computer simulations, or other types of exercises (Mehta, 2006). In the current study, the majority of participants stated that drills and disaster management courses should be implemented, developed, and practiced. In addition to drills and disaster management courses, first aid and basic cardiac life support training were cited as essential educational courses that should be taken in order to be prepared for disasters. These courses were also cited to be just as important in the current study as in a previous study (Fung et al., 2008). Nurses in the Fung et al. (2008) study also cited protocols for disaster management and disaster drills to be important in the preparation for disasters. During a disaster situation there can be a large number of victims, and first aid and basic cardiac life support training are equally important for a victim's survival. Immediate provision of first aid in particular is necessary to prevent the number of victims from growing and can limit injury and further development of complications (Turale, 2014). Therefore, nurses should be provided with opportunities to join actual disaster events, participate in mock disaster drills, and enroll in other educational opportunities and training that are relevant to disaster preparedness. In one study, self-efficacy enhancing activities were recommended to be integrated in disaster training for nurses (Melnikov et al., 2014).

Conclusions

This study showed that nurses perceived that they are not fully prepared for disasters and were not aware of disaster management protocols in the workplace. In agreement with previous study findings, both the areas of nursing academia and hospital administration play a major role in assuring that nurses and future nurses are equipped with the necessary knowledge and skills to handle such unexpected situations. For instance, hospital administrators should support the development and formulation of disaster protocols and provide essential disaster training for nurses. They also should require nurses to engage in disaster planning and mock drills in order to enhance their competence in disaster situations and be oriented with disaster preparedness. At the academic level, nursing curricula should incorporate basic principles of disaster management into nursing courses as a framework for addressing this critical deficit.

Acknowledgments

The authors would like to express their gratitude to all nursing students who participated in the study.

Clinical Resources

- Disaster preparedness & response: http://www.nursingworld.org/disasterpreparedness
- Emergency preparedness and public health nursing: http://dekalbhealth.net/public-health-nurse/emergency-preparedness-and-nursing/
- Ready, willing, and able: Preparing nurses to respond to disasters: http://www.medscape.com/viewarticle/579888_8

References

Al Khalaileh, M. A., Bond, E., & Alasad, J. A. (2012). Jordanian nurses' perceptions of their preparedness for disaster management. *International Emergency Nursing*, *20*, 14–23.

Arbon, P., Bobrowski, C., Zeitz, K., Hooper, C., Williams, J., & Thitchener, J. (2006). Australian nurses volunteering for the Sumatra-Andaman earthquake and tsunami of 2004: A review of experience and analysis of data collected by the Tsunami Volunteer Hotline. *Australasian Emergency Nursing Journal*, *9*, 171–178.

Baack, S., & Alfred, D. (2013). Nurses' preparedness and perceived competence in managing disasters. *Journal of Nursing Scholarship*, *45*, 281–287.

Chaput, C. J., Deluhery, M. R., Stake, C. E., Martens, K. A., & Cichon, M. E. (2007). Disaster training for prehospital providers. *Prehospital Emergency Care*, *11*, 458–465.

Duong, K. (2009). Disaster education and training of emergency nurses in South Australia. *Australasian Emergency Nursing Journal*, *12*(3), 86–92.

Eshghi, K., & Larson, R. C. (2008). Disasters: Lessons from the past 105 years. *Disaster Prevention and Management: An International Journal*, *17*, 62–82.

Fung, O. W., Loke, A. Y., & Lai, C. K. (2008). Disaster preparedness among Hong Kong nurses. *Journal of Advanced Nursing*, *62*, 698–703.

Guha-Sapir, D., Vos, F., & Below, R. (2013). *Annual disaster statistical review 2013: The numbers and trends (CRED, Brussels, Belgium)*. Retrieved from http://www.cred.be/sites/default/files/ADSR_2013.pdf

Ibrahim, F. A. A. (2014). Nurses' knowledge, attitudes, practices and familiarity regarding disaster and emergency preparedness–Saudi Arabia. *American Journal of Nursing Science*, *3*, 18–25.

International Council of Nurses. (2009). *ICN framework of disaster nursing competencies*. Retrieved from http://www.wpro.who.int/hrh/documents/icn_framework.pdf?ua=1

Jiang, L., He, H. G., Zhou, W. G., Shi, S. H., Yin, T. T., & Kong, Y. (2015). Knowledge, attitudes and competence in nursing practice of typhoon disaster relief work among Chinese nurses: A questionnaire survey. *International Journal of Nursing Practice*, *21*, 60–69.

Kubota, H., & Chan, J. C. (2009). Interdecadal variability of tropical cyclone landfall in the Philippines from 1902 to 2005. *Geophysical Research Letters*, *36*, L12802.

Landesman, L. Y., & Veenema, T. G. (2007). Natural disasters. In T. G. Veenema (Ed.), *Disaster nursing and emergency preparedness for chemical, biological, and radiological terrorism and other hazards* (2nd ed., pp. 327–349). New York: Springer.

Leon Abbott, P. (2005). *Natural disasters* (5th ed.). New York: McGraw-Hill Science.

Lim, G. H., Lim, B. L., & Vasu, A. (2013). Survey of factors affecting health care workers' perception towards institutional and individual disaster preparedness. *Prehospital and Disaster Medicine*, *28*, 353–358.

Mayumi, M., Mariko, O., Takako, I., Yuko, K., Akiko, S., . . . Chikako, I. (2009). Present state of disaster nursing education of the nursing university in Asia region. *Journal of Japan Society of Disaster Nursing*, *10*, 29–35.

Mehta, S. (2006). Disaster and mass casualty management in a hospital: How well are we prepared? *Journal of Postgraduate Medicine*, *52*, 89–90.

Melnikov, S., Itzhaki, M., & Kagan, I. (2014). Israeli Nurses' intention to report for work in an emergency or disaster. *Journal of Nursing Scholarship*, *46*(2), 134–142.

Natan, M. B., Nigel, S., Yevdayev, I., Qadan, M., & Dudkiewicz, M. (2014). Nurse willingness to report for work in the event of an earthquake in Israel. *Journal of Nursing Management*, *22*(7), 931–939.

National Disaster Risk Reduction and Management Council. (2014). *Updates re effects of Typhoon Yolanda (Haiyan)*. Retrieved from http://www.usaid.gov/sites/default/files/documents/1866/philippines_ty_fs22_04-21-2014.pdf

Oppenheimer, C. (1991). People and volcanoes: Taal Island, Philippines. *Geology Today*, *7*, 19–23.

Pan American Health Organization. (2001). *Humanitarian supply management and logistics in the health sector*. Washington, DC: Author.

Perron, A., Rudge, T., Blais, A., & Holmes, D. (2010). The politics of nursing knowledge and education critical pedagogy in the face of the militarization of nursing in the war on terror. *Advances in Nursing Science*, *33*, 184–195.

Philippine Board of Nursing. (2009). *Philippines Nursing Act of 2002*. Retrieved from http://www.prc.gov.ph/uploaded/documents/NURSING%20LAW.PDF

Ranse, J., & Lenson, S. (2012). Beyond a clinical role: Nurses were psychosocial supporters, coordinators and problem solvers in the Black Saturday and Victorian bushfires in 2009. *Australasian Emergency Nursing Journal*, *15*, 156–163.

Ranse, J., Lenson, S., & Aimers, B. (2010). Black Saturday and the Victorian bushfires of February 2009: A descriptive survey of nurses who assisted in the prehospital setting. *Collegian*, *17*, 153–159.

Turale, S. (2014). Disaster training for nurses: A moral and humanitarian imperative. *International Nursing Review*, *61*, 3.

United Nations. (2004). *Resolution 49/22A of December 1994, International Decade for Natural Disaster Reduction*. Retrieved from http://www.un.org/documents/ga/res/49/a49r022.htm

Veenema, T. G. (2006). Expanding educational opportunities in disaster response and emergency preparedness for nurses. *Nursing Education Perspectives*, *27*, 93–99.

World Health Organization. (2007). *Risk reduction and emergency preparedness: WHO six-year strategy for the health sector and community capacity development*. Retrieved from http://www.who.int/hac/techguidance/preparedness/emergency_preparedness_eng.pdf

World Health Organization. (2009). *Disaster preparedness and response: World Health Organization regional office for Europe*. Retrieved from http://www.preventionweb.net/files/10464_NPmeetingAstanaWHOPPT.pdf

Yan, Y. E., Turale, S., Stone, T., & Petrini, M. (2015). Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education. *International Nursing Review*, *62*, 351–359.

Yang, Y. N., Xiao, L. D., Cheng, H. Y., Zhu, J. C., & Arbon, P. (2010). Chinese nurses' experience in the Wenchuan earthquake relief. *International Nursing Review*, *57*, 217–223.

JOURNAL OF NURSING SCHOLARSHIP

PROFESSION AND SOCIETY

Interprofessional Education: A Summary of Reports and Barriers to Recommendations

Afaf I. Meleis, PhD, DrPS(hon), FAAN

Former Dean and Professor of Nursing and Sociology, University of Pennsylvania School of Nursing, Philadelphia, PA, USA

Key words
Interprofessional education, interdisciplinary, nursing education, healthcare teams

Correspondence
Dr. Afaf I. Meleis, University of Pennsylvania—School of Nursing,
418 Curie Blvd., 418 Fagin Hall, Philadelphia,
PA 19104, USA

Accepted: November 4, 2015

doi: 10.1111/jnu.12184

Abstract

Purpose: Effective, quality care to achieve the newly developed sustainable development goals requires the development of collaborative teams and is predicated on implementing transformative interprofessional education and on team members who are equally empowered. This is a report on The Lancet commission on transformative education for health professionals and the National Academy of Medicine's dialogues on developing and implementing innovations to enhance collaborations and to facilitate the effectiveness of healthcare teams.
Methods: Using postcolonial feminist theory for critical analysis and integrations of findings from both reports, as well as for identification of barriers to achieving equity in team functioning.
Findings: The global Lancet commission and the National Academy of Medicine/Institute of Medicine forum developed frameworks that could be used to educate the next generation of professionals based on identifying the local needs of communities within a global context. Recommendations included breaking down silos that exists between schools and using an equity and justice framework in developing educational programs; utilizing contemporary innovations in teaching that correspond with innovations in healthcare systems; and insuring investments in time, energy, and resources in interprofessional education. However, without addressing the silos created through professional identities and power differentials, goals of interprofessional education and collaborative practice may not be achieved.
Conclusions: While a great deal has been written about interprofessional education, it is imperative for faculty in the different professional schools and for members of healthcare teams to engage in dialogues that address the fundamental and most obstinate barriers to forming equitable teams, which is the consistent narrative of medical privilege and centrism.
Clinical Relevance: The dialogues about medical privilege and physician centrism in education and health care could drive the development of programmatic approaches to enhancing interprofessional education and teamwork based on justice and equity frameworks.

Globalization provides many new opportunities, as well as many new challenges. Educators for the health professions encounter similar challenges and can benefit from new opportunities. Professional education needs to keep pace with these changes by designing strategies to work together to surmount the walls that have been built between their students and to decrease silos that affect curricula, faculty, and students. To meet global health needs more effectively and efficiently and to enhance the quality of care while decreasing the cost, graduates of the different professional schools should be prepared to work in teams. Developing, encouraging, and implementing team-based learning approaches and interprofessional education (IPE) provide opportunities for mutual learning of joint solutions for the increasing complexity of the healthcare problems populations encounter. However, functioning and effective teams are predicated on having students in different professional schools educated together. True IPE that promotes the formation of equitable team membership will not occur until the persistent, privileged medical narrative is replaced with well-formed individual agency and equitable structural recourses for all professions. Neither of these are easily achieved without addressing the historical context that persistently gave medicine its privilege and hierarchal supremacy. In addition, the deliberate and consistent plan to use justice and equity models in IPE and in healthcare teams are the ingredients for change.

Effective, quality care with better health outcomes for populations is driven by collaborative teams who work together and who compliment and complete the care provided. Effective teamwork requires a transformation of how health professionals are educated

A new set of sustainable development goals (SDGs) was approved by the United Nations (UN) in 2015. Heads and leaders in many countries pledged to work diligently toward achieving these goals by 2030 (UN, 2015).

Two of the new 17 SDGs address achieving equity, health, and wellness for all populations (goals 3 and 5). Therefore, it is important at this moment in time to consider what some of the drivers are that may increase the potential successes in achieving these goals by 2030.

An independent commission was formed to address questions related to the state of global healthcare issues and outcomes (Bhutta et al., 2010). The global commission, made up of 20 multidisciplinary educators, clinicians, and policy makers representing different regions in the world, focused on questions related to health professionals' education and developed a set of futuristic recommendations (Bhutta et al., 2010). Subsequently, the National Academy of Medicine (NAM; formally the Institute of Medicine) appointed a forum to explore ways by which the commission recommendations would be implemented (NAM, 2011–2013).

The goals of this article are multifold: first, to present a summary of the multidisciplinary, multinational commission report that was published in The Lancet; second, to summarize the findings of the NAM commission; and third, using a feminist postcolonial framework, provide an analysis of the issues that may be the barriers in creating the interprofessional, collaborative teams, which is the goal called for in the report as fundamental in meeting the other goals.

Historically, many reports emerged in the early 1900s about reforming medical, nursing, and public health education. Three reports—the Flexner report on medical education (Flexner, 1910), the Goldmark report on nursing and nursing education (Goldmark, 1923), and the Welch-Rose report on public health education (Welch, 1915)—were instrumental in shaping the education for these three health professions. In fact, these reports transformed education for medical, nursing, and public health students through applying science and scientific discoveries to education.

However, all the advances in health care in the 21st century have not informed subsequent much needed changes in the education of health professionals, resulting in paucity in meeting the healthcare needs of populations. One indication of this is that the health care provided is inequitable, with many barriers to universal access to care, resulting in glaring disparities in healthcare indicators, which are found in both developed and developing countries. Prejudice and discrimination due to gender, sexual orientation, race, country of origin, and ethnicity lead to disparate health care. There are global infections that have not been eradicated and an increase in noncommunicable diseases. In the meantime, there has been a revolution in science and technology, leading to increased life expectancies. And while aging could lead to a long, healthy lifespan, there are many indications that with longer life expectancy, there is an increase in many chronic illnesses with implications for long-term disabilities. Similarly, with the rapid increase in urbanization and globalization, there are new environmental and behavioral threats, leading to increases in noncommunicable diseases such as asthma, diabetes, and cardiovascular disease, as well as escalated risks for violence due to deteriorating urban dwellings that are stressed by the demographic transition and mass entry of immigrants and migrants. Without attention to their environment and needs, these developmental, epidemiological, and economic transitions place populations in the path of new risks that require more coordinated, collaborative interventions for which healthcare professionals are ill prepared to address. Healthcare professionals are in fact trained in, and work in, silos based on old, outmoded paradigms that do not address the emerging diseases, illness trajectories, and needs of populations.

The commission, adopting global perspectives and equity and justice frameworks, sought to develop a framework that could be used to educate the next generation of professionals, who would be equipped to address these emerging needs and healthcare challenges. The commission chose to focus on the education of health professionals at post-secondary school levels and those who are typically educated in universities. The exclusion of community care givers or professionals not educated at the university level was only deliberate for putting boundaries on the task at hand, and not because these groups' contributions are not considered valuable to the health care of populations.

To develop its analysis and interpretations that led to the recommendations, the commission visited different countries' educational systems, reviewed reports, listened to health professionals, studied healthcare outcomes, and compared and contrasted educational programs and their impact on graduates and healthcare outcomes. In addition, a young generation of professionals participated through mobilizing groups of students from different professions and different countries to solicit their perceptions and opinions about their education, and to review and comment on the report and recommendations. Their perspectives informed the final report and influenced recommendations for different approaches to educating health professionals.

In reviewing historical developments of curricula, there were three generations of educational reform. These did not develop linearly; rather, they were overlapping and sometimes they existed simultaneously, ranging from science based to problem based to systems based. The latter is competency driven, with competencies that are gleaned locally and globally. Nursing education and medical education have attracted in the past a great deal of attention from donors and from philanthropic efforts, beginning with the Rockefeller and Carnegie foundations, and more recently, with the Josiah Macy Jr. Foundation (2013), producing several reports on reforms in medical and nursing education, and recommendations for a future of interprofessional collaboration. It is of interest that all the reports had similar themes, harmonizing that education for health professions is in dire need of reform. Considering the history and the current state of education, and being mindful of other reports' recommendations, the commission's report made several broad recommendations within equity and justice principles. It linked educational systems with healthcare systems and suggested that educational curricula must reflect the needs of communities, as well as the healthcare demands for a workforce. The entry point to education, as well as to the healthcare system, is the population that produces students, and this is the same population that has needs for health care. Hence, the entry into education systems and into employment in healthcare systems must be connected. Recruiting into professional schools must reflect the diversity of the population and the goals for graduates who can respond to the needs of their populations, which are diverse in race, gender, religion, and national origins. With the increasing local and global complexities in health care, the commission supported and highlighted the need for insuring that professional education is focused on producing diverse, equitable, collaborative healthcare teams. This will not and cannot be accomplished, asserted the commission, unless educational programs also become collaborative and interdependent. To accomplish that, there should be drastic changes in institutional structures, as well as in how institutions teach and provide resources for more complimentary learning mechanisms that are more congruent with 21st century information sciences. The goals are interdependent education and transformative learning using technology and more innovative approaches to teaching and learning.

Transforming education requires reform in career pathways that reflect the needs of the populations and the education surrounding such reform, which can be gained through global partnerships. Though career pathway adaptations must be done locally, reflecting revolutions in education and technology, as well as resources and needs, transforming the educators and learners must be influenced by global knowledge. While educators and clinicians may learn from each other globally, they must know the local context and be in tune with the needs of the local populations, work opportunities, and health care goals within the locality where they will practice. What this translated to is developing and implementing IPE using innovative teaching and learning that is responsive to populations and healthcare systems, but well informed by global strategies, issues, and healthcare needs.

More specifically, The Lancet commission recommended that to achieve the transformative education that will make a difference in health care, the following must happen (Meleis, 2011):

- Students, faculty, and recipients of care must work together in changing programs.
- Develop curricula based on competencies driven by population needs.
- Design, admission, and criteria for students in different programs should reflect market and population needs.
- Use innovative and futuristic instructional approaches.
- Develop different, more congruent strategies to evaluate students in interprofessional programs.
- Promote new types of professionalism that reflect IPE and roles.
- Establish joint planning mechanisms that engage different constituents in planning curricula, students, learner experiences, and evaluations.
- Develop mechanisms for accreditations that reflect and honor interprofessionalism.
- Educate for discovery, critical thinking, teamwork, and team leadership while utilizing and translating best practices.

- Most significantly, it is important to recognize the urgent need to invest time, energy, intellect, and resources to insure a paradigm shift.

As indicated in a subsequent study conducted by the Robert Wood Johnson Foundation, the equitable partnership in education and practice does not happen overnight. "It takes time, patience and perseverance to build interprofessional collaboration" (Tomasik & Fleming, 2014, p. 12).

One major outcome of The Lancet report was the establishment of the National Academy of Medicine (formally the Institute of Medicine) Global Forum on Innovation in Health Professional Education (co-chaired by Dr. Jordan Cohen and myself) to create dialogues related to the recommendations of this report, as well as to combine it with the report by the National Academy of Medicine and the Robert Wood Johnson Foundation, The Future of Nursing: Leading Change, Advancing Health (NAM, 2010). Both reports produced powerful themes about education and partnerships, and advocated for using the best capacities of team members individually and collectively. This multidisciplinary and international forum convened stakeholders in higher education from the disciplines of medicine, nursing, dentistry, pharmacy, and public health, among other health disciplines, as well as patients and community participants, to dialogue, to support, and to envision innovative mechanisms to implement the recommendations of both reports. This forum was designed to reflect a commitment to innovations and to transform the education of the professions. IPE was considered one of the major innovations to be addressed.

The forum had 55 members representing 18 different professions and countries. Webcasts reached Africa, Europe, the Middle East, and Asia, as well as South, Central, and Latin America. The forum emphasized and modeled student learning that must be informed by patients' and communities' voices and needs. Rather than being profession-centric, members were cognizant of the goal of becoming more population- and patient-centric. Deliberations about IPE included issues in community-based IPE, cost, evaluations, innovations in teaching and learning, empowering women, increasing diversity, globalization, technology, leadership, measuring impact, and insuring preventative care and wellness and health as goals, utilizing the best capacity of all team members and ways to achieve that were central to dialogues (NAM, 2011–2013).

The goals of the forum were to provide a platform for robust dialogues, promote debates among representatives of organizations and professions, uncover issues, and provide guidelines for each topic. Each of these topics, with dialogues and recommendations, are summarized in an easily accessible NAM report. (See Clinical Resources provided at the end of this article.) Each member was expected to reflect on the impact of the dialogues on their organization and to present the next steps that they may take to transform education training or practice in their own organizations. While it is not possible to summarize all of the incredible, rich and robust dialogues nor all of the findings and the outcomes, here are a few important observations:

- Definition of IPE is not universal, and there are many interpretations as to what it means.
- Implementation of IPE is complex because of structural constraints. It requires long-term and sustainable planning and implementation.
- Professionals have their own languages, which makes it difficult for communication across professions.
- It is easier to implement IPE in community-based education.
- There are many methods and instruments to measure IPE; however, there are not any well-established, validated, and reliable metrics to evaluate IPE and determine the effects IPE has on collaborative practice and on patient care.
- The ethical implications of interdisciplinary education should be a major topic of dialogue.
- While IPE is an innovative practice, there are other innovations to be explored and implemented to enhance patient- and community-based teaching and learning. Among them are the flipped classroom, the world café model, and simulation labs.
- Guidelines for culturally competent care should be implemented in the education of all health professions. Existing models may be used as a starting point.
- Patient- or population-centered models of care should be a focus for IPE.
- Reform in the education of health professions must be well aligned with health system reform. One cannot happen without the other.
- Similarly, innovations in IPE must correspond with innovations in healthcare systems.
- Investment of time, energy, and resources is essential for implementing IPE and innovative teaching and learning strategies.

To achieve innovative, transformative health professional education and develop interdependent and interprofessional education, the commission recommended several enabling actions. These were to mobilize individual and organizational leadership and champions; to enhance global public, private, and philanthropic investments; and to strengthen global learning through innovative digital and technological advancement and through sustentative changes in teams, evaluation, and learning. While many organizations have proceeded to begin the implementation of IPE through single courses, internships, or simulation labs, none of them will completely produce the transformative outcomes that all the reports advocate without giving careful attention to fundamental barriers. I strongly believe that the major barrier to true, equitable partnership lies within the long history of medical privilege that has created the major power differential. In addition, another fundamental barrier lies in professional identities.

Professional Identity and Power Differential

Partnerships evolve based on equity in relationships and equality in dialogues. There are two fundamental barriers to what Gordon, Mendenhall, and O'Connor (2012) define as team intelligence as the active capacity of individual members to learn, teach, communicate, reason, and think together by establishing shared goals, values, and mission, and without being hampered by true or imagined hierarchies. However, a power differential does exist, and with it there are also established professional identities that are historically entrenched.

I use postcolonial feminist theory as a framework to describe and interpret the power differential among members of the different professional schools and teams. Postcolonialism is about unequal power structures, and about the dominance of colonialists in shaping ideas and the thoughts and identities of those who were colonialized. The culture of the dominant, powerful colonialists invariably defined and redefined values and meanings attributed to phenomena and behaviors of the culture that is dominated (McGibbon, Mulaudzi, Didham, Barton, & Sochan, 2014). I use postcolonialism as it sheds light on relationships between members of the health professional educators, as well as the teams of clinicians. Without awareness and analysis of the power differential and gender divide in the health professions, the same ineffective, hierarchical system will continue to prevail. Even when a few changes are made to support developing joint interprofessional causes, such as simulation lab experiences or joint degrees, unless "individual agencies" and "structural barriers" are addressed, the silos will triumph.

Nursing students, faculty, and staff identities that are influenced by the perceived power and supremacy of medical science and physician leadership that is historically rooted become a barrier to their voices, their use of nursing science, and their clinical judgment that is based on the domain of nursing. Individual agency is formed through interactions with others and within political and structural contexts. Globally, physician power is valued and dominant, and structural resources focus on medical science and medical interventions; therefore, there is also a focus on medical education. In most if not all cultures, nurses are not treated equally, and similarly, students from the different health professional schools experience this inequality. Anderson (2014) differentiated between being treated equally and equitably, indicating that equitable treatment is more grounded in social justice because it requires attention to sociocultural context, history, and individual agency. The challenge is how to level the field and base curricular deliberations, instructions, and evaluations on equity, and how to create a just culture of interprofessional players.

The second fundamental issue is what Pecukonis (2014) calls profession-centrism, which is parallel in its meaning to ethnocentrism. Students of siloed professions spend a great deal of time learning their own language, values, and beliefs, nurturing their own practice, investing in their own communities, and creating a sense of insiders and outsiders. The goal for them is to develop a professional identity similar to an ethnic identity, only this identity is disguised under the goal of professionalism, which leads to focusing on similarities within a profession and differences from other professions. Efforts to preserve and protect professional identity "promotes isolation, elitism and territoriality" (Pecukonis, 2014, p. 60). Identities are formed through interaction with significant others. If professional schools exist in silos, students and faculty within these individual schools become the health professionals they affiliate with, which enforces their identity and their professional-centrism. While it is vital for a dedicated profession, such as nursing, to insure that students develop strong professional identity based on expertise, which provides them with confidence to have a voice, to exert their clinical judgment, and to practice their critical thinking and advocacy, the paradox is in how such an identity does not mushroom into negative aspects that lead to profession-centric behaviors of exclusivity. In a study conducted by the Robert Wood Johnson Foundation to determine best practices to develop a "culture of health," they found that creating a level playing field could be achieved when team members understand each other's roles and model respect when speaking with and about each other, when different discipline members are trained together, when team members know each other as human beings, and when patients became part of the team (Tomasik & Fleming, 2014). Members of the NAM workshops who dealt with professional silo issues questioned whether it was timely to deal with turf battles by establishing and implementing transdisciplinary professionalism characterized by developing upstream agreements among all professions about behaviors that reflect professionalism. This could be achieved first by finding out from the public what they expect from the health professions. This approach, which calls for substituting professionalism in one profession with one interprofessional professionalism, will require radical thinking for medicine to relinquish control and for other professions to develop their own strong sense of agency without the profession-centric baggage that comes with it ("Squeezing Out the Doctor," 2012). That means being comfortable and voiced about phenomena and knowledge that are driven by disciplinary perspectives for the purpose of insuring effective care for populations, rather than for asserting a singular identity and separatedness.

Conclusions

To improve health care, to meet the complex healthcare needs of populations in the face of globalization, urbanization, and the tremendous revolution in scientific discoveries, it is essential to have functioning, collaborative teams. Collaborative teams depend on educating and training members together, who are willing to be respectful of each other's professions, who are voiced and are able to function up to their full individual capacities that are aligned with their education. Providing innovative IPE is a requirement in achieving functioning teams. A great deal has been examined about IPE that has been described in multiple reports. It is timely for all health professional educational institutions to engage in robust dialogues on the best strategies to implement some ways of educating students from the different health fields together, to evaluate the results, and to test the outcomes on patient care. However, the most obstinate barriers to this team-oriented approach, the persistent narrative of medical privilege and the profession-centrism, must be replaced with equity and transdisciplinary narratives.

Acknowledgments

The ideas in this manuscript were developed during a residency at The Rockefeller Foundation, Bellagio Center in Bellagio, Como, Italy.

Clinical Resources

- American Association of Colleges of Nursing. Core competencies for interprofessional collaborative practice: https://www.aamc.org/download/186750/data/core_competencies.pdf
- The Josiah Macy Jr. Foundation. Interprofessional education and teamwork: http://macyfoundation.org/priorities/c/interprofessional-education-and-teamwork
- National Academy of Medicine/Institute of Medicine. Global forum on innovation in health professional education: https://iom.nationalacademies.org/Activities/Global/InnovationHealthProfEducation.aspx
- Robert Wood Johnson Foundation. Advancing interprofessional education: http://www.rwjf.org/en/library/articles-and-news/2011/05/advancing-interprofessional-education.html
- United Nations. Millennium development goals: https://sustainabledevelopment.un.org/
- United Nations. Sustainable development knowledge platform: https://sustainabledevelopment.un.org/

References

Anderson, J. (2014). Forward: Social justice: Continuing the dialogue. In P. N. Kagan, M. C. Smith, & P. L. Chinn (Eds.), *Philosophies and practices of emancipatory nursing: Social justice and praxis*. New York, NY: Routledge.

Bhutta, Z. A., Chen, L., Cohen, J., Crisp, N., Evans, T., Fineberg, H., & Zurayk, H. (2010). Education of health professionals for the 21st century: A global independent commission. *Lancet, 375*(9721), 1137–1138.

Flexner, A. (1910). *Medical education in the United States and Canada: A report to the Carnegie Foundation for the Advancement of Teaching bulletin number four (The Flexner Report)*. Retrieved from http://archive.carnegiefoundation.org/publications/medical-education-united-states-and-canada-bulletin-number-four-flexner-report-0

Goldmark, J. (1923). *Nursing and nursing education in the United States. Commission for the Study of Nursing Education*. New York, NY: Macmillan Co.

Gordon, S., Mendenhall, P., & O'Connor, B. B. (2012). *Beyond the checklist: What else health care can learn from aviation teamwork and safety*. Ithaca, NY: Cornell University Press.

Josiah Macy Jr. Foundation. (2013). *Interprofessional care coordination: Looking to the future*. Issue brief (Vol. 1, issue 2). New York, NY: The Josiah Macy Jr. Foundation.

McGibbon, E., Mulaudzi, F. M., Didham, P., Barton, S., & Sochan, A. (2014). Toward decolonizing nursing: The colonization of nursing and strategies for increasing the counter-narrative. *Nursing Inquiry, 21*(3), 179–191.

Meleis, A. (2011). *Education of health professionals for the 21st century and its significance for nursing. Nursing & midwifery links*. The Global Network of WHO Collaborating Centres for Nursing and Midwifery Development. University of São Paulo, Ribeirão Preto College of Nursing, São Paulo, Brazil. Retrieved from http://www.globalnetworkwhocc.com/links-magazine.html

National Academy of Medicine. (2010). *The future of nursing: Leading change, advancing health*. Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine. Retrieved from http://iom.nationalacademies.org/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health.aspx

National Academy of Medicine. (2011–2013). Global forum on innovation in health professional education. Retrieved from https://iom.nationalacademies.org/Activities/Global/InnovationHealthProfEducation.aspx

National Academy of Medicine. (2013). Establishing transdisciplinary professionalism for improving health outcomes—Workshop summary. *Global Forum on Innovation in Health Professional Education*. Retrieved from https://iom.nationalacademies.org/Reports/2013/Establishing-Transdisciplinary-Professionalism-for-Improving-Health-Outcomes.aspx

National Academy of Medicine. (2015). Measuring the impact of interprofessional education (IPE) on collaborative practice and patient outcomes. *Global Forum on Innovation in Health Professional Education*. Retrieved from https://iom.nationalacademies.org/Reports/2015/Impact-of-IPE.aspx

Pecukonis, E. (2014). Interprofessional education: A theoretical orientation incorporating profession-centrism and social identity theory. *Journal of Law, Medicine & Ethics, 42*(Suppl. 2), 60–64.

Squeezing out the doctor. (2012, June 2). *The Economist*, 25–27. Retrieved from http://www.economist.com/node/21556227

Tomasik, J., & Fleming, C. (2014). *Lessons from the field: Promising interprofessional collaboration practices*. Princeton, NJ: Robert Wood Johnson Foundation.

United Nations. (2015). Sustainable development knowledge platform. Retrieved from https://sustainabledevelopment.un.org/

Welch, W. H. (1915). *Rose W. Institute of Hygiene, presented to the General Education Board.* RF, RG 1.1, Series 200L, Box 183, Folder 2208. New York, NY: Rockefeller Archive Center.