

# The Scholarship Related to Nursing Work Environments Where Do We Go From Here?

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Nursing shortages within American hospitals are in part associated with problematic work environments. Scholarship related to work environments is multidisciplinary and has been conducted using traditional and constructivist approaches to science and knowledge development. Nursing research related to nurses' work environments in hospitals is often conceptualized around variables such as job satisfaction, professional practice environment, and job stress. Macro-level variables associated with political, economic, and social aspects of the work environment have received less attention. Philosophical issues are considered. Person-Environment Congruence Theory is proposed as a framework capable of addressing environmental incongruence in hospital nursing work environments. Implications for theory and research using the framework are described. **Key words:** *hospital, nursing shortage, occupational stress, work environment*

**T**HE developing worldwide nursing shortage continues to receive significant attention within public and professional media, and is expected to reach crisis proportions within the United States over the next decades.<sup>1-3</sup> The cause of the shortage is complex and acknowledged to be the result of a number of factors, including an aging population, decreased nursing school enrollments, increased employment opportunities for women, stagnant wages and benefits, and poor working conditions.<sup>4,5</sup>

The problematic nature of hospital work environments has been acknowledged, and the delivery of professional, high quality nursing care for patients and families within hospitals has been acknowledged to be a priority by major stakeholders.<sup>6,7</sup>

Research and theory associated with work environments has a diverse history within a

number of academic disciplines. The purpose of this article will be to review and analyze a selection of traditional and constructivist research and theory associated with work environments. Examples of nursing research associated with each approach will be described. Person Environmental Congruence theory will be proposed as a framework for knowledge development in nursing work environments. Suggestions for theory and research using the framework will be made. Philosophical issues related to knowledge development in nursing and other work environments will be noted.

## TRADITIONAL APPROACHES TO THE WORK ENVIRONMENT

Study of the work environment as a mechanistic, measurable, and discrete phenomenon within an observable reality has been studied within a number of academic disciplines including industrial/organizational psychology, human factors engineering, and occupational health.

Robert Sundstrom, in "Work Places: Towards a Psychology of Offices and Factories,"

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has reviewed the history and results of the research related to the work environment conducted within industrial/organizational psychology.<sup>8</sup> Early work in this area is generally credited to Frederick W. Taylor, a mechanical engineer who studied the movements of factory workers as they shoveled coal into industrial furnaces. By scrutinizing the details of the work—how much coal each man put into each dig of the shovel, the size of the shovel used, and the nature of the movement used to put the coal in the furnace, etc—Taylor was able to predict and prescribe which motions and tools would lead to greater productivity. The time and motion studies that Taylor conducted became associated with a deterministic approach to the work environment known as *Scientific Management*. Because real gains in productivity were realized with scientific management, interest in work environments spread to other industrial and organizational settings. Henry Ford reportedly developed the assembly line using the approach and contemporary examples of “Taylorism” that can be discerned within the process control studies associated with Total Quality Management principles.

Significantly higher levels of worker dissatisfaction, low morale, and work-related injury accompanied the increased productivity associated with scientific management. By the mid 20th century, publication of the Hawthorne Studies\* and the humanistic theories of social psychologists such as Maslow<sup>9</sup> and Lewin<sup>10</sup> and turned research interest away from mechanistic to humanistic variables that culminated in a “Human Relations” movement that developed in the 1960–1970s.

Contemporary research related to the work environment within industrial/organizational psychology focuses on a number of variables

within individual, interpersonal, and organizational domains. The construct of job satisfaction remains fundamental within theory and research, although the evidence connecting job satisfaction to productivity and organizational effectiveness remains inconclusive. Substantial evidence for a relationship between satisfaction and absenteeism/turnover has been demonstrated. Meso and macro-level theories also continue to be used to link job satisfaction with the attainment of individual, interpersonal, and organizational goals.

Researchers within human factors engineering and occupational health have examined how work environments contribute to decreased performance, burnout, job stress, absenteeism, turnover, workload, occupational exposures, workplace violence, work-related injury, and other negative outcomes. The concept of job stress has received attention for its proposed relationship with a number of important outcomes including satisfaction and productivity. A large body of research is available for review, although conceptual knowledge and general theoretical models remain under developed.

Nursing researchers have proposed and conducted a significant amount of theoretically oriented research work related to the job satisfaction of hospital nurses. Some of the constructs associated with this research include job satisfaction, “professional practice environments,” and job stress.

Hinshaw and colleagues began research in the 1970s related to job satisfaction, stress, turnover, and retention.<sup>11</sup> Their work led to the development of a 5-stage model that in a later study was able to account for approximately 50% of the variance in turnover experienced by the participating hospitals over a 1 year period.<sup>12</sup> Leveck and Jones later added to the Hinshaw-Atwood model by examining the influence of management style.<sup>13</sup> Nurses were found to have higher levels of group cohesion when participative managerial styles were utilized. Decreased levels of job stress were also found to be associated with higher satisfaction, retention, and quality of care.

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\*A series of quasi-experimental studies conducted by the General Electric Company in which productivity levels were found to vary both with changes in ambient conditions (lighting, warmth, etc) and observation alone.

Recent reviews of research related to job satisfaction and turnover have been conducted. Tai et al have noted that a plethora of research designs, definitions, sampling plans, and other research variables have been used over a 20-year period of research and that the findings are difficult to synthesize.<sup>14</sup> Blegen conducted a meta-analysis of the concepts utilized in nursing research related to job satisfaction and found that job stress and organizational commitment were the factors most strongly associated with job satisfaction.<sup>15</sup>

The work environment as site of "professional practice" has also emerged. Aiken and colleagues have demonstrated that the positive health outcomes emerge when professional practice environments are in place within hospital settings.<sup>16,17</sup> Propelled in part by the "Magnet" hospital study commissioned by the American Academy of Nursing in the early 1980s, the concept of a "professional practice environment" is thought to characterize hospitals that are able to attract and retain nurses despite shortage conditions. Factors associated with a professional practice environment include professional autonomy, control over practice, collegiality with physicians, and organizational support.

Within nursing research, the concept of job stress has been associated with a number of variables including organizational support and job satisfaction, and workload and burnout.<sup>18-21</sup> Nurses of various education levels, in multiple settings, working with patients of differing acuity have been studied, and although definitive conclusions cannot be drawn, the research evidence is accumulating for a relationship between job stress and undesirable outcomes.

## CONSTRUCTIVIST APPROACHES TO THE WORK ENVIRONMENT

Consideration of the work environment as a socially, politically, and economically constructed phenomenon has emerged since the 1970s within a number of disciplines including architecture, geography, and sociology.

Basic assumptions within this approach include the nonneutrality of observations (and therefore science), and that existing power relations are always at play when the work environment is considered. Gender, or the construction of female and male identities within societies, is also viewed as a fundamental arbiter of experience.

Sherry Ahrentzen, a feminist scholar and architect, argues that contemporary architecture does not view the everyday lives of women as a priority. Built environments for work, childcare, transportation, healthcare, and home activities are rarely considered, and the goal of the male-dominated discipline, is to produce High Art.<sup>22</sup> Ahrentzen argues that feminist theory, whether based on liberal, cultural, or postmodern assumptions can and should be used to address women's environments.

Churchman argues that feminist theory can be used to address asymmetrical power relationships.<sup>23</sup> Stein described such a situation—the doctor nurse game—within hospital nursing work environments more than 30 years ago.<sup>24</sup> Today's doctor nurse games are different because the power relations have changed. In an era of managed care, the control of outcomes has assumed preeminence and power is held by administrators who seek health related outcomes that fit within defined fiscal goals.

Work environments have also been viewed critically. Wooding and Levenstein argue that within advanced capitalist societies, the largest social and economic exploitation of workers continues to be at the point of production.<sup>25</sup> Their recommendations include the democratization of the work environment. Fairris<sup>26</sup> has examined the work environment transformed by Total Quality Management perspectives and questioned whether gains in productivity have been achieved by real efficiencies of production or rather, harder working employees. Other researchers and scholars critical of orthodox perspectives within work environments point out that factors such as "deskilling" and an escalation of work hours contribute

significantly to work stress and negative health outcomes.<sup>27,28</sup>

Within an emerging discipline known as feminist geography, the importance of women's physical and social space has been proposed. McDowell and Marsey for example, argue that the limited geographical space allotted to women impacts their status and power relations within contemporary society.<sup>29</sup> Weissman views the structure of women's spaces as inherently discriminatory,<sup>30</sup> while the relationship between geography and knowledge development has also been proposed.<sup>31</sup> The relationship between geography and the work environments of women, specifically nurses has received scant attention.

Meleis notes that women's work is devalued and unaccounted for and worthy of more support by nursing.<sup>32,33</sup> Studies of working women have been conducted,<sup>34</sup> and organizational factors contributing to work stress have been cited,<sup>35</sup> but overall, constructivist approaches to the work environment are rare.

## **PHILOSOPHICAL ISSUES**

Contemporary research related to nursing work environments must be conducted in a society in which major functions (health care, the regulation of work environments) are increasingly influenced by profit-oriented business/managed care models and managerialistic philosophies.<sup>36,37</sup> Such an approach sees control—of both administrative and clinical processes, as a basic goal. It is an approach that emphasizes outcomes (which ones?), evidence (as defined by who?), and quality (by whose standards?). It is not an approach that fosters a reflexive, critical examination of the underlying assumptions and power relations. Rather, fiscal and administrative health outcome data, readily available, becomes the proposed fodder for the all important seat at the policy table.<sup>38</sup>

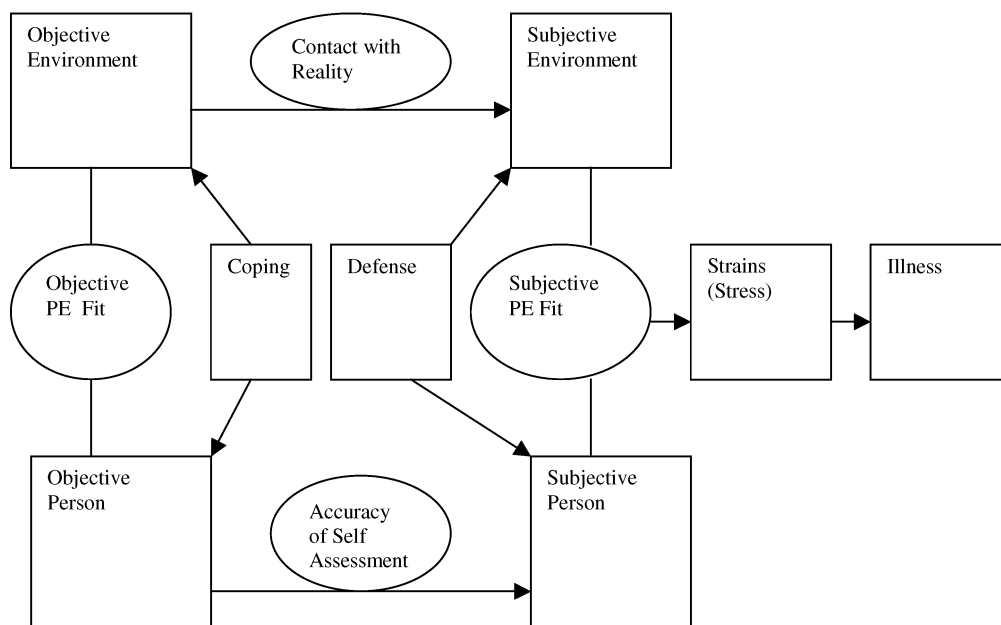
Alternative models for knowledge development in nursing have been proposed.<sup>39</sup>

Nurses, as long-term witnesses to the reality of deteriorating work environments and health care quality of within an unsupported, fractured, bureaucracy offer a perspective to health care audiences both individually and collectively.

Patricia Moccia has argued that nurses must become social activists.<sup>40</sup> Such an approach fits within the American Nurses Association's (ANA's) mission statement and is consistent with perspectives on environmental research advocated by Chopoorian and Stevens.<sup>41,42</sup> Gortner notes that nurses formally desire power,<sup>43</sup> but the wisdom of such an approach has not been challenged. Attaining power *per se* may not be what nurses should be aiming for, and nursing research does not necessarily need to focus on narrow, organizationally oriented outcomes that squander time, energy, and focus. As a profession with responsibilities to society, nursing is socially mandated to improved health within individuals, groups, communities, and societies. A more critical approach that exposes corrupt, unbalanced power relations and leads to substantive reform might be ultimately more energizing and productive.

## **PERSON-ENVIRONMENT CONGRUENCE THEORY**

One theoretical framework that has potential for knowledge development within nursing work environments is Person-Environment Congruence theory. Conceptually related to job stress, it is an abstract theory based on Kurt Lewin's Field theory,<sup>44</sup> and the Needs Press theory of Henry Murray.<sup>45</sup> Person-Environment Congruence theory argues that people either fit in their environment or not. Individuals are seen as having basic needs for safety, socialization, privacy, accomplishment, etc. The environment is seen as exerting multiple, various presses or demands upon individuals. When the needs of individuals and the press of the environment fit well together, or are congruent, satisfaction and fulfillment results.



**Figure 1.** Person-environment congruence theory. As detailed by Van Harrison.<sup>46</sup>

A lack of fit, or incongruence leads to stress, dissatisfaction, and negative outcomes.

Van Harrison illustrates the proposed model within his review of occupational stress research<sup>46</sup> (see Fig 1). Individuals within the environment are theorized as being subject to coping and defense mechanisms. Additionally, the model proposes subjective and objective measures of congruence, accuracy of self-assessment, and contact with reality variables, all of which are of course subject to challenge.

Multiple outcomes are possible with use of the theory—if incongruence within the environment cannot be altered, individuals may develop negative compensatory behaviors, physiological or psychological strains (stress) or a combination of all 3 in response to the perceived incongruence. If incongruence in the environment can be lessened to improve the perceived person-environmental fit, enhanced well-being and desirable outcomes can be theorized to increase. Person-Environment Congruence theory has been used to examine the choice of college majors by students<sup>47</sup> and how environment influ-

ences the moods of geriatric patients in nursing homes.<sup>48</sup> The theory continues to be used within occupational health and organizational psychology to address a variety of issues related to job stress.

## NURSING WORK ENVIRONMENTS

It can be argued that nursing work environments within hospitals are, on the whole, incongruent. Nightingale gives anecdotal support for such within *Notes on Hospitals*.<sup>49</sup> Heerwagen and colleagues<sup>50</sup> have argued that environmental design has a major but poorly acknowledged impact on work stress, an outcome that is noted to negatively impact productivity levels. Two types of congruence within work environments—functional and psychosocial congruence—are thought to impact individual and organizational outcomes:

Functional congruence refers to the capacity of a work environment to support instrumental tasks—that is, does the environment provide enough of the right kind of space, access to important

resources, appropriate levels and type of stimulation, and comfortable ambient conditions?

Psychosocial congruence, on the other hand, deals with the capacity of the environment to support psychological and social well being, such as the ability to regulate privacy and social behavior, the provision of space for rest and relaxation, opportunities to personalize the environment, having a place of one's own that can be personally managed, and opportunities to engage in collective activities.

Environmental congruence within hospital nursing work environments has not been addressed. Nurses who work within ward environments, traditionally work "on the run" from poorly organized and administered nursing stations and poorly equipped patient rooms. The absence of basic support for the work of nurses may be a factor in the "unfinished work" and job stress that is reported as problematic.<sup>51</sup> Person-Environment Congruence theory is arguably a useful framework with which to address a fundamental problem of hospital nursing environments that is often articulated as "inadequate support."<sup>52</sup> Because the theory argues that positive outcomes result from functional and psychosocial congruence, it is logical to assume that efforts to improve the environmental congruence of hospital ward environments would result in lower levels of stress and higher levels of productivity—highly pertinent in the ongoing shortage environment. The theory can utilize traditional outcomes such as productivity and job stress, yet also employ feminist research methods to give voice to the everyday reality of working women, improve quality of work life, and pursue goals related to social justice.

## **IMPLICATIONS FOR THEORY AND RESEARCH**

The functional and psychosocial congruence of nursing work environments is capable of being studied, but the desirability of doing so, as well as methodological issues need to be addressed. Person-Environment Congruence theory is abstract and requires addi-

tional development for empirically oriented research and theory testing. For use in nursing work environments, such developments might include formulating operational definitions of functional and psychosocial congruence within different settings, ie, clinic versus inpatient; geriatric versus oncology. Exemplars of minimal and maximal functional and psychosocial congruence could be theoretically and operationally defined, and instruments to assess both aspects of congruence developed and tested. Alternatively, concept development could be pursued inductively, through interviews or focus group methodology with nurses employed in different settings.

Another approach from traditional geographical perspectives that can be used to study nursing work environments is areal differentiation. This is one of the earliest practices of geography and uses physical measurements to get "the lay of the land." Using such an approach, cubic foot measures of nursing work environments could be used to describe designated nursing workspace within patient rooms, and nursing units. Measures for personal belongings, conference work, rest areas, etc could also be taken as well as the presence or absence of ready access to important resources and supplies. A constructivist approach to such research might collect similar data from other interest groups within hospital settings for comparison. Indirect measures could be assessed, nurses' perceptions of the functional and psychosocial congruence of the work environment could also be assessed, although extant theory notes that coping and defense mechanisms may affect perceptions.

Hospital administrators wishing to manage the delivery of nursing care within hospitals—part of which involves maintaining an experienced and committed nursing staff—may have something to gain from establishing programs to address the functional and psychosocial incongruencies within their institutions. The current trend toward healing environments highlighted within the Pebble Project ([www.healthdesign.org](http://www.healthdesign.org)) is showing

that attention to functional and psychosocial congruence positively impacts nursing satisfaction and retention levels.<sup>53</sup> Feasibility studies testing aspects of the theory can be conducted within hospital ward units to assess for improvement in proxy measures of productivity, such as percentage of sick time, percentage of voluntary turnover, or decreased stress levels as measured by survey or laboratory values. Based on the theoretical framework, intervention studies could be developed for highly incongruent environments—quasi-experimental studies surveying stress or productivity levels preintervention and postintervention. Pedometer studies measuring nurse mileage per shift could be used to assess the results of an intervention to improve functional congruence. Person environment congruence theory is a macro level theory that can be modified to specific environments and used to address environmental incongruence within nursing work environments. Alternately, the congruence of nursing work environments, as representative of women's

work, could be compared to the congruence levels of a male-oriented service profession, say firefighters for example.

## CONCLUSION

The issue of the invisibility of nursing and nursing work has often been lamented. If it is, as Hodder<sup>54</sup> notes, that the true reflection of reality is seen in the material culture allotted to a social group, then fundamental changes in nursing work environments may need to occur for significant improvements in the long-term retention of nurses to occur. Nursing theory as women's work also needs space for theoretical development. Nursing workspace has not been examined. Addressing the environmental congruence of hospital ward nursing environments using Person-Environment Congruence theory is one framework that may be useful for making substantive progress in the delivery of hospital nursing care and its theoretical development.

## REFERENCES

1. Associated Press. Nursing shortage expected to become serious. *USA Today*. February 13, 2001. Available at: <http://www.usatoday.com/news/health/2001-02-13-nursing-shortage.htm>. Accessed September 2002.
2. Levine L. *A Shortage of Registered Nurses: Is it on the Horizon or Already Here?* Washington, DC: Library of Congress; 2001.
3. Kingma M. *The Emerging Global Nursing Shortage*. Geneva, Switzerland: International Council of Nurses; 2001.
4. Buerhaus PJ, Staiger DO, Auerbach DI. Implications of an aging registered nurse workforce. *JAMA*. 2000;283(22):2948-2954.
5. Steinbrook R. Nursing in the crossfire. *N Engl J Med*. 2002;346(22):1757-1765.
6. ANA. *Nursing's Agenda for the Future: A Call to the Nation*. Washington, DC: American Nurses Association; 2002.
7. AHA. AHA ideas in action. Health care workforce: work environment. American Hospital Association. Web site. Available at: [http://www.hospitalconnect.com/aha/key\\_issues/workforce/ideas/Environment-Archive2002.html](http://www.hospitalconnect.com/aha/key_issues/workforce/ideas/Environment-Archive2002.html). Accessed November 4, 2002.
8. Sundstrom E. *Work Places: The Psychology of the Physical Environment in Offices and Factories*. New York: Cambridge University Press; 1986.
9. Maslow A. A theory of human motivation. *Psychol Rev*. 1943;50:370-396.
10. Lewin K. *The Conceptual Representation of Psychological Forces*. Durham, NC: Duke University Press; 1938.
11. Hinshaw AS, Verran J, Chance H. A description of nursing care requirements in six hospitals. *Commun Nurs Res*. 1977;9:261-283.
12. Lucas MD, Atwood JR, Hagaman R. Replication and validation of anticipated turnover model for urban registered nurses. *Nurs Res*. 1993;42(1):29-35.
13. Leveck M, Jones C. The nursing practice environment, staff retention, and quality of care. *Res Nurs Healthb*. 1996;19(4):331-343.
14. Tai T, Bame S, Robinson C. Review of nursing turnover research, 1977-1996. *Soc Sci Med*. 1998;47(12):1905-1924.
15. Blegen MA. Nurses' job satisfaction: a meta-analysis of related variables. *Nurs Res*. 1993;42(1):36-41.
16. Aiken LH, Sloane DM, Lake ET, Sochalski J, Weber AL.

- Organization and outcomes of inpatient AIDS care. *Med Care*. 1999;37(8):760-772.
17. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;288(16):1987-1993.
  18. Jamal M, Baba VV. Job stress and burnout among Canadian managers and nurses: an empirical examination. *Can J Public Health*. 2000;91(6):454-458.
  19. Denton M, Zeytinoglu IU, Davies S, Lian J. Job stress and job dissatisfaction of home care workers in the context of health care restructuring. *Int J Health Serv*. 2002;32(2):327-357.
  20. Flanagan NA, Flanagan TJ. An analysis of the relationship between job satisfaction and job stress in correctional nurses. *Res Nurs Healthb*. 2002;25(4):282-294.
  21. Brokalaki H, Matziou V, Thanou J, Ziropiannis P, Dafni U, Papadatou D. Job-related stress among nursing personnel in Greek dialysis units. *Edtna Erca J*. 2001;27(4):181-186.
  22. Ahrentzen S. The F word in architecture: feminist analyses in/of/for architecture. In: Dutton T, Mann L, eds. *Reconstructing Architecture: Critical Discourses and Social Practices*. Minneapolis: University of Minnesota Press; 1996:71-118.
  23. Churchman A. Women and the environment: questioned and unquestioned assumptions. In: Wapner S, ed. *Theoretical Perspectives in Environment-Behavior Research: Underlying Assumptions, Research Problems, and Methodologies*. New York: Kluwer Academic/Plenum Publishers; 2000:320.
  24. Stein LI. The doctor-nurse game. *Arc Gen Psychiatry*. 1967;16(6):699-703.
  25. Wooding J, Levenstein C. *The Point of Production: Work Environments in Advanced Industrial Societies*. New York: The Guilford Press; 1999.
  26. Fairris D. Are transformed workplaces more productively efficient? *J Economic Issues*. 2002;36(3):659-670.
  27. Herdman E. *The Deskillling of Registered Nurses: the Social Transformation of Nursing Work in a New South Wales Hospital, 1970-1990* [dissertation]. New South Wales, Australia: University of Wollongong; 1992.
  28. Kawachi I, Kennedy BP. *The Health of Nations: Why Inequality is Harmful to Your Health*. New York: The New Press; 2002.
  29. McDowell L, Marsey D. *Geography Matters*. Cambridge, England: Cambridge University Press; 1984.
  30. Weissman LK. *Discrimination by Design: A Feminist Critique of the Man-Made Environment*. Urbana, Ill: University of Illinois Press; 1992.
  31. McDowell L, Sharp JP, eds. *Space, Gender, Knowledge: Feminist Readings*. London: Arnold Publishing; 1997.
  32. Meleis AI. Preface. Women's work, health and quality of life: it is time we redefine women's work. *Women Health*. 2001;33(1/2):xv-xviii.
  33. Meleis AI. Man works from sun to sun, but woman's work is never done: insights on research and policy. *Healthb Care Women Int*. 2002;23(6/7):742-753.
  34. Meleis AI, Messias DKH, Arruda EN. Women's work environment and health: clerical workers in Brazil. *Res Nurs Healthb*. 1996;19(1):53-62.
  35. Trubshaw EA, Dollard ME. Representation of work stress in an Australian public hospital: a case study. *AAOHN J*. 2001;49(9):437-444.
  36. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press; 2001.
  37. Beardwood B, Walters V, Eyles J, French S. Complaints against nurses: a reflection of the new managerialism and consumerism in health care. *Soc Sci Med*. 1999;48(3):363-374.
  38. Bowman CC, Gardner D. Building health services research capacity in nursing: views from members of nursing's leadership. *Nurs Outlook*. 2001;49:187-192.
  39. Allen DG. Nursing research and social control: alternative models of science that emphasize understanding and emancipation. *Image J Nurs Sch*. 1985;17(2):58-64.
  40. Moccia P. At the Faultline: social activism and caring. *Nurs Outlook*. 1988;36:30-33.
  41. Stevens PE. A critical social reconceptualization of environment in nursing: implications for methodology. *Adv Nurs Sci*. 1989;11(4):56-68.
  42. Chopoorian TJ. Reconceptualizing the environment. In: Moccia P, ed. *New Approaches to Theory Development*. New York: National League for Nursing; 1986:39-54.
  43. Gortner S. Research for a practice profession. In: Nicholl L, ed. *Perspectives on Nursing Theory*. 3rd ed. Philadelphia: Lipincott; 1997:693-700.
  44. Lewin K. *Field Theory in Social Science*. New York: Harper & Row; 1951.
  45. Murray HA. Preparations for the scaffold of a comprehensive system. In: Koch S, ed. *Psychology: A Study of Science—Formulations of the Person and the Social Context*. New York: McGraw-Hill; 1959.
  46. Van Harrison R. Person-environment fit and job stress. In: Cooper CL, Payne R, eds. *Stress at Work*. Chichester, England: Wiley; 1978.
  47. Stern GG. *People in Context: Measuring Person-Environment Congruence in Education and Industry*. New York: Wiley; 1970.
  48. Kahane E, Liang J, Felton BJ. Alternative models of person-environment fit: prediction of morale in three homes for the aged. *J Gerontol*. 1980;35(4):584-595.
  49. Nightingale F. *Notes on Hospitals*. 3rd ed. London: Longman; 1863.
  50. Heerwagen JH, Heubach JG, Montgomery J,



- Weimer WC. Environmental design, work, and well-being: managing occupational stress through changes in the workplace environment. *AAOHN J.* 1995;43(9):458-468.
51. Sochalski J. Nursing shortage redux: turning the corner on an enduring problem. *Health Aff.* 2002;21(5):157-164.
52. Muncer S, Taylor S, Green DW, McManus IC. Nurses' representations of the perceived causes of work-related stress: a network drawing approach. *Work Stress.* 2001;15(1):40-52.
53. Beckley ET. This mortar cures: healthcare design improves healing and bottom line. *Mod Physician.* February 2003;7:36-37.
54. Hodder I. The interpretation of documents and material culture. In: Denzin NK, Lincoln YS, eds. *Handbook of Qualitative Research.* Thousand Oaks, Calif: Sage; 2000:703-715.