

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

SCHOOL OF NURSING

THE NATURAL RESTORATIVE ENVIRONMENT: IMPLICATIONS FOR NURSING
PRACTICE

ASHLEY DAVID
Spring 2012

A thesis to be
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Nursing
with honors in Nursing

Reviewed and approved* by the following:

Dr. Margaret Cushman
Assistant Professor
Thesis Supervisor

Dr. Donna Fick
Professor of Nursing
Honors Adviser

*Signatures are on file in the Schreyer Honors College.

ABSTRACT

Natural restorative environment therapy is an intervention aimed at restoring directed attention. Directed attention is essential for daily functioning and involves activities that require concentration. Fatigue of directed attention can cause increased distractibility, irritability, and impulsivity; leading to increased risk exposure. Restoration of directed attention can occur by use of activities which require no energy. Natural restorative environment therapy involves the use of the natural environment to restore attention. Some activities included in this intervention are: nature walks, caring for pets, wildlife watching, gardening, nature photography, general nature observation, and sailing. This systematic review aims to determine possible uses of natural restorative environments in nursing practice. The review seeks to answer the following questions: Does a natural environment have implications for patient outcomes in nursing practice? What methods of implementing nature as an intervention have been used in nursing? A total of five studies were included in the review. Findings offer areas for future research in this area, as well as direct implications for nursing practice.

TABLE OF CONTENTS

Introduction.....	1
Definition of Terms.....	2
Attention Restoration.....	3
Methods.....	5
Results.....	6
Methods used in reviewed articles.....	7
Findings of reviewed studies.....	9
Conclusion.....	11
References.....	14

LIST OF FIGURES

Figure 1. Study selection for systematic review.....16

LIST OF TABLES

Table 1. Review matrix.....	17-21
Table 2. Implications for research and practice.....	22

ACKNOWLEDGMENTS

I would like to dedicate this thesis in loving memory of my father, John R. David.

I would like to thank Dr. Cushman for her continual feedback and guidance throughout the completion of this project. I want to thank my academic advisor, Dr. Fick, for her guidance during the research process and time spent providing editing assistance. Lastly, this thesis would not be possible without the motivational support of my family, friends, and teachers.

Introduction

Florence Nightingale explained the need for nurses to consider holistic methods to promote patient health. She offered five essential areas to a healthy home: pure air, pure water, efficient drainage, cleanliness, and light. She argued that attention to these areas could help safeguard against infection. Direct sunlight and fresh air are thought to be beneficial to patients. The variety of scenery and views could also offer benefits to patient recovery. Nightingale explains, “The effect in sickness of beautiful objects, of variety of objects, and especially of brilliancy of colour is hardly at all appreciated” (1902). Form, color, and light have a physical effect on the body. Noise is another environmental factor discussed by Nightingale. She explains that noise creates an expectation in the mind, which harms a patient. Frequent interruptions and conversation can put a strain upon a patient’s attention. The effort to filter out this noise requires energy (Nightingale, 1902). Her holistic approach to the role of a nurse is consistent with the idea of alternative therapies in health care.

Natural restorative environment (NRE) therapy is one specific alternative to pharmacological interventions. Illness may affect the capacity for attention and mental functioning. In addition to the possible impact of illness, if one seeks medical treatment for a health condition, the treatment facility can also affect mental functioning. For instance, the health care environment includes multiple elements associated with pain or discomfort. These environmental stimuli require attention, resulting in increased mental effort required to overcome such distractions. Directed attention is critical to effective learning and mental functioning. Consequently, it is important to determine how illness and health care processes increase mental processing demands. Pain, anxiety, and frequent distractions in the health care environment impose constraints on typical functioning ability of individuals. In theory, the use of a

restorative environment may offer means to help patients manage information more effectively (Cimprich, 1992). However, there limited research regarding the therapeutic use of nature in the clinical setting. Furthermore, while restorative benefits from the natural environment are acknowledged, translation to utilize nature in the clinical setting has been limited. The purpose of this systematic review is to determine possible uses of natural restorative environments in nursing practice by reviewing nursing studies that use natural environments. More specifically it will attempt to answer: Does a natural restorative environment have implications for patient outcomes in nursing practice? What methods of implementing nature as an intervention have been used in nursing? Research regarding natural restorative therapy is valuable in order to advance understanding of such therapies. Potentially, natural restorative therapy could be a low-cost intervention, with wide availability, and limited side effects as opposed to conventional pharmacological interventions.

While research and reviews have studied the use natural restorative therapies, none of these reviews focus solely on nursing care. This review seeks to fill this gap by exploring existing nursing research and identifying areas necessary for further research.

Definition of Terms

Nature is defined as: “The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations” (A. Stevenson (Ed.), 2010). The term natural environment is not meant to define only elements considered pure or natural, as nature can be found in both urban and rural settings. The elements of nature such as: trees, clouds, fields, wildlife, and plants are accessible for use as a therapeutic intervention. Natural restorative environment therapy is the

use of the natural environment to restore attention and sense of well-being. Activities included in this intervention are nature walks, caring for pets, wildlife watching, gardening, photographing nature, sailing, general nature observation, and many more (Kaplan, Kaplan, & Ryan, 1998).

Kaplan argues that the environment has a strong effect on human cognition. Attention Restoration Theory states that directed attention plays a role in why mental fatigue occurs (Kaplan, Kaplan, & Ryan, 1998). Two types of attention were identified by William James. The first type is called involuntary attention, which requires no effort to attend to. The other type of attention is voluntary attention, which requires effort (James, 1892). To avoid confusion, the term *directed attention* was adopted to describe voluntary attention (Kaplan, & Kaplan, 1989). Directed attention involves activities that require concentration and is under voluntary control. Some activities requiring directed attention are: information processing tasks, listening to lectures, and decision making. This type of attention is subject to fatigue because it requires effort and energy (Kaplan, Kaplan, & Ryan, 1998). Attentional fatigue can cause increased distractibility, irritability, and impulsivity (Brewer & Therrien, 2000). Attention is selective: it is the ability to focus awareness on some elements of the internal or external environment while filtering out others. This selectivity allows coherence of thought and prevents individuals from experiencing endless confusion that would be caused by overwhelming environmental stimuli (Cimprich, 1992).

Attention Restoration

Restoration of directed attention can occur by use of activities or stimuli which require no energy, allowing the mind to be captured by fascination. Natural restorative environment

therapy draws upon attention restoration by use of nature as the captivating stimuli. Kaplan and Kaplan note four factors necessary for a restorative experience: fascination, coherence, sense of being away, and compatibility with inclinations and goals (Kaplan, & Kaplan, 2008). Sources of involuntary attention include fascinating elements that are potentially dangerous, survival-related, or nature-related. Cimprich explains, “Contents that are fascinating are potentially dangerous (e.g., things that cause bodily injury or pain), survival-related phenomena (shelter, food, weather), as well as aspects of nature epitomized in living green things of all kinds (plants, gardens, parks) and water in the environment” (1992). The natural environment can include a variety of outdoor settings, not necessarily remote or marvelous. NRE emphasizes the use of settings that are nearby and easily accessible. Some examples are parks, open fields, backyard gardens, and even the view of trees from a window. The restorative function of natural environments can offer an array of health benefits. Directed attention fatigue could result from almost any illness including: cancer, depression, and anxiety. Use of natural restorative environments could be implemented in peoples’ everyday lives, in order to foster greater well-being, attentional ability, and healing (Kaplan, Kaplan, & Ryan, 1998).

This systematic review aims to determine possible uses of natural restorative environments in nursing practice. More specifically, the review seeks to answer the following questions: Does a natural environment have implications for patient outcomes in nursing practice? What methods of implementing nature as an intervention have been used in nursing?

Methods

This systematic review examines original research published from 1970 to May 2011 using the online databases: PubMed, CINAHL, and ProQuest Nursing & Allied Health Source. Search terms in PubMed included: “natural environment” AND “nursing”. Search terms in CINAHL were: “natural restorative environment” AND “attention”. Search terms used in ProQuest Nursing & Allied Health Source were: “natural restorative environment” AND “nursing” OR “attention”. Inclusion criteria for article selection included only full-text articles, English language, reference list available, scholarly publications. Records were excluded if they had non-relevant keywords or were review articles.

Results

A total of 688 records were identified using the three search domains (Fig. 1). After inclusion and exclusion criteria were considered, a total of 42 articles remained for closer inspection and abstract review. After reading abstracts and titles for relevancy, 13 articles remained from the three search domains. Duplicate results were then eliminated after identifying relevant results from each database and remaining articles were assessed by determining if subject and purpose were relevant to the topic of study. A final number of 5 articles met all criteria and are included in the systematic review.

Articles included in the review studied a variety of conditions and diseases in regards to natural restorative interventions. The conditions researched include breast cancer, pregnancy, stroke rehabilitation, and clinical depression. All five studies in this review focused on improving patient cognitive functioning.

The earliest study (Cimprich, 1993) examined the impact of attentional fatigue on patients' ability to process information about disease process and treatment decisions following surgery for breast cancer. While attention problems had been previously documented in breast cancer patients, no studies had considered the impact of attentional fatigue on cognitive performance before or after treatment. Building on this study, Cimprich and Ronis's 2003 research focused on determining the value of a natural restorative environment intervention in counteracting attentional fatigue over the initial phase of treatment in women with newly diagnosed breast cancer.

Stark's (2003) research explored whether natural environments could improve directed attention in women preparing for birth and parenting. A key difference in this patient population

is health status, as the subjects were healthy. The use of natural restorative environments for patient rehabilitation following a stroke was the focus of a 2005 case study by Detweiler & Warf. In this study researchers explored the use of nature on reducing stress and improving attention, goals of post-stroke rehabilitation programs, based on previous literature that suggested positive effects. The most recent article in this review (Gonzalez & Hartig, 2009) studied clinically depressed patients, who experience a distortion of cognition. Due to the attentional impairments associated with depression, researchers explored the effect of nature-based interventions on attentional capacity of clinically depressed adults. All of the studies' purposes are related to improving attentional capacity or combating attentional fatigue.

Each of these five nursing studies centered on patient care and determining ways to ultimately improve patient outcomes, regardless of the disease or condition studied. Overall, the hypotheses and research aims of these studies are similar. Chronologically, the studies build on previous literature.

Methods used in reviewed articles

Subject characteristics vary to some extent based on the specific diseases and conditions explored in the studies (Table 1). For instance, studies about breast cancer patients and patients in the third trimester of pregnancy are limited to female samples. Of the remaining two articles, the study on post-stroke rehabilitation is a case study of one 74 year old male, while the study assessing clinically depressed adults had a sample that was 83 percent female. In general, the studies reviewed had relatively small sample sizes, ranging from one to one hundred fifty-seven participants. The settings and methods of natural restorative interventions vary. The Cimprich (1993) study utilized an original home-based standardized NRE intervention protocol, where

participants are given information about directed attention and can choose what activities they participate in. Visiting a scenic spot, wildlife watching, listening to sounds of nature, and gardening are some examples of restorative activities. Likewise, Stark's (2003) study used the same protocol for restorative activities in the natural environment as did Cimprich and Ronis's 2003 study. The setting for natural restorative therapy in the post-stroke study was a dementia wander garden, which meets the criteria for a restorative setting: being away, extent, fascination, and compatibility. An urban farm setting providing opportunities for therapeutic horticulture was utilized in Gonzalez and Hartig's (2009) study on clinical depression.

Objective measurement tools were used in all five studies (Table 1). Cimprich (1993) measured attentional functioning using the Digit Span, Symbol Digit Modalities Test, Letter Cancellation, and the Necker Cube Pattern Control. The subjective Attention Function Index (AFI) was developed for this study. In Stark's 2003 study, attentional functioning was measured using the Digit Span forwards and backwards, Trail-making A and B, Category Matching, and Errors Scale. The Cimprich and Ronis (2003) study measures Capacity to Direct Attention using a Digit Span forward and backward test, Trail-making A and B, and Necker Cube Pattern Control tests, and the AFI. Perceived attentional capacity was likewise measured using the AFI in Gonzalez & Hartig's study (2009). In this study, experience of restorative activities is measured using the Perceived Restorative Scale and severity of depression is measured using the Beck Depression Inventory questionnaire. Notably, Detweiler and Warf's study did not measure attentional functioning, and instead used measurements related to the patient's ambulation goals.

Studies following Cimprich's 1993 legacy research used measurement tools and protocols for natural restorative environment interventions similar to that used in her study. Overall, samples show limited diversity in terms of the race and education level of participants.

The studies had small samples limiting the ability to generalize study findings. Given the variation in subject age and gender of this body of nursing literature, comparisons are difficult to draw. Also, none of these studies explored the effect of natural restorative environment interventions on young adult or pediatric populations. The Detweiler and Warf case study presents a different approach to methodology and data collection from the other four, as the focus of this study was patient rehabilitation goals, rather than attentional functioning.

Findings of the reviewed studies

Similarities and differences were found in the results of the nursing research studies selected for this review (Table 1). Cimprich's 1993 study on attention restoration in post-operative breast cancer patients showed that attentional deficits were present in patients following surgery. All participants exhibited a decreased capacity for directed attention, with the lowest attentional capacity occurring in the early post-operative period. Improvements were found in attentional functioning scores over time for the intervention group, while there was inconsistent performance over time for the nonintervention group. Self ratings of attentional functioning also increased consistently for the intervention group, and were inconsistent over the measurement time periods for the nonintervention group. These findings implied that attentional capacity in women after breast cancer surgery can be restored with a nursing NRE intervention. Stark's 2003 study found that encouraging women to spend time in nature related activities might help pregnant women improve their ability to concentrate. While Cimprich's study showed improvement in several measurements of attentional functioning, this study only showed improvement in the measurement of self-monitoring under pressure using the Errors Scale. Women in the treatment group had significantly fewer errors following the intervention, than those in the control group, which indicated a greater capacity of directed attention. Although the

Errors Scale was the only measure to show significant change in directed attention with intervention, the importance of error detection is profound. If an NRE intervention is effective in reducing errors, risk exposure may be reduced. Cimprich and Ronis's (2003) study findings suggested that early application of natural restorative environment interventions before breast cancer treatment could give women a head start in preventing attentional fatigue over the course of illness. Participants in the intervention group had a significantly greater capacity to directed attention recovery from pre-surgery to post-surgery than the nonintervention group. Detweiler and Warf (2005) found the use of dementia gardens could help to motivate post-stroke patients in achieving rehabilitation goals. While there were no objective measurements of attentional capacity in this study, the wander garden setting seemed to enable the patient to increase his attention to therapy goals by providing a less threatening environment. Gonzalez and Hartig's (2009) study found depression scores declined over the course of a therapeutic horticulture intervention. Perceived attentional capacity improved over the course of the therapeutic horticulture intervention, and participants reported high levels of 'being away' and 'fascination' throughout the intervention. Participants who found the intervention to engage their attention at a higher level showed a greater decline in depression scores over the course of the intervention. Findings suggested that informing clients about horticultural or other nature based activities could be beneficial for those with clinical depression. The five studies showed increased attention in patients with NRE interventions, regardless of disease or condition.

Conclusion

On the whole, there were positive patient outcomes following the implementation of natural restorative environment interventions. At the same time, the aforementioned findings raise many important questions regarding the effects of NRE as a nursing intervention (Table 2). In regards to all studies in this review, it is unclear whether or not there is a minimum amount of time which participants spend in nature during their chosen NRE activities to be successful in improving cognitive abilities. Furthermore, it is unknown if specific nature activities are more effective at restoring attention than others. Additional research comparing various NRE activities and amount of time of nature activity intervention is needed. While all five studies showed an increase in cognitive function as a result of NRE interventions, more research is necessary to determine other activities that may also be beneficial in restoring attentional and mental function.

As previously noted, small sample sizes and sample homogeneity are limitations to these results. The studies included in this review present examples of natural restorative environment therapies that were used in nursing. Clearly there are few studies on the use of NRE in nursing, given that this review spanned sixteen years. Due to the variety of diseases and conditions researched in the studies reviewed, it is difficult to draw strong conclusions about NRE benefits. Natural restorative environments have potential uses for future practice, as well as future research in health care practice and more specifically for holistic nursing care. However, gaps in the research evidence still exist. More research is needed on the use of NRE interventions for each of these specific patient conditions (breast cancer, pregnancy, post-stroke rehabilitation, and depression), and other conditions where cognition is affected, in order to make definitive recommendations for nursing practice. In addition, further testing is needed to determine the

effects of NRE interventions at various stages of each illness. Samples with greater diversity in terms of patient gender, ethnicity, age, educational background, and socioeconomic status would allow for a stronger body of evidence. Also, with a current increase in the elderly population, methods to provide high quality and cost effective care to this population are needed. The potential restorative effects of NRE therapies for geriatrics offers an exciting area for future research aimed at meeting a specific population need.

Despite these limitations and areas for future research, these findings do have implications for clinical nursing practice (Table 2). For example, the role of the nurse as a patient educator is directly impacted by these findings. Both nurses and patients need greater awareness and education about the impact of illness on attentional fatigue. Nurses can provide patients with information that defines directed attention and offers ideas for specific activities to combat mental fatigue. As patients become more aware of NRE interventions via nurse education, they gain greater control over their own treatment options, and thus patient autonomy is enhanced. Ability to direct attention is an essential part of daily life. Mental fatigue can cause increased distractibility, irritability, and impulsivity (Brewer & Therrien, 2000). The failure of directed attention at critical times can lead to human error and have serious consequences, such as motor vehicle accidents, injury, or death. Therefore, risk exposure may be reduced by improving mental functioning with NRE therapy. Given the research findings presented in this review, NRE interventions in nursing offer a potentially low cost, accessible, and low risk treatment option for a variety of patients. For example, use of natural restorative environment therapies may combat mental fatigue in women with breast cancer. This could help breast cancer patients to follow complex treatment regimens, complete self care, and concentrate during demanding phases of illness. NRE may also be useful at preventing attentional fatigue in

pregnant women, who have many mental tasks to attend to. An improvement in directed attention can help women to better prepare for birth and parenting by allowing them to learn new skills, complete self care, and make decisions. Additionally, NRE therapies could be useful at restoring mental functioning in those diagnosed with clinical depression. Such interventions can improve depressed patients' ability to complete activities of daily living by improving their attentional functioning. Even though there is not a full evidence base of research, nurses can offer patients the option of NRE therapy because there are no known risks to such treatment. Additionally, the activities included in natural restorative environment interventions can be tailored to patient interests, abilities, and goals. While numerous questions remain for future research, the possibilities stemming from NRE interventions are promising. There is potential for further theory development and continued research aimed at determining the best practice guidelines for NRE in nursing practice. Research exists on the use of NRE interventions within other disciplines like: ecology, psychology, environmental design, and recreation. This poses the possibility for collaboration of nurse researchers with other professionals in order to refine best practice guidelines. Implementing restorative environments as adjuncts to conventional treatment could be beneficial to a variety of patients, as the disease process has an effect on directed attention. Nurses are on the forefront of patient care, and will likely be some of the practitioners responsible for implementing natural interventions as more information becomes available through additional research.

References

- Brewer, T., & Therrien, B. (2000). Minor brain injury: new insights for early nursing care. *The Journal of Neuroscience Nursing*, 32(6), 311-317. Retrieved from http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Retrieve&list_uids=11155345&dopt
- Cimprich, B. (1992). A theoretical perspective on attention and patient education. *Advances in Nursing Science*, 14(3), Retrieved from <http://ezaccess.libraries.psu.edu/login?url=http://search.proquest.com.ezaccess.libraries.psu.edu/docview/618132812?accountid=13158>
- *Cimprich, B. (1993). Development of an intervention to restore attention in cancer patients. *Cancer Nursing*, 16(2), 83-92
- *Cimprich, B., & Ronis, D. L. (2003). An environmental intervention to restore attention in women with newly diagnosed breast cancer. *Cancer Nursing*, 26(4), 284-292.
- *Detweiler, M. B., & Warf, C. W. (2005). Dementia wander garden aids post cerebrovascular stroke restorative therapy. *Alternative Therapies in Health and Medicine*, 11(4), 54-58.
- *Gonzalez, M. T., Hartig, T., Grindal, G., Martinsen, E. W., & Kirkevold, M. (2009). Therapeutic horticulture in clinical depression: a prospective study. *Research and Theory for Nursing Practice: An International Journal*, 23(4).
- Hartig, T. (2008). Green space, psychological restoration, and health inequality. *The Lancet* 372(9650), Retrieved from <http://search.proquest.com/docview/199034699?accountid=13158>

James, W. (1892). *Psychology: The briefer course*. New York: Holt.

Kaplan, R., & Kaplan, S. (1989). *The experience of nature*. New York, NY: Cambridge University Press.

Kaplan, R., Kaplan, S., & Ryan, R. (1998). *With people in mind: design and management of everyday nature*. Washington, D.C.: Island Press.

Kaplan, R., & Kaplan, S. (2008). Creating a larger role for environmental psychology: the reasonable person model as an integrative framework. *Journal of Environmental Psychology*, 29(3), doi: 10.1016/j.jenvp.2008.10.005

“Nature” (2010). A. Stevenson (Ed.), *Oxford dictionary of English*. Oxford University Press.

Retrieved from

<http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t140.e0549>

910

Nightingale, F. (1902). *Notes on nursing*. New York, NY: D. Appleton and Company

Snyder, M., & Lindquist, R. (2001). Issues in complementary therapies: how we got to where we are. *The Online Journal of Issues in Nursing*, 6(2), Retrieved from www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume62001/No2May01/ComplementaryTherapiesIssues.aspx

*Stark, M. (2003). Restoring attention in pregnancy: the natural environment. *Clinical Nursing Research*, 12(3), 246-265. Retrieved from EBSCOhost.

*included in review

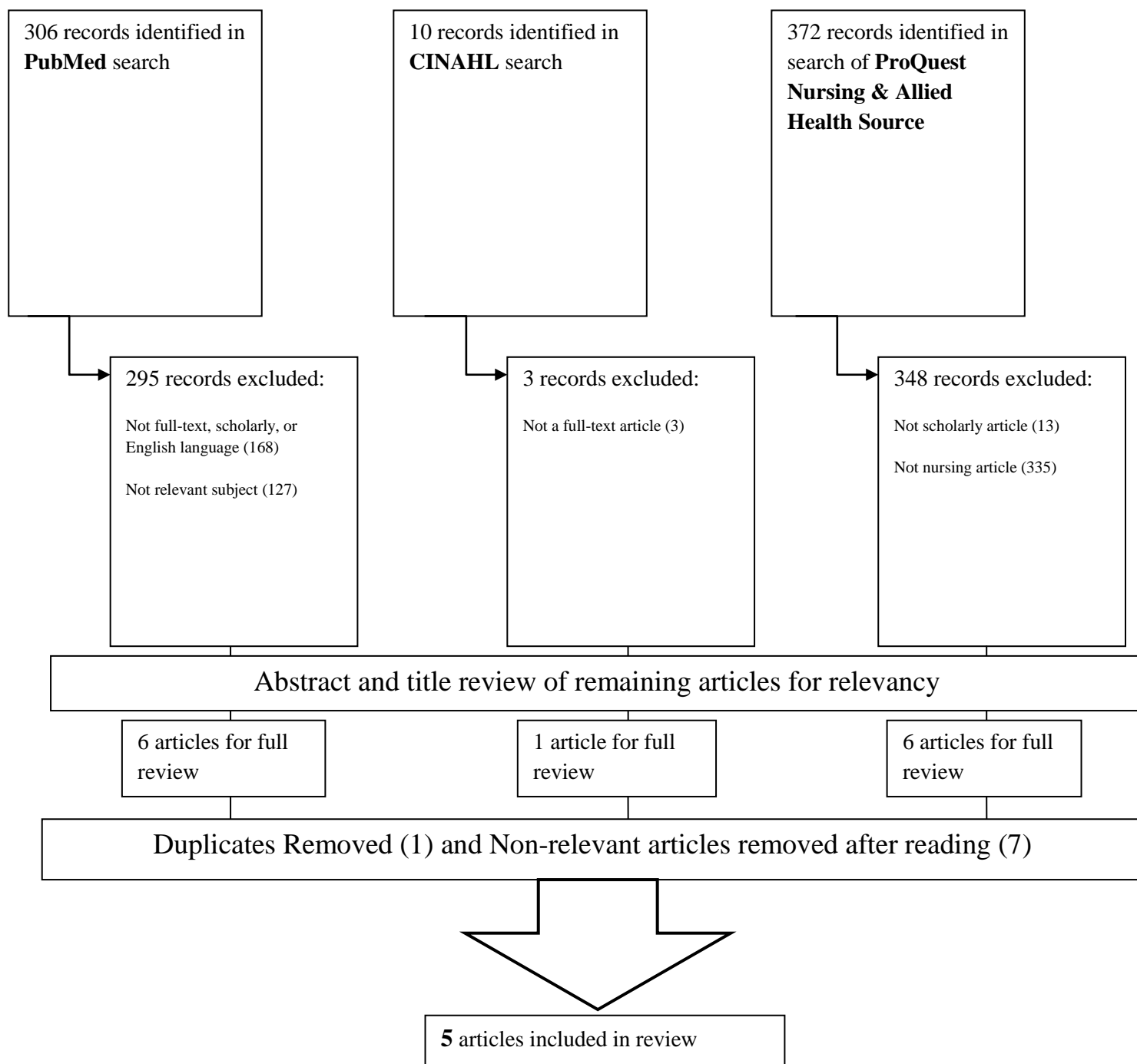


Figure 1. Study selection for systematic review of the use of natural restorative environments in nursing.

Review Matrix

Table 1. Source documents organized chronologically and summarized according to selected abstract topics

Author(s), title, journal	Year	Purpose	Sample	Design/Methods	Data Collection Procedures/Tools	Results	Strengths/Weaknesses
Cimprich, B. Development of an intervention to restore attention in cancer patients. <i>Cancer Nursing</i>	1993	To test the effects of an experimental intervention aimed at maintaining or restoring attentional capacity in women following surgery for breast cancer	32 females with newly diagnosed Stage I or II breast cancer	Theoretical based intervention	<p>Attentional capacity measured at four time points (3, 18, 60, 90 days after surgery)</p> <p>-Objective measures: Digit Span, Symbol Digit Modalities Test, Letter Cancellation, Necker Cube Pattern Control</p> <p>-Subjective: Attentional Function Index (AFI) developed for this study</p> <p>-Visual Analogue Mood Scale to test for depression</p> <p>Subjects randomly assigned to receive an experimental intervention or to receive no intervention: Experimental intervention: participation in attention-restoring activities 20-30 minutes at least 3 times per week.</p>	<p>Subjects in both groups showed significant attentional deficits 3 days after surgery</p> <p>Significant improvement in TAS scores over time for the intervention group; pattern of inconsistent performance for the nonintervention group over time</p> <p>Both groups showed a significant gain in AFI mean scores over time; the intervention group showed a consistent improvement at each time point, while the nonintervention group showed an improvement at 18 days</p>	<p>Limitations:</p> <p>Certain demographic differences between the intervention and nonintervention groups (subjects in intervention group tended to be older and included more women who had mastectomies)</p> <p>Attentional measurement tools are newly constructed, therefore validity and reliability must be further established</p>

<p>Stark, M.A., Restoring attention in pregnancy: the natural environment. <i>Clinical Nursing Research</i></p>	2003	<p>To test whether regularly spending time in the natural environment would improve directed attention for women in the 3rd trimester of pregnancy</p>	<p>Women attending prenatal classes in last trimester of pregnancy, between 26-36 weeks gestation, English speaking, 94% White, 74% college educated, Mean age: 29</p> <p># of subjects: 57 (29 in treatment group; 28 in control group)</p>	<p>Quasi-experimental study</p>	<p>Pre-test and Post test measurements: Digit span tests (forward and backward), Trailmaking A and B, Category Matching, Errors Scale- measures undetected errors and self monitoring under pressure</p> <p>Intervention: natural environment for experimental group, Women were given verbal and written information about directed attention and activities incorporating the natural environment, Women agreed to spend 120 minutes per week in restorative activities and keep a log</p> <p>Control group: discussion of last trimester of pregnancy following pre-test measurements, participants complete a log of their leisure activities</p>	<p>Encouraging women to spend time in nature related activities and designing health care environments to incorporate nature may help pregnant women improve their ability to concentrate and reduce errors</p>	<p>Strength: random assignment to treatment or control groups, statistical analysis of data</p> <p>Limitations: time of entry into study and time of post test varied between participants (all women were posttest at 36-37 weeks) Therefore, some women had more time to make lifestyle changes with restorative activities than others Only 18 women completed the intervention Limited diversity of sample</p>
---	------	---	--	---------------------------------	---	---	--

<p>Cimprich, B. and Ronis, D. L. An environmental intervention to restore attention in women with newly diagnosed breast cancer. <i>Cancer Nursing</i></p>	2003	<p>To determine the value of a natural restorative environment intervention in counteracting attentional fatigue in women with newly diagnosed breast cancer</p>	<p>157 women Age range: 27-86 86% white Confirmed new diagnosis of early stage breast cancer With primary treatment plan of breast-conserving surgery or mastectomy; being treated at a Midwestern university medical center</p>	Longitudinal study	<p>Random assignment to experimental and nonintervention groups. Natural restorative environment (NRE) intervention before surgery -120 minutes per week before surgery Capacity to directed attention (CDA) measured before and after surgery -CDA assessed with digit span forward and backward test; trail making A and B; and Necker cube pattern control -Symptom distress scale used to evaluate level of distress</p>	<p>Attention tests before treatment fell within normal values for healthy adults. Participants randomly assigned to the intervention group showed significantly greater CDA recovery from the pre-surgical to pre-adjuvant therapy period, than the non-intervention group Findings suggest that early application of NRE intervention before breast cancer treatment, could give women a head start in preventing attentional fatigue over the course of illness and treatment.</p>	<p>Limitations: homogenous sample (white, well-educated)</p>
--	------	--	--	--------------------	--	--	--

<p>Detweiler, M.B., Warf, C.W., Dementia wander garden aids post cerebrovascular stroke restorative therapy <i>Alternative Therapies in Health and Medicine</i></p>	2005	<p>To explore the use of dementia wander gardens in enabling patients to achieve rehabilitation goals following stroke</p>	<p>Participants: post-CVA, at long term care facility</p> <p>Case history: 74 year old male; left parietal infarction</p>	<p>Case study</p> <p>Dementia wander garden: easy to navigate, secluded from spectators, minimal hazards</p> <p>The garden meets Kaplan's criteria for a restorative setting: being away, extent, fascination, and compatibility</p> <p>Outdoor rehab therapy sessions ranging from 15 minutes to 60 minutes</p>	<p>Patient ambulation goal of 350 feet: measure his ambulation distance in the garden and assess completion of ADL's</p>	<p>Patient was able to pursue outdoor rehabilitation goals in a less threatening environment due to feeling less self-conscious in the wander garden setting</p> <p>The patient overcame his anxiety of walking in public spaces and reached the 350 feet ambulation goal</p> <p>Use of dementia wander gardens may help motivate patients to achieve goals in post-stroke rehabilitation</p>	<p>Limitations: accurate conclusions cannot be made from one patient case</p>
---	------	--	---	--	--	---	---

<p>Gonzalez, M.T., Hartig, T., et al. Therapeutic horticulture in clinical depression: a prospective study. <i>Research and Theory for Nursing Practice: An international journal</i></p>	2009	<p>Assess the change in severity in clinical depression and perceived attentional capacity during a therapeutic horticulture intervention</p>	<p>18 Adults (3 men, 15 women) Age range: 27-65</p> <p>16 Adults with DSM-IV major depression,, or 2 with depressive phase of bipolar II</p> <p>At 3 month follow-up, 16 people completed questionnaires</p>	<p>Prospective study Single-group within-subject design</p>	<p>Urban farm setting: open, hilly, natural landscape</p> <p>12-week therapeutic horticulture program: both active and passive gardening activities</p> <p>Severity of depression measured with Beck Depression Inventory (BDI) questionnaire</p> <p>Perceived attentional capacity measured with Attentional Function Index (AFI)</p> <p>Experience of restorative activities measured with Perceived Restorativeness Scale (PRS)</p> <p>Measurements taken before horticulture intervention, after 4 weeks of intervention, after 8 weeks, and after 12 weeks</p>	<p>Over the course of the therapeutic horticulture intervention, BDI scores declined an average of 9.7 points; The most significant change occurred during the first 4 weeks of intervention.</p> <p>Perceived attentional capacity improved over the course of the intervention; mean AFI score increased 10.2 points; greatest improvement in scores occurred during the initial stage of the intervention</p> <p>Participants reported high levels of 'being away' and 'fascination' throughout the intervention</p> <p>Participants who found the intervention to engage their attention at a higher level, showed a significantly greater decline in BDI scores over the course of the intervention</p> <p>Changes in BDI and AFI scores between the second and fifth measurement points were moderately correlated; suggesting that severity in depression declined slightly as the perceived attentional capacity improved- however, not clinically significant</p> <p>At the 3 month follow up following the horticulture intervention, there was a slight increase in BDI scores from the previous measurements; Overall reduction in BDI scores from baseline was still significant; AFI scores decreased from previous measurement, and no longer differed significantly from baseline</p>	<p>Limitations: Not a randomized controlled trial design -Therefore, results do not provide strong statements about causation</p> <p>Small sample size</p> <p>Strengths: First study investigating therapeutic horticulture with a properly diagnosed clinical depression sample</p> <p>Use of multiple measurement points and follow-up measurements</p>
---	------	---	--	---	---	---	---

Implications

Table 2. Future areas for NRE research and implications for nursing practice

Next areas for future research with NRE interventions	Implications for nursing
Studies which include a more diverse sample including variation in: gender, ethnicity, age, educational level, socioeconomic status	Patient education about attention, attentional fatigue, and methods to restore directed attention
Studies including specific populations that have not been studied thus far: pediatrics and geriatrics	Collaboration with researchers in other disciplines in order to determine best practice guidelines for NRE interventions
Are specific nature activities more effective at restoring directed attention than others?	Ability to offer patients the option of NRE as an adjunct to treatment for a variety of conditions
What is the optimal amount of time spent on the restorative activity for an improvement in cognitive functioning to result?	A potential cost-effective, low risk, accessible intervention in nursing care
Are current restorative intervention protocols the most effective method of implementing NRE therapies?	Information about NRE therapies can be included in nurse education in order to increase awareness in the profession
How does a natural restorative environment intervention compare to other activities that might improve cognitive performance?	

VITA

Ashley David

Contact Information:

929 Evan Drive
Downingtown, PA 19335
Ashley.david01@gmail.com

Education:

B.S., Nursing, May 2012, The Pennsylvania State University—University Park, PA
The Schreyer Honors College
Thesis Title: The natural restorative environment: Implications for nursing practice

The Chinese University of Hong Kong, Nethersole School of Nursing study abroad program
Schreyer Ambassadors Travel Grant recipient

Association Memberships:

Sigma Theta Tau International Nursing Honor Society, Beta Sigma Chapter

Professional Experience:

Bayada Nurses, Home Care Specialists— Downingtown, PA (May 2010-Present)
Pediatric Home Health Aide

St. Martha Manor – Downingtown, PA (May 2009-August 2009)
Resident Aide

Activities:

Penn State Sign Language Organization
Biology Club
PSU School of Music, Sinfonietta violist (2008-2010)