

Use of Ambient Lighting in Creating a Healing Environment for an Inpatient Psychiatric Unit

Mekeesha McClure, MSN, ANP-BC
Sheron Salyer, DNSc, RNC, CHRC, VHA – CM
VA Tennessee Valley Healthcare System

VA Tennessee Valley Healthcare Systems

Two Medical Centers

Alvin C. York Campus
Murfreesboro, TN

Nashville Campus
Nashville, TN

14 Community Based
Outpatient Clinics (CBOC)
located in TN and 2 in Western
KY



Components of Health: Surroundings



Physical and Emotional

- Environment directly affects you and your health.
- Pay attention to what might influence your life and health, and improve what you can.
- It matters to have safe, comfortable, and healthy spaces

VHA Mental Health Care is built around the concept of recovery

Specific principles for Mental Health (MH) care should:

- Be recovery-oriented
- Provide a therapeutically enriching environment.
- Provide a safe and secure environment
- Be integrated and coordinated
- Provide respectful and healing surroundings
- Accommodate a diverse range of patient populations and care needs. (OC & FM, 2010).

Changing the Inpatient Mental Health Environment

In an effort to provide a holistic, healing environment in the Inpatient Mental Health (MH) unit, it is important to identify the evidence-based literature on this physical environment. Lighting is an important element of the physical environment in an MH unit where staff work and patients live their lives while hospitalized.



Principles of VHA Mental Health Care

Unit design should consider the spirit and sensibilities of both patients and care providers (OC & FM, 2010).

Lighting in mental health units has to maintain a safe and secure facility while creating a therapeutic environment (OC & FM, 2010).



Unit Design Recommendations from OC & FM

1. Design to provide daylight in all feasible areas in appropriate quantities.
2. Distribute daylight uniformly where possible, with no significant dark spots.
3. Provide daylight sensitive controls for the artificial lighting fixtures so they will automatically turn off when not needed.
4. Sun control is essential to avoid excessive temperature exposure and maintain privacy.

Human Response to Light Exposure

Light impacts human health and performance by four main mechanisms:

1. Enabling performance of visual tasks
2. Controlling the body's circadian system
3. Affecting mood and perception
4. Facilitating direct absorption for critical chemical reactions within the body (Joseph, 2006).

Human Circadian System

Light transmitted to the hypothalamus controls the body's circadian rhythm (Joseph, 2006).

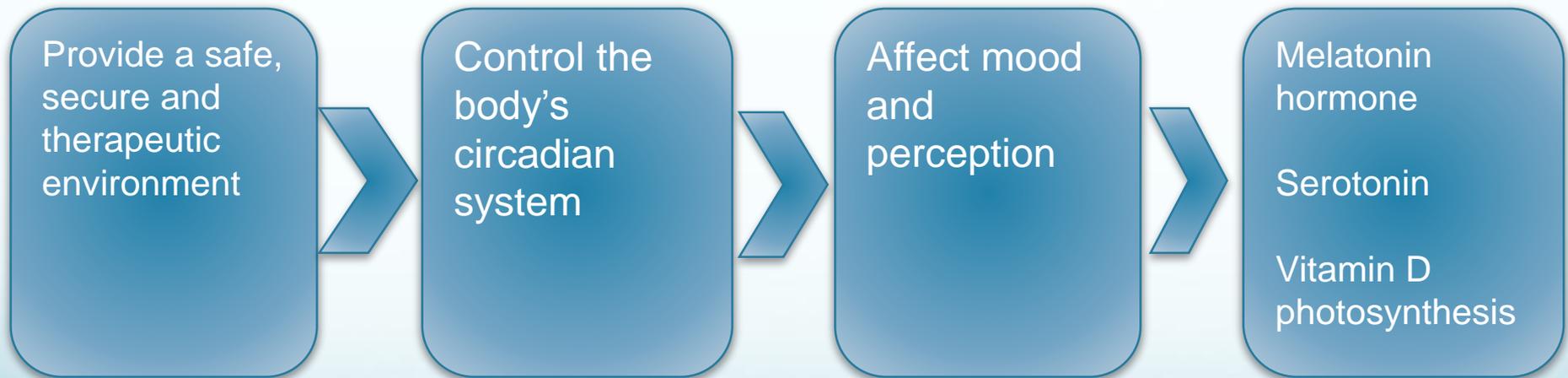
The human circadian system has 3 components (Joseph, 2006):

1. An internal oscillator
2. External oscillators
3. Melatonin hormone

Melatonin levels in the body determine a person's activity and energy level (Joseph, 2006).

Melatonin Hormone

Light exposure in healthcare settings reduces depression in patients, decreases length of hospital stay, improves sleep, reduces agitation in dementia patients, and eases pain (Joseph, 2006).



Environmental Lighting Impact on Physical and Emotional Wellbeing

Systematic Review Objectives

Perform a literature review using CINAHL and Medline databases to answer the following PICO question:

“What is the patient’s response to alternative lighting in an Inpatient Psychiatric Unit and does it produce different or better outcomes for patients when compared to standard hospital lighting?”

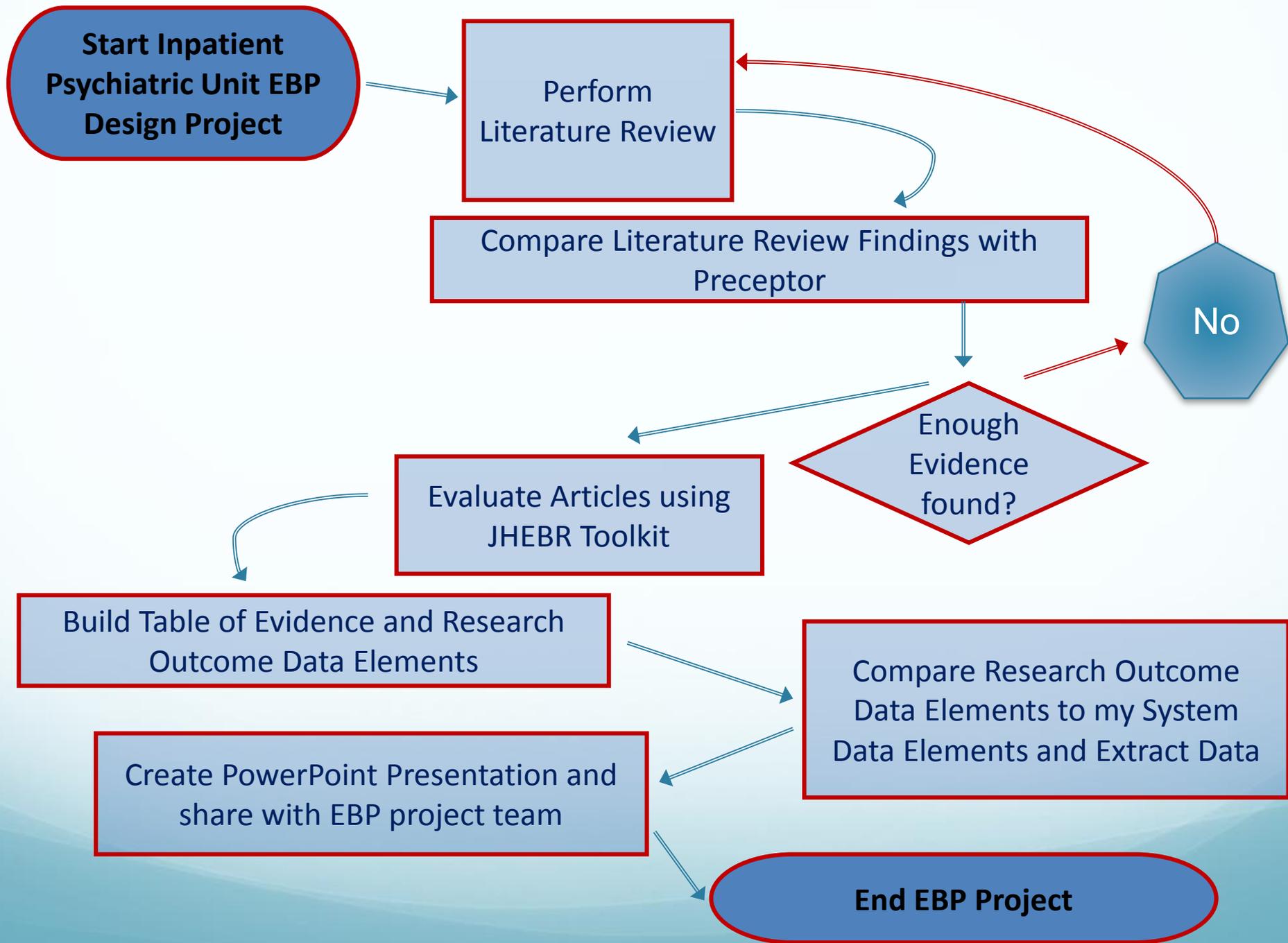
Systematic Review Objectives

The “P” in the PICO acronym stands for populations/people/patient/problem, in this case, representing the Veterans and families seen on the Inpatient Psychiatric Unit.

The “I” represents interventions that could be implemented focusing on patient-centered or patient friendly environments shown to provide improved outcomes for patients.

The “C” represents comparison Bright Light Therapy and Standard Lighting for improvement in circadian rhythm and mental health symptoms

The “O” stands for outcome of the research and how it can be applied to enhance the patient’s experience.



32 articles reviewed & 18 relevant to PICO question

10 Research articles

- Systematic review with meta-analysis
- Quasi-experimental designs
- Descriptive & Exploratory designs

8 Non-research articles

- Literature reviews
- Systematic reviews of non-experimental designs
- Expert opinions

Examples of Lighting Intervention & Outcomes

Study Description

66 older persons with dementia participated in 338 three-week intervention periods.

Participants were evaluated on the effect of ambient bright light therapy (BLT), 2000-3000 lux: AM bright light, PM bright light,

Comparing all day bright light versus standard light.

Outcomes

In no comparison was agitation significantly lower under any therapeutic condition in comparison to standard lighting, 400-600 lux (industry minimum standard for tasks).

Ambient bright light is not effective in reducing agitation in dementia and may exacerbate this behavioral symptom (Barrick et al., 2010).

In a similarly designed study: Lighting Intervention Outcomes

Study Description

A different but similar study evaluated 66 older adults with dementia

Exposed to 4 lighting conditions (2,000 to 2,500 lux and 500 to 600): a) morning bright light, b) evening bright light, c) all-day bright light, and d) standard light.

Exposures occurred over multiple 3-week periods.

Outcomes

Findings did not support the use of ambient bright light therapy as a treatment for depressive symptoms in persons with dementia

Subpopulation of persons with dementia may benefit from this intervention and should be considered on an individual level (Hickman et al., 2007).

Lighting Intervention Outcomes

A convenience sample of 23 women and 17 men, all inpatients, were monitored for 72 hours to observe light exposure, sleep-wake patterns, mood, and pain.

The light intensity was low, mean daytime was 104.80 lux.

Sleep time was fragmented and low, mean 236.35 minutes of sleep per night.

Light levels were insufficient for circadian entrainment

Low light exposure significantly predicted fatigue and total mood disturbance.

Higher light exposure was associated with less fatigue and lower total mood disturbance in participants with pain (Bernhofer et. al, 2013).

Length of Stay

174 admissions with a total group average of 18.1 days length of stay with $SD=11.88$, range 6 to 86 days.

The rooms in one psychiatric inpatient unit were placed so that half were bright and sunny and the rest were not.

Bright light room exposure measured 500 to 5000 lux.

Dull light room exposure measured 200 to 300 lux.

In length of stay comparisons of patients coping with depression, those in sunny rooms had an average stay of 16.9 days compared to 19.5 days for those in dull rooms (Beauchemin & Hays, 1996).

Meta-Analysis of Lighting Therapy

20 randomized controlled trials were reviewed comparing bright light with inactive placebo treatments for non-seasonal depression.

Most of the studies applied bright light as adjunctive treatment to drug therapy, sleep deprivation, or both.

The treatment response in the bright light group was better than in the control treatment group, but did not reach statistical significance.

The result was mainly based on studies of less than 8 days of treatment.

Meta-Analysis of Lighting Therapy

11 trials to determine light impact on cognition, ADLs, sleep, challenging behavior, and psychiatric symptoms associated with dementia.

Theoretically, changes in sleep patterns for people with dementia might be reversed by stimulation of light.

Light sources varied with no effect from BLT on cognitive function, sleep, agitation, or psychiatric symptoms associated with dementia.

There is insufficient evidence to recommend the use of bright light therapy in dementia.

Results from a single study, which found a beneficial effect on ADLs, should be regarded with caution and need to be replicated before supporting a recommendation for the use of bright light therapy (Forbes et al., 2014).

Outcomes Measured

Subjective

Profile of Mood States Brief Form

Subjective Pain Scores

Cornell Scale for Depression in Dementia

Completion by staff caregivers of 14 item Cohen-Mansfield Agitation Inventory

Objective

Plasma samples for melatonin

Direct observation by research personnel

Length of hospital stay

Light exposure and sleep-wake patterns

Outcomes measures at TVHS

Subjective

Generalized Anxiety Disorder Scale

Short Form Health Survey (SF-36)

Patient Satisfaction Scores

Geriatric Depression Scale Short Form

Patient Health questionnaire-9 (PHQ-9)

Objective

Pittsburgh Agitation Scale

Direct observation by research/caregiver personnel

Medical Record review

Length of hospital stay

Light exposure and sleep-wake patterns

Common Study Limitations

In general, the quality of reporting was poor, and many reviews did not report adverse effects systematically.

Due to limited data and heterogeneity of studies, these results need to be interpreted with caution.

True blindness was very difficult to achieve because studies were from various settings, short and medium term only, and very heterogeneous in treatment methods, patient groups, and outcomes (Tuunainen, A., Kripke, D., & Endo, T., 2009).

Differentials for severity of symptoms prior to bright light therapy and quality of improvement were not regularly expressed.

Summary

Positive Effect

Depression outcomes

Less fatigue and lower mood disturbance in participants with pain

Length of stay

BLT appears to have modest but measureable effect on sleep in geriatric especially if exposed for 2 hours in AM.

No Effect

Not effective in reducing agitation in dementia and may worsen symptoms

There was no effect of bright light therapy on cognitive function, agitation, or psychiatric symptoms associated with dementia.

Summary

Research on ambient lighting's impact on psychiatric units is limited. Overall, data reviewed suggests benefit from ambient lighting in subsets of patients, however the mixed results suggests cautious use.



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QUESTIONS???

Contact Info

Mekeesha McClure, MSN, ANP-BC
Psychiatric Ambulatory Services Clinic
Murfreesboro, TN, 37086
mekeesha.mcclure@va.gov
615-225-3720

Dr. Sheron Salyer, Research Compliance Officer
Research Service
Nashville, TN, 37212
sheron.salyer@va.gov
615-873-6743