Psychologically mediated effects of the physical healthcare environment on work-related outcomes of healthcare personnel (Protocol)

Dijkstra K, Pieterse ME, Pruyn AT

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[Intervention Protocol]

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Karin Dijkstra[1], Marcel E. Pieterse[1], Ad T.H. Pruyn[1]

[1]Marketing Communication and Consumer Psychology, University of Twente, Enschede, Netherlands

Contact address: Karin Dijkstra, Marketing Communication and Consumer Psychology, University of Twente, Drienerlolaan 5, Enschede, 7522 NB, Netherlands. k.dijkstra@utwente.nl.

Editorial group: Cochrane Effective Practice and Organisation of Care Group.
Publication status and date: Edited (no change to conclusions), published in Issue 1, 2009.

Citation: Dijkstra K, Pieterse ME, Pruyn AT. Psychologically mediated effects of the physical healthcare environment on work-related outcomes of healthcare personnel. *Cochrane Database of Systematic Reviews* 2006, Issue 4. Art. No.: CD006210. DOI: 10.1002/14651858.CD006210.

ABSTRACT

This is the protocol for a review and there is no abstract. The objectives are as follows:

The objective of this review is to assess the psychologically mediated effects of the physical healthcare environment on work-related outcomes of healthcare personnel.

BACKGROUND

Drahota and colleagues are conducting a systematic review of the impact of the sensory hospital environment on adult patient health-related outcomes (Drahota 2004). They clearly state the importance of environmental design in relation to the health of patients and give a plain overview of the relevance of the subject. Recent research suggests that the possible effects of physical environmental stimuli on the health and well-being of patients in healthcare settings has gained much attention (see for example Devlin 2003; Schweitzer 2004). These studies show that the physical healthcare environment is capable of having a positive influence on the patient, a concept known as 'healing environments'.

The importance of a healthcare environment that promotes the health and well-being of patients is evident, but this healing environment should not negatively affect healthcare personnel. Moreover, the physical healthcare environment has different functions for the two main user groups, patients and healthcare personnel. Where the first group of users needs to recover as quickly as possible or adapt to specific acute and chronic conditions (Stichler 2001), the second group needs to work in this environment on a daily basis.

The physical healthcare environment is part of the personnel's 'workscape'. This can make the environment an important determinant of job satisfaction as well as of judgments regarding functionality of the work environment. Work-related outcomes like job satisfaction or employee well-being have been shown to be associated with work performance, productivity, and ultimately, to the quality of healthcare (Lundstrom 2002). In order to effectively build or renovate healthcare facilities, it is necessary to pay attention to the needs of healthcare personnel as well as patients.

Considering the substantial budgets to be spent on hospital design and construction (Babwin 2002), a rigorous, systematic review is needed for the development of evidence-based guidelines for the design of healthcare facilities.

There are two ways in which the physical healthcare environment can impact personnel. First, it can have a direct physiological influence, meaning the effects are mainly unmediated or unmoderated by psychological processes (Taylor 1997). Two literature reviews are already available that concern this direct physiological influence. In 2003, Hickman et al (Hickam 2003) conducted a literature review on the effects of healthcare working conditions, but focused solely on patient safety (Hickam 2003). Ulrich 2004 performed a much broader review focusing not only on effects of the physical environment on staff and quality of care, but on patients as well. Their findings with respect to staff concerned the workflow and are mainly focused on ergonomic issues.

The second wayin which the physical healthcare environment may affect personnel is through psychological processes as a result of sensory perceptions. These processes can be of a cognitive or emotional nature. Since there is no review available on the effects of the physical environment on personnel, this review will be restricted to this second category of processes. In the ambivalent cases where environmental changes affect healthcare personnel both psychologically and physically, studies will only be included when the outcome measures are indicative of psychologically mediated effects. For example, furniture may directly affect personnel by causing back pain. The effect may also be indirect by providing a more homely ambience. We will include studies with outcome measures such as mood or stress, but exclude studies measuring back pain.

In sum, a healthcare environment is needed that is psychologically supportive for both patients and healthcare personnel. The patient perspective is covered by the review of Drahota 2004. Our review will add the personnel perspective. Understanding the physical environmental stimuli that may affect workplace stress, reduce absenteeism, lower staff turnover, and even support providing high-quality care, will contribute to more efficient hospital design.

OBJECTIVES

The objective of this review is to assess the psychologically mediated effects of the physical healthcare environment on work-related outcomes of healthcare personnel.

METHODS

Criteria for considering studies for this review

Types of studies

This review will incorporate randomised controlled trials quasi-randomized controlled trials and cluster randomized controlled trials, as these are considered the most reliable scientific technique for assessing effects of interventions (Schulz 1995).

Types of participants

This review will include both medical and paramedical personnel who are directly involved in treatment and care of patients in healthcare settings. This includes primarily physicians and nurses.

Types of interventions

For the purpose of this review physical environmental stimuli were defined as follows:
Physical environmental stimuli are part of the (shared) healthcare environment and can be classified as ambient, architectural or interior design features that influence healthcare personnel through mediation by psychological processes.

This review will include studies that investigated interventions involving work-related effects of environmental stimuli in healthcare settings, and compared these either to environmental stimuli, or to no environmental stimuli at all. We will include studies manipulating a single environmental stimulus as well as those manipulating multiple stimuli simultaneously.

Interventions are those environmental stimuli that fit the criteria described below: (Harris 2002):

1) They can be classified as architectural features. Architectural features can be defined as the relatively permanent aspects of the physical environment and include for example:

A. windows (versus none or different types of views from windows);

B. room size (different room sizes);

C. spatial layout (different types of layout).

2) They can be classified as interior design features. Interior design features can be defined as the less permanent aspects of the environment, they are predominantly visual in nature and include for example:

A. coloring (e.g. of walls, different colors)

B. artwork (different styles or art versus no art)

C. furniture (different types)

D. carpeting (different types

E. natural elements (e.g. providing access to nature, plants versus no plants)

3) They can be classified as ambient features. Ambient features can be defined as the intangible features of the environment that tend to affect the nonvisual senses and include for example:

A. lighting (e.g. natural versus artificial, amount of lighting)

B. music (different types or music versus no music)

C. sound/noise (e.g. absence or presence of noise, effects of noise-reducing aids)

D. scents (different types, scents versus no scents)

We will exclude environmental stimuli that have a direct, physiological effect on healthcare personnel. These include, for example, hygiene related features, such as the number or location of sinks and hand-cleaner dispensers (Muto 2000). In the ambivalent cases where environmental changes affect healthcare personnel both psychologically and physically, we will include studies when any outcome measures are potentially indicative of psychologically mediated effects and both physical and psychological outcomes will be reported.

We will also exclude studies if the environmental manipulation is confounded with non-environmental changes, such as changes in the organisational climate or nursing care policy.

All studies must have been conducted in healthcare settings. This includes hospitals, nursing homes, psychiatric facilities, and ambulatory care facilities.

Types of outcome measures

We will include a broad range of outcome measures, since the healthcare environment may affect different aspects of both objective and subjective perceptions of nurses and physicians with regard to their daily work (environment). These outcomes can be categorized in measures concerning (1) job satisfaction (e.g. work morale, stress, burnout, sick leave); (2) satisfaction with the physical healthcare environment; (3) quality of life (e.g. mood, well-being); and (4) quality of care (such as medical errors).

Search methods for identification of studies

We will search the following electronic databases:

(a) The EPOC Register (and the database of studies awaiting assessment) was reviewed (see SPECIALISED REGISTER under GROUP DETAILS)

(b) The Cochrane Central Register of Controlled Trials (CENTRAL) and the Database of Abstracts of Reviews of Effectiveness

(c) MEDLINE, Embase, CINAHL, Civil Engineering Database and Compendex

Other sources:

(a) Hand searching of those high-yield journals and conference proceedings which have not already been hand searched on behalf of the Cochrane Collaboration.

(b) Reference lists of all papers and relevant reviews identified.

(c) Authors of relevant papers will be contacted regarding any further published or unpublished work.

(d) Authors of other reviews in the field of effective professional practice will be contacted regarding relevant studies that they may be aware of.

Search strategies for electronic databases are being developed using the methodological component of the EPOC search strategy combined with selected MeSH terms and free text terms. The following are the terms that will be used in the MEDLINE search strategy. This search strategy will be translated into the other databases using the appropriate controlled vocabulary as applicable.

1 environment design/

2 exp *Environment, Controlled/

3 ((multisensory or multi-sensory or sensory or therapeutic or restorative or healing) adj2 (environment$ or design)).tw.

4 workplace/

5 exp “Facility Design and Construction”/

6 exp Health Facility Environment/

7 ((environmental or ambient) adj2 (design or feature$ or stimuli)).tw.

8 or/1-7

9 exp Health personnel/

10Health manpower/

11 exp Patient care team/

12 physician$.tw. Or nurs$.tw. Or pharmacist$.tw. Or dentist$.tw Or dental staff.tw Or laboratory personnel.tw Or medical staff.tw

13 or/9-12

14 8 and 13

15 randomized controlled trial.pt.

16 controlled clinical trial.pt.

17 random$.tw.
18 or/15-17
19 14 and 18
20 8 and 18
21 8 and 19

Data collection and analysis

Selection of studies

One reviewer (KD) will carry out the initial search. Two reviewers (KD, MP) will independently assess the potential relevance of all titles and abstracts identified from the electronic searches. We will retrieve full text copies of all articles that are identified as potentially relevant, and resolve disagreements through arbitration of a third reviewer (AP).

Quality

We will assess the quality of all eligible trials using the criteria described in the EPOC module (see ADDITIONAL INFORMATION, ASSESSMENT OF METHODOLOGICAL QUALITY under GROUP DETAILS). We will provide details in the table 'Characteristics of excluded studies'.

Data extraction

Two reviewers will undertake data extraction independently, using the EPOC data collection checklist. We will resolve any disagreements through discussion among the reviewers. If data are missing, we will attempt to contact the authors of the studies to obtain the missing information.

Data analysis

We will group included studies by intervention. Interventions are categorized as architectural, interior design, and ambient features. We will use these categories in grouping the results; within these categories we will subdivide by specific environmental stimuli.

This review also incorporates studies manipulating several environmental stimuli simultaneously; we will discuss these studies in a separate category.

We will conduct statistical analysis (meta-analysis) for direct comparisons, if a pooled estimate makes practical sense and data are available or can be obtained. In the case of continuous outcome variables, we will calculate either (1) a standardised mean difference (SMD), if different techniques were used to measure the same outcomes; or (2) a weighted mean difference (WMD), for identical measures. For dichotomous measures, we will calculate a relative risk (RR). For all studies included in meta-analyses, we will calculate 95% confidence intervals (95% CI).

Trials comparing randomised or allocated clusters (healthcare organisation or organisational units) that do not account for clustering during analysis have 'potential unit of analysis errors'. This may result in artificially high p-values and over-narrow confidence intervals (Ukoumunne 1999). We will reanalyse studies with potential unit of analysis errors where possible, and mark these as 'reanalysed'. If this is not possible, we will report only point estimates.

We do expect heterogeneity in interventions, outcome measures, type of patients and type of healthcare settings, which will limit the degree to which it makes sense to pool studies. Therefore, if meta-analysis is not possible due to substantial heterogeneity, we will provide a discursive presentation of the results, grouped by interventions, with supporting tables. We will also report characteristics of the population, the type of healthcare setting and outcome measures in these tables.

We will consider the presence of heterogeneity qualitatively by looking at sizes and directions of effects. We will use the chi-squared test for heterogeneity and the I^2 statistic to assess heterogeneity in a quantitative manner.

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* *Indicates the major publication for the study*

WHAT'S NEW

8 July 2008	Amended	Converted to new review format.

HISTORY

Protocol first published: Issue 4, 2006

CONTRIBUTIONS OF AUTHORS

All review authors have contributed to the production of the protocol. KD lead the writing of the protocol, and MP and AP provided comments and feedback. For the full review: KD will develop and run the search strategy. KD and MP will screen records for eligibility. AP will act as arbitrator should disagreement arise. KD and MP will abstract data, undertake analysis, interpret the results and write up the review. AP will be consulted through the review process to provide feedback and comments.

DECLARATIONS OF INTEREST

None known.

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- Netherlands Board for Health Facilities, Netherlands.