



KEY POINT SUMMARY

OBJECTIVES

The objective of this research was to study the physical environment's influence on exercise therapy.

Room for improvement: a randomised controlled trial with nested qualitative interviews on space, place and treatment delivery

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Key Concepts/Context

The physical environment of a hospital can impact its clinical outcomes and is connected to a patient's sense of well-being. Literature also indicates that construction and renovation of healthcare facilities in the US are relying increasingly on evidence-based design to achieve better clinical outcomes and reduce costs. However, the authors note, it is not known how the physical environment impacts health outcomes in rehabilitation and exercise centers. This was the aim of this study. Participants in the study underwent exercise therapy for knee and hip pain in two different exercise rooms – a newly-built enhanced one and an old standard one. Their treatment was assessed objectively and through interviews. It was found that participants in the standard room responded better to treatment than those in the newly-built one. The authors conclude that the physical environment does influence response to treatment and that the influence depends on factors like patient groups, treatment duration, types of intervention, and healthcare.

Methods

This study was a randomized controlled clinical trial, where both participants and therapists were blind to the primary study objective. The mixed-methods study involved group interviews of the participants and assessment of their outcomes. Posters and leaflets at general practitioner clinics, local newspapers, and social media were used to recruit participants (≥ 35 years of age with ≥ 3 -month-old persistent hip or knee pain and willingness and ability to participate in group-based exercise therapy) for this study. Recruited participants did eight weeks of exercise therapy in 1. a newly-built physically enhanced environment, 2. a standard environment, 3. were waitlisted and did not receive any intervention. The physical



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environments of both exercise rooms were different in location, age, and appearance. The newer exercise room was housed in the second floor of a facility built in 2012, looked clean and new, had views of a sport and recreational park, good acoustics, rubberized floors, and smooth concrete walls with pictures of landscapes. The older exercise room was located in the basement of a building built in 1974. It looked old and worn, had polished wooden floors, no windows, bars on walls, unadorned concrete walls, and accessing it was down staircases and dark corridors. Both exercise groups were supervised by physiotherapists as they worked on the NEuroMuscular Exercise or NEMEX program. Primary outcome of the group therapy was assessed (based on the reply to one question: how the knee/hip problem was as compared to at the start of the therapy) at the end of eight weeks by a 7-point Global Perceived Effect (GPE) score. The scale for responses ranged from 'markedly worse' through 'no change' to 'markedly improved'. Secondary outcomes in terms of changes from day one of therapy to the follow-up after eight weeks were also assessed. Focus group interviews were conducted – three with 13 participants from the enhanced environment and three with 12 participants from the standard environment. Individual interviews of two supervising therapists were also conducted. QSR Nvivo 11 data management software was used to code and analyze the interviews. To avoid bias, the interview data was analyzed prior to statistically analyzing the outcome measures. The study was conducted between January and November 2014 – 103 participants were randomly assigned by a computer – 42 to the enhanced environment, 40 to the standard environment, and 21 were waitlisted. It was hypothesized that the primary outcome would rate the physically enhanced room better than the standard room than the waitlist.

Findings

Participant characteristics: The mean age of the participants was 58.5 years (standard deviation was 9.9 years), 61% were women, 63% had knee pain, 59% had clinically diagnosed rheumatic osteoarthritis, and 81% had pain for one year or more.

Primary outcome (assessment of treatment at the end of eight weeks): The two exercise groups showed significant improvement as compared to the waitlisted group ($p=0.05$), which had no significant improvement. Participants in the standard exercise room responded better to the treatment versus those in the enhanced exercise room. This proved the hypothesis wrong but was not statistically significant ($p=0.07$). Also, those who participated in a minimum 12 of 16 exercise classes found the standard room more favorable than the enhanced room.



Secondary outcome (assessment of changes from day one of therapy to after therapy): All patient-reported secondary outcomes favored the standard room over the enhanced room.

The responses of participants in the group interviews were summarized as follows:

Reflections on the exercise environments: Participants said that the standard room represented their physical state – old and worn; it made them feel at home; was nostalgic as it reminded them of their school gyms. Participants from neither group liked the mirrors in the exercise rooms.

Sense of fellowship: The large windows in the enhanced exercise room provided a much-needed positive distraction and made the participants feel part of the larger community. Participants reported liking the music and the views in the enhanced exercise room but said that it deterred social interaction among them. On the other hand, participants in the standard room felt a strong social connection among themselves – as there were no outside views or pleasant surroundings to distract them.

Transition: Participants in the enhanced exercise room reported their access to the room in positive tones – ascending open stairway, feeling part of a larger community. On the other hand, participants in the standard exercise room described their access to their room in negative tones – descending an enclosed stairway into a dark, unwelcoming basement. Over the period of their therapy, they changed their impression and considered the standard exercise room to be therapeutic.

Limitations

The authors do not identify any limitations to this study. One limitation of the study was that it was not determined if the participants were taking medications for their pain before the start of the therapy or during the therapy.

Design Implications

The authors conclude that the physical environment does influence response to treatment. They suggest matching patient preferences to treatment rooms.

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