ORIGINAL RESEARCH Randomised controlled trial

Effect of heated mittens on physical hand function in people with hand osteoarthritis

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Objective To assess the effect of electrically heated mittens on physical hand function in people with osteoarthritis of the hands compared with control mittens.

Design Randomised controlled trial.

Setting Osteoarthritis outpatient clinic, Copenhagen, Denmark.

Participants 200 adults with hand osteoarthritis aged 42-90 years. 100 participants were assigned to the intervention group and 100 to the control group.

Interventions Electrically heated mittens or control mittens (heating elements disconnected) worn for at least 15 minutes daily for six weeks.

Main outcome measures The primary outcome was change in hand function measured on the function subscale of the Australian/Canadian hand osteoarthritis index (AUSCAN; score 0-100 points) at six weeks. Key secondary outcomes included changes in the AUSCAN hand pain subscale (score 0-100 points), global rating of hand osteoarthritis related problems (0-100 visual analogue scale), and grip strength (newtons) at six weeks. Analysis of secondary outcomes was performed using a hierarchical gatekeeping approach.

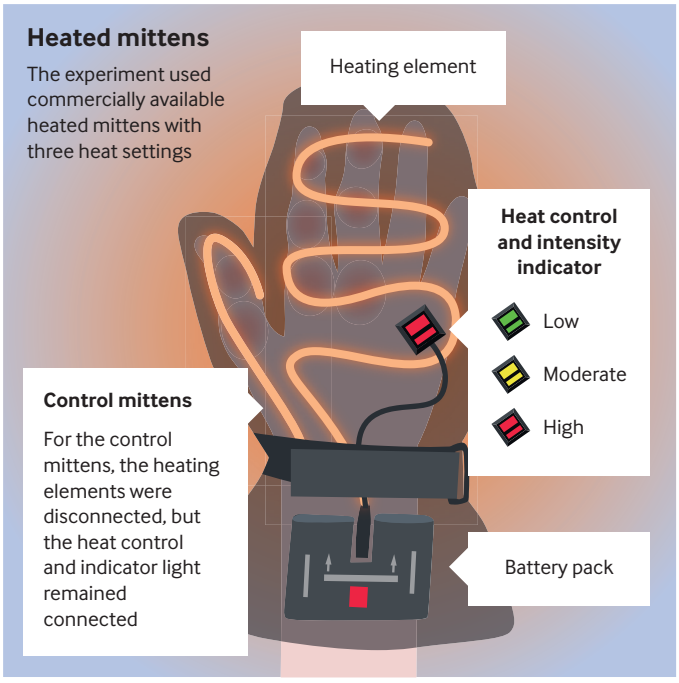
Results 91 participants in the intervention group and 95 in the control group completed the trial. The mean age of participants was 71 years, 87% (n=173) were women, and mean body mass index was 24.9 (SD 4.4). Median disease duration was 10 years (interquartile range 5-15 years). The between group difference for change in the AUSCAN function subscale score at week 6 was 3.0 points (95% confidence interval (CI) −0.4 to 6.3; P=0.09) in favour of heated mittens. For the key secondary outcome, change in AUSCAN hand pain score from baseline, a group difference was observed of 5.9 points (95% CI 2.2 to 9.5) in favour of heated mittens. Changes in global rating of hand osteoarthritis related problems and grip strength did not differ between the groups with an observed difference between groups of 2.8 points (95% CI −3.7 to 9.2) and 2.3 newtons (95% CI −16.3 to 21.0) in favour of heated mittens, respectively. A major limitation was not being able to mask the participants throughout the trial.

Changes in hand osteoarthritis related problems and grip strength did not differ between the groups

Conclusion Electrically heated mittens used for at least 15 minutes daily for six weeks did not provide additional benefits in hand function compared with control mittens with the heating elements disconnected for people with hand osteoarthritis. Heated mittens provided no additional benefits on global rating of hand osteoarthritis related problems and grip strength. A small benefit was detected for hand pain, but this could have been overestimated.

Trial registration ClinicalTrials.gov NCT04576403.

Patient and public involvement Patients were involved in the design of the study; see full paper on bmj.com for details.



WHAT IS ALREADY KNOWN ON THIS TOPIC

- Hand osteoarthritis is common and causes pain and reduced function
- Existing treatments have small to moderate effects
- Heat is conditionally recommended as a symptom moderation tool, but the supporting evidence is of low quality

WHAT THIS STUDY ADDS

- Electrically heated mittens used daily for six weeks were not associated with additional improvements in the primary outcome of hand function compared with control mittens (heating elements disconnected)
- Nor did the heated mittens provide additional benefits in global rating of hand osteoarthritis related problems and grip strength
- A small additional benefit was detected for hand pain, but this was likely overestimated

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From friend at the bedside to health adviser to all

Hospital radio is evolving from offering companionship on the wards to bringing health and wellbeing broadcasting to the community, finds **Richard Hurley**

"I get a real buzz out of it." General practitioner Victoria Wilson presents a weekly live show on Hospital Radio Exeter after she visits the wards to take music requests and dedications. "It's a nice way to interact with patients. Some patients want to chat but then don't request a song," she tells *The BMJ*. "But if they've enjoyed the conversation then that's equally as worthwhile."

Wilson explains: "Patients often have magazines and books, but when they're feeling poorly, listening to something in bed, eyes closed, might take less energy yet it's still entertaining or distracting."

The Hospital Broadcasting Association supports 170 such UK stations, mostly charities, and several thousand volunteers like Wilson with the aim "to aid patient recovery and promote health and wellbeing to all listeners."

Many patients still access the radio through hospital bedside units: on average 1231 a day for 6.2 hours each across the UK in November 2024. But broken bedside units are often not replaced, and increasingly hospital radio is available on FM and DAB (digital audio broadcast), online, and through apps and smart speakers. Some patients may not have, or may struggle to use, their own device, and stations may also fundraise to distribute radios to wards.

Many stations run on NHS sites—often in cupboards, given the high demand for space. Increasingly, however, stations have studios in the community, and some broadcast to GP surgeries, care homes, and the wider public, and with increasing programming and messaging about health and wellbeing.

Hospital radio might help counter patients' boredom, loneliness, anxiousness, and disorientation

Cheering patients up

"A friend at the bedside" has long described hospital radio's primary goal. "It can be a real benefit for patients who don't have many visitors," says Sam Smette, chair of trustees at the Hospital Broadcasting Association. "It's the personal, emotional connection between the patient and the volunteer that hopefully cheers patients up and makes their day a little bit better."

Some stations even broadcast direct from the wards. Radio Cherwell in Oxford's live children's show has volunteers playing games and giving out prizes at the bedside—"the best Saturday morning fun ever," says Ian Pinnell, vice chair of Hospital Broadcasting Association's trustees and long time volunteer at the station. On another live quiz show for adults, different hospital sites compete: "Ward visitors with microphones are team captains for the patients. It can turn into quite a battle."

A 2016 review commissioned by the Hospital Broadcasting Association, which is due to be updated next year, concluded that hospital radio might help to counter boredom, loneliness, anxiousness, disorientation, and depersonalisation in hospital by providing patients with entertainment, social interaction, a sense of belonging, and by enabling their stories and preferences to be heard. Health and wellbeing information could also usefully be shared, it suggested, and volunteers report benefits too. Meeting hospital patients' psychosocial needs may also help to reduce stays and save costs.

Public health information

In 2020, when the covid-19 pandemic restrictions kicked in, health secretary Matt Hancock told the Commons, "Hospital radio is always important, but. . .when visitors have not been able to go into hospitals, it is even more important." Many presenters and volunteers bought their own equipment to broadcast from home. Prince Charles and singer James Blunt hosted dedicated shows.

The stations also provided ready-made ways for trusts to disseminate official public health information and the latest restrictions to patients. Public health messaging persists; for example, Radio Horton has recently featured the blood pressure campaign Know your numbers!, and Stoptober, to encourage smoking cessation during the month of October.

The Hospital Broadcasting Association offers its member stations programmes including *Health Today*, in which former BBC reporter Dominic Arkwright chats with experts and celebrities about health topics. *The Word on Health* for 21 years has offered bitesize wisdom on topics like mental health, vaccination, screening programmes, and infection control. *10 Today* encourages

From far left: Victoria Wilson from Radio Exeter; the Sheffield team; Radio Hillingdon volunteers with a patient (top); and Coventry's radio studio

older people to stay active through 10 minute movement and stretching classes. Individual stations also produce their own health and wellbeing content, and may broadcast announcements from the trust and charities such as Age UK.

Smette, who presents a weekly show at Radio Horton in Banbury, says stations are increasingly exploring programming that engages staff, who are "there all the time." Radio Horton has covered the trust's staff recognition awards, for example.

Football commentary

UK hospital radio began at York Hospital in the 1920s, the Hospital Broadcasting Association says. Early motivation was to provide football commentary to patients who couldn't get to matches. Although hospital stations are dotted around the world, "it's very much a UK thing," says Pinnell. Hospital Broadcasting Association has helped stations launching in France and the Netherlands and had inquiries about launching stations in Australia, Brazil, and the US.

The UK stations sustain their services through funding from sponsorship and by hosting events in the community, which also raises awareness of their work and helps to recruit volunteers. Patients who experience radio ward volunteers may decide to volunteer once recovered "to give something back," he says.

The connection with the volunteer cheers patients up, makes their day a bit better—Sam Smette

Veronica Bromhead volunteers for Radio Horton in her retirement, helping patients set up their radios and headphones and taking their requests. Aged 15, she was in hospital with a ruptured appendix. "I was really poorly. A radio volunteer like me asked if I wanted a record played." Bromhead asked for The Bay City Rollers' song *I only want to be with you* to be played. "They played it, and it cheered me up no end." She jumped at the chance to pay back the good turn. "I remembered how I felt. When you're in hospital it can be long days and nights. If you can't sleep, our station is on 24 hours a day," she says. "It gives patients and staff such a boost. If it makes just one person's day, I've done my job."

Simon Tidmarsh is a presenter on Coventry Hospital Radio; by day, he works in the hospital's quality department. The hyper-local focus explains hospital radio's popularity, he says. He started volunteering in 2011, as a way into the radio industry. Presenters including Jeremy Vine, Phillipa Forrester, and Jacqui Oatley trod this path. Andrew Peach, a BBC news and current affairs presenter, says volunteering at BHBN hospital radio in Birmingham early in his career "taught me the most important thing about radio: it is all about the listener."

Promoting health and wellbeing

Despite the ubiquity of smartphones and music streaming services today, and a decline in the number of stations over recent decades, hospital radio is reinventing itself, with the pandemic emphasising its value. Some trusts don't recognise hospital radio's value to patients and staff, and when stations close it's "really sad and hard for us," says Smette.

"It's as important today as when it first started," says Pinnell. "It's morphing into a broader service to promote health and wellbeing." Smette thinks this "could help reduce strain on the NHS, by sharing health and wellbeing content and raising awareness of activities in the local community that can help improve mental or physical health."

By broadcasting beyond the wards to the public, hospital radio can reach increasing numbers of patients in community care or on virtual wards, as well as recently discharged hospital inpatients who could benefit from the connection and health focused messaging, the Hospital Broadcasting Association's review concluded.

Wilson would like to offer listeners more clinical information. "It's just a matter of fitting it in." In relation to hospital radio and volunteering, she says, "Support it. It's a really good service for patients. And it's a really rewarding thing to do."

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Solidarity kitchens: how pandemic food assistance developed to offer much more

A grassroots food assistance programme in Brazil that grew from covid lockdowns is now trying to counter obesity and other diseases of poverty, **Rodrigo de Oliveira Andrade** reports

"When the covid-19 pandemic began, I knew Brazil would face a battle against hunger," says Adriana Salay Leme, a historian in the city of São Paulo. So when their restaurant was forced to shut during the pandemic, Leme and her husband, the chef Rodrigo Oliveira, started feeding people living in Vila Medeiros, a poor neighbourhood on the outskirts of the city, helping to spawn a mass movement for distributing free meals to people affected by the pandemic.

"We closed in March 2020 in compliance with the emergency measures, and the next day we started serving free lunch boxes from the front door," Leme tells *The BMJ*. This is how the project "Quebrada Alimentada" (Feed the outskirts) was born. Today, in addition to daily lunch boxes, Quebrada Alimentada distributes monthly basic food hampers to around 260 families in Vila Medeiros, including in Jardim Julieta, an informal settlement that formed during the pandemic in mid-2020.

Similar solidarity kitchens, as this sort of initiative has been dubbed, have proliferated across the country, providing not just food but education and health access to the most vulnerable people—and inspiring government funding for a scheme.

From global leader to families in need

Brazil was once a global leader in the fight against hunger. Between 2004 and 2013, government policies aimed at eradicating poverty reduced the proportion of households experiencing hunger from 9.5% to 4.2%. But the dismantling of these policies by the governments of presidents Michel Temer and Jair Bolsonaro, alongside economic crises, worsening social inequalities, and the pandemic, took a heavy toll.

RICARDO D'ANGELO

More than 100 000 meals were served between 2020 and 2023

Food insecurity rose from 36.7% in 2018 to 58.7% of the Brazilian population in 2022. In the six months from November 2021 to April 2022, the number of people going hungry jumped from 19.1 million to 33.1 million. "Faced with all this social tragedy, it was left to civil society to mitigate the problem of hunger in the country," says Aline Rissatto Teixeira, a nutritionist from the School of Public Health at the University of São Paulo. Leme and Oliveira's restaurant was based in Vila Medeiros, and this inspired them to start their project.

Quebrada Alimentada started with the two of them serving about 60 lunch boxes to families registered at a local centre that offered educational activities to children and adolescents from low income families in São Paulo. After a photo went viral on social media, demand increased. "Suddenly, we were producing up to 200 lunch boxes," Leme says.

Other restaurants started giving them stock that they couldn't use because of the pandemic. This resulted in more than 100 000 meals being served between 2020 and 2023. Still, she says, "at one point, the demand for food greatly exceeded our capacity, and we were no longer able to identify those who needed it the most."

To meet this demand, she contacted primary care clinics (Unidades Basicas de Saude, UBS) in Vila Medeiros, which were seeing many malnourished people at that time. Only one agreed to join the project, but it was enough to see them through a difficult time, says Leme. "They began identifying the most vulnerable families and referring them to our restaurant to take the lunch boxes."

Among the most vulnerable were those in Jardim Julieta, a new informal settlement that sprung up as a direct consequence of the pandemic. Isolation measures to contain the spread of coronavirus hit Brazilian families hard. The economy sank, and people who had lost their jobs or were evicted from their homes began to occupy vacant land in northern São Paulo. In the beginning there were 30 families living there; it currently houses more than 840.

Valdirene Ferreira Frazão, who serves as Jardim Julieta's de facto leader, moved there in May 2020 after losing her job in the events industry. She weeded and cleared the land with her two children. With emergency aid from the federal government, she built a shack in two days. "Today we have electricity, water, and sewage, and we are improving the quality of the houses. Our idea is to stay; we don't want to leave," she says.

RICARDO D'ANGELO

MAURO PIMENTEL/AFP/GETTY IMAGES

Quebrada Alimentada has been vital to keeping these residents alive and is now offering them hope for the future. In late 2023, Frazão suggested that Leme and Oliveira build a community kitchen that could double up as a cook school in Jardim Julieta. After raising money through crowdfunding—and dipping into their own pockets—they were able to begin construction on a building for the project a few months later.

"Our goal is to prepare and serve 500 meals every day, contributing to alleviating hunger among the residents of Jardim Julieta and neighbouring areas," Frazão tells *The BMJ*. "The space will also offer professional training in gastronomy to the people of the neighbourhood."

From one kitchen to a movement

Leme, Oliveira, and Frazão aren't alone. An estimated 2000 similar solidarity kitchens sprung up across Brazil around the same time, many of them organised by the Homeless Workers' Movement (MTST in Portuguese). The MTST launched its first solidarity kitchen in Rio de Janeiro, looking to feed those who found themselves homeless and jobless, just like in Jardim Julieta. Around 30 more MTST kitchens are open across 11 states, all displaying a "free lunch" sign.

Amid various challenges, solidarity kitchens in Brazil provide nourishment and hope to vulnerable communities

These kitchens have inspired a new federal government programme. The National Solidarity Kitchen Programme was launched by Presidente Luíz Inácio Lula da Silva in July 2023 to support initiatives that produce at least 100 meals a day and operate five times a week. The Jardim Julieta community kitchen-school, once built, is one of those set to benefit.

RICARDO D'ANGELO

The federal government programme comes at a vital time—more than 40 000 families are estimated to have become homeless between March 2020 and February 2023 and are now living in informal settlements across the country.

Besides fighting food insecurity, solidarity kitchens may also help improve health through better diets, researchers say. "Many of them use fresh, locally grown, and organic food," says Denise de Sordi, a researcher at the vice presidency of environment, healthcare, and health promotion at Oswaldo Cruz Foundation.

"Solidarity kitchens also help establish a daily and ongoing connection with vulnerable populations, such as homeless people and immigrants," says Leme. "These are people who are not accustomed or don't know how to seek health services, and the kitchens provide them with access to health resources through food distribution."

She recalls that during the pandemic health professionals from their partner health centre assisted people in the lunch box queue. As a result of those interactions, Quebrada Alimentada is now working with the Hospital Sírio-Libanês, one of the best in Latin America, to analyse the effect of Jardim Julieta's community kitchen-school on health. They want to determine whether health indicators—such as obesity, diabetes, and cholesterol levels—as well as socioeconomic conditions among residents improve.

"We're interested in whether children, by frequently eating quality food, show improvements in school performance, and whether there is an increase in parental income and better housing conditions," says Leme.

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How to transport a polar bear

Emergency helicopters in Norway's northern Svalbard archipelago sometimes take unusual passengers, write **Astrid K V Harring and colleagues**

Six hundred miles north of mainland Norway, deep in the Arctic Circle, the Svalbard archipelago spans over 60 000 km, with a population of just 2596. Longyearbyen, the "capital city," has a small hospital to provide primary and emergency care. The hospital has 24 staff, including three doctors and at least one surgeon. Longyearbyen also has a fire department that has one ambulance with a stretcher.

With few roads and rugged terrain, Svalbard has two search and rescue helicopters that also provide helicopter emergency medical service (HEMS)—and unusual transfer missions. Each helicopter crew includes a medical rescue technician, and one has an anaesthetist. The helicopters carry the same equipment as mainland HEMS bases, including a handheld ultrasound machine and blood products.

Annually the crews conduct over 80 missions, mostly search and rescue or as primary responders to medical emergencies. Authorities have recorded fewer than five cardiac arrests that occurred outside of hospital in the past 10 years.

Oxygen masks can crumble

Winds blowing across the vast Arctic landscape lead to low and unpredictable temperatures, from −30 °C one day to a relatively comfortable +5 °C the next. Here, battery life is short, oxygen masks can crumble, and endotracheal tubes must be secured with strips to prevent connectors from detaching.

Despite the frozen road conditions, there are no reports of injuries from road traffic incidents. Over half of Norway's registered snowmobiles are found in Svalbard. Most snowmobile crashes involve inexperienced drivers and alcohol consumption. The population acts as an ambulatory blood bank.

Roaming polar bears

Three thousand polar bears live in the wider Barents Sea region, and about 300 roam Svalbard's islands. The bears have a better sense of smell than dogs, and have the strength to smash in cabin doors in search of food. They also enjoy items with questionable nutritional value, such as snowmobile seats and clipboards (fig 1).

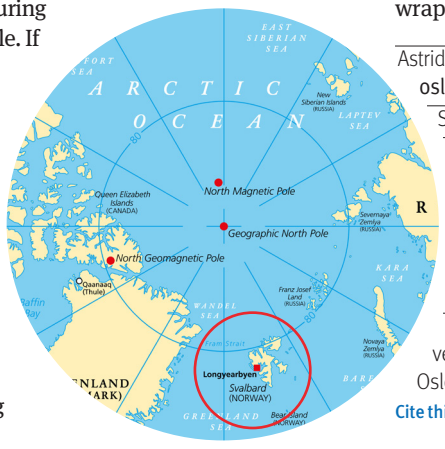
In the past 50 years, polar bears have killed six people and injured several more. Outside Longyearbyen people must carry a rifle and flare gun (the doctor and helicopter medical rescue technician have Magnum 44 revolvers). Every year, polar bears are shot during encounters with people. If an autopsy is needed, dead polar bears can be transported in a cargo net hanging beneath a helicopter (fig 2).

The changing climate in the Arctic results in less sea ice. This has changed the habits of polar bears, forcing them to the mainland. Thus polar bears sometimes stray into populated areas. To escort them back to the wild, they are herded using a helicopter. The polar bears are monitored using thermal imaging to ensure that they do not overheat while running (fig 3).

Polar bears sometimes stray into populated areas and must be escorted back

If herding fails, bears are sedated and then transported by helicopter. A veterinarian administers 5-10 mg/kg of tiletamine and zolazepam intramuscularly and might supplement this with medtomidine. Further sedation is often not needed after administration of the potent and long acting sedative drugs (figs 4 and 5). Tiletamine is more potent and has a longer duration of action than ketamine, and zolazepam is four times more potent than diazepam.

The crew roll sedated bears (300-600 kg male or 150-350 kg female) onto stretchers and into helicopters with brute strength and teamwork (fig 6). Given the effects of the muscle relaxing drugs and the effects of atmospheric pressure with rising altitude, the stretcher and the bottom half of the polar bear should be wrapped generously in plastic (fig 5).



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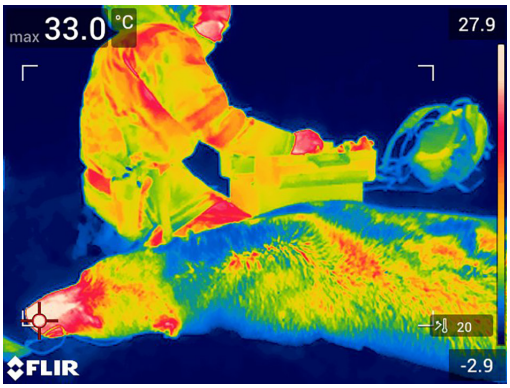

Fig 3 | Infrared thermal image of a sedated polar bear used to monitor body temperature. Red and white show the warmest areas; blue the coldest. *(Photo courtesy of Jon Aars, Norwegian Polarinstitute, used with permission).*

Fig 1 | A polar bear cub, next to the sedated mother, biting a clipboard. *(Photo courtesy of Jon Aars, Norwegian Polarinstitute, used with permission).*

Fig 4 | Airway management and SpO_2 monitoring of a sedated polar bear. *(Photo courtesy of Jon Aars, Norwegian Polarinstitute, used with permission).*

Fig 2 | A dead polar bear being carried in a cargo net. *(Photo courtesy of the Norwegian Polarinstitute, used with permission).*

Svalbard has two search and rescue helicopters that also provide helicopter emergency medical service—and unusual transfer missions

Fig 5 | Coauthor MMM's first transport of a sedated polar bear on 16 October 2014. The crew learnt the hard way that sedated bears must be wrapped in plastic during transport. *(Photo courtesy of Governor of Svalbard, used with permission).*

Fig 6 | The team preparing to roll a sedated polar bear onto a stretcher before lifting it into the helicopter. *(Photo courtesy of Jon Aars, Norwegian Polarinstitute, used with permission).*

To view a video on BMJ.com of polar bears being transported please scan the above QR code

Barcelona's Casa Milà, designed by Antoni Gaudi, is feted by the Humanise campaign as a model for urban architecture

AXS HOTO/ALAMY

OPINION Cleo Valentine

Moving from harmful to healthy built spaces

More than half the world's population lives in urban areas; the UN predicts this will increase to nearly two thirds by 2050, but many urban environments fail to support or even actively harm public health. The effects of the built environment on public health and wellbeing may be more substantial than previously understood. Those responsible—architects, developers, and public authorities—must collaborate and consider health more closely.

Medical experts and public health officials should be routinely involved in the design process, and planning law and regulations should mandate health considerations in design and construction. By recognising that health encompasses complete physical, mental, and social wellbeing—not merely the absence of disease—we can prioritise physical and mental health over purely economic considerations, ultimately creating healthier built environments.

Architectural health research has garnered increasing global attention in recent years. Initiatives such as the Humanise campaign champion architectural design that prioritises health and wellbeing. This emerging research discipline has identified that subtle variations in architectural and urban design elements are associated with improved physical and mental health outcomes and wellbeing, taking into account other socioeconomic determinants of health.

Architectural designs should prioritise comfortable and restorative spaces. Subtle variations in architectural and urban elements can profoundly affect social, physical, and mental wellbeing. Smaller rooms with lower ceilings, lower window-to-wall ratios, limited visual appeal, and inadequate openness of spaces may increase a sense of enclosure and trigger stress responses that are associated with increased morbidity and mortality. Healthy specifications for these features remain difficult to define, as their effects are subjective and depend on the room's function. To maximise return on investment, developers often face pressure to reduce room sizes, ceiling heights, and the number of windows. Architectural health research can have a crucial role here by identifying design strategies such as using cost neutral adjustments or design efficiencies that improve occupant wellbeing without increasing costs.

In addition, visually monotonous environments—characterised by uniform, featureless facades with long stretches of blank walls and minimal architectural details—may induce more stress responses than more visually engaging and intricate settings. Similarly, architectural facades and features with highly geometric, repetitive, high contrast patterns are known to increase visual stress, contributing to headaches and, in extreme cases, migraines and seizures. Facades with more openings, such as doorways and windows, and varied architectural elements may make for a less stressful experience.

The aim is to create built environments that not only foster health and wellbaing but also reduce inequalities and support urban sustainability

Emerging architectural health research should inform global policy and practice worldwide. Insights from clinical observation and longitudinal clinical studies to characterise long term health effects of the built environment on populations are needed. Medical professionals generally recognise poor quality housing as an influential factor in adverse health outcomes. Health systems worldwide could benefit from integrating growing evidence that specific urban and architectural designs influence chronic illness and disease. This integration could involve incorporating architectural health insights into public health policies, updating clinical guidelines to account for environmental risk factors, and fostering collaborations between healthcare professionals, urban planners, and architects to design spaces that mitigate health risks and promote wellbeing.

As research develops, the aim is to create built environments that not only foster health and wellbeing but also reduce inequalities and support urban sustainability, paving the way for a healthier and more equitable society. The future of our health will be influenced by the thoughtful and innovative ways we design our built environment.

Cleo Valentine, doctoral scholar, University of Cambridge

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