

Study finds exercise treadmills significant cause of hand burns in children

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In recent years, home exercise equipment has become increasingly common, and treadmills have continued to be the largest selling exercise category by a large margin. However, this trend has also led to an unfortunate increase in treadmill-related hand burns for children, with estimates indicating that more than 12,000 children are treated in emergency departments for home exercise equipment-related injuries in the United States each year.

A study published by Nationwide Children's Hospital researchers in the *Journal of Burn Care and Research* has found that pediatric treadmill burns are the second most common hand injury after stovetop burns, are more severe, and require greater and longer care in comparison to other contact hand burns.

"We were alarmed by the number and severity of treadmill-related burns that we encountered in our outpatient burn clinic, and by the fact that these treadmill burns appeared to be deeper compared to other contact hand burns," said Dana L. Noffsinger, CPNP-AC, pediatric nurse practitioner for the Burn Program at Nationwide Children's and first and corresponding author on the recent study. "After reviewing the research, we found that the studies in this area were inadequate."

Because previous studies have been limited in the number of patients and have lacked a comparison group, Noffsinger and colleagues decided to evaluate how common and severe treadmill-related hand burn injuries were. The team compared treadmill-related hand burn injuries to contact

hand burns that were seen at the pediatric burn center and affiliated urgent care system at Nationwide Children's.

"We looked back at the charts of all patients who presented to a regional Level 1 Pediatric Burn Center from 2010 to 2014 with treadmill and hand contact burns," explained Noffsinger, who is also a nurse researcher in the Center for Pediatric Trauma Research at Nationwide Children's. "Strikingly, our study found that treadmill hand burns accounted for 4% of our total burn population, while contact hand burns accounted for 12%, and that treadmill hand burns were the second leading cause of hand burns."

A majority of the injuries are from the hand getting stuck in the treadmill and a running belt causing a friction burn. Patients with treadmill burns also experienced an increased length of care compared to those with contact hand burns, 51 days versus 11 days, including a need for therapeutic interventions, which results in increased physical and psychological stress, as well as increased healthcare costs.

"Given the potential severity of treadmill hand burns and concern of functional outcomes, children with treadmill hand burns should be referred to a pediatric burn center," said Jonathan Groner, MD, medical director of the Center for Pediatric Trauma Research and trauma medical director of the Level 1 Trauma Program at Nationwide Children's, who also collaborated on this study. "Multidisciplinary teams including nurses, occupational therapists, advanced healthcare providers and surgeons specialized in burn care can provide optimal care for these injuries."

According to researchers, hand burn injuries most commonly occur in early childhood, when mobility increases. Due to their curiosity, young children explore their environments, often using their hands, and they may not understand or appreciate the potential dangers of hot objects or

machinery.

"We can ensure a safer environment for children by helping caregivers recognize that a treadmill is a piece of heavy machinery, by having them read and understand safety mechanisms in place for their treadmill, and by having them prevent access to the machine during treadmill use," said Huiyun Xiang, MD, MPH, PhD, director of the Center for Pediatric Trauma Research, who also contributed to this study. "We also recommend the use of baby gates or play pens, to not leave a running treadmill unattended, and to have caregivers position the treadmill to face the room."

Provided by Nationwide Children's Hospital

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