LETTER

Indoor temperature and relative humidity in hospitals: workplace considerations during the novel coronavirus pandemic

The link between seasonal variation and viral outbreaks is a topic of much debate.[1] It is postulated that cold temperatures increase viral half-lives and that low relative humidity (RH) adversely influences natural processes that otherwise lead to viral inactivation.[2 3] As such, there is a growing interest in whether indoor temperature and RH may be modifiable risk factors for aerial transmission of viruses. Indeed, preclinical studies and observational data suggest that high temperature as well as RH in the 40%–60% range may reduce transmission of the novel coronavirus (COVID-19).[4 5] And although high humidity has been shown to reduce transmission of various other aerosolised viruses,[3] once RH exceeds 60%, the likelihood of mould growth increases significantly.

At present, various regulatory bodies in the USA suggest that during winter months, indoor temperature should be maintained between 20°C and 24°C, while RH should be maintained between 20% and 60%.[6] Given that social distancing by healthcare providers may be difficult to achieve in the workplace, we investigated ambient temperature and RH at three major teaching hospitals in Boston, Massachusetts. Measurements were performed using a commercially available temperature and RH monitor (Extech Instruments, Nashua, New Hampshire, USA). The device was placed in an unobstructed area and allowed to calibrate over 5 min before recording the temperature and RH. For each location, five separate areas were assessed and averaged (table 1).

Our data demonstrate that both, temperature and RH, vary by location among the three hospitals. While temperatures were typically within the recommended range of 20°C–24°C, most locations were maintained towards the lower end of this range. However, RH was consistently below 40% in all the areas that were assessed. It is important to acknowledge that while our findings are interesting, we only sampled a small number of large teaching hospitals in the northeast USA. Consequently, our findings may not be generalisable to all hospitals. Further studies, drawing on a wider, more representative sample, are needed to determine whether hospital indoor temperature and RH may have room for optimisation.

While definitive evidence to support the benefits of maintaining higher indoor temperatures as well as RH between 40% and 60% is still needed, hospitals may want to consider routinely measuring indoor climate since optimising these parameters may be a relatively simple, low-cost intervention to potentially decrease the risk of aerial transmission of viruses among healthcare providers and patients.

Table 1 Temperature and relative humidity in three major Boston-area teaching hospitals

	Hospital #1	Hospital #2	Hospital #3
Temperature (°C)			
Academic offices	21 (21–23)	23 (22–23)	21 (20–22)
Common office areas	22 (21–23)	23 (23–24)	21 (21–22)
Low traffic public areas	23 (22–23)	24 (24–24)	22 (22–23)
High traffic public areas	22 (22–23)	24 (24–24)	23 (22–23)
Operating rooms	21 (20–22)	22 (22–23)	20 (20–21)
Intensive care units	22 (22–23)	25 (24–26)	23 (22–24)
Relative humidity (%)			
Academic offices	29 (28–30)	15 (15–17)	19 (19–21)
Common office areas	33 (31–35)	18 (17–20)	23 (22–24)
Low traffic public areas	26 (26–28)	24 (22–24)	28 (26–29)
High traffic public areas	29 (28–30)	24 (24–26)	28 (28–30)
Operating rooms	33 (32–34)	25 (24–27)	32 (29–33)
Intensive care units	33 (33–35)	23 (23–25)	29 (28–32)

Data are presented as median (IQR).

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