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Letter to the Editor

Changing hand hygiene behaviour might not be that easy

Sir,

We read with great interest the manuscript by Hansen *et al.* describing the effect of seemingly irrelevant contextual features to nudge hospital visitors to perform hand hygiene [1]. The best combination of nudges had a moderate impact on hand hygiene compliance (HHC) which increased from 0.4% to 19.7%. Still, one in five persons did not sanitize. The combination consisted of placing a free-standing alcohol-based hand rub (ABHR) dispenser in front of the entry doors of the hospital, made salient by attaching a pink sign and a pink duct tape line on the floor to signal that rules existed on the use of the ABHR dispenser when crossing the line.

Based on these results, the Hygiene Committee of the Capital Region of Denmark considered implementing the same nudges to inpatient wards in the region's hospitals. Therefore, we wish to share our experiences implementing a similar approach in an inpatient ward, and to emphasize caution when extrapolating methods from hospital visitors to healthcare workers (HCWs).

We aimed to assess the effect of this low-cost, low-effort approach on HCWs' HHC in patient rooms where most clinically relevant situations take place. A small-scale, prospective, observational study was conducted during a two-month period (December 2020 to January 2021) in a surgical inpatient ward, Bispebjerg University Hospital, Denmark. To avoid the risk of bias associated with direct observations and to collect results around the clock, an electronic hand hygiene system (sani nudge™, Copenhagen, Denmark) was used to obtain HHC data

from doctors ($N = 6$) and nurses ($N = 18$) [2–4]. The system was installed in 2016, and the data collection for this study was initiated electronically via a cloud-based platform to minimize Hawthorne-like effects.

The study was divided into a baseline period (one month) and an intervention period (one month). As in the Hansen *et al.* study, the nudge intervention consisted of pink-coloured tape to match the main colour of the yearly hand hygiene campaign [1]. The duct tape was also placed on the floor at the entrance of each patient room next to the ABHR dispensers to serve as visual reminders and signal to the HCWs that certain hand hygiene rules applied when crossing the lines. The wall-mounted ABHR dispensers were not moved because they were already placed at the entry of the rooms. We did not put up a pink sign next to the ABHR dispenser as Hansen *et al.* did, but pink-coloured hand hygiene stickers were already placed on doors and walls.

The hypothesis was that the HCWs, like the visitors entering a hospital, would associate the pink-coloured tape (nudge) with hand hygiene, resulting in more frequent ABHR use and increased HHC [1]. Unpaired Student's *t*-test was used to assess differences between baseline and intervention since HHC data were aggregated on group level. Normal distribution was confirmed using the Kolmogorov–Smirnov test.

Interestingly, we found that this particularly simple and static nudge (colourful tape on the floor at patient room entrances) had no impact on the HHC of HCWs whatsoever (Table I). The lack of effect may be explained by banner blindness due to frequent exposure. Fatigue and depletion are not expected to have affected the hospital visitors in the study by Hansen *et al.* Also, using a combined approach of moving the dispensers and adding a sign next to it (salience) may have achieved a measurable effect. Finally, the hospital visitors had a much lower baseline HHC than the HCWs, making it easier to document clinically relevant increases in HHC.

This study indicates that combined or dynamic nudges might be needed to change the behaviour of HCWs effectively and sustainably. More important, however, is the fact that an intervention does not necessarily work across settings. Thus, based on these experiences, we highly recommend testing various settings before implementing large-scale hand hygiene interventions.

Conflict of interest statement

M.B.H. is working in Konduto ApS which has developed sani nudge™. The other authors declare that they have no competing interests. All authors have approved the final article.

Table I
Hand hygiene compliance in the surgical inpatient ward

Staff	Patient contact	Hand hygiene compliance		P-value
		Baseline	Intervention	
Doctors	Before	25	23	0.76
	After	52	57	0.73
Nurses	Before	31	35	0.10
	After	49	46	0.46

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References

- [1] Hansen PG, Larsen EG, Modin A, Gundersen CD, Schilling M. Nudging hand hygiene compliance: a large-scale field experiment on hospital visitors. *J Hosp Infect* 2021;118:63–9.
- [2] Knudsen AR, Kolle S, Hansen MB, Møller JK. Effectiveness of an electronic hand hygiene monitoring system in increasing compliance and reducing healthcare-associated infections. *J Hosp Infect* 2021;115:71–4.
- [3] Stangerup M, Hansen MB, Hansen R, Sode LP, Hesselbo B, Kostadinov K, et al. Hand hygiene compliance of healthcare workers before and during the COVID-19 pandemic: a long-term follow-up study. *Am J Infect Control* 2021;49:1118–22.
- [4] Iversen A-M, Kavalaris CP, Hansen R, Hansen MB, Alexander R, Kostadinov K, et al. Clinical experiences with a new system for automated hand hygiene monitoring: a prospective observational study. *Am J Infect Control* 2020;48:527–33.

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