CORRESPONDENCE

Promoting Hand Hygiene Compliance: PSYGIENE—a Cluster-Randomized Controlled Trial of Tailored Interventions

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An Ongoing Task

Von Lengerke et al. (1) in their article discussed a problem that has partially been reported to us from other participants in the German „Clean Hands Campaign“ (*Aktion Saubere Hände*). Notably, in both study groups, compliance was generally improved compared with the baseline value before the start of the intervention, although in both groups, only half of the medical staff were immediately affected by the intervention measures.

The authors described the implementation of 29 tailored behavior change techniques in the intervention group compared with 15 in the control group. Some of those techniques, which were used in the intervention arm only, were actually explicitly recommended by the Clean Hands Campaign. For example, optimizing distribution of dispensers, using bottles that fit into the pockets of staff's coats, and correct hand hygiene when using examination gloves are central goals of the campaign to improve compliance with hand hygiene measures (2). Measures focusing on individual indications (for example, preceding aseptic activities) and optimizing workflows are explicitly supported by the campaign. It would certainly have been interesting to obtain a detailed insight into the behavior change techniques that exceeded established measures.

The Clean Hands Campaign agrees with the authors that measures to improve hand hygiene will have to be tailored to the needs of individual wards. For this reason, the campaign makes a multitude of materials available to participants, which can be used according to individual needs and requirements, but which should not be misunderstood as a „one size fits all“ approach. Strengthening compliance successfully requires continuous effort.

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REFERENCES

1. von Lengerke T, Lutze B, Krauth C, Lange K, Stahmeyer JT, Chaberny IF: Promoting hand hygiene compliance: PSYGIENE—a cluster-randomized controlled trial of tailored interventions. *Dtsch Arztebl Int* 2017; 114: 29–36.
2. Reichardt C, Koniger D, Bunte-Schönberger K, et al.: Three years of national hand hygiene campaign in Germany: what are the key conclusions for clinical practice? *J Hosp Infect* 2013; 83: 11–6.

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Video-based Approaches

Von Lengerke's working group studied compliance of hand hygiene measures in doctors and nursing staff. The data were collected by the use of questionnaires.

Response rates of 71% and 63% showed that tailored interventions helped improve compliance from 54% and 55% to 64% and 70%, respectively. The data obtained from the questionnaires were optimistically interpreted and the improvement rates were moderate. Professor Petra Gastmeier from Charité—Universitätsmedizin Berlin and coauthors estimated the number of hospital-acquired infections to be 500 000 and the number of deaths in Germany to be 15 000 (2).

Studies, using video monitoring, of hand hygiene measures showed that correct hygiene measures were only obeyed, at the start of the study, by 10–15%. By consistent video monitoring, after 12 weeks the compliance rose to 81% (3). Another study showed a rise of compliance from less than 10% to 82% after 16 weeks and after 75 weeks a rise to 88% (4).

Training and instructions are certainly tried and tested to show nursing staff and doctors the necessity of correct hand hygiene. But additionally, continuous monitoring—for example, by video—is the only proven measure to guarantee sustained good hand hygiene in hospitals. Insufficient hand hygiene should lead to a warning issued to prevent the maintaining of insufficient hand hygiene and such staff should be dismissed after the third such warning. Otherwise it is nearly impossible to improve the hygiene in Germanys' hospitals so that the number of cases of infection and deaths resulting from pathogens can be notably lowered.

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REFERENCES

1. von Lengerke T, Lutze B, Krauth C, Lange K, Stahmeyer JT, Chaberny IF: Promoting hand hygiene compliance: PSYGIENE—a cluster-randomized controlled trial of tailored interventions. *Dtsch Arztebl Int* 2017; 114: 29–36.
2. Gastmeier P, Geffers C, Herrmann M, et al.: [Nosocomial infections and infections with multidrug-resistant pathogens – frequency and mortality]. *Dtsch Med Wochenschr* 2016; 141: 421–6.
3. Khan A, Nausheen S: Compliance of surgical hand washing before surgery: Role of remote video surveillance. *J Pak Med Assoc* 2017; 67: 92–6.
4. Armellino D, Hussain E, Schilling ME, et al.: Using high-technology to enforce low-technology safety measures: the use of third-party remote video auditing and real-time feedback in healthcare. *Clin Infect Dis* 2012; 54: 1–7.

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The author declares that no conflict of interest exists.

In Reply:

We thank Kramer and Kieseewetter for their comments on our original article on the compliance results of the PSYGIENE-study (1).

First, an apparent misconception by Kieseewetter must be clarified, namely the indication that hygienic hand disinfection compliance was assessed by questionnaire: in fact, it was operationalized via direct observation in line with the gold standard by the World Health Organization and Germany's nationwide "Clean Hands Campaign" (*Aktion Saubere Hände*, ASH) (1). Thus, irrespective of their appraisal, the achieved increase rates are valid.

Also, it was with interest that we read his thoughts on video monitoring to promote compliance. The most recent systematic review article concluded that no sufficient evidence was available to recommend video monitoring systems (2), and whether more recent work such as the observational study on surgical hand washing in Pakistan (3), which Kieseewetter cites, is applicable to hygienic hand disinfection in German health care is questionable.

Yet, we agree with Kieseewetter when he at least indirectly poses the question of how compliance rates of $\geq 80\%$ can be sustainably achieved (which even the cluster-randomized controlled PSYGIENE-trial with its comparably long follow-up period did not accomplish). In this regard, it is in fact appropriate to evaluate technological, e.g. video-based, methods over and above interventions such as educational training sessions and feedback discussions.

However, in our view such methods will only be sustainable if they are not primarily used for repression, going as far as (as suggested by Kieseewetter) dismissal in case of repeated non-compliance, but only if they are integrated in evidence-based, multimodal strategies which allow for individual goal-setting, organizational incentives, and professional accountability (4).

Responding to the comment by Kramer, the fact that in the PSYGIENE-study, compliance initially increased in both study arms, despite participation rates in the educational training sessions of about 50% only, is probably explainable both by the intensified supervision of all wards (i. e. the „booster“-effect [1]) and the 100 percent participation rates in the feedback discussions.

Besides, we willingly clarify that the psychologically tailored interventions were compared to the local ASH at Hannover Medical School (MHH, *Medizinische Hochschule Hannover*). The narrative for this is the impression that while the Health Ac-

tion Process Approach had been described as its compliance model by the national ASH on its homepage, and in this sense made available to the MHH as well, it had not been sufficiently recognized by MHH's ASH-personnel. It is in this sense that the description of the PSYGIENE-control arm as a "one size fits all"-approach was implied.

However, we are convinced that campaigns, and thus the ASH as well, are in fact susceptible to this risk. Thus, hand hygiene interventions should proceed as theory-based as possible by consequent empirical assessment of relevant compliance determinants and matched selection of behavior change techniques (5). It is in this approach (and not so much in "new" methods) that the PSYGIENE-study's innovation lies (1).

Finally, we agree with Kramer that hand hygiene promotion (like guideline implementation and quality management) is a continuous task.

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REFERENCES

1. von Lengerke T, Lutze B, Krauth C, Lange K, Stahmeyer JT, Chaberny IF: Promoting hand hygiene compliance: PSYGIENE—a cluster-randomized controlled trial of tailored interventions. *Dtsch Arztebl Int* 2017; 114: 29–36.
2. Strigley JA, Gardam M, Fernie G, Lightfoot D, Lebovic G, Muller MP: Hand hygiene monitoring technology: a systematic review of efficacy. *J Hosp Infection* 2015; 89: 51–60.
3. Khan A, Nausheen S: Compliance of surgical hand washing before surgery: role of remote video surveillance. *J Pak Med Assoc* 2017; 67: 92–6.
4. Luangasanatip N, Hongsuwan M, Limmathurotsakul D, et al.: Comparative efficacy of interventions to promote hand hygiene in hospital: systematic review and network meta-analysis. *BMJ* 2015; 351: h3728.
5. Michie S, Carey RN, Johnston M, et al.: From theory-inspired to theory-based interventions: a protocol for developing and testing a methodology for linking behaviour change techniques to theoretical mechanisms of action. *Ann Behav Med* 2016; doi:10.1007/s12160-016-9816-6 [Epub ahead of print].

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