



**Fig. S1:** Flow chart

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	Page 1, Abstract	Abstract: “This retrospective cohort study analyzed 136 healthcare workers”
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Page 1, Abstract	Entire Abstract: background, objectives, methods, results, conclusion
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Pages 1-2, Paragraphs 1–4	States the gap in comparative effects of alcohol vs. chlorhexidine on hand microbiota, skin tolerance, and HAIs despite known individual efficacy.
Objectives	3	State specific objectives, including any prespecified hypotheses	Pages 2, Paragraphs 5–6	To evaluate the impact of transitioning from alcohol-based to chlorhexidine-based disinfectants on hand microbiota, skin tolerance, and hospital infection rates.
Methods				
Study design	4	Present key elements of study design early in the paper	Pages 2, Materials and Methods, Case selection	“This study utilizes a retrospective cohort design, involving 136 healthcare personnel... divided into two distinct phases”
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Pages 2, Case selection	“January 1, 2022 to June 30, 2022 (alcohol group)”; “July 1, 2022 to December 31, 2022 (chlorhexidine group)”; single hospital
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants	Pages 2, Materials and Methods	Inclusion and exclusion criteria for healthcare personnel

		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	N/A	No case matching; identical 136 participants sequentially formed alcohol-exposed cohort (n=136) and chlorhexidine-exposed cohort (n=136).
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Pages 3-4, Materials and Methods	Exposures: alcohol vs chlorhexidine; Outcomes: bacterial count, reduction rate, skin scores (Larson, Sauermann, TEWL), HAI incidence
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Pages 3-4, Materials and Methods	Detailed methods: swab sampling, VITEK 2, Tewameter, Larson scale, infection records from hospital department
Bias	9	Describe any efforts to address potential sources of bias	Pages 2, Case selection, Pages 4, Statistical analysis	Retrospective design, anonymized data, waiver of informed consent; statistical tests appropriate for data distribution
Study size	10	Explain how the study size was arrived at	N/A	Not reported

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Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Pages 4, Statistical analysis	Normal distribution tested (Shapiro-Wilk); data as mean±SD or median (IQR); Pearson/Spearman correlation
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	Pages 4, Statistical analysis	Chi-square, Fisher's exact, Wilcoxon rank-sum, t-test; no multivariable adjustment reported
		(b) Describe any methods used to examine subgroups and interactions	N/A	Not reported
		(c) Explain how missing data were addressed	N/A	Not reported
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	N/A	No follow-up loss (two phases, same 136 participants completed)
		(e) Describe any sensitivity analyses	N/A	Not reported
<b>Results</b>				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Pages 4, Baseline characteristics of participants	All screened candidates fulfilling inclusion criteria were enrolled; final analytic sample: n=136 for each phase, all participants finished full testing and statistical analysis.
		(b) Give reasons for non-participation at each stage	Pages 2, Exclusion criteria	Exclusion due to pre-existing severe systemic illness, disinfectant allergy, severe skin lesions, pregnancy/breastfeeding or off-protocol disinfectant usage.
		(c) Consider use of a flow diagram	-	Fig. S1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Pages 8, Table 1	Age, sex, BMI, experience, education, role, department, risk level
		(b) Indicate number of participants with missing data for each variable of interest	N/A	Not reported
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	N/A	Not reported
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time	Tables 2–7, Figures 1–3	Bacterial counts, reduction rates, pathogen detection, resistant bacteria, skin scores, HAI rates
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure	N/A	Not reported
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures	N/A	Not reported
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	N/A	Not reported

		(b) Report category boundaries when continuous variables were categorized	All result tables	Only unadjusted estimates (t, $\chi^2$ , P values); no adjusted estimates
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A	All continuous outcomes analysed in original numerical form without categorization or cutoff setting.
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A	Not reported
<b>Discussion</b>				
Key results	18	Summarise key results with reference to study objectives	Pages 6,7,11, Discussion	Alcohol: faster kill. Chlorhexidine: longer effect, better skin tolerance, but staff prefer alcohol. No HAI difference.
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Pages 11, Paragraph 5	Retrospective design, self-reported skin assessment, single hospital, short time frame, limited generalizability
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Pages 11, Paragraph 5	Both disinfectants effective; choice may depend on preference; compliance equally important
Generalisability	21	Discuss the generalisability (external validity) of the study results	Pages 11, Paragraph 5	“may not adequately represent... variability... limit generalizability”
<b>Other information</b>				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Pages 16, Funding	No funding was received

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).