

# INPLASY

## Questionnaires to assess knowledge, attitudes and practices (KAP) on healthcare-associated infections, hand hygiene and antimicrobial resistance among medical and nursing students in Europe: a scoping review protocol

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### ADMINISTRATIVE INFORMATION

**Support** - None.

**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202570099

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 July 2025 and was last updated on 24 July 2025.

### INTRODUCTION

**Review question / Objective** The aim of the present scoping review is to systematically identify, describe and compare the questionnaires used in European studies assessing knowledge, attitudes and/or practices of medical and nursing students regarding: healthcare-associated infections (HAIs), hand hygiene (HH), and antimicrobial resistance (AMR).

**Population:** undergraduate medical or nursing students.

**Concept:** use of questionnaires to assess knowledge, attitudes and/or practices (KAP) regarding HAI, HH and/or AMR.

**Context:** educational or academic settings in European countries.

**Background** Healthcare-associated infections (HAIs), hand hygiene (HH), and antimicrobial resistance (AMR) are critical challenges in healthcare systems worldwide. The education of future healthcare professionals is a cornerstone in addressing these issues. Medical and nursing

students represent a key target for preventive strategies and for promoting a One Health perspective. Numerous surveys have been conducted to explore knowledge, attitudes and practices (KAP) on these topics. However, no review has yet systematically mapped the structure, content, and validation status of questionnaires used in Europe for this population. This scoping review aims to fill this gap by identifying and analyzing all questionnaires used in studies involving medical and nursing students in European countries to assess KAP regarding HAI, HH, and AMR.

**Rationale** Healthcare-associated infections (HAIs), hand hygiene (HH), and antimicrobial resistance (AMR) are major public health challenges requiring strong prevention and control strategies. Medical and nursing students play a key role, as their early training influences future clinical practices. Several studies in Europe have assessed students' knowledge, attitudes, and practices (KAP) regarding these issues using structured questionnaires. However, no review has

systematically mapped the characteristics, content, or validation status of these tools. A scoping review is therefore needed to identify, summarize, and compare the questionnaires used in European studies targeting undergraduate students. This will support the development of context-appropriate, evidence-based instruments for educational and surveillance purposes, and will contribute to strengthening infection prevention strategies within health professions education.

## METHODS

**Strategy of data synthesis** The following electronic databases will be searched: MEDLINE via PubMed; Embase via Ovid; CINAHL. Manual reference list searching (snowballing) of included studies and relevant reviews will be also conducted.

The following search strategy was developed for PubMed and will be adapted for Embase (via Ovid) and CINAHL to ensure database specificity.

```
(
  "Hand Hygiene"[Mesh]
  OR (hand AND (rub OR wash* OR hygiene OR
  disinfection OR saniti?tion))
  OR "Cross Infection"[Mesh]
  OR "Infection Control"[Mesh]
  OR "infection control"
  OR (("healthcare associated" OR "healthcare-
  associated" OR nosocomial OR hospital) AND
  infection*)
  OR HAI
  OR "One Health"[Mesh]
  OR "one health"
  OR "onehealth"
  OR "one medicine"
  OR "Universal Precautions"[Mesh]
  OR "Personal Protective Equipment"[Mesh]
  OR "Gloves, Protective"[Mesh]
  OR "PPE"
  OR "standard precaution*"
  OR "protective clothing"
  OR "glove*"
  OR "Antimicrobial Stewardship"[Mesh]
  OR "Drug Resistance, Microbial"[Mesh]
  OR ((antimicrob* OR antibiotic* OR drug) AND
  resistance*)
  OR AMR
  OR "drug-resistan*"
  OR ((antimicrobial OR antibiotic) AND stewardship)
)
AND
("Students"[Mesh]
OR student*)
AND
(medical OR medicine OR nurs*)
```

```
AND
(questionnaire*)
AND
("Health Knowledge, Attitudes, Practice"[Mesh]
OR "Guideline Adherence"[Mesh]
OR "Awareness"[Mesh]
OR knowledge
OR attitude*
OR practice*
OR awareness
OR adherence
OR compliance
OR literacy).
```

**Eligibility criteria** Inclusion criteria: quantitative primary studies using structured questionnaires (e.g., cross-sectional surveys, pre-post studies, interventional trials); studies conducted in European countries (both EU and non-EU). No restriction on language or publication date. Exclusion criteria: studies on healthcare professionals (postgraduate or practicing); studies on other disciplines (e.g., pharmacy, veterinary medicine, dentistry, etc.); qualitative studies or studies without a structured questionnaire.

**Source of evidence screening and selection** All retrieved references will be imported into Zotero. Duplicates will be removed before screening. Two reviewers will independently screen titles and abstracts, followed by full-texts of potentially eligible studies. Disagreements will be resolved through discussion or by involving a third reviewer. The study selection process will be documented using a PRISMA-ScR flow diagram.

**Data management** A structured form will be used to extract relevant data. The following variables will be collected: study characteristics (first author; year; country; study design; study period); population-related data (discipline: medicine/nursing; year of course; sample size; response rate; sex distribution; questionnaire-related data (topic(s): HAI, HH, AMR; number of items; domains covered; response scale; administration method, e.g., online, paper, supervised; development: new/adapted/validated; validation status); outcomes (main KAP results, if applicable; availability of questionnaire). Data extraction will be carried out by two reviewers independently.

**Reporting results / Analysis of the evidence** Findings will be synthesized narratively and descriptively. Frequencies and cross-tabulations will be used to describe topics covered, domains assessed, and questionnaire characteristics. Tables and figures (e.g., frequency matrices,

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heatmaps, bar graphs) will be used where applicable. Patterns across countries, study populations, and domains will be discussed to highlight common structures and gaps.

**Language restriction** No.

**Country(ies) involved** Italy.

**Keywords** Healthcare-associated infections; hand hygiene; antimicrobial resistance; AMR; KAP; knowledge; awareness; practice; students; medicine; nursing.

**Contributions of each author**

Author 1 - Marco Fonzo.

Author 2 - Maria Giovanna Marcomini.

Author 3 - Daniele Calò.

Author 4 - Chiara Bertoncello.