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| Study Protocol: Education of General Practitioners in the use of ultrasonography.**Authors:** Henriette Sav Madsen (1) Camilla Aakjær Andersen (2), Joachim Frølund Hansen (3), Thomas Løkkegaard (2) and Martin Bach Jensen (2).Affiliations: (1) Medical student at Aarhus University, Denmark. 2) Research Unit for General Practice in Aalborg, Department of Clinical Medicine, Aalborg University, Denmark (3) Centre for Health Sciences Eduacation, Aarhus University, Denmark |
| **Review question(s)**The primary objective of the study is to systematically review and synthesize the published literature regarding the education of GPs and GPs in training in the use of ultrasonography. A detailed overview on the different educational elements and assessment of the technical ultrasonography skills of GPs and GPs in training will be included. **Searches**This review uses articles identified in a previous systematic review and performs an updated literature search using the same search string. We prospectively register this review in PROSPERO before conducting the definitive literature search in the following databases: MEDLINE via Pubmed, EMBASE via OVID, Cinahl via Ebsco, Web of Science, and Cochrane Register of Controlled Trials. A hand-search of the reference lists of relevant articles will also be conducted for other potential relevant references. Additionally, we will search ClinicalTrials.gov to identify unpublished studies. No restrictions will be made concerning year of publication or publication type in the search. We will search for the keywords “ultrasonography” and “general practice” in combination and we will apply and replace with thesaurus terms. **Types of study to be included**Clinical trials, observational studies, audit, and case series will all be included. To be included papers have to fulfill the following criteria:(1) A published full-text paper must be available.(2) The paper must contain original data from a clinical study.(3) The paper must describe training in the use of ultrasonography among GPs or GPs in training. (4) The preformed ultrasonography must be performed by a GP or a GP in training. (5) The paper must describe ultrasonography with an image for the clinician to view.Excluded are: (1) Papers describing ultrasonography as thermal therapeutic ultrasound (2) Papers describing ultrasonography without production of an image for the clinician to view.(3) Papers not based on a clinical study or clinical case series. (4) Papers not published in Danish, English, Norwegian or Swedish. **Condition or domain being studied**Education of GPs or GPs in training in the use of ultrasonography.**Participants/ population**GPs and GPs in training who participate in an ultrasonography training programme or education in the use of ultrasonography. **Intervention(s), exposure(s)**Ultrasonography training programs or education for GPs or GPs in training. **Comparator(s)/ control**Not applicable.**Context**Papers describing ultrasonography education or training programs for GPs or GPs in training applied in general practice or other settings. **Outcome(s)****Primary outcomes**We will extract any information about the ultrasonography education of GPs and GPs in training in terms of how educational programs were composed, which educational elements were included, and how the participants’ technical ultrasonography skills were assessed in the included papers.Thus, there are no specific pre-defined primary outcomes, as we expect the included studies to use a range of different outcomes to describe educational programs. **Secondary outcomes**1. Which ultrasound scans and organs were included in the educational programs?
2. Were the GPs and GPs in training trained according to an already established educational program?
3. How were the educational programs organised?
4. How were the educational elements organised?
5. Who taught the GPs and GPs in training how to use ultrasonography?
6. Who assessed the technical ultrasonography skills of GPs and GPs in training?
7. How was the quality of ultrasound scans performed by the GPs or GPs in training?
8. Was there a follow-up after the educational programs?
9. How did the GPs and GPs in training experience the educational programs?
10. Were there any reported harms associated with the training of GPs and GPs in training in ultrasonography?
11. How were the educational programs developed?

**Data extraction, (selection and coding)**Two reviewers will independently screen articles according to the inclusion and exclusion criteria. Selected articles by the two reviewers will be compared for consistency after abstract and full-text reading. Any disagreement whether to include a study will be resolved through discussion or by involving a third reviewer. Data will be extracted using a modified version of Cochranes data extractions template and compared afterwards for consistency. All inconsistencies between the two forms will be resolved by discussion between the two data extractors. Any disagreement between the data extractors after the initial discussion related to inconsistencies between the two individual data extractions will be solved involving a third person. **Risk of bias (quality) assessment**The included papers will be assessed by two independent raters using the Downs and Blacks checklist for checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. Any disagreements between ratings will be resolved by discussion between the raters. Consultation with a third party will be used if disagreements still appear after this discussion. **Strategy for data synthesis**As the literature is expected to present great variation in both extent and content of the ultrasonography education provided for GPs and GPs in training, we aim to describe the results narratively.**Analysis of subgroups or subsets**Not applicable. **Dissemination plans**The results of the review will be published in an international peer-reviewed scientific journal with the following author list: Henriette Sav Madsen, Camilla Aakjær Andersen, Joachim Frølund Hansen, Thomas Løkkegaard and Martin Bach Jensen.**Contact details for further information**Henriette Sav MadsenTrøstrupsgade 4c, 1. Sal7400 HerningDenmarkHenriettemadsen23@hotmail.com**Organisational affiliation of the review**Research Unit for General Practice in Aalborg, Department of Clinical Medicine, Aalborg UniversityFyrkildevej 7, 1. Sal lejl. 39220 Aalborg ØDenmark**Review team**Henriette Sav Madsen (HSM)Camilla Aakjær Andersen (CAA) Joachim Frølund Hansen (JFH)Thomas Løkkegaard (TL)Martin Bach Jensen (MBJ)**Details of any existing review of the same topic by the same authors**A previous review, titled “Point-of-care ultrasound in general practice: a systematic review” (PROSPERO registration number CRD42016038302), has identified 51 articles containing information about the use of ultrasonography in the general practice. Out of these, 36 articles described an education or a training program programme for GPs or GPs in training. In this review we will make an updated literature search using the same search string. Written acceptance by the authors of the previous review have been given. **Anticipated or actual start date**3th of July 2018.**Anticipated completion date**3th of July 2019.**Timeline:** June, 2018: * PROSPERO registration.

July, 2018: * Updated literature search.
* Screening and selection of eligible articles.

August, 2018: * Data extractions.
* Risk of bias (quality) assessment.
* Analysis.

2019:* Updated literature search.
* Updating the analysis.
* Submitting the review.

**Data:** The systematic review do not contain any personal sensitive data. All data will be stored in Refworks or on a secure server at Aalborg University.**Funding sources/sponsors**None.**Conflicts of interest**All authors declare no conflict of interests.**Other registration details**None.**Language**English.**Country**Denmark.

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