Data Article

Cardiopulmonary resuscitation (CPR) psychomotor skills of laypeople, as affected by training interventions, number of times trained and retention testing intervals: A dataset derived from a systematic review

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ARTICLE INFO

ABSTRACT

This article is a companion to a systematic review, entitled, *Associations between cardiopulmonary resuscitation (CPR) knowledge, self-efficacy, training history and willingness to perform CPR and CPR psychomotor skills: a systematic review* (Riggs et al., 2019). The data tables described in this article summarise the impact that specific training interventions, number of times trained, and retention testing intervals have on laypeople's CPR psychomotor skills, as reported by peer-reviewed journal articles. The psychomotor skills included are: compression rate, compression depth, duration of interruptions to compressions, chest recoil, hand placement, proportion of adequate or 'correct' compressions, ventilation volume, compression-to-ventilation ratio, duty cycle and overall skills. The data tables described in this article are available as a supplementary file to this article.

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Specifications table

Subject area	*Medicine, public health, cardiology*
More specific subject area	*Cardiopulmonary resuscitation (CPR), cardiac arrest, training methods for the general public, basic life support (BLS), CPR psychomotor skills of laypeople*
Type of data	*Tables*
How data was acquired	*Systematic review of primary articles related to the association of training factors (e.g. training interventions, number of times trained, duration since training) with CPR psychomotor skills of laypeople*
Data format	*Raw and analysed*
Experimental factors	*Description of the literature published during or after 2005 relating to training methods and factors that influence CPR psychomotor skills*
Experimental features	*Systematic review*
Data source location	*Primary, peer-reviewed journal articles, published during or after 2005, and obtained through systematic searches of MEDLINE, Scopus, EMBASE, CINAHL, CENTRAL, PsycInfo, Informit and Web of Science*
Data accessibility	*Data are available as an Excel file (*.xlsx) accompanying this article as a supplementary file*
Related research article	*Riggs M, Franklin R, Saylany L. Associations between cardiopulmonary resuscitation (CPR) knowledge, self-efficacy, training history and willingness to perform CPR and CPR psychomotor skills: a systematic review. Resuscitation* [1].

Value of the data
- Describes a variety of CPR psychomotor skill outcome measures in adult laypeople
- Provides, in a standardised format, extracted data from current literature on the effects of training interventions on CPR psychomotor skills of adult laypeople
- Facilitates identification of gaps in the current literature
- Allows for further analysis to confirm and extend the findings of the accompanying systematic review [1].
- These data allow for researchers to standardise the CPR psychomotor skill outcomes to be collected when designing future studies, to maximise comparability of results with pre-existing studies

1. Data

This dataset (available in the accompanying Supplementary Excel Spreadsheet file) summarises, in 28 tables, the psychomotor skill data extracted from 31 primary peer-reviewed articles that met the inclusion criteria for the related systematic review [2–32]. The psychomotor skills for which data were extracted and reported were: compression rate, compression depth, duration of interruptions to compressions, chest recoil, hand placement, proportion of adequate or 'correct' compressions, ventilation volume, compression-to-ventilation ratio, duty cycle and overall skills.

The data are ordered into three sections. Section 1 (Supplementary Tables 1–15) summarises the data that compares the effectiveness of two interventions on improving given psychomotor skills at a single time point (usually immediately after training) or which compares pre-training and post-training data to evaluate the effectiveness of a single given intervention. This data is useful to directly compare and evaluate the effectiveness of interventions in the short-term. Section 2 (Supplementary Tables 16–26) contains tables summarising the data that indicates the skill retention of particular groups within each study. For data to be included in the tables in this section, data must have been available for the particular study group both immediately after a training intervention and at another time period in the future (e.g. 2 weeks or 2 months later). This allows the deterioration of skills within groups who received particular types of training to be described. Section 3 (Supplementary Tables 27 and 28) contains tables summarising the data that compares the effectiveness of two interventions at a time period delayed from the time of initial training (i.e. retention time periods). For data to be included in tables in this section, skills of two groups trained initially at the same time, but using different training methods, had to be evaluated at the same retention time interval. This allows direct comparison of the effectiveness of interventions at achieving longer-term skills retention.

Data was separated into tables specific for a given psychomotor skill. Data was presented as means, medians or proportions of participants and mean differences, median differences and differences of proportions were used to summarise effect sizes. For each datapoint, the assessment method and duration between training and testing was reported.

2. Experimental design, materials, and methods

One of the aims of the systematic review was to review the extent to which training history (including training interventions, number of times trained, and duration since last training) was associated with cardiopulmonary resuscitation (CPR) psychomotor skills.

2.1. Eligibility criteria

Articles were included if they met the following inclusion criteria:

- *Participants:* Members of the general public aged 18 years or older. Studies with health professionals or student health professionals were excluded, including students without previous CPR training, as they may have higher levels of education and motivation to learn CPR skills. Performance of neonatal or infant CPR was excluded.
- *Interventions*: Training included any activity designed to improve CPR performance, training history, number of times trained and duration since last training.
- *Comparators:* Studies had to attempt to make an association between relevant interventions and outcomes. Comparison groups could have different: time since last training, number of times trained, or training interventions.
- *Outcomes:* The primary outcomes were seven objective measures of CPR performance, whether assessed using a mannequin or in an actual resuscitation attempt: compression rate, compression depth, compression-ventilation ratio, duration of interruptions to chest compressions, chest recoil, correct hand placement, proportion of correct compressions, ventilation volume and overall score. Secondary outcomes were: return of spontaneous circulation (ROSC) and survival rates after actual resuscitation attempts.
- *Study designs:* Any peer-reviewed analytical study that presented original primary data of CPR psychomotor ability in out-of-hospital settings was eligible for inclusion. Studies of CPR performed in hospitals, nursing homes or general practices, and animal studies, were excluded. Data must have been collected during or after 2005.

2.2. Information sources

MEDLINE, Scopus, EMBASE, the Cumulative Index of Nursing and Allied Health (CINAHL), the Cochrane Central Register of Controlled Trials (CENTRAL), PsycInfo, Informit and Web of Science were used. Databases were searched from 1 January 2005 to 10 February 2018 (date of search) to ensure studies used CPR guidelines from 2005 onwards.

Database searches were supplemented by retrieving and screening references cited by Parts three and eight of ILCOR's 2015 International Consensus on CPR and Emergency Cardiovascular Care Science With Treatment Recommendations (CoSTR) [9,19], and summary of ILCOR's 2017 CoSTR [20]. References cited by included studies were also retrieved and screened.

The search strategy was designed in MEDLINE, using combinations of medical subject heading (MeSH) and free-text searches, then translated to equivalent searches in other databases (see Appendix 2 of the related systematic review for full search strategies [1]). The search strategy was reviewed by a librarian to consider whether all possible relevant search term combinations were included (i.e. to maximise sensitivity) and ensure that the search strategy correctly reflected review objectives (i.e. the search strategy was valid).

Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework [33], duplicates were removed, then title and abstract screening was performed by one author (MR). After level 1 screening, full-text articles were independently assessed by two reviewers (MR and LS) using a standardised study selection form (see Appendix 3 of the related systematic review [1]) and disagreements resolved through discussion, or by involving a third reviewer (RF). Figure 1 of the related systematic review details the flow of studies through the PRISMA framework [1].

Data were independently extracted by two authors (MR and LS) using a standardised data extraction form (see Appendix 4 of the related systematic review [1]).

Participant variables extracted include: number of participants, age, sex and training history. It was noted whether ethnicity, level of education, or participant anthropometry were reported. Study characteristic variables include: study design, country, whether single-centre or multi-centre, and inclusion and exclusion criteria. For studies assessing training interventions, assessment details extracted include: duration, mannequin, guideline and method of assessment.

Where no assessment guideline was reported, the guideline current at time of training, data collection, study submission for publication, or study publication (in priority order) was used. It was assumed that the source of training materials reflected whether American Heart Association (AHA) or European Resuscitation Council (ERC) guidelines were used. If the training material source was unclear, just the relevant year of the guideline used was extracted, as AHA and ERC guidelines were identical for most outcome measures of interest.

For training intervention and retention studies, the intervention groups, number of participants, training facilitation method, training duration and time between intervention and assessment were extracted. For self-efficacy, knowledge, and willingness, groups representing different magnitudes of each variable and the number of participants were extracted.

Outcome data extracted include pre-test, post-test, effect size and statistical significance data for compression rate (Supplementary Tables 1-2 and 16), compression depth (Supplementary Tables 3-5 and 17), percentage of correct compressions (Supplementary Tables 10 and 22), duration of interruptions (Supplementary Tables 6 and 18), chest recoil (Supplementary Tables 7 and 19), hand placement (Supplementary Tables 8-9 and 20-21), ventilation volume (Supplementary Tables 11-12 and 23), correct compression-ventilation ratio (Supplementary Tables 13 and 24), duty cycle (Supplementary Table 14), overall skills (Supplementary Tables 15 and 25-26), and survival rates (to discharge, ROSC, 1-month).

Means, medians, and proportions of participants performing a given skill correctly, were extracted into a Microsoft Excel spreadsheet and mean differences, median differences and differences in proportions were calculated by subtracting the 'intervention' group value from the 'control' group value. Pre-test, no training, or usual training groups were designated the 'control' group and post-test, training using a specified method, or experimental training method groups were designated the 'intervention' group.

Conflicts of interest

MR was a volunteer with St John Ambulance (Queensland) at the time of writing. He did not receive any monetary payments from St John Ambulance for his services, but has attended St John CPR and first aid courses for free. RF and LS do not have any conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104236.

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