



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Available online at [ScienceDirect](https://www.sciencedirect.com)

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Basic life support training courses safety and infection risk in Italy during the COVID-19 pandemics

To the Editor

Early bystander-initiated cardiopulmonary resuscitation (CPR) can double or triple survival from cardiac arrest.¹ The COVID-19 pandemics caused fear of infection and negatively impacted on bystander CPR and ultimately on outcome.^{2,3} In Italy training centers stopped basic life support (BLS) courses during the first pandemic wave in March-June 2020, to then restart their activity, paying attention to infection prevention. Indeed, in June 2020, COVID-19 prevention strategies were described in a directive from the Italian Ministry of Health (Circolare n.21859), recommending specific interventions, as also indicated by the European Resuscitation Council (ERC) and American Heart Association (AHA),^{4,5} i.e. distance between personnel, room air change, use of facial mask and gloves, adequate manikins and training material disinfection.

Aim of this study was to assess the safety/risk of the on-site BLS training courses in Italy during the COVID-19 pandemics, according to the above recommendations. Data were collected through a

14-items survey submitted to all the Italian Resuscitation Council (IRC)-ERC and AHA training centers, which provided BLS courses from June 1st, 2020 to January 31st, 2021. In addition, all the new SARS-CoV-2 infection cases occurred within 30 days after the course, were reported.

Among the 398 Italian IRC/ERC and AHA training centers, 337 performed BLS courses during the study period and were invited to the reply to the survey. A response rate of 30% was recorded. During the period, 7833 participants attempted a BLS course; most of the attendees (68%) were healthcare workers, while lay people represented only 32% ($n = 2499$). Main reasons to attend the course are reported in Fig. 1A.

The course was considered useful by 90% of attendees, including the new training on the correct use of personal protective equipment (94% of responses). However, 80% of trainees manifested a fear to get infected in attending the course, mainly during the practice session (69% of responses). Indeed, 94% of attendees reported

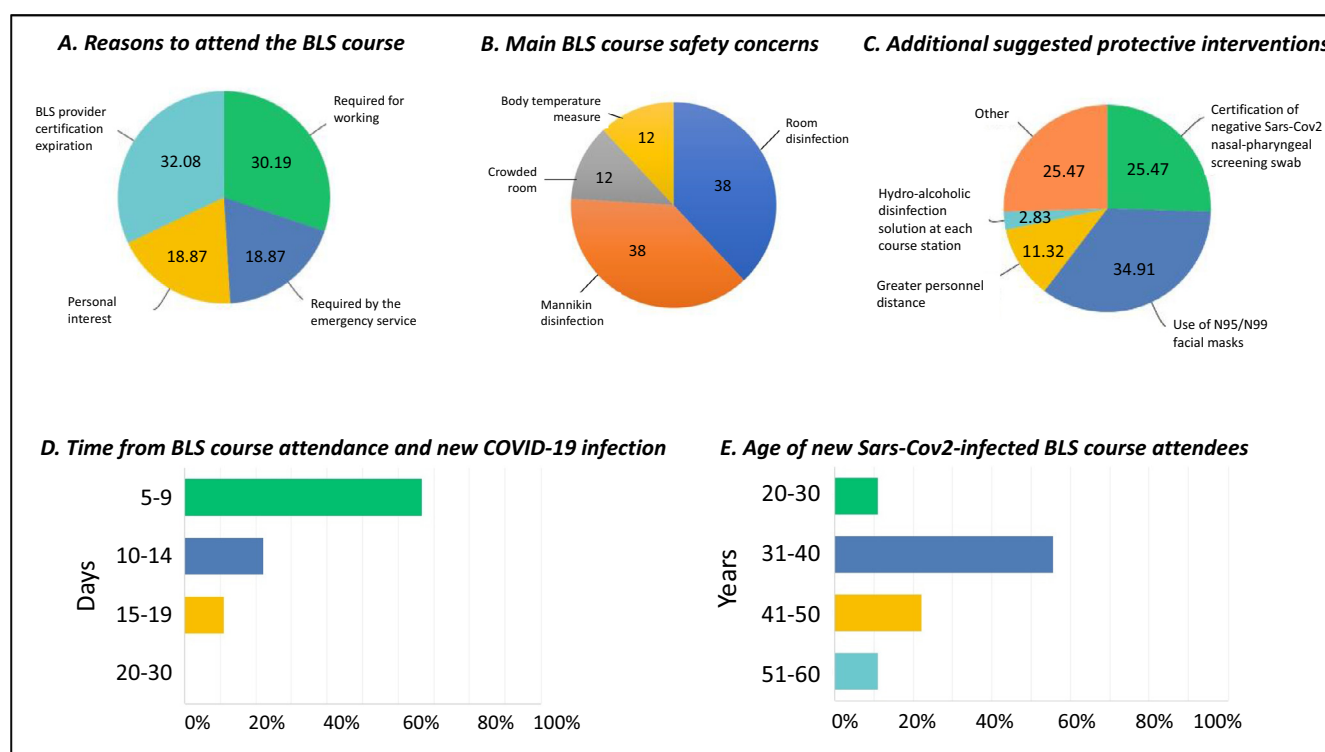


Fig. 1 – BLS safety course.

concerns about course safety, especially related to room and mannikin disinfection (Fig. 1B). Interventions reported in Fig. 1C were considered useful for infection prevention, i.e. Sars-Cov2 swab screening, use of facial mask, and personnel distance.

Interventions adopted to prevent infection, as recommended by the Italian law, were considered useful and easy to be applied in 92% and 87% of responses, respectively. The use of a facial mask during the course was not seen as a barrier to communication by 85% of interviewed.

Nine new COVID-19 infection cases were reported after the courses held during the study period, with 90% of them occurring within 5–14 days after the course (Fig. 1D). Age of infected trainees ranged between 31–40 years (Fig. 1E). The BLS courses-infection risk was 0.11%, with an overall estimated incidence rate of 54.8 by 100,000 attendees.

This is the first report on the incidence of BLS courses-related Sars-Cov2 infection, and it defines a benchmark to evaluate the safety of on-site CPR courses during pandemic outbreaks. In a risk-benefit perspective, in front of approximately 70,000 cardiac arrest/year in Italy, the infection risk during BLS courses seems very limited and can be further reduced by implementing prevention strategies.

Conflict of Interest

GR is the President of Italian Resuscitation Council.
AS is the past President of Italian Resuscitation Council.
All the other authors declare no conflicts.

REFERENCES

1. Semeraro F, Greif R, Böttiger BW, et al. Systems saving lives. *Resuscitation* 2021;161:80–97.
2. Lim ZJ, Ponnappa Reddy M, Afroz A, et al. Incidence and outcome of out-of-hospital cardiac arrests in the COVID-19 era: a systematic review and meta-analysis. *Resuscitation* 2020;157:248–58.
3. Paoli A, Brischigliaro L, Scquizzato T, Favaretto A, Spagna A. Out-of-hospital cardiac arrest during the COVID-19 pandemic in the Province of Padua, Northeast Italy. *Resuscitation* 2020;154:47–9.
4. Nolan JP, Monsieurs KG, Bossaert L, et al. European Resuscitation Council COVID-guideline writing groups. European Resuscitation Council COVID-19 guidelines executive summary. *Resuscitation* 2020;153:45–55.
5. Edelson DP, Sasson C, Chan PS, et al. American Heart Association ECC interim COVID guidance authors. Interim guidance for basic and advanced life support in adults, children, and neonates with suspected or confirmed COVID-19: from the emergency cardiovascular care committee and get with the guidelines-resuscitation adult and pediatric task forces of the American Heart Association. *Circulation* 2020;141:e933–43.

Fausto D'Agostino

*Unit of Anaesthesia, Intensive Care and Pain Management,
Department of Medicine, Campus Bio Medico University and
Teaching Hospital, Rome, Italy*

Pasqualino Rossi

Health Prevention Directorate, Italian Ministry of Health, Italy

Felice Eugenio Agrò

*Unit of Anaesthesia, Intensive Care and Pain Management,
Department of Medicine, Campus Bio Medico University and
Teaching Hospital, Rome, Italy*

Pierfrancesco Fusco

*Department of Anesthesia and Intensive Care Unit, San Salvatore
Academic Hospital of L'Aquila, L'Aquila, Italy*

Claudio Ferri

*Department of Life, Health, and Environmental Sciences, University
of L'Aquila, S. Salvatore Hospital, L'Aquila, Italy*

Massimo Ciccozzi

*Medical Statistic and Molecular Epidemiology Unit, University of
Biomedical Campus, Rome, Italy*

Andrea Scapigliati

*Fondazione Policlinico Universitario A. Gemelli, IRCCS, Institute of
Anaesthesia and Intensive Care, Catholic University of the Sacred
Heart, Rome, Italy*

Giuseppe Ristagno *

*Department of Pathophysiology and Transplantation, University of
Milan, Milan, Italy
Department of Anesthesiology, Intensive Care and Emergency,
Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico,
Milan, Italy*

* Corresponding author at: Department of Pathophysiology and Transplantation, University of Milan, Milan, Italy and Department of Anesthesiology, Intensive Care and Emergency, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Via Francesco Sforza 35, 20122 Milan, Italy.

E-mail address: gristag@gmail.com,

Received 14 August 2021

Accepted 17 August 2021

<https://doi.org/10.1016/j.resuscitation.2021.08.029>

© 2021 Elsevier B.V. All rights reserved.