aperio

Humbsch, P., Bohm, K., Gintrowicz, R., & Jastrzebska, I. (2025). Difficulties and Challenges in the Implementation of Resuscitation Training in Germany Based on Surveys from the Heart Saver Project in Brandenburg. *International Journal of First Aid Education*, *8*(1), 27–38. https://doi.org/10.25894/ijfae.8.1.2703

RESEARCH

Difficulties and Challenges in the Implementation of Resuscitation Training in Germany Based on Surveys from the Heart Saver Project in Brandenburg

Philipp Humbsch*, Konrad Bohm, Robert Gintrowicz, Izabela Jastrzebska

*Corresponding author

ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) education in schools is a proven strategy to increase layperson intervention rates and improve survival outcomes in out-of-hospital cardiac arrest (OHCA). In Germany, only 51% of OHCA patients receive layperson CPR, compared to 85% in Norway, contributing to a lower 30-day survival rate (10.4% vs. 14%). Despite a 2014 recommendation for school-based CPR training, nationwide implementation remains inadequate.

Methods: This study utilized a descriptive survey to investigate barriers to CPR education implementation in German schools and federal states. Teachers from schools that previously withdrew from a Brandenburg pilot project were interviewed, and education ministries across all 16 federal states were consulted. Data analysis included qualitative and quantitative methods to identify key challenges and potential solutions.

Submitted: 14 October 2024 **Accepted:** 05 May 2025 **Published:** 03 June 2025

Results: Amongst the 33 schools initially enrolled in the pilot project, only five completed it, with 28 withdrawing. Teachers from schools that withdrew cited time constraints (66.7%), lack of teaching materials (58.3%), and insufficient training opportunities (75%) as major barriers. The survey of education ministries revealed that only two federal states had comprehensively implemented CPR education, while six had integrated it into their curricula.

Conclusion: Despite strong support from educators, structural deficits, insufficient funding, and organizational shortcomings hinder sustainable CPR training in German schools. Financial investment, standardized teaching materials, and nationwide coordination are essential to overcoming these barriers. Without concrete political and financial commitments, Germany risks continued stagnation in CPR education, limiting potential improvements in OHCA survival rates.

Keywords: Resuscitation training; Out-of-hospital cardiac arrest (OHCA); Layperson intervention; School curriculum; Implementation barriers

ZUSAMMENFASSUNG

Hintergrund: Die Schulung in Wiederbelebungsmaßnahmen (CPR) in Schulen ist eine bewährte Strategie, um die Laienreanimationsrate zu erhöhen und die Überlebenschancen bei einem außerklinischen Herz-Kreislauf-Stillstand (OHCA) zu verbessern. In Deutschland erhalten lediglich 51 % der OHCA-Patienten eine Laienreanimation, im Vergleich zu 85 % in Norwegen, was zu einer geringeren 30-Tage-Überlebensrate führt (10,4 % vs. 14 %). Trotz einer Empfehlung aus dem Jahr 2014 zur Einführung von CPR-Schulungen in Schulen ist eine flächendeckende Umsetzung bislang unzureichend.

Methoden: Diese Studie verwendete eine deskriptive Umfrage, um Hindernisse bei der Umsetzung von CPR-Schulungen in deutschen Schulen und Bundesländern zu untersuchen. Lehrkräfte von Schulen, die sich aus einem Brandenburger Pilotprojekt zurückgezogen hatten, wurden befragt, ebenso wie Bildungsministerien aller 16 Bundesländer. Die Datenauswertung erfolgte mittels qualitativer und quantitativer Methoden, um zentrale Herausforderungen und mögliche Lösungsansätze zu identifizieren.

Ergebnisse: Von den 33 ursprünglich am Pilotprojekt teilnehmenden Schulen führten nur fünf das Projekt vollständig durch, während 28 sich zurückzogen. Lehrkräfte der aus dem Projekt ausgetretenen Schulen nannten Zeitmangel (66,7 %), fehlende Unterrichtsmaterialien (58,3 %) und unzureichende Fortbildungsmöglichkeiten (75 %) als Hauptgründe. Die Befragung der Bildungsministerien ergab, dass lediglich zwei Bundesländer CPR-Schulungen umfassend umgesetzt hatten, während sechs Länder diese in ihre Lehrpläne integriert haben.

Fazit: Trotz großer Unterstützung durch Lehrkräfte verhindern strukturelle Defizite, unzureichende Finanzierung und organisatorische Mängel eine nachhaltige CPR-Ausbildung an deutschen Schulen. Finanzielle Investitionen, standardisierte Lehrmaterialien und eine bundesweite Koordination sind notwendig, um diese Barrieren zu überwinden. Ohne konkrete politische und finanzielle Zusagen droht Deutschland ein anhaltender Stillstand in der CPR-Ausbildung, was potenzielle Verbesserungen der OHCA-Überlebensraten erheblich einschränkt.

Schlüsselwörter: Wiederbelebungstraining; Außerklinischer Herz-Kreislauf-Stillstand (OHCA); Laienreanimation; Schulcurriculum; Umsetzungsbarrieren

STRESZCZENIE

Tło: Edukacja w zakresie resuscytacji krążeniowo-oddechowej (RKO) w szkołach stanowi sprawdzoną strategię zwiększającą liczbę interwencji podejmowanych przez świadków zdarzeń oraz poprawiającą przeżywalność w przypadkach pozaszpitalnego zatrzymania krążenia (OHCA). W Niemczech jedynie 51% pacjentów z OHCA otrzymuje pomoc od osób postronnych, podczas gdy w Norwegii odsetek ten wynosi 85%. Przekłada się to na różnice w 30-dniowym wskaźniku przeżycia: 10,4% w Niemczech wobec 14% w Norwegii. Pomimo rekomendacji z 2014 roku dotyczącej wprowadzenia szkoleń RKO do szkół, ogólnokrajowe wdrożenie tej inicjatywy pozostaje niewystarczające.

Metody: W niniejszym badaniu zastosowano opisową ankietę w celu zidentyfikowania barier w realizacji edukacji RKO w niemieckich szkołach i poszczególnych krajach związkowych. Przeprowadzono wywiady z nauczycielami ze szkół, które wycofały się z pilotażowego projektu w Brandenburgii, oraz z ministerstwami edukacji we wszystkich 16 krajach związkowych. Analiza danych obejmowała metody jakościowe i ilościowe w celu określenia głównych wyzwań i potencjalnych rozwiązań.

Wyniki: Spośród 33 szkół początkowo zaangażowanych w projekt pilotażowy, tylko pięć ukończyło program, a 28 się wycofało. Nauczyciele ze szkół, które zrezygnowały, wskazywali na brak czasu (66,7%), niedobór materiałów dydaktycznych (58,3%) oraz brak odpowiednich szkoleń (75%) jako główne przeszkody. Ankieta wśród ministerstw edukacji wykazała, że tylko dwa kraje związkowe w pełni wdrożyły edukację z zakresu RKO, a sześć zintegrowało ją ze swoimi programami nauczania.

Wniosek: Pomimo dużego poparcia ze strony nauczycieli, braki strukturalne, niewystarczające finansowanie oraz problemy organizacyjne utrudniają trwałe wdrożenie szkoleń RKO w niemieckich szkołach. Konieczne są inwestycje finansowe, standaryzacja materiałów dydaktycznych i koordynacja na poziomie krajowym, aby przezwyciężyć te bariery. Bez konkretnych zobowiązań politycznych i finansowych Niemcom grozi dalszy zastój w edukacji RKO, co ograniczy możliwości poprawy wskaźników przeżywalności OHCA.

Słowa kluczowe: Szkolenie z resuscytacji; Pozaszpitalne zatrzymanie krążenia (OHCA); Interwencja osób postronnych; Program nauczania w szkołach; Bariery wdrożeniowe

It is well-established that increasing the willingness of laypeople to perform cardiopulmonary resuscitation (CPR) in Germany could improve survival rates among the approximately 55,000 patients who experience out-of-hospital cardiac arrest (OHCA) annually (Behrens et al., 2020; Christ et al., 2014; Schroeder et al., 2017; Zeymer et al., 2023). Currently, the 30-day survival rate in Germany, Europe's largest economy, is only 10.4%. In contrast, Norway reported a survival rate of 14% in 2021, with 85% of OHCA patients receiving layperson CPR (Bjørshol et al., 2023), compared to 51% in Germany (Fischer, 2024). This 3.6% difference in survival rates corresponds to approximately 2,000 preventable deaths in Germany annually if layperson CPR rates were raised to the Norwegian level.

It is well-documented that CPR education in schools increases the proportion of the population equipped with resuscitation skills (Bohn et al., 2015). Alongside other factors, school-based CPR education serves as a vital strategy in combating sudden cardiac death, encouraging children to assist others, and fostering enjoyment in learning, with long-term societal benefits (Böttiger, 2015). Since 2014, this issue has been addressed through a recommendation from the Standing Conference of Ministers of Education and Cultural Affairs in Germany (Gröbel, 2014). However, German states have largely

failed to implement CPR education on a widespread basis by 2022, limiting efforts to pilot studies and regional projects (Rücker et al., 2022).

As of 2023, only the federal states of Mecklenburg-Western Pomerania and Baden-Württemberg had achieved comprehensive implementation of school-based CPR education (two out of the 16 federal states). In Brandenburg, a pilot project aimed at implementing CPR education, starting at Grade 7, was launched. Of the initial 33 schools, only five fulfilled their commitment to participate in the project (Kehlert et al., 2024). While the project demonstrated that the education was worthwhile and students achieved the desired learning outcomes, the high dropout rate was a setback. The reasons remain unclear.

Although numerous studies explore CPR instruction in different age groups, by different instructors (Abelairas-Gómez et al., 2014; Bohn et al., 2012; Humbsch et al., 2023; Wingen et al., 2022) the appropriate duration, and the structure of the lessons (Schroeder et al., 2017), only a few authors currently address the sustainable and long-term implementation of such training, as well as the necessary resources and obstacles that need to be overcome. Following the pilot project in Brandenburg, school staff were interviewed about the reasons for the high cancellation rate and potential issues in the process. In addition, the Ministries of Education and the Arts of all 16 federal states were consulted on the current status of implementation. The aim was to identify the underlying problems in the implementation of CPR training in the 16 federal states of Germany from the connections found and to derive potential solutions from these findings.

METHODS

Study Setting and Design

This study is based on interviews with school staff and an inquiry conducted amongst the Ministries of Education from Germany's 16 federal states as part of the "Herzensretter" study (English: Heart Saver) (Kehlert et al., 2024). The primary objective was to identify barriers and opportunities for the long-term curricular integration of CPR education at two levels. First, by conducting interviews with teachers from 28 schools that did not implement the project to understand challenges at the school level. Second, surveying the Ministries of Education to examine obstacles in adopting the recommendation of the KMK (Kultusministerkonferenz, English: Standing Conference of the Ministers of Education and Cultural Affairs) at the state level. Based on these findings, the study aims to derive potential solutions for more effective nationwide implementation.

Interview Study

First, all schools (n = 33) were contacted to determine whether they had conducted the pilot project (Figure 1). Schools were divided into two groups: those that had implemented the project (n = 5) and those that had not (n = 28). Teachers from the group that had not implemented the project were identified as potential participants and were contacted by the research team.

They were invited to participate in an interview about the project. Follow-up interviews were conducted with those that agreed to participate. The interviews were voluntary and were conducted with the designated contact teacher from each non-participating school. The interview questions were specifically developed for this study and pretested with a small group of teachers for clarity and completeness. They included both closed and open-ended questions:

1. Should the lessons be taught by the school's teachers or external specialists?
2. In your opinion, will resuscitation lessons be taught in your school in the medium term?
3. How many teachers should teach resuscitation lessons?
4. How do you see the need to establish resuscitation lessons in schools? Answer on a five-point Likert scale: very useful, somewhat useful, neutral, somewhat not useful, not useful, don't know (no rating).
5. What needs to be done to establish resuscitation lessons?

The questionnaire for the interviews, as well as the questions used to survey the ministries, were validated in consultation with school teachers, principals, and first aid instructors to ensure relevance to the study objectives.

Data Analysis

Responses were recorded and grouped semantically where possible, see Table 1. The semantic grouping of questions

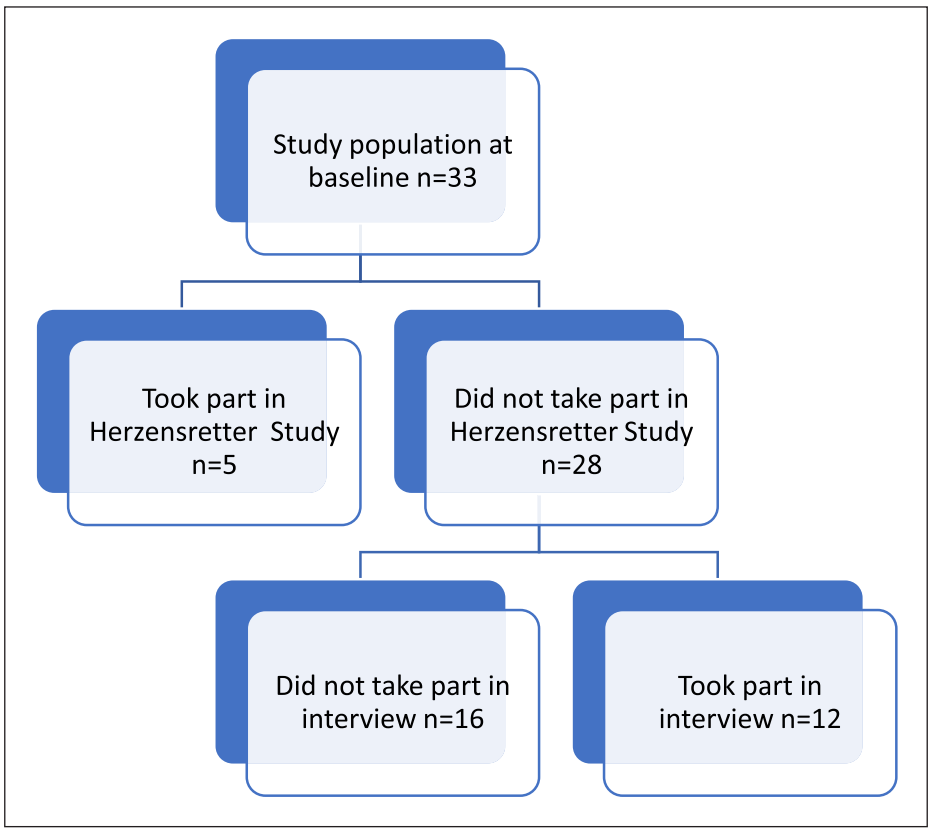

Figure 1: Study population for the school interviews (based on the Herzensretter study).

was carried out by analyzing their content-related similarity and meaning. Related questions are clustered together to form thematic groups. This process enables a structured categorization of the questions and helps identify key topics and recurring patterns within the dataset. Open-ended answers were analyzed qualitatively to identify recurring themes and patterns.

Ethical approval for the underlying "Herzensretter" study, which included follow-up interviews with teachers (conducted in this study), was granted by the ethics committee of Charité Universitätsmedizin Berlin, Campus Virchow-Klinikum (Application Number EA2/041/20). Further ethical approval was not required for the survey of education ministries, because this present study is a follow-on study from the previous study, using publicly available data.

Statistical Analysis

Statistical analysis was applied selectively based on the nature of the data. For categorical variables where comparisons between groups were relevant, such as instructor preference (Question 1), we conducted statistical tests (e.g., chi-square test). For questions aimed at identifying general trends, such as the importance rating of resuscitation training (Question 4) or reported obstacles (Question 5), descriptive statistics were deemed sufficient, as the primary goal was to summarize the responses rather than test specific hypotheses.

Inquiry Among Ministries

A systematic inquiry was conducted among the education ministries of Germany's 16 federal states to evaluate the status of CPR education implementation. The questions, set out in Table 2, were:

1. Is CPR training part of the curriculum?
2. Is CPR training offered statewide?
3. At what grade level do students in your federal state typically begin receiving CPR training in school?

4. Could you please indicate the duration of CPR training sessions provided in schools in your federal state?

Standardized emails containing a predefined questionnaire were sent to the education ministries of all 16 states. Follow-up reminders were sent to non-responding ministries at intervals of two and four weeks.

Responses were reviewed by the research team to ensure consistency and accuracy. Discrepancies or ambiguities were clarified directly with the respective ministries. The collected data were tabulated and comparatively analyzed to highlight differences between states, identifying patterns and challenges.

RESULTS

Teachers from a total of twelve schools participated in the interviews, and their anonymized responses are summarized in Table 1. The interview results highlight different perspectives on implementing resuscitation lessons in schools. Regarding the preferred instructors, 50% (6/12) of schools favored their teachers, citing organizational challenges and financial constraints as the reasons for this. In contrast, 25% (3/12) of schools preferred external experts for their specialized knowledge, while 25% (3/12) remained neutral, stating that both options were possible. The chi-square test results in a chi-square statistic of 1.5 and a p-value of approximately 0.472. This indicates that there is no significant deviation from an equal distribution ($p > 0.05$), meaning the preference for own teachers, external experts, or neutrality does not significantly differ from what would be expected by chance.

School (Number)	Should the lessons be taught by the school's teachers or external specialists	In your opinion, will resuscitation lessons be taught in your school in the medium term?	How many teachers should teach resuscitation lessons?	How do you see the need to establish resuscitation lessons in schools?	What needs to be done to establish resuscitation lessons?
1	School teachers; external trainers complicate the organization	Yes	Min. 2	Very useful	More support from leadership, training, time
2	External experts preferred	Definitely in the 7th grade; later, there's barely time due to few biology lessons	One—each biology/sports teacher teaches their own class during their regular lesson time	Very useful	Time, training, teaching materials
3	School teachers preferred over external experts	Yes	Min. 2	Very useful	Time, teaching materials
4	School teachers preferred over external experts	Yes	Min. 2	Very useful	Training
5	School teachers preferred over external experts	Yes	Min. 2	Useful	Training
6	External experts preferred	Yes	Min. 2	Useful	Training, better logistics (hygiene)
7	Prefer external experts, but also possible with teachers	Yes	Min. 2	Useful	Training, better logistics (hygiene)

(Contd.)

School (Number)	Should the lessons be taught by the school's teachers or external specialists	In your opinion, will resuscitation lessons be taught in your school in the medium term?	How many teachers should teach resuscitation lessons?	How do you see the need to establish resuscitation lessons in schools?	What needs to be done to establish resuscitation lessons?
8	External experts preferred	Yes	Min. 2	Useful	Training, better logistics (hygiene), teaching materials (own mannequins)
9	School teachers; external trainers not financially feasible	Yes	Min. 2	Very useful	More time, teaching materials (own mannequins), better logistics (hygiene), training
10	School teachers preferred over external experts	Yes, first aid is already well established in our school (9th graders complete the full first aid certificate)	Min. 2	No rating	More support from school leadership, more time, more teaching materials (videos, pictures, books)
11	Prefer external experts, but also possible with teachers	Yes	Min. 2	Useful	Teaching materials (videos, pictures, books)
12	Prefer external experts, but also possible with teachers	Hopefully	Min. 2	Useful	Time, training, teaching materials

Table 1: Anonymized responses from schools that voluntarily participated in the interviews.

The vast majority (91.7% or 11/12 of schools) believed that resuscitation lessons would be introduced in the 7th grade, with one school already integrating a full first aid certification program for ninth graders. Most schools agreed that at least two teachers should be responsible for teaching these lessons to ensure effective instruction. On a five-point Likert scale, 41.7% (5/12) of schools rated resuscitation lessons as "very useful," while 50% (6/12) found them "useful." One school did not provide a rating (8.3% or 1/12).

Several challenges were identified including the need for additional time (41.7% or 5/12 of schools), teacher training (75% or 9/12 of schools), better logistical arrangements such as hygiene considerations (33.3% or 4/12 of schools), and improved teaching materials (50% or 6/12 of schools). Some schools specifically mentioned the necessity of dedicated mannequins, videos, pictures, and books to enhance instruction. Additionally, 16.7% (2/12) of schools emphasized the importance of support from school leadership for successful implementation.

The responses to Question 5 (What needs to be done to establish resuscitation lessons?) were categorized into thematic groups and illustrated using a bar chart (Figure 2). The responses given thus represent the expectations of the teachers, which they see as prerequisites for sustainably integrating and implementing resuscitation training in the curriculum. A possible relationship between schools preferring their own teaching staff and those planning to implement the training was examined. However, we found that both those that preferred their own teaching staff and those

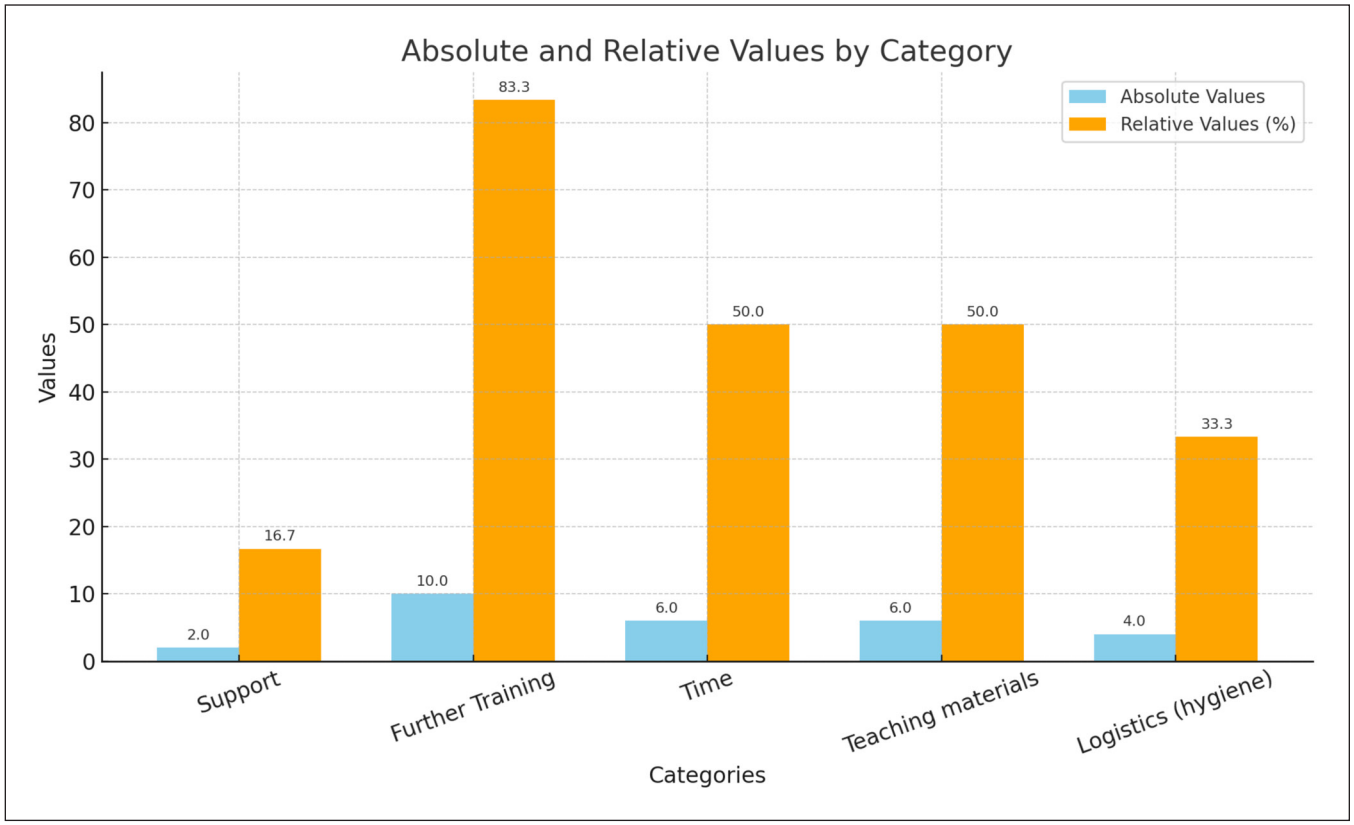

Figure 2: Bar chart of responses to question 5 **"What needs to be done to establish resuscitation lessons?"** showing all mentioned items in the responses of teachers in the school interviews.

who wanted external instructors all indicated that they planned to implement resuscitation training in the 7th grade, suggesting this preference did not influence the decision to introduce training.

Findings from the survey of Education Ministries

The results of the survey are provided in Table 2.

Out of Germany's 16 federal states, six (37.5%) reported that resuscitation training is already firmly embedded within their school curricula. In five states (31.25%), integration is currently being planned, while the remaining five (31.25%) had not yet initiated any relevant measures.

When it comes to implementation, only two states (12.5%) have established resuscitation training on a statewide level. In contrast, six states (37.5%) offer such training regionally or through pilot projects, with the long-term goal of expanding coverage. However, half of the states (50%) reported having no comprehensive programs in place.

The majority of states (12 out of 16, or 75%) begin resuscitation training in the 7th grade. Two states (12.5%) have extended this instruction to primary schools, while another two (12.5%) did not provide any information on the grade level at which training begins.

Regarding the duration of training, 13 states (81.25%) follow a standard format of two teaching units. The remaining three states (18.75%) did not specify any details about the duration.

Statistical Test

Curriculum Integration vs. statewide Implementation: A chi-square test was conducted to examine the relationship between curriculum integration and nationwide implementation. The result ($\chi^2 = 5.4$, $p = 0.067$) indicated no significant association ($p > 0.05$).

State	Is CPR Training Part of the Curriculum?	Is CPR Training Offered Statewide?	What is the starting grade for CPR training in your state?	What is the duration of CPR training in your state?*
Bavaria	Yes	Yes	7th Grade	2UE
Hesse	No, but planned	No, but planned	7th Grade	2UE
Saxony	No, but implicitly through first aid	No, but planned	7th Grade	2UE
Lower Saxony	No, but possibly from 2026	No	7th Grade	N/A
Hamburg	Yes, starting in primary school	Pilot projects	7th Grade, in pilot projects from 2nd Grade	2UE
Berlin	No	No	N/A	N/A
North Rhine-Westphalia	No	Pilot projects	7th Grade	2UE
Baden-Württemberg	Yes	Yes	Primary school for first aid, 7th Grade for CPR	2UE
Mecklenburg-Western Pomerania	Yes	Pilot projects, but statewide implementation planned	7th Grade	4UE (2UE for first aid, 2UE for CPR)
Brandenburg	No, but implicitly in health promotion	Pilot projects	7th Grade, regionally from primary school	2UE
Thuringia	No	No	7th Grade	2UE
Schleswig-Holstein	No	Yes, but not comprehensively	7th Grade	2UE
Saarland	Yes, but only in theory	No, but planned	7th Grade	2UE
Bremen	No	No	N/A	N/A
Bavaria	Yes	Yes	7th Grade	2UE
Hesse	No, but planned	No, but planned	7th Grade	2UE
Saxony	No, but implicitly through first aid	No, but planned	7th Grade	2UE
Lower Saxony	No, but possibly from 2026	No	7th Grade	N/A

Table 2: Results of the survey sent to the education ministries of all 16 states.

*UE is a unit of time used in the German education system. It corresponds to a period of 45 minutes. 2UE = 90 minutes.

DISCUSSION

The interview results indicate that structural and resource-related deficits present major challenges to implementing resuscitation training in schools. Schools that withdrew from the pilot project, despite initially agreeing to participate, cited insufficient training, a lack of teaching materials, and time constraints as key obstacles. Similarly, teachers emphasized that these limitations make effective instruction difficult. To manage organizational challenges, they suggested having at least two instructors per session to ensure smooth lesson delivery.

Encouragingly, the interviewed teachers demonstrated high motivation and recognized the value of resuscitation training. This was expected, as participating schools had

volunteered for the pilot phase. The central issue during the pilot phase of the *Herzensretter* project was not a lack of acceptance among teachers but rather insufficient resources.

The COVID-19 pandemic exposed additional vulnerabilities in the concept. Originally planned for the 2019/2020 school year, the project was significantly disrupted by the pandemic, which led to school closures, teaching interruptions, and staff shortages. Deficiencies in physical infrastructure, such as inadequate ventilation systems, exacerbated the situation.

Funding for the pilot project was also insufficient to ensure sustainable implementation. Although the state provided initial resources including 40 resuscitation mannequins and training sessions for instructors, critical follow-up tasks, including maintenance and cleaning of the mannequins, were not addressed. The long pandemic-induced hiatus meant that trained instructors could not refresh their skills and missed resuscitation sessions have yet to be rescheduled. A lack of accompanying teaching materials and ongoing professional development further hindered sustainable implementation.

The survey of ministries highlighted that these challenges are not isolated. Among the 16 federal states, only six had formally integrated resuscitation training into their curricula, and just two had achieved statewide implementation. Where training is conducted, it generally adheres to the 2014 recommendations of the Standing Conference of the Ministers of Education and Cultural Affairs (KMK), (i.e., two teaching units starting in the 7th grade).

Statistical analysis underscored these findings. A chi-square test showed no significant correlation between curriculum integration and statewide implementation ($p = 0.067$). This indicates that curriculum integration alone is insufficient to ensure sustainable implementation.

In summary, despite strong support from teachers and the recognized importance of resuscitation training for public health, its implementation is hindered by structural challenges, insufficient funding, and organizational deficiencies. Sustainable adoption requires targeted investments in resources, comprehensive financing, and centralized coordination to support schools in overcoming these obstacles. Additionally, according to the statements made by the teachers in the interviews, standardized teaching materials could represent an improvement.

Limitations

The limitations of this study fall into several key areas that may influence the interpretation of the results. First, the study was based on a non-representative sample, as only schools that had voluntarily registered for the previous pilot project were included. This introduces potential bias, as these schools may have higher intrinsic motivation or better infrastructure compared to the average school. Furthermore, interview participation was voluntary, raising the possibility of non-response bias, as schools with limited resources or a critical stance toward the project may have opted out.

Second, the low response rate from schools and late and sparse responses from ministries poses challenges. Sixteen schools did not respond, and not all ministries provided complete answers. This incomplete data could mean that actual barriers and progress remain underreported.

Third, the validity of the interview questionnaire is another consideration. Although the questionnaire was piloted and developed in consultation with experts, it is unclear whether it fully captured all relevant aspects of resuscitation training in schools. Contextual factors such as regional differences in educational infrastructure or specific political frameworks may have been overlooked.

Finally, temporal and logistical constraints presented limitations. Data collection occurred within a restricted time frame, potentially overlooking significant developments, particularly those related to the long-term impacts of the COVID-19 pandemic. This pandemic not only disrupted school capacities but also shifted educational priorities, limiting the generalizability of the findings.

CONCLUSION

Resuscitation training saves lives. It can be effectively implemented by schoolteachers, medical students, physicians, paramedics, and first-aid instructors from aid organizations. Research has already identified the necessary components of these programs, including their frequency, content, and optimal teaching strategies to increase lay resuscitation rates.

Given this robust body of evidence, it is increasingly urgent to address the lack of progress in Germany over the past decade. Tackling the infrastructural issues involved in implementing first-aid training requires acknowledging the "elephant in the room": it will incur costs. We need functional infrastructure, efficient resource allocation, and innovative approaches such as the use of online platforms to deliver CPR training and/or a combination of online and in-person instruction to enhance accessibility and effectiveness. Professional development opportunities and teaching materials are also needed, along with mechanisms for independently measuring implementation. All of this entails costs for both procurement and maintenance.

While the path is long, it is undoubtedly worthwhile. As of 2025, the situation remains largely unchanged, with only two federal states having achieved statewide implementation. It is no longer a question of whether resuscitation training is valuable but how it can be implemented. Embedding it in curricula alone is insufficient. Financial commitment and clear expectations regarding program structure, delivery methods, and resources are essential. After a decade, it is alarming that a greater level of implementation has not been achieved across Germany.

COMPETING INTERESTS

Philipp Humbsch is a co-founder of the Pépinière Foundation, the Jan-Anton Mikulicz Radecki Foundation and the Pépinière Association, which are voluntary organizations that carry out first aid projects in primary schools in Germany and Poland.

Konrad Bohm is a co-founder of the Pépinière Foundation and the Pépinière Association, which are voluntary organizations that carry out first aid projects in primary schools in Germany.

Robert Gintrowicz received a student research grant by the Pépinière Foundation, Frankfurt (Oder), Germany. This research grant was partially funded by the Ministry of Science, Research and Culture of the federal State of Brandenburg, Germany. Beyond that he is a member of the Pépinière Association, which is a local voluntary organization that carries out first aid projects in primary schools in germany.

Izabela Jastrzebska is a co-founder of the Jan-Anton Mikulicz Radecki Foundation which is a voluntary organization that carry out first aid projects in primary schools in Poland and Germany.

AUTHOR AFFILIATIONS

Philipp Humbsch orcid.org/0000-0002-0414-1287
Helios Hospital, Bad Saarow, Brandenburg, Clinic for Anesthesiology, Intensive Care and Analgesic Therapy; Pépinière INP gGmbH, Frankfurt (Oder), Germany and Pépinière Foundation, Frankfurt (Oder), Germany
Konrad Bohm
Pépinière INP gGmbH, Frankfurt (Oder), Germany and Pépinière Foundation, Frankfurt (Oder), Germany
Robert Gintrowicz orcid.org/0000-0002-2972-6943
Pépinière INP gGmbH, Frankfurt (Oder), Germany and Klinik für Anästhesiologie m. S. operative Intensivmedizin und Prodekanat für Studium und Lehre, Charité Universitätsmedizin, Berlin, Deutschland
Izabela Jastrzebska
Medycyna Ratunkowa, Fundacja imię Jana-Antoniego Mikulicza-Radeckiego, Debno, Poland and Pépinière INP gGmbH, Frankfurt (Oder), Germany

REFERENCES

Abelairas-Gómez, C., Rodríguez-Núñez, A., Casillas-Cabana, M., Romo-Perez, V., & Barcala Furelos, R. (2014). Schoolchildren as life savers: At what age do they become strong enough? *Resuscitation*, *85*, 814–819. https://doi.org/10.1016/j.resuscitation.2014.03.001

Behrens, N.-H., Fischer, M., Krieger, T., Monaco, K., Wnent, J., Seewald, S., Gräsner, J.-T., & Bernhard, M. (2020). Effect of airway management strategies during resuscitation from out-of-hospital cardiac arrest on clinical outcome: A registry-based analysis. *Resuscitation*, *152*, 157–164. https://doi.org/10.1016/j.resuscitation.2020.04.015

Bjørshol, C. A., Nordseth, T., & Kramer-Johansen, J. (2023). Why the Norwegian 2021 guideline for basic life support are different. *Resuscitation Plus*, *14*, 100392. https://doi.org/10.1016/j.resplu.2023.100392

Bohn, A., Lukas, R. P., Breckwoldt, J., Böttiger, B. W., & Van Aken, H. (2015). "Kids save lives": Why schoolchildren should train in cardiopulmonary resuscitation. *Current Opinion in Critical Care*, *21*(3), 220–225. https://doi.org/10.1097/MCC.0000000000000204

Bohn, A., Van Aken, H. K., Möllhoff, T., Wienzek, H., Kimmeyer, P., Wild, E., Döpker, S., Lukas, R. P., & Weber, T. P. (2012). Teaching resuscitation in schools: Annual tuition by trained teachers is effective starting at age 10. A four-year prospective cohort study. *Resuscitation*, *83*(5), 619–625. https://doi.org/10.1016/j.resuscitation.2012.01.020

Böttiger, B. W. (2015). "A Time to Act" – Anaesthesiologists in resuscitation help save 200,000 lives per year worldwide: School children, lay resuscitation, telephone-CPR, IOM and more. *European Journal of Anaesthesiology | EJA*, *32*(12), 825. https://doi.org/10.1097/EJA.0000000000000374

Christ, M., von Auenmüller, K. I., Grett, M., Dierschke, W., & Trappe, H.-J. (2014). Who observes out-of-hospital cardiac arrests in Germany? *Deutsche Medizinische Wochenschrift (1946)*, *139*(44), 2225–2230. https://doi.org/10.1055/s-0034-1387296

Fischer, M. (2024). Jahresbericht des Deutschen Reanimationsregisters: Außerklinische Reanimation im Notarzt- und Rettungsdienst 2023. *Fischer M, Wnent J, Gräsner J-T, Seewald S, Rück L, Hoffmann H et al: Jahresbericht des Deutschen Reanimationsregisters: Außerklinische Reanimation im Notarzt- und Rettungsdienst 2023*, *62024*, 101–110. https://doi.org/10.19224/ai2024.v101

Gröbel, V. (2014, July 7). *Kultusminister: Pflichtunterricht Wiederbelebung in den Schulen in ganz Deutschland kommt! – AGNNW [minister of culture: compulsory classes in first aid is coming to schools all over germany!]. In German.* https://www.agnnw.de/?p=1465

Humbsch, P., Gintrowicz, R., Dietrich, A., Weckwerth, J., Schultze-Berndt, C., Nasert, A., Dolabella, R., Kehlert, J., Keil, K. C., Bohm, K., Schmöche, S., Icke, K., & Keil, T. (2023). Evaluation of a 2-day First Aid Course Including Basic Resuscitation With 1,268 Primary School Children Aged 6–13 Years – A Multicenter Intervention Study. *International Journal of First Aid Education*, *6*(1), Article 1. https://doi.org/10.25894/ijfae.6.1.11

Kehlert, J., Icke, K., Sick, R., Cüppers, C., Ergec, I., Bödeker, M., Berghöfer, A., Humbsch, P., & Keil, T. (2024). Evaluation of a 90-minute school-based resuscitation course with 340 middle school students – a multicenter intervention study. *International Journal of First Aid Education*, *7*(1), Article 1. https://doi.org/10.25894/ijfae.2310

Rücker, G., Wingen, S., Rott, N., & Böttiger, B. W. (2022). Der aktuelle Umsetzungsstand von Wiederbelebungsunterricht in Schulen in Deutschland – Umfrageergebnisse einer Abfrage der Ministerien aller Bundesländer. *Notfall + Rettungsmedizin*, *27*(2), 143–148. https://doi.org/10.1007/s10049-022-01010-2

Schroeder, D. C., Ecker, H., Wingen, S., Semeraro, F., & Böttiger, B. W. (2017). „Kids Save Lives" – Wiederbelebungstrainings für Schulkinder. *Der Anaesthesist*, *66*(8), 589–597. https://doi.org/10.1007/s00101-017-0319-z

Wingen, S., Rott, N., Dirks, B., Greif, R., Papaspyrou, H., Eckstein, A., Lambertz, P., Koch-Schultze, R., & Böttiger, B. W. (2022). Die Ausbildung von Lehrerinnen und Lehrern als Multiplikatoren für den Wiederbelebungsunterricht an Schulen. *Notfall + Rettungsmedizin*, *25*(4), 245–251. https://doi.org/10.1007/s10049-021-00870-4

Zeymer, U., Pöss, J., Zahn, R., & Thiele, H. (2023). Prehospital resuscitation: Current status, results and strategies for improvement in Germany. *Herz*, *48*(6), 456–461. https://doi.org/10.1007/s00059-023-05214-1