

## Correspondence

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## Popular websites as a source of misinformation on first aid in foreign body airway obstruction

**Running title:** Websites – a source of misinformation on first aid

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*Dear Editor,*

Being one of the leading causes of accidental death, foreign body airway obstruction (FBAO) is recognized as a major public health problem worldwide [1,2]. Severe airway obstruction induces rapid progression of hypoxia, and longer obstruction time represents a significant risk factor for death or vegetative state [2]. Early recognition of the problem and removal of the foreign body by a witness of the emergency at the accident scene is critical to prevent loss of life and is known to be associated with better neurological outcomes [3,4]. Although severe FBAO is commonly witnessed by other people [5], bystanders rarely attempt first aid to remove foreign bodies [2,6]. This emphasizes the importance of the wide distribution of adequate knowledge and skills of first aid for FBAO in the community.

While instructor-led first aid courses still constitute the best practice for acquiring and maintaining life-saving competencies, considering the limited availability of such training [7] and the progressive digitalization of society, internet-based self-learning nowadays represents an important option for first aid education that can be used to supplement the instructor-led training or may serve as a better-than-nothing solution for people who cannot attend the course. Despite the potential utility, including the opportunity to reach a huge number of learners, online resources may not adhere to relevant guidelines on first aid and contain mistakes that represent the risk of harm [8,9]. Little is known however about the quality of open information on first aid for FBAO available on the Internet. Thus, the study was carried out to assess the accuracy of instructions on first aid for FBAO presented online. Also, it was assumed that novel artificial intelligence (AI)-powered chatbots may perform the quality check automatically. Consequently, our secondary aim was to test the performance of two cutting-edge chatbots in this regard.

In October 2023, Google was prompted “what to do choking” on a desktop computer with a search location set to London, the UK. The search results ordered by Google according to relevance were reviewed consecutively, and links to the first 35 websites that provided textual instructions on first aid for FBAO were collected for analysis. Manual evaluation of the instructions in terms of completeness and correctness was performed by the authors (physicians with experience in clinical

practice and education in emergency medicine) independently using the respective 10-item section of the European Resuscitation Council (ERC) Research NET checklist for quality appraisal of educational resources on adult Basic Life Support [10]. The instructions were rated for the satisfaction of each checklist item phrasing as True (completely satisfied=2 points), Partially True (satisfied in part=1 point), or Not True (not satisfied or absent=0 points). The results of the evaluation were compared, and any discrepancies between the reviewers' ratings were resolved through discussion. Based on the evaluation, a sum score was calculated for each website. For automated evaluation, Bard (Google LLC, USA) and Bing (Microsoft Corporation, USA) AI chatbots were inquired using the predeveloped prompt (Appendix) to evaluate the websites' content by applying the same checklist and rating criteria. The results of the manual and the chatbot-run evaluations were compared.

Of the 35 studied websites, 42.9% ( $n=15$ ) were owned by commercial entities, 28.6% ( $n=10$ ) by charities or other non-profit entities, 17.1% ( $n=6$ ) by government organizations, and 11.4% ( $n=4$ ) by academic organizations. Based on the manual evaluation, the sum score varied from 3 to 16 out of the possible 20 points (median 11.0, interquartile range [IQR]: 8.0-13.0). The essential advice on first aid, including instructions to immediately call for help in severe FBAO, to encourage coughing when the victim is conscious and able to cough, and to start cardiopulmonary resuscitation in the unresponsive and abnormally breathing victim, were commonly missing or incomplete (Table and Dataset[11]). Description of back blows and abdominal thrusts on many occasions contained insufficient details on how to correctly perform the maneuvers. Most websites omitted the guidelines-recommended [12] instructions to avoid blind finger sweep and to get the victim examined by a qualified healthcare practitioner after successful application of abdominal thrusts or chest compressions. Further, some websites contained guidelines-discordant and potentially harmful advice, e.g., to perform abdominal thrusts on an unresponsive victim or to head the victim with FBAO to the emergency department instead of calling for emergency medical services (Dataset[11]). It is worth noting that among the websites with relatively low scores ( $\leq 10$  points), there were reputable and well-trusted sources, such as the British Red Cross and WebMD, that are consistently highly ranked by search engines and usually presented among the top search results.

Evaluation of the chatbots' performance in terms of their ability to assess the quality of the websites' content showed that these AI tools were generally inaccurate (see Table and Dataset[11]). Whereas Bard persistently assigned the highest possible rating for all checklist items (median 20.0, IQR: 20.0-20.0), Bing's rating (median 14.0, IQR: 10.3-15.8;  $p=0.029$ ) was variable but much higher than that of manual assessment, and there was no statistical correlation with the manual rating. Further, Bing failed to produce any rating for three websites. Overall, the chatbots in their current performance cannot be recommended to carry out the automated quality assessment. The AI chatbots represent a sort of "black box" technology, and it is not clear how these tools generated their particular scores for the websites' content. Further research with the participation of experts in the AI field is necessary to unveil the reasons behind the chatbots' variable and inaccurate assessments and to better understand future implications for the use of AI chatbots in automated quality appraisal of public digital resources on first aid.

In summary, this explorative study confirmed the poor quality of instructions on first aid for FBAO presented on highly-ranked openly available websites, suggesting the ongoing dissemination of inaccurate, incomplete, and occasionally harmful advice among a vast number of people around the globe. Whereas the websites' owners should comprehend their responsibilities when publishing content on first aid online and guarantee its full compliance with the recommended best practices, relevant healthcare stakeholders, including the World Health Organization and the International Liaison Committee on Resuscitation, are supposed to recognize misinformation on first aid as a public health problem and strive toward development of uniform procedures for infodemiological surveillance and quality assurance of open information on first aid. Emphasizing the issue of misinformation as part of the international consensus on first aid and the creation of a corresponding expert task force could be reasonable first steps to raise awareness of the problem and potentiate pertinent research.

**Data availability statement.** The data that support the findings of this study are openly available in Mendeley Data repository [11].

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**Table.** Conformity of the webpages containing instructions on first aid in foreign body airway obstruction with the checklist criteria.

Checklist criteria	Completely satisfied			Partially satisfied			Not satisfied or absent		
	Manual (N=35), % (n)	Bard (N=35), % (n)	Bing (N=32), % (n)	Manual (N=35), % (n)	Bard (N=35), % (n)	Bing (N=32), % (n)	Manual (N=35), % (n)	Bard (N=35), % (n)	Bing (N=32), % (n)
1. Does the resource instruct to suspect choking if someone is suddenly unable to speak or talk, particularly if eating?	2.9 (1)	100.0 (35)	75.0 (24)	74.3 (26)	0.0 (0)	9.4 (3)	22.9 (8)	0.0 (0)	15.6 (5)
2. Does the resource state that the rescuer should immediately ask a helper to call EMS or call themselves when recognising severe choking?	8.6 (3)	100.0 (35)	21.9 (7)	80.0 (28)	0.0 (0)	34.4 (11)	11.4 (4)	0.0 (0)	43.8 (14)
3. Does the resource instruct to encourage coughing when the victim is conscious and able to cough?	34.3 (12)	100.0 (35)	75.0 (24)	48.6 (17)	0.0 (0)	3.1 (1)	17.1 (6)	0.0 (0)	21.9 (7)
4. Does the resource instruct to give up to 5 back blows if coughing fails to clear the obstruction or the victim starts to show signs of fatigue?	54.3 (19)	100.0 (35)	84.4 (27)	40.0 (14)	0.0 (0)	3.1 (1)	5.7 (2)	0.0 (0)	12.5 (4)
5. Does the resource describe correct technique for back blows (i.e. support the victim's chest with one hand and lean the victim forwards; apply sharp blows between the shoulder blades using the heel of your other hand)?	62.9 (22)	97.1 (34)	75.0 (24)	31.4 (11)	2.9 (1)	9.4 (3)	5.7 (2)	0.0 (0)	15.6 (5)
6. Does the resource instruct to give up to 5 abdominal thrusts if back blows are ineffective?	57.1 (20)	100.0 (35)	87.5 (28)	28.6 (10)	0.0 (0)	0.0 (0)	14.3 (5)	0.0 (0)	12.5 (4)
7. Does the resource describe correct technique for abdominal thrusts (i.e. stand behind the victim and put both arms around the upper part of the victim's abdomen, lean the victim forwards, clench your fist and place it between the umbilicus and the ribcage, grasp your fist with the other hand and pull sharply inwards and upwards)?	42.9 (15)	97.1 (34)	65.6 (21)	37.1 (13)	2.9 (1)	12.5 (4)	20.0 (7)	0.0 (0)	21.9 (7)
8. Does the resource instruct to start CPR when the victim is unconscious with absent or abnormal breathing?	2.9 (1)	97.1 (34)	59.4 (19)	77.1 (27)	2.9 (1)	15.6 (5)	20.0 (7)	0.0 (0)	25.0 (8)
9. Does the resource state that blind finger sweep should be avoided?	14.3 (5)	100.0 (35)	12.5 (4)	8.6 (3)	0.0 (0)	6.3 (2)	77.1 (27)	0.0 (0)	81.3 (26)
10. Is it clear that the victim successfully treated with abdominal thrusts or chest compressions should be examined by a qualified healthcare practitioner?	25.7 (9)	100.0 (35)	21.9 (7)	8.6 (3)	0.0 (0)	0.0 (0)	65.7 (23)	0.0 (0)	78.1 (25)
<i>Mean percentage</i>	30.6	99.1	57.8	43.4	0.9	9.4	26.0	0.0	32.8

Abbreviations: CPR, cardiopulmonary resuscitation; EMS, emergency medical services.