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COMPLIANCE OF THE TURKISH CARDIOPULMONARY RESUSCITATION VIDEOS ON YOUTUBE WITH THE 2020 AHA RESUSCITATION GUIDELINES: CROSS-SECTIONAL ANALYTICAL STUDY

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ABSTRACT

INTRODUCTION: Video-sharing platforms have become popular and widely used sources of information today. The Internet is an accessible source for individuals, medical students, and healthcare professionals to acquire knowledge when searching for health-related information. Access to information has increased with the widespread use of the Internet today. Recognition of sudden cardiac arrest and initiating interventions according to current guidelines can be achieved through education. This study aims to assess the accuracy of BLS and CPR videos on YouTube following the 2020 AHA Resuscitation Guidelines.

MATERIAL AND METHODS: This study follows a cross-sectional analytical design. The YouTube website was searched using the following keywords for Turkish videos uploaded from October 21, 2020, to September 7, 2023: 'CPR, cardiopulmonary resuscitation, basic life support, CPR, advanced cardiac life support'. October 21, 2020, was chosen as the reference date since it marks the publication date of the 2020 AHA guidelines.

RESULTS: A total of 265 Turkish videos were evaluated from all videos uploaded to YouTube. The analysis included 130 videos that met the inclusion criteria.

CONCLUSIONS: Turkish BLS and CPR YouTube videos violate the 2020 AHA criteria for offering basic information to the public and cannot teach healthcare workers advanced medical skills. The greater viewing of anonymous sources' videos suggests that non-experts are submitting videos on hot themes to gain viewers. Having these instructional films reviewed before releasing them to YouTube will ensure accurate, complete, and valuable health information and enhance viewing.

KEYWORDS: internet; video; basic life support; resuscitation; guidelines

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INTRODUCTION

Video-sharing platforms have become popular and widely used sources of information today. The most popular among these video-sharing sites is YouTube, which has an active user base of 2.68 billion as of 2023 [1]. Approximately 52% of internet users worldwide visit YouTube at least once a month [1, 2]. The videos uploaded to this site consist of informative, entertaining, newsworthy, and educational content.

There has been a significant increase in internet use to access health information. Recent studies have shown that 51% of internet users utilize video-sharing sites to access health information [3]. With the growing interest in health topics, the Internet has started to feature more health-related content [4–6]. The Internet is an accessible source for individuals, medical students, and healthcare professionals to acquire knowledge when searching for health-related information. Alongside the positive effects of increased internet use in healthcare, there are also negative impacts. The vast amount of information available on the Internet increases the likelihood of spreading inaccurate health information. The adverse effects of obtaining health information from the Internet include privacy and confidentiality issues, risks associated with harmful and incorrect advice, discouraging patients from visiting healthcare professionals, and uncertainty about the quality and reliability of the information.

Early recognition of sudden cardiac arrest and initiation of treatment with appropriate protocols improves survival rates [7–10]. The prompt implementation of cardiopulmonary resuscitation (CPR) and its steps increase these rates [7]. Education is the most effective way to ensure knowledge of CPR steps [11, 12]. Access to information has increased with the widespread use of the Internet today. Recognition of sudden cardiac arrest and initiating interventions according to current guidelines can be achieved through education.

Although there have been studies examining the accuracy and reliability of BLS (basic life support) and CPR videos uploaded to YouTube [13, 14], based on the following research, the authors have not come across a study that explicitly investigates their compliance with the updated 2020 AHA guidelines [15]. This study aims to assess the accuracy of BLS and CPR videos on YouTube following the 2020 AHA Resuscitation Guidelines.

MATERIAL AND METHODS

This study follows a cross-sectional analytical design. The YouTube (YouTube©, https://www.youtube.com; YouTube, LLC, San Bruno, CA, USA) website was searched using the following keywords for Turkish videos uploaded from October 21, 2020, to September 07, 2023: 'CPR, cardiopulmonary resuscitation, basic life support, CPR, advanced cardiac life support'. October 21, 2020, was chosen as the reference date since it marks the publication date of the 2020 AHA guidelines.

Videos that met at least one exclusion criterion were not included in the study. These criteria included 'non-medical content (advertisements, news, interviews), videos in languages other than Turkish, paediatric CPR footage, live action footage lacking educational content, comedic or entertaining content not intended for educational purposes, duplicate videos, videos demonstrating CPR devices, animal CPR footage'.

For the included videos, the following data were recorded: sources (official medical organizations: AHA, ILCOR, ERC; healthcare professionals and organizations: doctors, nurses, paramedics, medical faculties, hospitals; unidentified, news), duration, view counts during the study period, comparison of the years with more videos screened from 2020 to the present, model usage (human, manikin, or both), and average scores (first assessment and second assessment).

The videos that met the inclusion criteria were reviewed by two emergency medicine specialists. In cases of disagreement between the two specialists, the opinion of a third emergency medicine specialist was sought.

In the first assessment, the videos' validity was evaluated based on selected information deemed essential for the BLS algorithm (Tab. 1). In the second assessment, the videos' ability to convey advanced medical knowledge was evaluated (Tab. 2). Information regarding significant updates mentioned in the 2020 AHA guidelines was selected for this evaluation.

Statistical analysis

The research data was analysed using the SPSS 23.0 statistical software package (IBM, Armonk, NY, USA). The data were presented as means, standard deviations, medians, minimums, maximums, percentages, and frequencies. The normal distribution of continuous variables was confirmed using the

Table 1. Selected criteria from the basic life support (BLS) algorithm used for video assessment

Selected information from the basic life support algorithm
(1) Ensuring scene safety
(2) Checking for unresponsiveness of the patient
(3) Establishing and evaluating airway patency and breathing
(4) Activating the emergency medical system using mobile devices
(5) C-A-B sequence
(6) 30:2 chest compressions
(7) Correct localization of chest compressions
(8) Appropriate depth of chest compressions (5–6 cm)
(9) Use of defibrillator
(10) Compression rate of 100–120/minute

Table 2. Selected innovations mentioned in the 2020 American Heart Association guidelines for video assessment

Selected innovations from the 2020 AHA guidelines
(1) Immediate initiation of CPR for individuals suspected of cardiac arrest (low risk of harm due to chest compressions)
(2) Prompt administration of adrenaline in non-shockable rhythms
(3) Administration of adrenaline when the first defibrillation attempt fails in shockable rhythms
(4) Use of audiovisual devices is beneficial
(5) ETCO2 > 10 mmHg
(6) No benefit of dual sequential defibrillation
(7) IV access is the preferred route for administering primary medications, and if IV access is unsuccessful or inappropriate, IO access should be attempted
(8) Administration of IM or IN naloxone.

CPR — cardiopulmonary resuscitation; IO — intraosseus; IM — intramuscular; IN — intranasal

Shapiro-Wilk test. Analysis of variance (ANOVA) was used to compare normally distributed continuous variables among more than two groups. The Kruskal-Wallis test was used for non-normally distributed data. Post hoc tests were applied afterwards. A significance level of $p < 0.05$ was considered statistically significant in all analyses.

RESULTS

A total of 265 Turkish videos were evaluated from all videos uploaded to YouTube between October 21, 2020, and April 1, 2023, using the search terms "CPR", "cardiopulmonary resuscitation", "basic life support", "BLS", "advanced cardiac life support", ACLS and "chest compressions". Out of these videos, 135 were excluded based on the exclusion criteria. The number of excluded videos and the reasons for exclusion are presented in Table 3.

Table 3. Number of excluded videos

Reason for exclusion	n
Presence of non-medical content (advertisements, news, interviews)	14
Pediatric cardiopulmonary resuscitation footage	105
Lack of educational content, presence of live-action videos (real-life footage)	2
Comedic and entertaining content	0
CPR device demonstrations	2
Duplicate videos	11
Animal cardiopulmonary resuscitation footage	0
Total	135

CPR — cardiopulmonary resuscitation

The analysis included 130 videos that met the inclusion criteria. The majority of the videos (n = = 102, 78.5%) were uploaded by unidentified sources, followed by videos uploaded by healthcare professionals or organizations (n = 24, 18.5%) and videos uploaded by official medical organizations (n = 4, 3.1%).

The duration of the videos ranged from 6 to 7496 seconds (mean: 851 ± 1210 seconds; median: 517 seconds). Videos longer than 10 minutes had the highest average view counts (mean: 5870 ± 18627; median: 309; minimum: 3; maximum: 112,704), followed by videos with durations between 5 and 10 minutes (median: 130; minimum: 5; maximum: 110,487), and videos with less than 5 minutes of duration (median: 48; minimum: 5; maximum: 90,852). There was a statistically significant relationship between video duration, and view counts in videos less than 5 minutes and videos longer than 10 minutes ($p < 0.005$).

Among the videos included in this study, human subjects were used in 5.4% (n = 7) of the videos to demonstrate medical procedures, manikins were used in 83.1% (n = 108) of the videos, and a combination of human subjects and manikins was used in 10% (n = 13) of the videos. Neither human subjects nor manikins were present in the two videos (1.5%). The type of educational resource used was not statistically associated with the average view counts.

Among the videos included in this study, 7 received a total score of 18. Table 4 shows the number

Table 4. The number of videos containing each criterion

Required information	Number of videos containing required information (%)
Ensuring scene safety	87 (66.9%)
Checking for unresponsiveness of the patient	126 (96.9%)
Establishing and evaluating airway patency and breathing	125 (96.2%)
Activating the emergency medical system using mobile devices	112 (86.2%)
C-A-B sequence	87 (66.9%)
30:2 chest compressions ventilation ratio	120 (92.3%)
Correct localization of chest compressions	109 (83.8%)
Appropriate depth of chest compressions (5–6 cm)	91 (70%)
Use of defibrillator	77 (59.2%)
The compression rate should be 100–120/minute	74 (56.9%)
Immediate initiation of CPR for individuals suspected of cardiac arrest (due to low risk of harm from chest compressions)	19 (14.6%)
Prompt administration of adrenaline in non-shockable rhythms	11 (8.5%)
Administration of adrenaline when the first defibrillation attempt fails in shockable rhythms	11 (8.5%)
The usefulness of audiovisual devices	10 (7.7%)
ETCO2 > 10 mmHg	9 (6.9%)
No benefit of dual sequential defibrillation IV access is the preferred route for administering primary medications, and if IV access is unsuccessful or inappropriate,	9 (6.9%)
IO access should be attempted	9 (6.9%)
IM, IN naloxone	8 (6.2%)

CPR — cardiopulmonary resuscitation; IO — intraosseus; IM — intramuscular; IN — intranasal

of videos containing each type of information. The average total scores for the videos, calculated based on the average scores, are shown in Table 5 (according to Tab. 1 and Tab. 2). Videos uploaded by healthcare professionals and organizations had the highest average total score (11.7 ± 4.69), followed by videos uploaded by official medical organizations (9.2 ± 1.50), and videos with unidentified sources (7.5 ± 2.59). The scores of videos uploaded by healthcare professionals and organizations were significantly higher than videos with unidentified sources ($p < 0.05$).

The average view counts, average video duration, and scores were presented according to the video source (Tab. 6). The scores of videos uploaded by healthcare professionals and organizations were significantly higher than videos with unidentified sources ($p < 0.05$). Videos with unidentified sources received more views than those uploaded by official institutions and healthcare personnel.

The relationship between the average number of views and the scores was examined.

According to the specified criteria:

— Videos with a score of 1–2 were viewed 56 ± ± 62 times (median: 32; minimum: 13; maximum: 149).
— Videos with a score of 3–4 were viewed 13,283 ± 30,568 times (median: 30; minimum: 7; maximum: 90,852).
— Videos with a score of 5–6 were viewed 1,615 ± 6,290 times (median: 42; minimum: 5; maximum: 27,572).
— Videos with a score of 7–8 were viewed 3,959 ± ± 19,151 times (median: 119; minimum: 4; maximum: 110,487).
— Videos with a score of 9–10 were viewed 4,241 ± ± 16,294 times (median: 249; minimum: 3; maximum: 112,704).

The view counts were statistically significantly associated with the scores. It was observed that

Table 5. The average total score of the videos included in this study

	Mean	Standard deviation	Median	Minimum	Maximum
Score (primary assessment) (0–10)	7.75	2.323	8	1	10
Score (secondary assessment) (0–8)	0.66	2.010	0	0	8
Total score (0–18)	8.42	3.455	8	1	18

Table 6. Average view counts, average video duration, and scores by video source

	Uploaded by official medical institutions	Uploaded by healthcare professionals or organizations	Uploaded by unidentified sources	All videos
Average view counts	1174 ± 2013 Median: 220 (65–4191)	4124 ± 12,583 Median: 299 (6–50455)	4620 ± 18,788 Median: 90 (3–112,704)	4422 ± 17,466 Median: 145 (3–112,704)
Scores according to the first assessment*	8.00 ± 1.15 Median: 8 (7–9)	9.00 ± 1.91 Median: 10 (2–10)	7.45 ± 2.35 Median: 8 (1–10)	7.75 ± 2.32 Median: 8 (1–10)
Scores according to the second assessment**	1.25 ± 3.65 Median: 0 (0–8)	2.79 ± 3.65 Median: 0 (0–8)	0.14 ± 0.85 Median: 0 (0–8)	0.66 ± 2.01 Median: 0 (0–8)
Average total score	9.25 ± 21.90 Median: 10 (2–18)	11.79 ± 4.69 Median: 10 (2–18)	7.56 ± 2.59 Median: 8 (1–18)	8.42 ± 3.45 Median: 8 (1–18)

*Video scores based on criteria selected from core cardiac life support algorithms; **Video scores based on what is new in the 2020 American Heart Association guidelines

the group with the highest score (9–10) had more views than other groups, which was statistically significant.

DISCUSSION

In today's world, the Internet has become a popular source of information [5, 14, 16]. Patients increasingly turn to online sources to gather information about their health conditions and treatment options [6, 17]. Especially in underdeveloped or developing countries, people cannot access health care education. And the prevalence of health service education in the society is not very high. For this reason, social media networks and YouTube, which are easy to access, stand out as education platforms for many people [18]. Video-based resources have become an important source for people to acquire knowledge. Studies have shown that 38% of patients seek information about their health online, leading to decreased rates of seeking medical help and delayed treatment [19]. Videos containing incorrect or incomplete information are believed to be responsible for this trend. While platforms like YouTube are often recommended as potential sources of information, this study demonstrates that YouTube videos are inadequate in providing basic information about TYD algorithms and advanced medical knowledge consistent with the 2020 AHA CPR guidelines.

Uploading videos online is easy and readily accessible, but finding the desired content accurately can be challenging. In the following study, 51% of the videos did not meet the inclusion criteria. Previous studies on the reliability of YouTube videos, including their compliance with guidelines such as ATLS® (9th edition) and BLS and cardiac massage, have shown exclusion rates ranging from 80% to 94% [13, 14, 20, 21]. Although this rate has slightly decreased in the study, with 1 out of 2 videos failing to provide the desired content, the high exclusion rate makes it challenging to find the necessary content on a widely viewed video-sharing platform like YouTube.

It was found that only 21.6% of the videos were uploaded by healthcare professionals, organizations, and official medical institutions. Considering the importance of critical topics such as cardiopulmonary resuscitation, which can impact human lives and require rapid intervention, it is believed that healthcare professionals and official institutions should share more videos on these subjects. Additionally, considering that individuals uploaded 78.5% of all videos without expertise in health-related matters and without undergoing any form of quality control, it becomes evident that videos containing incorrect information pose a significant public health problem [22].

It was found that as the duration of the videos increased, the number of views also increased, with videos longer than 10 minutes having the highest view rates. Moreover, videos that received the highest scores according to the AHA guidelines [15] also had the highest number of views. One expected effect of conveying all the information is that the video will be longer. This indicates that the number of views tends to increase when the entire information is adequately presented. Therefore, instead of being

concerned that longer videos may not be watched, official institutions and healthcare professionals should focus on delivering accurate, up-to-date, and comprehensive information when uploading videos.

The videos uploaded by healthcare professionals have received the highest scores and have been the most viewed. This can be attributed to the fact that they have the highest average scores and the public's trust in healthcare personnel. To maintain this trust, healthcare professionals should fulfil their responsibilities in the best and most comprehensive way possible, follow the latest guidelines, and stay updated on topics such as cardiopulmonary resuscitation, which every physician should be knowledgeable about regardless of their specialization.

Healthcare professionals uploaded six videos that received a perfect score, while an unidentified source uploaded one. Regarding the most fundamental information, such as when to start CPR, official institutions provide a 100% correct response. At the same time, the videos' healthcare professionals and unidentified sources have a lower percentage, only 11%. While videos uploaded by unidentified sources may occasionally contain accurate and complete information, it cannot always be assumed that official institutions and healthcare professionals consistently provide correct and up-to-date information. Videos uploaded by official institutions and healthcare professionals should comply with the most recently updated guidelines and undergo scrutiny.

Official institutions should do their part by uploading comprehensive, up-to-date videos in line with the latest guidelines. They should strive to create visually appealing and engaging videos with good image quality and, if necessary, seek support. The YouTube platform should also be supportive and regulatory in this matter. Independent expert commissions should highlight current and comprehensive videos in the algorithm, while advertisements and sponsorships should be prevented.

When examining the relationship between average views and scores, it was observed that the group with the highest scores (9–10) was viewed more than other groups. Although it is impossible to obtain clear information about the content without watching the video, if videos on health and academic topics are initially scored according to guidelines before being viewed, the number of viewers in videos with higher scores would increase.

In the first evaluation, videos uploaded by official institutions and organizations received an average of 8.00 ± 1.15 (median: 8, 7 to 9). No videos published by official institutions and organizations received a score below 7 in the first evaluation [23]. Katipoğlu et al. also revealed that the average score was not below 6 [23]. However, it has been observed that the rate of watching videos shared by official institutions and organizations is lower than other contributors. This situation suggests that official institutions and organizations should produce more content and enrich their posts with various visuals to increase the viewing rate.

According to a study based on the 2015 AHA guidelines [15], the present results show an almost double increase in accuracy and exchange rates [23]. This can be attributed to increased reliance on online resources to access up-to-date information and improved YouTube video quality. In addition, the fact that health professionals uploaded 85% of the videos with full scores may be because the concern of being watched drives personal accounts.

The authors believe it is necessary to establish a separate section, such as "YouTube Academy", on social media platforms like YouTube, which have significant viewership, specifically for academic and medical topics. These posts should be reviewed by academic advisors and created based on current guidelines. Furthermore, official institutions and healthcare professionals who share vital information such as CPR on publicly accessible platforms like YouTube should follow current literature and guidelines to provide reliable, up-to-date, and comprehensive information.

The main limitation of this study is the subjectivity of the inclusion and scoring criteria used in this study. Only Turkish videos were evaluated for consistency with the 2020 AHA Resuscitation Guidelines [24] and did not consider other resuscitation guidelines (e.g., ERC Resuscitation Guidelines 2021 [25]).

CONCLUSIONS

Turkish videos on BLS and CPR posted on YouTube do not comply with the 2020 AHA guidelines regarding providing basic information to the general population and healthcare professionals cannot obtain advanced medical knowledge through these videos. The higher viewership of videos uploaded by unidentified sources indicates that individuals without expertise in the subject are uploading videos to increase their viewership on popular topics. Implementing a mechanism to review these educational

videos before uploading them to YouTube would ensure the dissemination of accurate, comprehensive, and useful health-related information and increase the viewership of such videos.

Article information and declarations

Author contributions

Conceptualization, A.E.G. and B.K.; methodology, A.E.G. and B.K.; software, A.E.G., V.S., M.Y. and B.K.; validation, K.K., M.P., B.K; formal analysis, A.E.G. and B.K.; investigation, A.E.G., V.S., M.Y., E.S., T.S. and B.K; resources, A.E.G. and B.K.; data curation, A.E.G. and B.K.; writing — original draft preparation, A.E.G. and B.K.; writing — review and editing, A.E.G., V.S., M.Y., E.S., T.S., K.K., M.P., J.S. and B.K; visualization, A.E.G. and B.K.; supervision, B.K. and K.K; project administration, A.E.G. and B.K. All authors have read and agreed to the published version of the manuscript.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author (B.K.).

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Conflicts of interest

The authors declare no conflict of interest.

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