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Original paper

Features and circumstances of out-of-hospital cardiac arrests caught on camera: an analysis of publicly available online videos

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Abstract

Background: Videos of out-of-hospital cardiac arrests (OHCA) publicly shared online provide a rare source to investigate the features and circumstances before and after collapse. They also shape public understanding and attitudes, potentially influencing lay responses and expectations after cardiac arrest. We aimed to collect and analyse videos of out-of-hospital cardiac arrest shared online.

Methods: We conducted a descriptive analysis of publicly available OHCA videos identified through a systematic search of YouTube and Google (November 2024–April 2025). Videos were eligible if they depicted a real-life OHCA. Cardiac arrest features and characteristics were extracted and summarized descriptively.

Results: We identified and analysed 127 videos depicting 145 unique OHCAs from all continents between 1984 and 2025. Most recordings (51 %) originated from closed-circuit television cameras. Victims were male in 87 % of cases, and 53 % had an age greater than 40 years. Prodromal signs were visible in 98 % of cases, lasting a median of 3 s (IQR 2–5), and included slowing or pausing activity (49 %), altered head/arm movements (32 %), and reaching for support (28 %). Post-collapse signs were observed in two-thirds of assessable cases, including seizure-like movements (36 %) and agonal breathing (22 %). Bystanders noticed the collapse after a median of 1 (IQR 1–2) second and approached the victim after 2 (IQR 1–4) seconds.

Conclusions: Publicly available videos of OHCA offer a rare view into the earliest moments of collapse, highlighting consistent recognition cues, frequent misinterpreted signs, and an action gap between recognition and intervention. These insights may inform education, training, and development of novel strategies aimed at improving recognition and response.

Keywords: Sudden cardiac death, Out-of-hospital cardiac arrest, Cardiopulmonary resuscitation, Video analysis, Symptoms

Introduction

Out-of-hospital cardiac arrests (OHCA) represent a significant public health challenge in which both community and professional aspects of the chain of survival are crucial to achieving favourable outcomes.[1] Early recognition, rapid activation of emergency medical services (EMS), and the community's knowledge and willingness to perform cardiopulmonary resuscitation (CPR) until EMS arrive are key determinants of survival.[2,3] Despite their central role, the very first moments of collapse and the immediate reactions of those present are rarely witnessed and available to healthcare professionals,[4] leaving a critical gap in our understanding of how OHCA unfolds in

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real life and the development of novel strategies to improve recognition and response.

In recent years, video depicting real OHCAs have increasingly appeared online, sometimes gaining wide circulation when involving public figures or athletes collapsing during sporting events.[5,6] These recordings provide an unfiltered window into the onset of cardiac arrest, including prodromal signs, collapse dynamics, and the responses of bystanders – unique information that is otherwise inaccessible to clinicians and researchers. At the same time, because these videos are widely viewed online and through social media, they may influence how the public perceives cardiac arrest, shapes attitudes toward resuscitation, and informs willingness to intervene.

To date, a comprehensive systematic collection and analysis of publicly available OHCA videos has never been performed. Such analysis could provide more than a description of what the public sees: it may also generate clinically relevant insights and inform education, communication strategies, and public health campaigns, while also laying the foundation for the development of novel approaches to improve cardiac arrest recognition and response, such as artificial intelligence systems for early arrest detection in public spaces.[7] Accordingly, this study aimed to systematically identify and evaluate OHCA videos available online, focusing on the circumstances surrounding collapse, victims' pre- and post-arrest characteristics, and the actions taken by bystanders.

Methods

Study design

This is a descriptive, video analysis of online OHCA videos collected and downloaded between November 2024 and April 2025. The study is part of the TIME-CARE study (Technological and Patient-tailored Innovations for Maximizing Effectiveness of Cardiac Arrest Resuscitation – ClinicalTrials.gov ID NCT06538155, funded by the European Union – Next Generation EU – NRRP M6C2 – Investment 2.1 Enhancement and strengthening of biomedical research in the NHS), and was approved by the ethical committee (CET 264-2024).

Video search and selection

We performed a systematic search of YouTube and Google to identify videos of real-life OHCAs. The search terms included: "cardiac arrest", "cardiac arrest incident caught on camera", "cardiac death caught on camera", "cardiac infarction", "commotio cordis", "Closed Circuit Television (CCTV) of cardiac arrest", "CCTV of cardiac death", "real cardiac arrest onset video", "real-life cardiac arrest", "sudden cardiac arrest footage", "sudden cardiac death", and "sudden death".

Videos were eligible if depicted a cardiac arrest event occurring in the out-of-hospital setting in individuals of all ages. We excluded cases where the collapse was not visible, where circumstances led us to doubt that the collapse was caused by a cardiac arrest. Examples of excluded cases included videos suspected of depicting cerebral collapse rather than cardiac arrest, such as extensive seizures, spasm activity, or suspected fainting. We also excluded cases where the video resolution was too low for detailed information and cases that appeared staged.

We attempted to confirm each cardiac arrest case through online searches (e.g., from video accompanying text, news reports, or interviews with the victim or their close ones).

All videos were screened by two investigators (KAK, TS).

Data extraction

A structured data extraction form was developed in Excel and piloted before use. For each video, we recorded data categorized into six domains: video characteristics, patient data, circumstances and activity prior to arrest, response to cardiac arrest, and treatment of cardiac arrest. Age was estimated if missing.

OHCA signs prior to collapse were categorized into touching face or neck, deliberately sitting or lying down, visibly stopping or slowing down, change of head or arm movements, reaching for people or surroundings, respiratory signs, touching chest/stomach or chest pain, and neurological signs.

We assessed the public's response to cardiac arrest by examining how bystanders recognised the collapse, approached the victim, and alerted others. Information regarding survival was derived from spoken or written content within the video and, where possible, corroborated using secondary online sources.

Statistical analysis

Data were summarized descriptively. Categorical variables are presented as counts and percentages, while continuous variables are presented as medians with interquartile ranges (IQR). SPSS version 30 (SPSS Inc., Chicago, USA) was used for analysis.

Results

Characteristics of included videos

A total of 127 publicly available videos depicting 145 unique real-life OHCA cases were identified. The median video duration was 58 (IQR, 24–110) seconds. YouTube was the predominant publication platform (142/154, 98 %), followed by digital news media (3/145, 2 %). Videos were recorded between 1984 and 2025. The videos had a global distribution: Asia (35/85, 41 %), North America (29/85, 34 %), Europe (14/85, 17 %), South America (3/85, 4 %), Africa (3/85, 4 %), and Oceania (1/85, 1.2 %). Video recordings originated from CCTV cameras (74/145, 51 %), handheld cameras (38/145, 26 %), and TV productions (29/145, 20 %). Additionally, 2.8 % (4/145) were handheld footage of CCTV recordings. An example of videos frames is available in Fig. 1.

Characteristics of cardiac arrests

Of the 145 victims, 126 (87 %) were male. The median age, available for 52 of 145, was 27 years (IQR, 20–53). Age had to be estimated in the 64 % of cases lacking this information. The largest age group was 40–50 years (31/139, 22 %). Overall, 53 % of victims had a confirmed or estimated age higher that 40 years. Notably, 18 cases involved victims aged 0–20 years (Table 1).

Median time from onset of visible signs to collapse was 3 (IQR, 2–5) seconds, with the longest duration lasting 24 s. Signs prior to OHCA were visible in 98 % (142/145) of the cases. The most common signs were visibly slowing down or pausing activity (71/145, 49 %), changing the pattern of hand or head movements (47/145, 32 %), and reaching for support (40/145, 28 %). Other behaviours included sitting or lying down in a controlled manner (16/145, 11 %), touching the face or neck (15/145, 10 %), and trying to get up after the initial collapse (8/145, 6 %). Respiratory signs like heavy breathing were noted in 6 % (8/145) of the cases, while 12 % (17/145) touched their chest or stomach or expressed chest pain. Neurological signs, such as stretching legs or arm extensions, were observed in 5 % (7/145) of videos. We found no distinct patterns or

Fig. 1 – Representative frames from a publicly available video of out-of-hospital cardiac arrest illustrating the sequence of events: pre-collapse (A), post-collapse (B), bystander response (C), and initiation of basic life support (D).

direction of collapse. Of the 145 cases, 28 % (40/145) fell to their front, 28 % (40/145) to their back, 10 % (15/145) to their right side, 15 % (21/145) to their left side, and 20 % (29/145) straight down.

In 95/145 cases (66 %), post-collapse signs were not assessable due to interrupted or poor video quality. In the remaining 50 cases, visible post-collapse signs were observed in 66 % (33/50). Of these, 22 % (11/50) showed agonal breathing, 36 % (18/50) twitching or limb movements, and 8 % (4/50) both signs (Table 1).

Survival information was available for 88/145 cases (61 %), with 33/88 survivors (38 %) (Table 1).

Circumstances and activity prior to cardiac arrest

Time of day was determined in 78 cases, with 52/78 cases (67 %) occurring during daytime hours. In total 143/145 cases (99 %) were recorded in public settings; 2/145 cases were from private homes. Most cases took place indoors 93/141 (66 %). The most common locations were sports or workout areas (60/145 cases, 41 %), public outdoor spaces (22/145, 15 %), and performance or entertainment venues (21/145, 15 %) (Table 2). The most common activities prior to cardiac arrest were ball sports and dancing with 29/145 (20 %) cases each, followed by walking (22/145, 15 %) and sitting (18/145, 12 %). Overall, 82/145 victims (57 %) were engaged in sports or substantial physical activity such as ball sports, dancing, gym workouts, martial arts, or heavy manual labour (Table 2).

Cardiac arrest was visibly witnessed in 132 of 140 cases (94 %). In 124 of 137 cases (91 %), it was witnessed by bystanders, while in 8 of 137 cases (6 %) it was witnessed by EMS or healthcare personnel (Table 2).

Response to cardiac arrest

Time for bystanders to notice the collapse was available for 102/145 cases (70 %), with a median time of one (IQR, 1–2) second. Time to approach the victim after recognition was available in 87/145 cases (60 %), with a median time of two (IQR, 1–4) seconds. Bystander use of a phone or walkie-talkie, presumably for calling for aid, was observed in 11 cases. The timing for this alert was available in seven cases, with a median time of seven (IQR, 6–23) seconds.

A total of 39 videos (27 %) ended immediately following the collapse. Bystander CPR information was available in 73/145 cases (50 %) and CPR was administered in 28/73 cases (38 %). Of the 28 cases in which bystander CPR was administered, 10 occurred in the United States, 3 in the United Kingdom, 2 in China, 2 in Germany, and the remaining cases were reported from Australia, Brazil, Italy, Portugal, and Spain. For six cases, the country of occurrence could not be determined. Information on CPR from healthcare professionals, police, firefighters, security personnel, or first aid responders was available in 34/145 cases, and interventions were observed in 33/34 cases (97 %).

We were able to assess automated external defibrillator (AED) collection in 30/145 cases (21 %), with visual confirmation of retrieval in 16 cases. The AED was used in nine of those cases. In one additional video, use and retrieval were described in the voice-over but not visible, and AED was attached but not used in another. Implantable Cardioverter-Defibrillator (ICD) discharges were visible and confirmed in two cases.

Discussion

In this descriptive analysis of publicly available videos capturing 145 real-life OHCAs involving individuals of all ages and from all world regions, we identified a consistent pattern of very brief prodromal signs (median 3 s) immediately preceding collapse in almost all patients. There was no single “typical” direction of fall, such as front,

Table 1 – Characteristics of 145 out-of-hospital cardiac arrest cases recorded in publicly available online videos.

Characteristic	OHCA cases (*N* = 145)	Missing, n (%)
Patient sex, n (%)	145 (100)	0 (0.0)
Male, n (%)	126 (87)	
Age, median, n (IQR)*	27 (20–53)	93 (64)
Age groups, n (%)**	139 (96)	6 (4.1)
0–10 years, n (%)	1 (0.7)	
10–20 years, n (%)	17 (12)	
20–30 years, n (%)	28 (20)	
30–40 years, n (%)	21 (15)	
40–50 years, n (%)	31 (22)	
50–60 years, n (%)	23 (17)	
60+ years, n (%)	19 (14)	
Time from visible signs to collapse, seconds (IQR)	3 (2–5)	12 (8)
0–2 s, n (%)	53 (37)	
3–5 s, n (%)	45 (31)	
6–10 s, n (%)	22 (15)	
>10 s, n (%)	13 (9)	
Any post-collapse signs, n (%)	50 (34)	95 (66)
Yes, n (%)	33 (66)	
Type of post-collapse sign, n (%)	33 (100)	
Agonal breathing, n (%)	11 (33)	
Movements, n (%)	18 (55)	
Both agonal breathing and movement, n (%)	4 (12)	
Survival, n (%)	88 (61)	57 (39)
Yes, n (%)	33 (38)	

Abbreviations: OHCA, out-of-hospital cardiac arrest; IQR, inter quartile range. Percentages may not total 100 due to rounding.
* Confirmed age.
** Include cases in which the confirmed age was unavailable, and the age group was estimated.

Table 2 – Circumstances and activity before cardiac arrest in 145 out-of-hospital cardiac arrest cases recorded in publicly available online videos.

Characteristic	OHCA cases (*N* = 145)	Missing, n (%)
Location of collapse, n (%)	145 (100)	0 (0)
Sports and workout areas, n (%)	60 (41)	
Public and outdoor spaces, n (%)	22 (15)	
Performance and entertainment venues, n (%)	21 (15)	
Commercial area, n (%)	13 (9)	
Offices and workplaces, n (%)	11 (8)	
Educational or institutional buildings, n (%)	8 (6)	
Hospitality and event venues, n (%)	4 (3)	
Public and outdoor spaces, n (%)	2 (1)	
Religious areas, n (%)	2 (1)	
Indoor residential areas, n (%)	2 (1)	
Transportation areas, n (%)	2 (1)	
Indoors/outdoors, n (%)	141 (97)	4 (3)
Indoors, n (%)	93 (66)	
Outdoor, n (%)	48 (34)	
Time of day, n (%)	78 (54)	67 (46)
Day, n (%)	52 (67)	
Night, n (%)	26 (33)	
Type of activity prior to cardiac arrest, n (%)	145 (100)	0 (0)
Ball sports, n (%)	29 (20)	
Dancing, n (%)	29 (20)	
Walking, n (%)	22 (15)	
Sitting, n (%)	18 (12)	
Workout at gym, n (%)	17 (12)	
Standing, n (%)	14 (10)	
Singing/acting, n (%)	7 (5)	
Martial arts, n (%)	4 (3)	
Driving, n (%)	2 (1)	
Heavy manual labour, n (%)	2 (1)	
Drowning, n (%)	1 (1)	
Witnessed arrest, n (%)	140 (97)	5 (3)
Yes, n (%)	132 (94)	
Witnessed by, n (%)	137 (95)	8 (6)
Bystanders, n (%)	124 (86)	
EMS or healthcare personnel, n (%)	8 (6)	
Unwitnessed, n (%)	5 (3)	

Abbreviations: OHCA, out-of-hospital cardiac arrest. Percentages may not total 100 due to rounding.

back, lateral, or straight down. In addition, two-thirds of patients displayed post-collapse signs such as seizure-like movements and/or agonal breathing, which were often mistaken by bystanders for signs of life, leading to delayed recognition of cardiac arrest and initiation of CPR. The videos also permitted characterisation of bystander actions, including time to recognition, delay to approach, and whether CPR was initiated. Collectively, these observations offer an uncommon, third-person view of the earliest moments of OHCA, rarely available to clinicians, and highlight specific, observable cues that can be translated into educational content and potentially into improve cardiac arrest recognition and response.

Prodromal behaviours were visible in 98 % of cases and clustered around visibly slowing or pausing activity, altered head/arm motor patterns, and reaching for support. Although brief, these cues are visually salient: a sudden pause or loss of purposeful movement, a stumble with an immediate reach for nearby objects or people, or an abrupt interruption of an otherwise regular limb or head motion should prompt concern and rapid assessment.

Post-collapse signs, agonal breathing, abnormal movements, or both, occurred in roughly two-thirds of cases. Frontera et al. reported gasping in 31 % and seizure-like movements in 21 % of OHCA victims, along with eyes held wide open and frequent urine/stool emission and vomiting.[8] Perera and colleagues found that around 7 % of OHCAs were described by callers as “breathing,” using terms such as “barely”, “gasp”, “deep, big breaths”, and “laboured”.[9] Linzer et al. noted that OHCA may be mistaken for epilepsy because syncope with anoxic seizures can mimic epileptic activity.[10] These signs are often misclassified by laypeople, delaying CPR. Similar presentations may also appear in non-arrest conditions such as epileptic seizures or opioid overdose,[11] which require different interventions.[12,13] These findings reinforce a core message: gasping is not normal breathing, and that prolonged (more than a few seconds long) seizure-like movements are common in early arrest; both require immediate EMS activation and CPR in an unresponsive person who is not breathing normally. Layperson-initiated chest compressions in patients later determined not to be in cardiac arrest rarely caused injury.[14] This must be emphasized in public/professional training and in dispatch and telephone-CPR protocols.[15,16]

Despite median recognition and approach times of 1 and 2 s, respectively, bystander CPR was documented in only 38 % of cases with available data, and AED retrieval or use was rare, observations consistent with previous findings on these topics.[17–19] In addition to appropriate actions (alerting others and initiating CPR), recordings revealed a wide spectrum of non-relevant responses and cultural practices, including shaking the victim's legs, fanning, rubbing hands with liquids, and, in some instances, no treatment at all. Interpretation is constrained by truncation, many videos ended shortly after collapse, and by the fact that bystander CPR was only assessable in about half of cases. There was no evidence of dispatcher-directed CPR in the videos.

Current resuscitation teaching already highlights agonal breathing and seizure-like activity as common in early arrest and emphasises immediate CPR. Our video-based observations reinforce these messages with concrete, real-world imagery and timings, suggesting value in incorporating curated, ethically sourced footage into lay and professional training to improve recognition fidelity and decisional confidence. In addition, the visually recognisable sequence we observed (brief premonitory slowing, sudden transition from upright to supine/prone/lateral, subsequent motionlessness punctuated by agonal or abnormal movements) corresponds closely to features that computer-vision systems can detect (posture change, activity cessation, respiratory/limb kinematics). In the future, these videos could be used for the development of novel approaches to improve cardiac arrest recognition and response, such as artificial intelligence systems for early arrest detection in public spaces.[7]

Strengths and limitations

The strengths of this work include a comprehensive and systematic search of publicly available online sources for OHCA videos, resulting in a globally distributed dataset spanning several decades and diverse contexts. This approach enabled detailed extraction of visual and behavioural features rarely accessible to clinicians, such as prodromal signs, collapse dynamics, and early bystander responses. However, several limitations must be acknowledged. First, this dataset is not epidemiologically representative of OHCA and should not be interpreted as such. Unlike cardiac arrest registries, our aim was not to characterise incidence or population demographics but to analyse visual features and circumstances captured in publicly available videos. Despite a systematic search, publicly shared footage disproportionately depicted crowded, dramatic, or sport-related events involving younger males,[20] while arrests in private homes, the most common OHCA setting, were almost entirely absent. This likely contributed to the unusually young median age in our cohort, as cardiac arrests in younger individuals are more often recorded and disseminated online than those involving older adults. Second, patient demographics, outcomes, and confirmed diagnosis of cardiac arrest were frequently incomplete or unavailable, despite attempts to corroborate from secondary sources. Third, the median video duration was approximately one minute, often centred on pre-event circumstances, limiting assessment of post-arrest care and resuscitation efforts. Low resolution, unfavourable camera angles, edits, and occlusions may have introduced measurement error in timing and behavioural classification.

Conclusions

Publicly available videos of OHCA offer a unique view into the earliest moments of collapse, highlighting consistent recognition cues, frequent misinterpreted signs, and an action gap between recognition and intervention. We identified a consistent pattern of very brief prodromal signs (median 3 s) immediately preceding collapse in almost all patients. In addition, two-thirds of patients displayed post-collapse signs such as seizure-like movements and/or agonal breathing that were commonly misinterpreted. The videos also permitted characterisation of bystander actions, including time to recognition, delay to approach, and whether CPR was initiated. These insights may inform education, training, and development of novel strategies aimed at improving recognition and response.

CRediT authorship contribution statement

Kristin Alm-Kruse: Writing – review & editing, Writing – original draft, Formal analysis, Data curation, Conceptualization. **Tommaso Scquizzato:** Writing – review & editing, Writing – original draft, Software, Resources, Methodology, Formal analysis, Data curation, Conceptualization. **Matteo Di Mauro:** Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Junling Fu:** Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Arianna Gazzato:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Maria Vargas:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Conceptualization. **Maria Caterina Pace:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Conceptualization. **Giacomo Monti:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Investigation, Conceptualization. **Elena De Momi:** Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Conceptualization. **Giovanni Landoni:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Conceptualization. **Anna Mara Scandroglio:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Conceptualization. **Alberto Zangrillo:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Conceptualization.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: TS is the Social Media Editor of Resuscitation.

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