Media-based clinical research on selfie-related injuries and deaths

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ABSTRACT

BACKGROUND: The incidence of taking selfies and sharing them on social media as well as selfie-related behaviors is increasing, particularly among young people, possible leading to selfie-related trauma. Therefore, we performed this clinical study to draw attention to selfie-related injuries and deaths.

METHODS: We analyzed 159 selfie victims from 111 events or accidents, which were reported in the media sources. We evaluated vital results, demography, rhythmicity, preferences, event or accident types, selfie-related risk factors, affected body regions of victims with causes of injury, and death.

RESULTS: We found that the majority of selfie victims were students. Selfie-related injuries and deaths were reported most frequently in India, the US, and Russia. The most preferred site of taking selfies was the edge of the cliff. The most frequently reported event or accident type was falling from a height. Mostly multiple body parts were affected in selfie-related injuries and deaths. The most frequent causes of selfie-related deaths were multitrauma and drowning.

CONCLUSION: Selfie-related injuries and deaths have increased in the past years. Particularly, teenagers and young adults are at high risk for selfie-related traumas and deaths; therefore, drastic measures should be taken to reduce their incidence.

Keywords: Death; injury; selfie.

INTRODUCTION

With the increase in the smart phone production and innovative social media applications in the last decade, selfies have become an essential part of our daily lives, with multiple influences as a social media phenomena or a syndrome of crazy behaviors, particularly among young people. A study has shown that 98% of the youth owns a mobile phone and they are heavy users (>4 h day−1).[1] In 2014, a social survey conducted by the TIME Magazine listed 459 cities as “The Selfiest Cities in the World.” Among 459 cities, Makati City, Pasig, and Philippines were ranked as number 1 (258 selfie-takers per 100,000 people); Manhattan and New York as number 2 (202 selfie-takers per 100,000 people); and Miami and Florida as number 3 (155 selfie-takers per 100,000 people).[2]

Clinical researches in the realm of psychiatry suggest that heavy selfie-taking and sharing selfies on social media sites (selfie-related behaviors) and/or smartphone addiction are closely associated with narcissism and psychopathology.[3] Furthermore, some clinical trials on selfie-posting suggest that self-objectification and self-presentation behaviors on social websites, particularly for males, are also components of the dark triad of personality (Machiavellianism, narcissism, and psychopathy).[4,5] The neurocognitive reflections of intensive smartphone usage and selfie-related behaviors have been reported as temporary distractions and momentary lack of self-awareness in the...
current literature. Selfie-related behaviors and smartphone addiction also result in selfie-related traumatic risks and may cause injuries and deaths, generally in teenagers and young adults who take selfies in every moment of their daily lives. Smartphone addiction and selfie-related behavioral phenomena may also have negative effects on preteenagers as well as other living things in the nature. The number of selfie-related events and accidents is still on the rise. Recently, certain countries have introduced protective projects and a number of restrictive regulations to encourage safe use of smartphones and reduce selfie-related hazards or risks.

In this study, we prepared a media-based clinical research with a multifaceted perspective that was targeted to emphasize the importance of selfie-related injuries and deaths.

MATERIALS AND METHODS

Study Design

Study type: Clinical observational study (Original Research); cross-sectional design without controls.
Level of evidence: 4.14

Cases and Data Collection

In this media-based clinical study, we included 159 victims (humans only) involved in 111 different events or accidents related to selfies that were reported in media resources between December 2013 and January 2017 (a 38-months period). Following media resources were cited for selfie-related cases: 108 cases from Wikipedia’s official website, two from Turkish national media resources, and one from a Pakistani media resource. We performed a careful and detailed examination of all media resources to evaluate selfie-related injuries and deaths. (131 media resources from Wikipedia Pages and three from others). Among these media resources, we picked the ones that fit the criteria previously determined by us for our study and transferred the resources to an excel file as scientific data. We coded the data we could not find on media resources as "unknown or not reported." We determined that a group selfie consisted of >2 people in a particular pose and heavy selfie-taking as >4 h day⁻¹. Those aged 18–64 years were considered as the active age group taking selfies and using social media. We also regarded the injuries and deaths that occurred outside of the selfie-taking, but happened coincidentally during or after as “extra injuries” and “extra deaths.”

Statistical Analysis

Our study comprises data measured on categorical levels. Thus, descriptive statistics are given in tables showing frequency and percentage values along with pie-charts and bar graphs. In the inferential statistics section, Chi-square statistics method was used for comparing two categorical variables, and Cramer’s V coefficient was used for the correlation relation between two categorical variables.

Ethical Statement

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki, “Ethical Principles for Medical Research Involving Human Subjects.” The protocol was approved by Zirve University Ethics Committee (Permit number: 2014/19).

RESULTS

Demography

Among the 111 events or accidents examined, we determined that the total case (dead and injured) number was 159, the average age was 23.36±10.1 years, the number of dead people was 137, and the number of injured people was 22. We determined that the male to female ratio in these cases was higher. The average ages in selfie-related deaths and injuries were 23.48±10.1 (9–68) years and 22.63±10.1 (6–50) years (Table 1), respectively. We determined that the injury and death rates per event or accident were 0.19 (0–5) and 1.23 (0–7), respectively. When the social statuses of selfie victims were examined through our study, it was determined that students (particularly high school and university students) were predominant (84, 52.8%); the numbers of domestic and foreign (international) tourists were 78 (49%) and 15 (9.4%), respectively. The number of local resident was 66 (41.6%). We found that the country distribution and nationality distribution of selfie-related injury and death cases were highly compatible. The first three countries in terms of frequency of such events and victims were India (45 events or accidents, 40.5%; 75 victims, 47.2%), the US (10 events or accidents, 9%; 11 victims, 6.9%), and Russia (8 events or accidents, 7.2%; 10 victims, 6.2%), respectively (Fig. 1). The total number of extra injured people and extra dead was reported as 19 and 6, respectively by media sources.

Rhythmicity

We determined that the number of selfie-related injuries and deaths significantly increased per year (2014–2015 and 2016) (Fig. 2). When selfie-related injuries and deaths were examined according to months, we determined that the most

Table 1. Demographic data of selfie victims

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Age (Mean±SD)</th>
<th>(Min–Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>137</td>
<td>23.48±10.1</td>
<td>(9–68)</td>
</tr>
<tr>
<td>Male</td>
<td>104</td>
<td>23.12±9.7</td>
<td>(13–66)</td>
</tr>
<tr>
<td>Female</td>
<td>33</td>
<td>24.60±11.6</td>
<td>(9–68)</td>
</tr>
<tr>
<td>Injured</td>
<td>22</td>
<td>22.63±10.1</td>
<td>(6–50)</td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>21.5±10.6</td>
<td>(14–50)</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>24.0±9.8</td>
<td>(6–43)</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>23.36±10.1</td>
<td>(6–68)</td>
</tr>
</tbody>
</table>

SD: Standard deviation; Min: Minimum; Max: Maximum.
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Events or accidents occurred in August (18 events or accidents, 16.2%), July (16 events or accidents, 14.4%), and June (13 events or accidents, 11.7%). Conversely, the number of events or accidents reported in March, November, and December was the lowest and the same (5 events or accidents, 4.5%). When selfie-related injuries and deaths were examined in weekdays, most cases occurred on Saturdays (24 events or accidents, 21.6%) and Fridays (23 events or accidents, 20.7%); the lowest number of events or accidents was reported on Thursdays (15 events or accidents, 13.5%). Additionally, higher number of events or accidents occurred in the post-meridiem (p.m.) time interval (74 events or accidents, 66.7%).

Preferences

We found that selfie-related injuries and deaths mostly occurred in city suburbs (64 events or accidents, 57.7%). We also determined that selfie victims preferred natural scenes for a selfie (48 events or accidents, 43.2%); we also found out that the number of mono or alone selfies is higher than that of group selfies (>2 people) (60 events or accidents, 54%)

(Table 2). In this study, we determined that selfie victims mostly preferred to take selfies on the edge of a cliff (17 events or accidents, 15.3%). Selfie stick usage among selfie victims was remarkably low (2 events or accidents, 1.8%) We determined that total number of people in a selfie pose was 206, and 75.7% of these people were affected from selfie-related injuries and deaths.

Figure 1. The distribution of selfie-related injuries and deaths according to countries.

Figure 2. Increase in selfie-related injuries and deaths by years.

Table 2. Some preferences of selfie victims

<table>
<thead>
<tr>
<th>Preferences</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside the city</td>
<td>64</td>
<td>57.7</td>
</tr>
<tr>
<td>In the city</td>
<td>47</td>
<td>42.3</td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
<td>100</td>
</tr>
<tr>
<td>Scene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature and associated environments</td>
<td>48</td>
<td>43.2</td>
</tr>
<tr>
<td>Train, railway, and associated structures</td>
<td>22</td>
<td>19.9</td>
</tr>
<tr>
<td>Buildings and associated structures</td>
<td>17</td>
<td>15.3</td>
</tr>
<tr>
<td>Road, bridge, and associated structures</td>
<td>12</td>
<td>10.8</td>
</tr>
<tr>
<td>Dam and associated structures</td>
<td>7</td>
<td>6.3</td>
</tr>
<tr>
<td>Fields, farms, and associated structures</td>
<td>4</td>
<td>3.6</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
<td>100</td>
</tr>
<tr>
<td>Selfie stick use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown or not reported</td>
<td>109</td>
<td>98.2</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
<td>100</td>
</tr>
<tr>
<td>Selfie type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mono Selfie</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>Group Selfie (&gt;2 people)</td>
<td>51</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
<td>100</td>
</tr>
</tbody>
</table>
Event or Accident Categories

We determined that the most common event or accident type causing selfie-related injuries and deaths was falling from height (28 events or accidents, 25.2%) (Fig. 3). The most frequent causes of selfie-related deaths were multitrauma due to various causes (58 victims, 42.3%) and drowning (57 victims, 41.6%) (Fig. 4). The most frequent cause of selfie-related injuries was multitrauma due to falling from height (6 victims, 27.3%). The most common place of death in selfie-related deaths was the scene of accident (99 victims, 72.3%).

No deaths during transportation from the scene of accident to a hospital were reported. The most common body parts to be affected in selfie-related injuries and deaths were multiply body parts (>3) (76 victims, 47.8%) (Table 3).

Risk Factors

The most common behavioral risk factor in selfie-related injuries and deaths was people exhibiting dangerous behaviors for themselves and others around them (61 events or accidents, 55%). Neurocognitive risk factor causing negative effects (losing balance, temporary distraction, and/or lack of self-awareness) during selfie-taking was determined in 99 events or accidents (89.2%).

Comparisons

Chi-square test was conducted to determine the relation be-

Table 3. Body regions and/or systems affected by selfie-related injuries and deaths

<table>
<thead>
<tr>
<th>Body regions and/or systems</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head-Neck</td>
<td>14</td>
<td>8.8</td>
</tr>
<tr>
<td>Chest-Abdomen-Back</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Extremity</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Multiple body parts (&gt;3)</td>
<td>76</td>
<td>47.8</td>
</tr>
<tr>
<td>Non-traumatic or systemic effects</td>
<td>56</td>
<td>35.2</td>
</tr>
<tr>
<td>Multiple body parts (&gt;3) and systemic effects</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Extremity and systemic effects</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 3. Event or accident types in selfie-related injuries and deaths.

Figure 4. Causes of death of selfie victims.
between the affected body parts and/or systems and event or accident types and causes of death. The results were significant in both relations (p=0.001). Additionally, mildly positive relationships between the affected body parts and/or systems and event or accident types and causes of death of (r=0.67) and (r=0.83), respectively, were determined according to the Cramer’s V coefficient. Similarly, the results of chi-square test were significant in terms of relation; a mildly positive relationship between event or accident types and causes of death was determined according to the Cramer’s V coefficient (p=0.001 and r=0.85).

DISCUSSION

In 2013, more than 23 million selfies were shared on Instagram, and by the end of that year, the Oxford Dictionary declared “selfie” as “the word of the year” because its number reached 57 million. Selfie phenomenon particularly in young adult males has been a focus for neuropsychiatry for the last couple of years to point out narcissistic, psychopathologic, and prejudice-based asymmetrical behavioral tendencies, along with its negative effects (loss of balance, temporary distraction, and momentary loss of self-awareness) and positive effects (promoting positive affect through smartphone photography) with reference to reflecting the complexity of human behavior. People with high narcissism demonstrate intense self-focus, activity changes particularly in the anterior insula, and neuronal differences mainly in the right anterior insula. Selfie syndrome mainly concerns active, traveling age group; the various preventable traumatic risks of this syndrome concern travel medicine, emergency medicine, and preventive medicine. Heavy selfie-taking or smartphone, selfie, and social media addiction introduced a new generation to social area researchers, the “Scarengers,” who learn everything from the digital screen. Scarengers are thought to be in the teenager age group (13–19 years). Due to their high intellectual abilities and dynamism, scarengers tend to create a whole new special risk group in selfie-related injuries and deaths. Another important risk group is young adults (15–29 years). The studies of Dutta et al. and Sarosh et al. conducted on school-age adolescents and professional students showed that these age groups are heavy selfie-takers. No significant difference was determined in their gender-wise statistics. A research conducted in 2014 showed that social media was most frequently used by individuals aged between 18 and 29 years. Although the cases used in our study were in accordance with current researches in terms of social status and age groups, our study showed that males had a significantly higher risk for selfie-related injuries and deaths.

Wikipedia, a free online encyclopedia launched in 2001, is one of the most visited websites worldwide and is often consulted for health-related information; it was the major source of cases in this study. It is a common belief that the media sources in many cases are unreliable or false; therefore, all media resources (134 in total) in our study were meticulously and exactly evaluated by all researchers to increase the reliability of this media-based clinical research.

A research conducted by the TIME Magazine in 2014 listed “The Selfiest Cities in the World.” Even though none of the Indian cities were listed in the top 100 selfiest cities, we determined that India had the highest number in selfie-related injuries and deaths, suggesting that there is no strong correlation between the selfiest cities list and the cities where most selfie-related injuries and deaths actually occur. The security of the environment while taking a selfie might be a more important factor. However, India’s high teenager and adolescent population and the easy access of these groups to smartphone technology along with the fast increase of smartphone addiction might be regarded as potential factors for selfie-related injuries and deaths. The significant increase in the number of selfie-related injuries and deaths per year (2014–2015 and 2016) may be associated with the increase in the number of heavy selfie-takers and dangerous selfie-taking, with smartphone addiction and selfie-related behaviors, particularly among young people in recent years. In addition, the fact that the smartphone technology has developed a lot in such a short time and become accessible to everyone, along with the Selfie Phenomenon becoming popular, may also be important factors for the increase in selfie-related injuries and deaths. The sudden increase in selfie-related injuries and deaths especially in summer months and on weekends might be explained by people preferring these times for social activities and traveling. Selfie-related injuries and deaths are mostly seen in post-meridiem (p.m.) time interval, and this can be explained by people’s preference in daily communication and activity in social media sites timelines.

We determined that certain behavioral (exhibiting dangerous behaviors as the most frequently reported one) and cognitive (losing balance, temporary distraction, and/or the lack of self-awareness) risk factors had significantly high ratios in our study. Some neuroscience researches suggested that selfish victims often use emotionally controlled mental reflection by emphasizing extroversion of the crazy personality by choosing natural environments and dangerous areas such as the edge of a cliff and railways for posing. So, the Amygdala’s representation of the motivational activity of happy and angry facial expressions has been a neurocognitive explication of adventure and fearful poses. Therefore, dangerous places and poses exhibiting dangerous behaviors of selfie victims in our study are consistent with the current literature. In terms of functional anatomy, the left-sided face poses are predominantly controlled by the right hemisphere during selfie, and the right amygdala is active in fear expression. Moreover, in narcissism, the suppression of the left hemisphere that controls cognitive functions with right insular activity results in loss of environmental control in the victims. In such a case, it is difficult to prevent possible accidents including self-
The fact that affected multiple body parts (>3) and multiple traumas from various reasons (falling from height, being hit/ crushed by trains, truck collision, and many more) being the most frequent consequences can be explained by event or accident types and severity. In addition, the events that trigger each other can be explained as the domino effect. A typical example of this might be a victim being run over while taking a selfie in front of a moving train, experiencing multiple body parts and serious injuries or death caused by multiple traumas. The low selfie stick usage rate we determined in our study may be explained by alone or mono selfies being more common. Injury type or severity, physical situation of the scene, and helping hands in the selfie pose and around the scene may be effective in selfie-related deaths mostly occurring on the accident scene. In this study, we also determined that the majority of our selfie victims were tourists (domestic or international), and this can be explained by the fact that people take more selfies during traveling. Our findings are also supported by the current literature.

Conclusion
Selfie-related injuries and deaths have increased in recent years. All countries, particularly India, US, and Russia are at a high risk. Teenagers and young adult males are in the high-risk group for selfie-related injuries and deaths. Dangerous pose preferences, exhibiting dangerous behaviors, deaths and injuries wherein many body parts are affected caused by multiple traumas, and cognitive and behavioral risk factors are important for selfie-related injuries and deaths. Dangerous consequences of selfie-related behaviors should be assessed from a multidisciplinary point of view. Drastic measures should be taken to reduce selfie-related risks, and social projects to protect young people from selfie-related hazards should be encouraged.

Acknowledgment
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Özçekim ilişkili yaralanma ve ölümler analizi

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GEREÇ VE YÖNTEM: Çalışmamızda medya kaynaklarında rapor edilen 111 özçekim olayı veya kaza ile ilişkili 159 olgu değerlendirildi. Özçekimle ilişkili yaralanma ve ölümlerin nedenleri ile birlikte kurbanların vital bulguları, demografileri, ritmleri, tercihler, olay veya kaza tipleri, risk faktörleri ve etkilenen vücut bölgeleri değerlendirildi.


Anahtar sözcükler: Ölüm; yaralanma; özçekim.