

Evaluation of the Quality and Scientific Accuracy of YouTube Videos as a Source of Patient Education Information on Skin Self-examination

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ABSTRACT

Objective: YouTube is currently being used for obtaining healthcare-related information. The objective of the study was to evaluate the quality and scientific accuracy of YouTube videos as a source of patient education information about skin self-examination. **Methods:** A YouTube search was conducted using keywords: skin self-examination and skin self-exam. First 100 videos of each search term (total 200) were included. Videos with irrelevant content, non-English videos, and videos with no audio or visuals were excluded from the study. Selected videos were divided into two groups based on the source of the video: healthcare group and non-healthcare group. A 5-point Global Quality Score (GQS) was used to evaluate quality and a 9-point content score was used to assess the scientific accuracy of the videos. Total views and number of days since upload were noted. **Results:** Of the 200 videos, 22 videos were selected for the study. The mean GQS and content score of all videos assessed were four and 8.09 respectively. Of these, 19 videos were uploaded by healthcare group. The mean GQS and content score of these videos were 4.11 and 8.11, respectively. Three videos were uploaded by non-healthcare group. The mean GQS and content score of these videos were 3.33 and 8 respectively. There was no statistical significant difference ($P < 0.05$) for all the measured variables among videos based on source. **Conclusion:** There is potential to increase public awareness about skin self-examination by utilizing YouTube. Considering there is a lot of low-credibility information, people need to be guided to reliable videos.

Keywords: Skin cancer, Skin self-exam, Skin self-examination, YouTube
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INTRODUCTION

To date, skin cancer has become a major public health issue around the world. As per the World Health Organization, 2–3 million non-melanoma and 132,000 malignant melanoma skin cancer cases occur worldwide consistently. As ozone levels are depleted, the environment loses increasingly more of its defensive filtering capability allowing solar Ultraviolet (UV) radiation to reach at the Earth's surface. It is estimated that an additional 300,000 non-melanoma and 4500 melanoma skin cancer cases will be reported with a 10% decline in ozone levels.^[1]

Melanoma is a cancer that develops from pigment-producing melanocytes in the skin. Melanocytic nevi, also known as moles, are benign neoplasms composed of groups of melanocytes that can be present at birth or develop throughout childhood and young adulthood. Nonetheless, inherited or acquired DNA mutations, particularly those caused by UV radiation exposure can cause malignant changes in melanoma.^[2] Melanoma risk varies greatly depending on genetic, demographic, and behavioral factors.^[3] Melanoma in the family, fair skin and hair, a large number of moles, and even profession^[4] can all contribute to an increased overall risk.

UV radiation from the sun and other artificial sources is the most common preventable cause of skin cancer.^[5] Appropriate primary prevention strategies may aid in reducing the number of new skin cancer cases. The American Cancer Society recommends the following key strategies to avoid excessive UV radiation exposure: (1) Seek shade when out in the sun, especially between 10:00 a.m. and 4:00 p.m.; (2) Wear protective clothing (long-sleeved shirts, long trousers, or long skirts); (3) Wear caps with a wide brim; (4) Apply sunscreen with a sun protection factor of 30 or higher; and (5) avoid tanning beds.^[6] Secondary skin cancer prevention

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strategies include promoting early detection, professional skin examinations, and regular self-examinations of the skin.^[7]

Early detection of melanoma is possible due to skin lesions. Lesions on the skin should be examined for color, shape, and size. Early detection of melanoma results in a better prognosis for the cancer.^[8] Individuals must be aware of skin cancer and capable of performing skin self-examinations in order to receive timely diagnosis and treatment.^[9]

The internet, particularly platforms with abundant visual content such as YouTube (www.youtube.com), is now the most popular and frequently used source of information for people of all ages all over the world. There are two billion YouTube users worldwide; one billion hours of video are watched on YouTube

each day; and 500 h of video are uploaded to YouTube every minute.^[10]

In the past, studies have analysed YouTube videos as a source of information about breast self-examination^[11] and testicular self-examination.^[12] To the best of our knowledge, no studies have evaluated the content of YouTube videos on skin self-examination. The aim of this study was to evaluate the quality and scientific accuracy of YouTube videos as a source of patient education information about skin self-examination.

METHODS

Data Collection

On August 16, 2021, videos on YouTube were searched using the keywords skin self-examination and skin self-exam. The only search filter used was “sort by relevance” as the default filter for YouTube searches. Videos were searched after clearing of cache and using a new YouTube account to minimize results biased by cookies, personal settings, and browser history.

More than 90% of YouTube users clicked only the first 60 videos of search results to receive the desired information.^[13] First 100 videos for each search term were included in this study with the assumption that users would not go beyond the first 100 videos of search results. So the selection processes yielded total of 200 videos. Our methods were previously used in multiple studies that assessed YouTube as a source of patient education.^[12,14,15]

Inclusion and Exclusion Criteria

The ideal videos for us to evaluate were those that provided scientific, accurate, and comprehensive information about skin self-examination, as well as those that included all of the steps for performing skin self-examination. For this purpose, we included in our study videos in English that provide general information about skin self-examination as well as those that showed the steps of skin self-examination.

Some videos contained speeches by skin cancer survivors, physicians, or other individuals who provided information about skin cancer. However, skin self-examination was only mentioned as a word or sentence, and the items we intended to evaluate about skin self-examination were not mentioned; instead, we described them as irrelevant to our goals and excluded them. Videos with irrelevant content, non-English videos, and videos with no audio or visuals were removed from the playlist during the evaluation. Repeated videos were viewed as a single entity.

Uniform resource locators for all selected video samples included in the study were saved for data archiving and future reference.

The following information was extracted from each video: upload date, number of views, and source of the video. Average daily views were calculated by dividing the number of views by the number of days online.

Sources of Videos

The source represents the person or group that uploaded the video and were classified into:

Group 1: Healthcare group: Healthcare professionals, medical centers, professional organizations, and healthcare foundations.

Group 2: Non-healthcare group: Television channel, websites and lay persons.

Included videos were evaluated for overall quality and scientific accuracy of information about skin self-examination.

Global Quality Scale (GQS)

The quality of the videos was evaluated by GQS (Table 1), which has been used in many studies in the literature.^[11,12,14,15] It is a five-point scale based on the quality of information, flow, and ease of use of the information present online.

Content Analysis

Since there is no standardized system for evaluating the scientific accuracy of the skin self-examination videos, content analysis (Table 2) was devised by referring to the guidelines by recognized health organizations^[16,17] containing nine questions. The answer “no” was scored 0 point and the answer “yes” scored 1 point. Total points for each video were counted. Based on the sum of the points, the videos were scored as scientifically excellent (9), good (7–8), moderately good (5–6), poor (3–4), or very poor (0–2).

Table 1: GQS

Quality of videos	Score
Poor quality, poor flow, most information missing, not helpful for viewers	1
Generally poor, some information given but of limited use to viewers	2
Moderate quality, some important information is adequately discussed	3
Good quality, good flow, most relevant information is covered, useful for viewers	4
Excellent quality and excellent flow, very useful for viewers	5

GQS: Global Quality Score

Table 2: Content analysis

Has it mentioned the following important points related to skin self-examination?	
Frequency: Check skin regularly, typically once a month	1
Material needed: A skin self-exam is best done in a well-lit room in front of a full-length mirror and using a hand-held mirror	1
Alert findings: Notice any new spots on your skin, spots that are different from others, or spots that are changing, itching or bleeding	1
Limitations: It's important to understand that these are not the only ways skin cancer can appear, so annual professional screening is advisable	1
Has it mentioned the following steps of skin self-examination?	
Full body: examine body front and back in the mirror, then look at the right and left sides with your arms raised	1
Hands: bend elbows and look carefully at underarms, forearms, and palms	1
Legs: look at the back of legs and feet, spaces between toes, and the soles of feet	1
Neck and scalp: examine the back of the neck and scalp with a hand mirror, part hair for closer look	1
Back and buttocks: finally, check back and buttocks with hand mirror	1
Total	9

Two independent researchers reviewed and analyzed all of the videos. Disagreements among the researchers about the scoring criteria for a specific video were settled by debating the issue until a consensus was reached.

Statistical Analysis

Statistical analysis was performed using the IBM SPSS 20 statistical software (IBM, Armonk, NY, USA). Mean, standard deviation was calculated for all the variables. Independent *t*-tests were done to compare the mean values. *P* < 0.05 was considered significant.

RESULTS

As shown in Figure 1, 100 videos were screened for each of the two search terms (total = 200). According to exclusion criteria, 178 were discarded, 22 unique videos met the inclusion criteria.

The total number of views for all videos was 175,153 with an average daily view of 388. Descriptive statistics for the included videos are shown in Table 3. The mean GQS score was 4, indicating good quality, good flow, most relevant information is covered, useful for viewers. The mean content score was 8.09, indicating good scientific accuracy.

Figure 2 shows number of videos according to content score. There were 8 (36.36%) video that covered all the nine instructions about skin self-examination correctly. Eight (36.36%) videos

covered 8 instructions and 6 (27.27%) videos covered seven instructions correctly.

The results for each step are shown in Figure 3. Informing viewers that skin self-examination is best done in a well-lit room in front of a full-length mirror by using a hand-held mirror and instructions regarding steps to conduct the skin self-examination were correctly displayed most of the videos. Alerting the viewers about the limitations of skin self-examination and informing them about the annual screening from professionals were missed in 13 (59.09%) videos.

The distribution of the videos according to sources of upload is shown in Figure 4. Out of 22, 19 videos (86%) were uploaded

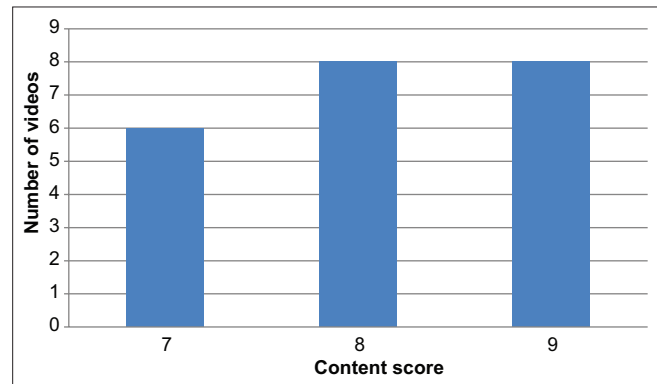


Figure 2: Number of videos according to content score

Table 3: Descriptive statistics of evaluated videos

Variable	Mean	Standard deviation	Minimum	Maximum
Views per day	3.88	6.32	0.12	29.12
GQS score	4	0.69	3	5
Content score	8.09	0.81	7	9

GQS: Global Quality Score

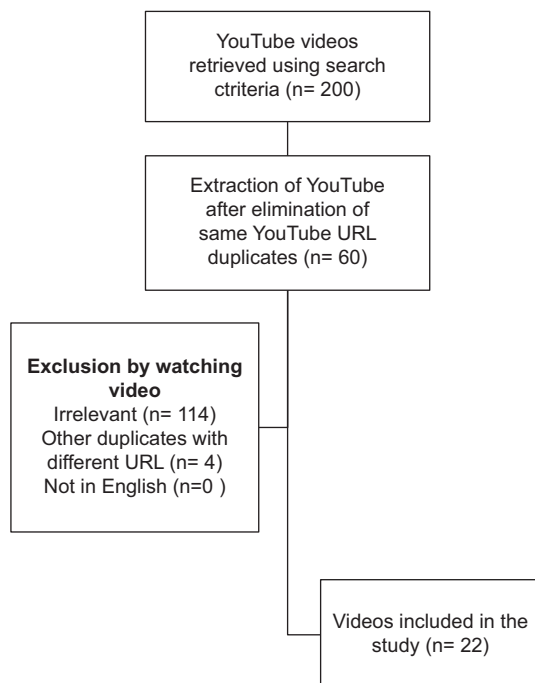


Figure 1: Flow chart of the search results and screening process

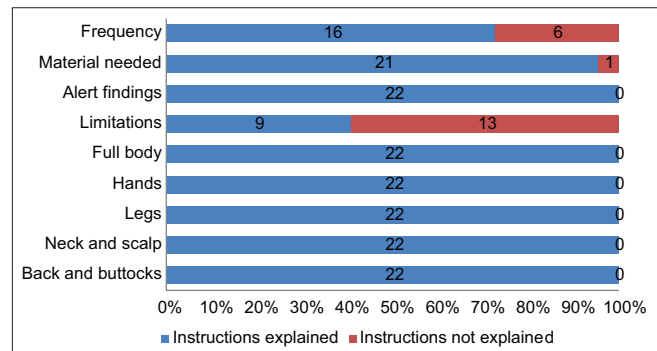


Figure 3: Number of instructions of skin self-examination explained and not explained in the analysed videos

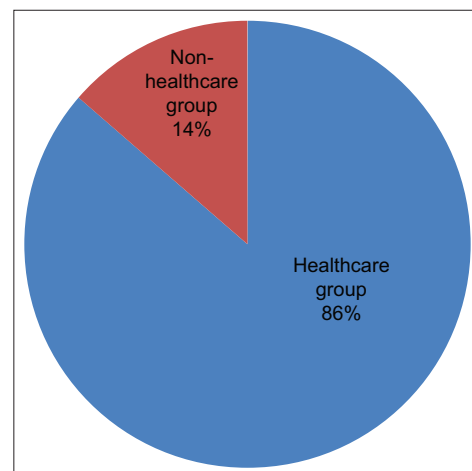


Figure 4: Distribution of the videos by sources of upload

by healthcare group, while 3 videos (14%) were uploaded by non-healthcare group.

Analysis of videos with respect to sources of upload is shown in Table 4. Statistical analysis showed that there was no statistical significant difference for all the measured variables between the videos uploaded by healthcare group and non-healthcare group.

DISCUSSION

Self-examination for skin cancer, as with breast and testicular cancer, is critical for early detection. As a result, people should be made aware of skin self-examination, and it should become a habit.^[18] Several studies have found that self-examination of the skin can reduce melanoma mortality by up to 63%, though there are concerns about its efficacy and subsequent identification of lesions by those at risk.^[19-21]

Social media use has become almost ubiquitous in modern society at an astounding rate. The internet, particularly platforms such as Facebook, Twitter, and YouTube, is now supplementing traditional information sources such as newspapers, magazines, radio, television,^[22] and face-to-face interactions. A large number of studies have been published on various aspects of health information delivery via internet platforms.^[23] Studies have analyzed the usefulness of YouTube videos in providing information on sun protection, skin cancer prevention, and other related topics so far.^[24-26] The objective of this study was to evaluate the quality and scientific accuracy of YouTube videos as a source of patient education information on skin self-examination.

In this study, videos were found in a way that lay person might also look for them; therefore, it reflect daily practice. Of the 200 videos, 178 were not included because they did not meet the inclusion criteria. We found, as in previous studies, that the high exclusion rates made it difficult to find the necessary content on YouTube.^[14,15,27,28] Despite the vast amount of information available on the Internet, unstructured formats frequently make it difficult to find what you need.

The videos examined in this study had a total of over one hundred seventy-five thousand views, suggesting people do watch videos related to skin self-examination on YouTube.

We noticed that YouTube videos are of high quality and scientifically accurate in terms of all the steps involved in skin self-examination. However, a few videos failed to warn viewers about the limitations of skin self-examination and to inform them about the importance of annual professional screening. People should be aware that, while YouTube can be a useful resource for learning about skin self-examination, it is not a substitute for regular screening by medical professionals.

In the literature, there is conflicting evidence about the learning value of YouTube videos for medical conditions and their potential to educate individuals. YouTube has been proven to be beneficial in some research, while its utility has been questioned in others. According to a study by Steinberg *et al.*,^[29] the majority of

prostate cancer videos on YouTube (73%) were of poor quality and content, indicating that YouTube was an unsatisfactory source of prostate cancer information for patients. Pant *et al.*^[30] concluded in a similar study evaluating myocardial infarction information that only a minority of videos (6%) presented unbiased comments on all key aspects of the disease. In a study by Pandey *et al.*,^[31] which evaluated YouTube as a source of information on the H1N1 influenza pandemic, 71% of videos contained relevant material, with 23% providing false information. Our study result lies somewhere between these studies. Some videos (36.36%) provided important and correct information on skin self-examination, while the rest of the videos had inaccurate or limited information.

There was no statistical significant difference in views per day between videos uploaded by healthcare professional group and non-healthcare group. Hence, healthcare professionals should adopt more engaging and easily understood language in their videos to increase visibility. Simple actions can be taken to make videos more accessible to patients. Because the YouTube search engine ranks videos based on "relevance," creating video metadata is critical; this includes adding enough relevant tags to the video, including keywords in the title and description, and selecting an appropriate thumbnail. Video uploaders should consider adding subtitles through YouTube's interface to improve accessibility for users whose first language is not English or for deaf sign language users. Furthermore, some videos consisted solely of text with music playing in the background. Color contrasts, video resolution, and sound quality must all be acceptable.^[28]

Social media has the potential to help close the health literacy gap by presenting information in novel ways that allow even the most illiterate people to learn.^[32] YouTube could be a useful information resource if a mechanism existed to direct lay people to verified and credible sources. Also, encourage both patients and doctors to report inaccurate or misleading videos to YouTube management for removal; and, perhaps most importantly, encourage doctors to upload their own videos and make quality information freely available online, as well as to use more engaging and easily understood language in their videos.^[33]

There are some limitations to this research. To begin with, study results may vary depending on the keywords used in the search. In this study, we conducted two separate searches using the keywords, which are the most likely keywords a layperson would use while searching YouTube for information on this topic. Some people, on the other hand, may use different search words and get different results. Also, YouTube's contents are constantly changing, with new videos being added and removed. As a result, the results may differ based on the day and time of the search. The 'snapshot' approach to data gathering is a limitation in our study, as it is in similar studies. Longitudinal or field-based research investigating the efficacy of YouTube as a source of patient education regarding skin self-examination is needed. Furthermore, we only examined English-language videos. Nonetheless, English

Table 4: Descriptive statistics of evaluated videos with respect to sources of upload

Variable	Group 1 (n = 19)				Group 2 (n = 3)				P-value
	Mean	Standard deviation	Min	Max	Mean	Standard deviation	Min	Max	
Views per day	3.96	6.77	0.12	29.12	3.40	2.76	3.69	6	0.89
GQS score	4.11	0.66	3	5	3.33	0.56	3	4	0.07
Content score	8.11	0.81	7	9	8	1	7	9	0.84

GQS: Global Quality Score

is a global language, and English-language information can be accessed from anywhere in the world.

Despite these limitations, we believe that important details and information can be obtained from this study for the accurate and complete delivery of medical content through online platforms.

CONCLUSION

There are many YouTube videos in English related to skin self-examination with acceptable quality and scientific accuracy. YouTube could constitute a very useful resource for information if patients were better educated on the location and availability of quality online content, and if medical professionals took a more active role in uploading reputable videos and highlighting inaccurate videos for removal.

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