YouTube Video Clips on Breastfeeding education and promotion for Arabic-speaking populations: A social media content analysis

Authorship and Affiliations
Fatmah Almoayad [a]; Anwar Alhashem [a]; Reem Alotaibi [a]; Renad Alashwl [a]; Alanoud Albahouth [a]; Nada Benajiba [b]; Patricia J. Kelly [c]; Basil H. Aboul-Enein [d]

[a] Princess Nourah Bint Abdulrahman University
College of Health and Rehabilitation Sciences
Department of Health Sciences
Riyadh, Saudi Arabia
E-mail: faalmoayad@pnu.edu.sa; AMAlHashem@pnu.edu.sa; reemhep1@gmail.com; Renad.al.ashwl@gmail.com; Alanoud.albahouth1@gmail.com

[b] Ibn Tofail University-CNESTEN
Joint Research Unit in Nutrition and Food
RDC-Nutrition AFRA/IAEA
Rabat, 14000 Kenitra, Morocco
E-mail: benajibanada@gmail.com

[c] Thomas Jefferson University
College of Nursing
901 Walnut Street
Philadelphia, PA, USA
E-mail: patriciajanekelly@gmail.com

[d] London School of Hygiene & Tropical Medicine
Faculty of Public Health and Policy
15-17 Tavistock Place
London
WC1H 9SH
United Kingdom
E-mail: Basil.Aboul-Enein@lshtm.ac.uk

Address correspondence and reprint requests to:
London School of Hygiene & Tropical Medicine
Faculty of Public Health and Policy
15-17 Tavistock Place
London
WC1H 9SH
United Kingdom
E-mail: Basil.Aboul-Enein@lshtm.ac.uk

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Ethical approval
Given the study's observational nature and utilization of publicly available data, it was not subject to IRB approval and therefore IRB was not acquired.

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Abstract

Background/Objective: While the benefits breastfeeding are well-documented and widely recognized, reports indicate that optimal breastfeeding rates are low in Arabic-speaking countries. This is a significant concern given the health benefits associated with breastfeeding for both infants and mothers. Previous research has shown that education interventions can increase breastfeeding knowledge, attitudes, and practices in Arabic-speaking populations. The social media platform YouTube holds significant potential for distributing customized health education for diverse audiences; specifically, this platform has the potential to empower mothers and normalize long-term breastfeeding. The aim of this study was to evaluate the quality of YouTube videos on breastfeeding available in the Arabic language.
Methods: We used standard procedures to search YouTube for Arabic breastfeeding videos posted on YouTube in December 2023. Videos were evaluated using the three scales of the DISCERN quality evaluation instrument (*reliability, information quality*, *video quality*) and total score. Comparative statistics were generated.
Results: A total of 165 videos met inclusion criteria, with 29.7% in the Education category; 43.6% were in Egyptian Arabic dialect. Almost all (91.75%) of the educational videos had a 'Medium' quality assessment. Educational videos and those using health professionals had higher quality assessments than those in other categories or done with other speakers.
Conclusion: The results of this review suggest that most content on the topic of breastfeeding was of only medium reliability and informational quality. New mothers seeking breastfeeding information or support may be in need of specific problem-solving information at a time when they are living with the often-difficulty reality of caring for a newborn or very young infant. There is a clear need for accurate, culturally congruent information to effectively support breastfeeding in Arabic-speaking countries. Future efforts should focus on improving the quality of online health education content, with implications for public health strategies and policy development.

Keywords

Social Media; Breastfeeding; Promotion; Arabic-speaking populations

Introduction

Breastfeeding offers numerous advantages for infants, mothers, and society at large. It is the optimal source of nutrition for infants, with exclusive breastfeeding suggested for the first six months of life, and subsequent breastfeeding for at least one to two years [1, 2]. Mothers who breastfeed have a reduced lifetime risk of multiple health conditions, including various cancers, postpartum depression, hypertension, cardiovascular disease, and type 2 diabetes mellitus [1]. For infants, breastfeeding reduces the risk of gastroenteritis, a major cause of morbidity and mortality, atopic dermatitis and acute otitis media, and has beneficial effects on their cognitive and developmental scores [1]. Increasing breastfeeding rates can also have economic benefits [3, 4]. Given this strong evidence, multicomponent strategies that protect, support, and promote breastfeeding should be enhanced, recognizing its benefits for long-term health [5].

Despite the well-documented benefits of breastfeeding, reports indicate that optimal breastfeeding rates are low in Arabic-speaking countries [6]. According to the UNICEF Global Database on Infant and Young Child Feeding, exclusive breastfeeding in the Eastern Mediterranean Region (EMRO) stands at 43%, and extended breastfeeding beyond one year is at 58% [7]. this knowledge must be effectively disseminated to encourage and normalize breastfeeding practices. Education interventions in Arabic-speaking countries can increase breastfeeding knowledge, attitudes, and practices, including early initiation of breastfeeding[8].. For instance, a study in Saudi Arabia found that women value internet and social media education for its cost-effectiveness and accessibility, despite concerns about information quality[9]. Platforms like YouTube, widely accessed for information sourcing and learning, can supplement education from health providers [10]. YouTube holds significant potential for distributing customized health education and communication messages, enhancing learning opportunities,

and playing a vital role in health promotion by reaching a diverse audience [10, 11]. The widespread interest in YouTube's breastfeeding content demonstrates that accessible, free video resources can supplement sustained breastfeeding support. With its capacity to bridge information gaps and create online community engagement, YouTube has the potential to become a key platform for empowering mothers and normalizing long-term breastfeeding [12].

However, YouTube also offers the potential to be a source of inaccurate information [11, 13]. Few studies have evaluated YouTube videos as a breastfeeding promotion instrument. Lazalde, Nakphong [12] found that popular English-language YouTube videos on breastfeeding typically provided factual and instructional content and conveyed a positive tone. They identified common topics such as breastfeeding positions, latch, and nutrition. Azak, Yılmaz, Şahin [14] evaluated the quality, content, and reliability of English YouTube videos about COVID-19 and breastfeeding, finding that most videos were informative but generally scored low in quality and reliability. Despite high view rates, the content needed improvement to be considered reliable. Alnasser, Almasoud, Aljohni, Almisned, Alsuwaine, Alohali, Almutairi, Alhezayen [9] found that educational videos delivered through mobile health platforms significantly influenced Arabic-speaking mothers' intentions towards exclusive breastfeeding. Yet, the effectiveness of these educational tools may vary depending on the quality, accuracy, and relevance to breastfeeding promotion. Despite the need to assess the quality of educational videos, for Arab-speaking populations, no studies were found assessing Arabic content related to breastfeeding on YouTube. This gap in the literature led to the current study's focus on evaluating the quality of Arabic YouTube videos on this topic.

Methods

The present study and analysis were conducted in December 2023. The search of videos posted on YouTube regarding breastfeeding was performed based on standard procedures and DISCERN online video quality evaluation instrument. The search included the following key words / terms "*Breastfeeding*", "*Exclusive Breastfeeding*" and "*Breast Milk*" Before to conducting search, each expert cleared their computer cookies and its cache. Additionally, the consistency of video results was checked prior to data extraction from search results. Given the study's observational nature and utilization of publicly available data, it was not subject to IRB approval and therefore IRB was not acquired.

Inclusion/Exclusion Criteria

To be included in the analysis, the YouTube video appeared in the search using the above terms. The language of search was classical Arabic language; hence all Arabic dialects were included. The search was conducted between September – December 2023 and the top 100 YouTube videos from the search were included in the study. The selection of the top 100 was based on reviews done on other health conditions which found that the first 60 to 200 videos obtained in any search are the one accessed by YouTube users [15-21]. The search settings were adjusted to sort the videos based on the highest to the lowest view count. Any YouTube video which was not related to breastfeeding, was in a non-Arabic language or did not appear among the top 100 most searched results were excluded.

Data Collection

Information of each video including video title, link, view count, number of comments, number of likes, number of dislikes, and video length were collected and tabulated for analysis. The

speakers featured in each video were categorized into health professionals (doctor, nurse, nutritionist, specialist), performer (actor, voice actor, multiple actors, influencer, announcer), and others (multiple speakers, no speaker). Video category label was classified into news and politics, entertainment, education, film and animation, how-to and style, science and technology, people and blogs, nonprofits and comedy. The type of the video was also classified into Blog, Educational, Film & animation, Lifestyle, and Lecture. The video source was classified according to the type of source as follows: Medical authorities (including the Ministry of Health), private channel (including private industry), news channel, and personal. Dialects were categorized into Egyptian, Alshamia, Classical Arabic+ Arabic subtitle, Algerian+ Moroccan, and other dialects (Iraqi + Kuwaiti + Sudanese + Yemeni).

Data Analysis

The content analysis was conducted independently by three health education experts (NB, FA, and AA), each evaluating and rating the videos independently. To ensure congruency and reproducibility during the data collection process; the health educators used the same standard procedures, together with the DISCERN evaluation instrument [22], developed for use in healthcare to judge the quality and reliability of health information [22].

DISCERN has been used applied before in other social media analysis studies [23-26]. Instrument items were divided into three scales; 1) *Reliability* (items 1-8); 2) *Information Quality* (items 9-15); and 3) *Video Quality* (item 16). Each item was independently scored by three experts, and the average of their scores was calculated for further analysis. A total scored summed the three scales.

The first 15 questions were scored from 1 to 5 depending on how well the item's criteria were met. A score of 1 indicated criterion not met, 3 indicated criterion moderately met, and 5 indicated that the video had met the specific criterion. Item 16, which assessed the overall quality of a video, used a continuous scale from 1 to 5. On this item, a score of 1 indicated that the quality of video was low and had important limitations; a score of 3 was given when the quality of the video was considered moderate with 'some limitations'; and a score of 5 meant that the video had good quality and was judged to be a 'useful source'. Scores of 2 (proximity to low quality) and 4 (proximity to high quality) were intermediates on the scale for all criteria.

To obtain a DISCERN score and assess relevant quality level, the scores of each of the 16 items were summed across the three health educators evaluators with total possible scoring ranged from a minimum of 16 to a maximum of 80. For the present research, three predetermined cut-off points were used to categorize the video quality level: low quality: 15-37.6, medium quality: 37.7-58.9, and high quality: 59-80 [26]. The mean score obtained from each of the three evaluators was calculated to mitigate any potential individual bias.

For the quantitative analysis, we used IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Chi-square test was used for comparisons between two groups. Monte Carlo correction test was applied when more than 20% of the cells had expected count less than five. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. Spearman coefficient was used to correlate between not normally distributed quantitative variables Significance of the obtained results was judged at values (p) that were less than or equal to 0.05. Qualitative data were described using number and percentage.

Results

A total of 182 YouTube videos were retrieved. After screening, only videos meeting the inclusion criteria were kept. Finally, the removal of duplicate videos resulted in a total of 165 videos meeting inclusion criteria. Out of these 165 videos, the Education category was the most common (29.7%), followed by People & Blogs (24.8%) and Entertainment (15.8%). Egyptian Arabic was the most common dialect in the videos (43.6%), followed by Classical Arabic with Arabic subtitles (25.5%), and Alshamia dialect (17%).

The videos had a mean duration time of 7.31 ± 6.40 minutes and were viewed by 381,612. Average number of comments on the videos was 322 (SD ± 507.0) and average 'likes' was 65, 06. (SD ± 12591), indicating positivity about a video, and specifically posted comments on 322 (SD ± 507) (see Table 1).

Health professionals spoke in 63.6% of the videos, and performers in 25.5%. Educational messages were the most common communication format at 58.2%., followed by 28.5% with lifestyle discussions. Personal channels were the main source of information (49.1%, followed by private channels (21.8%), and news channels (18.8%). Medical authorities, including the Ministry of Health, were the least common source of information. accounting for only 10.3% of the videos (See Table 2).

Reliability, Information Quality, Video Quality

The DISCERN Reliability scale assessed the accuracy of the information presented in each video, the clarity and relevance of the video's aims, the sources of information, and whether the information was reliable and unbiased. The scores for the eight reliability questions ranged from 1.08 to 4.6, with an overall scale score of 3.06 0.48 out of a possible 5 (see Table 3). The

reliability question with the highest mean score (4.6 ± 0.79) was “Is it balanced and unbiased?” while the question with the lowest mean score (1.08 ± 0.44) was, "Is it clear when information used or reported in the publication was produced?" These results indicate that the accuracy of the information on the videos was not particularly reliable.

The *Information Quality* scale assessed whether the information in a video described how breastfeeding works, the benefits and risks of breastfeeding, and relevant factors that would help someone make an informed decision. The scores for the eight information quality questions averaged 3.4 ± 0.69 (range 2.36-4.49). The information quality item with the highest score (4.49 ± 0.74) was “Does it describe the benefits of each treatment?” The information quality item with the lowest score 2.36 ± 1.26 was “Does it describe what would happen if no treatment is used?” These results indicate that the information available in the videos was only of medium quality.

The one item *Video Quality* scale found that 153 of the 165 breastfeeding videos (92.7%) were rated as 'Medium' (2-4), with a mean score of 3.16 ± 0.90.

When combined, the three scales of the DISCERN Evaluation Instrument had an *Overall Quality Assessment* mean score of 3.21 ± 0.53, again suggesting medium quality. Table 3 provides a breakdown of the video information for *Reliability*, *Information Quality*, and *Video Quality*.

An assessment of all the 165 videos found that 94.5% were rated as ‘Medium” for *Reliability*, 78.8% for *Information Quality,* and 81.2% for *Video Quality* (see Table 4).

The Spearman correlation coeffieicnts (rs) indicated that the Total DISCERN Evaluation Instrument Score was significantly correlated ($p < 0.001$) with the *Reliability* (rs = 0.816), the *Information Quality* (rs = 0.904), and the *Video Quality* scales (rs = 0.821). The In*formation Quality* scale also had a strong correlation with *Overall Quality* item (rs = 0.729) and with the 'Comment count' (rs = 0.391). The 'Like count' and 'Comment count' were highly correlated (rs

= 0.892), as were 'View count' and 'Like count' (rs = 0.833). Less significant correlations were seen between the *Reliability* scale and 'Duration' (rs = 0.386), and between 'Duration' and both 'Like count' (rs = 0.406) and 'Comment count' (rs = 0.474) (see Table 5).

In examining the relationship between the video category and the level of quality assessments, almost all the examined YouTubes had a ‘Medium’ assessment. For example, 91.75% of educational videos were rated with scale totals of 95.8% for *Reliability*, 72.9% for Information Quality, and 81.3% for *Video Quality*. Almost all the lifestyle videos also received 'Medium' across all quality assessments, with particularly high percentages in Total (97.9%) and *Reliability* scale (97.9%) and in the Total assessment (97.9%). Table 6 summarizes these results.

There was a statistically significant result found in the relationship between the evaluation scales and message type was in the overall *Reliability* assessment ($\chi 2 = 17.740$, MCp = 0.021), suggesting a relationship between the type of content and viewers' perceptions of the video's reliability. The other Chi-square results for *Total Quality Assessment* and the scales of *Information Quality,* and Video Quality were not statistically significant, suggesting that for these categories, the distribution of quality levels did not significantly differ across the types of messages.

There were statistically significant relationships between the different types of speakers and the *Total Quality Assessment* ($\chi 2 = 8.164$, MCp = 0.046), the *Reliability* ($\chi 2 = 14230$, MCp = 0.002), and the *Video Quality Scales* ($\chi 2 = 27.301$, MCp = 0.001), suggesting that the background of the speakers in the videos made a difference in viewers’ perceptions of reliability.

There were statistically significant relationships between the source of the videos and the *Reliability Scale* ($\chi 2 = 15.312$, MCp = 0.002) and in the *Overall Quality Scale* ($\chi 2 = 14,148$ MCp = 0.016).

Discussion

While the social media platform of YouTube has the potential to broadly education the public about health topics, the results of this review suggest that the majority of content on the specific subject of breastfeeding was of only medium reliability and informational quality. T**his aligns with findings from similar studies on YouTube content related to COVID vaccination** [27] **and insulin resistance** [28]**.** While 63.6% of videos used health professionals, only 25% were in the educational category. However, health professionals had higher quality ratings.

While one might expect health professionals to be providing accurate information about their field of knowledge, it is surprising that the quality and reliability ratings provided by health professionals on YouTube are not uniformly higher. Further research is needed to understand why this might be the case. The statistically significant relationships of the *Reliability* and the two *Quality* scales suggest that videos with higher reliability, information quality, and overall quality tended to have higher total scores. Engagement metrics such as the Like count and the Comment count are strongly interconnected. Less significant relationships were seen between 'Reliability' and 'Duration' (rs = 0.386), and between 'Duration' and both 'Like count' (rs = 0.406) and 'Comment count' (rs = 0.474), suggesting that while these associations exist, they are less pronounced than those related to quality assessments and engagement metrics.

This overall medium level of quality of breastfeeding YouTubes found in this analysis was similar to that found in recent systematic review of overall health information which concluded, “YouTube is not a reliable source of medical and health-related information. YouTube’s popularity-driven metrics such as the number of views and likes should not be considered quality indicators” [29].

The National Academy of Medicine and the World Health Organization have identified principles to recognize the credibility of online health information and distributed these principles in seven languages [30]. While Arabic was not one of the languages, these principles are still valuable as they emphasize the importance of information being "science-based, objective, transparent, and accountable" [31]. While not requiring social media platforms to specifically identify their sources as credible, the report suggests that platforms provide information that could at least identify their source as say, a health care organization" or "government health organization".

Conclusion

Concerns about quality in breastfeeding videos and other YouTube videos are worrying because it is not clear exactly how much influence watching low quality videos specifically affect viewer behaviors. Arabic-speaking mothers seeking breastfeeding information or support may be in need of specific culturally congruent problem-solving information at a time when they are living with the reality of caring for a newborn or very young infant. This period often coincides with uncertainty, sleep deprivation, physical pain and healing from childbirth. Accurate answers are needed, often in real time, and unfortunately, it does not seem that YouTube videos are going to provide them. Future work can provide an assessment of the actual impact of viewing these YouTube videos on specific breastfeeding behaviors. Without the ability to identify the source of their material, the social media platform YouTube cannot be regarded as a reliable source of breastfeeding information for Arabic-speaking mothers.

Authors' Contributions

FA: funding acquisition, and writing— review and editing. AnAl: data curation, formal analysis, investigation, and visualization. RAlo: data curation, formal analysis, investigation, and visualization. RAla: data curation, formal analysis, investigation, and visualization. AlAl: data curation, formal analysis, investigation, and visualization. NB: Writing—original draft, writing—review and editing. PJK: Writing—original draft, writing—review and editing. BAE: Conceptualization, project administration, supervision, Writing—original draft, writing—review and editing.

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Table 1. Distribution of BF YouTube videos by category, duration, dialect, views, likes, and comments (n=165).

	No. (%)
Video category label	
Education	49 (29.7%)
People & Blogs	41 (24.8%)
Entertainment	26 (15.8%)
How-to & Style	24 (14.5%)
News & Politics	8 (4.8%)
Science & Technology	7 (4.2%)
Nonprofits	5 (3.0%)
Film & Animation	4 (2.4%)
Comedy	1 (0.6%)
Dialect	
Egyptian	72 (43.6%)
Classical Arabic+ Arabic subtitle	42 (25.5 %)
Alshamia	28 (17%)
Algerian+ Moroccan	16 (9.7 %)
Other (Iraqi+ Kuwaiti+ Sudanes+ Yemeni)	5 (3.0 %)
No speaking	2 (1.2%)
Duration	
Mean + SD.	7.31 ± 6.40
Median (Min. – Max.)	5.45 (0.10-7.85)
***View* count**	
Mean + SD.	381,612.5 ± 678,936.2
Median (Min. – Max.)	132219 (34 – 5324445)
***Like* count**	
Mean ± SD.	6506.2 ± 12591.2
Median (Min. – Max.)	1271 (0 – 73000)
Comment count	
Mean ± SD.	322.4 ± 507.0
Median (Min. – Max.)	81 (0 – 2363)

Table 2. Distribution of BF YouTube videos according to speaker, type and source of the messages (n = 165)

	No. (%)
Speaker	
Health professionals (doctor, nurse, nutritionist, specialist)	105 (63.6%)
Performer (Actor, voice actor, multiple actors, influencer, announcer)	42 (25.5%)
Others (multiple speakers, no speaker)	18 (10.9%)
Type of message	
Educational	96 (58.2%)
Lifestyle	47 (28.5%)
Blog	13 (7.9%)
Film & animation	8 (4.8%)
Lecture	1 (0.6%)
Source	
Personal	81 (49.1%)
Private channel (including private industry)	36 (21.8%)
News channel	31 (18.8%)
Medical authorities (including MOH)	17 (10.3%)

Table 3. Descriptive analysis of BF YouTube videos and DISCERN quality assessments scale items (n = 165)

Q		Median (Min. – Max.)	Mean ± SD.
	DISCERN Reliability Scale Items		
1	Are the aims clear?	5 (1 – 5)	4.38 ± 1.03
2	Does it achieve its aims?	5 (1 – 5)	4.44 ± 0.93
3	Is it relevant?	5 (1.33 – 5)	4.55 ± 0.74
4	Is it clear what sources of information were used to compile the publication?	1 (1 – 5)	1.47 ± 0.91
5	Is it clear when information used or reported in the publication was produced?	1 (1 – 5)	1.08 ± 0.44
6	Is it balanced and unbiased?	5 (1 – 5)	4.60 ± 0.79
7	Does it provide details of additional sources of support and information?	1.33 (1 – 5)	1.84 ± 1.01
8	Does it refer to areas of uncertainty?	2 (1 – 4.67)	2.10 ± 0.97
	Reliability		3.06 ± 0.48
	DISCERN Information Quality Scale Items		
9	Does it describe how each treatment works?	3.67 (1 – 5)	3.49 ± 1.26
10	Does it describe the benefits of each treatment?	4.67 (1 – 5)	4.49 ± 0.74
11	Does it describe the risks of each treatment?	3 (1 – 5)	3.13 ± 1.39
12	Does it describe what would happen if no treatment is used?	2 (1 – 5)	2.36 ± 1.26
13	Does it describe how the treatment choices affect overall quality of life?	4.67 (1 – 5)	4.18 ± 0.98
14	Is it clear that there may be more than one possible treatment?	3.33 (1 – 5)	3.14 ± 1.26
15	Does it provide support for shared decision-making?	2.67 (1 – 5)	2.68 ± 1.16
	Information Quality		3.41 ± 0.69
	DISCERN Video Quality Scale Item		
16	Overall quality rating	3.33 (1 – 5)	3.16 ± 0.90
	DISCERN Total Quality Assessment Score		**3.21 ± 0.53**

SD: **Standard deviation**

Table 4. Distribution of BF YouTube videos according to overall DISCERN scale score for quality assessments of videos (n = 165)

DISCERN Scale	Low (1 – <2) No. (%)	Medium (2 – 4) No. (%)	High (>4 – 5) No. (%)	Average score (1 – 5) Mean ± SD.
Reliability	6 (3.6%)	156 (94.5%)	3 (1.8%)	3.06 ± 0.48
Information Quality	5 (3%)	130 (78.8%)	30 (18.2%)	3.41 ± 0.69
Video Quality	14 (8.5%)	134 (81.2%)	17 (10.3%)	3.16 ± 0.90
Total	**3 (1.8%)**	**153 (92.7%)**	**9 (5.5%)**	**3.21 ± 0.53**

Table 5. Relation between level of DISCERN quality assessments scale scores and videos' duration, view, like, and comments counts (n = 165)

		Reliability	Information of quality	Video quality	Total Score	Duration (min)	View count	Like count	Comment count
***Reliability* Scale**	r_s	1.000	0.541*	0.596*	0.816*	0.386*	0.033	0.143	0.220*
	p		<0.001*	<0.001*	<0.001*	<0.001*	0.677	0.067	0.004*
Information QualityScale	r_s		1.000	0.729*	0.904*	0.565*	0.212*	0.367*	0.391*
	p			<0.001*	<0.001*	<0.001*	0.006*	<0.001*	<0.001*
***Video Quality* Scale**	r_s			1.000	0.821*	0.544*	0.133	0.351*	0.417*
	p				<0.001*	<0.001*	0.089	<0.001*	<0.001*
***Total Quality* Assessment Score**	r_s				1.000	0.571*	0.156*	0.325*	0.376*
	p					<0.001*	0.045*	<0.001*	<0.001*
Duration (min)	r_s					1.000	0.185*	0.406*	0.474*
	p						0.017*	<0.001*	<0.001*
View count	r_s						1.000	0.833*	0.643*
	p							<0.001*	<0.001*
Like count	r_s							1.000	0.892*
	p								<0.001*
Comment count	r_s								1.000
	p								

r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

Table 6. Relation between DISCERN quality assessment scale scores and Type of message, Speakers, Sources (n = 165)

	N	Total Quality Assessment			Reliability Scale			Information Quality Scale			Overall Quality Scale		
		Low (n = 3)	Medium (n = 135)	High (n = 9)	Low (n = 6)	Medium (n = 156)	High (n = 3)	Low (n = 5)	Medium (n = 130)	High (n = 30)	Low (n = 14)	Medium (n = 134)	High (n = 17)
Type of message													
Blog	**13**	1 (7.7%)	12 (92.3%)	0 (0%)	1 (7.7%)	12 (92.3%)	0 (0%)	1 (7.7%)	12 (92.3%)	0 (0%)	3 (23.1%)	10 (76.9%)	0 (0%)
Educational	**96**	1 (1%)	88 (91.7%)	7 (7.3%)	3 (3.1%)	92 (95.8%)	1 (1%)	3 (3.1%)	70 (72.9%)	23 (24%)	5 (5.2%)	78 (81.3%)	13 (13.5%)
Film & animation	**8**	1 (12.5%)	6 (75%)	1 (12.5%)	1 (12.5%)	5 (62.5%)	2 (25%)	0 (0%)	7 (87.5%)	1 (12.5%)	1 (12.5%)	7 (87.5%)	0 (0%)
Lifestyle	**47**	0 (0%)	46 (97.9%)	1 (2.1%)	1 (2.1%)	46 (97.9%)	0 (0%)	1 (2.1%)	41 (87.2%)	5 (10.6%)	5 (10.6%)	38 (80.9%)	4 (8.5%)
Lecture	**1**	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)
χ^2 (^{MC}p)			13.633 (0.107)			17.740* (0.021*)			13.565 (0.077)			8.893 (0.327)	
Speaker													
Health professionals	**105**	0 (0.0%)	98 (93.3%)	7 (6.7%)	1 (1.0%)	103(98.1%)	1 (1.0%)	1 (1.0%)	80 (76.2%)	24 (22.9%)	2 (1.9%)	88 (83.8%)	15 (14.3%)
Performer	**42**	1 (2.4%)	39 (92.9%)	2 (4.8%)	1 (2.4%)	39 (92.9%)	2 (4.8%)	3 (7.1%)	35 (83.3%)	4 (9.5%)	4 (9.5%)	36 (85.7%)	2 (4.8%)
Others	**18**	2 (11.1%)	16 (88.9%)	0 (0.0%)	4 (22.2%)	14 (77.8%)	0 (0.0%)	1 (5.6%)	15 (83.3%)	2 (11.1%)	8 (44.4%)	10 (55.6%)	0 (0.0%)
χ^2 (^{MC}p)			8.164* (0.046*)			14.230* (0.002*)			8.078 (0.063)			27.301* (<0.001*)	
Source													
Personal	**81**	1 (1.2%)	74 (91.4%)	6 (7.4%)	2 (2.5%)	79 (97.5%)	0 (0.0%)	3 (3.7%)	59 (72.8%)	19 (23.5%)	5 (6.2%)	61 (75.3%)	15 (18.5%)
Private channel	**36**	2 (5.6%)	33 (91.7%)	1 (2.8%)	3 (8.3%)	33 (91.7%)	0 (0.0%)	2 (5.6%)	32 (88.9%)	2 (5.6%)	6 (16.7%)	29 (80.6%)	1 (2.8%)
News channel	**31**	0 (0.0%)	31(100%)	0 (0.0%)	0 (0.0%)	31(100%)	0 (0.0%)	0 (0.0%)	24 (77.4%)	7 (22.6%)	1 (3.2%)	29 (93.5%)	1 (3.2%)
Medical authorities	**17**	0 (0.0%)	15 (88.2%)	2 (11.8%)	1 (5.9%)	13 (76.5%)	3 (17.6%)	0 (0.0%)	15 (88.2%)	2 (11.8%)	2 (11.8%)	15 (88.2%)	0 (0.0%)
χ^2 (^{MC}p)			6.605 (0.256)			15.312* (0.002*)			8.018 (0.182)			14.148* (0.016*)	

χ^2: **Chi square test**
MC: **Monte Carlo**
p: p value for comparing between different categories
*: Statistically significant at $p \leq 0.05$