Original Paper

Distortions, Fabrications, and Manipulations: An Annotated Profile of Fact-Checked COVID-19 Misinformation in Arabic

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Abstract

Background: The COVID-19 pandemic gave rise to a global "infodemic" in which social media platforms amplified misinformation. Despite high social media adoption rates and heavy reliance on social media for pandemic news in Arabic-speaking countries, relatively little is known about the characteristics of online Arabic COVID-19 misinformation.

Objective: Using fact-checked claims related to COVID-19 collected from Arabic-language fact-checking websites, this study sought to provide a snapshot of the health-related information ecosystem in the Arab world. In doing so, it identified recurring characteristics and patterns that may help guide future research and interventions in the Arabic-speaking context.

Methods: We compiled a database of 234 COVID-19 fact-checked claims published online from March 2020 to March 2022, sourced from 4 International Fact-Checking Network–certified Arabic fact-checking organizations. Claims were coded inductively and deductively with high interrater reliability to determine misinformation type (κ=0.88), narrative typology (κ=0.913), framing strategies (κ=0.72), medical jargon use (κ=0.794), and societal implications (κ=0.752). All Cohen κ coefficients were significant at P<.001.

Results: Facebook was the most popular platform, followed by Twitter (subsequently rebranded X), with regular users being the primary source of debunked claims. The most common narrative typologies were COVID-19 biological aspects (origins, existence, diagnosis, prevention, transmission, and cures; 110/234, 47.2%) and vaccines (70/234, 30%). Fabricated or manipulated content (128/234, 54.9%), followed by misleading content (86/234, 36.9%), was the most common misinformation type. The most frequent framing strategy involved distortion of science and medicine (69/234, 29.6%), followed by entertainment or satire (55/234, 23.6%), political content (44/234, 18.9%), and conspiracies (31/234, 13.3%). Notably, 36.3% (85/234) of claims were translated from English, and only 50% (117/234) of the analyzed content was moderated by the original platforms.

Conclusions: Our curated sample demonstrates that fact-checked Arabic COVID-19 misinformation exhibited distinct patterns, including heavy reliance on translated content, manipulated content, and scientific distortion with significant gaps in platform moderation. These findings highlight the need for enhanced and rapid Arabic-language content moderation, cross-linguistic fact-checking collaboration, culturally appropriate media and health literacy interventions, and rebuilding institutional trust to address misinformation in the Arab world effectively.

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Keywords: COVID-19; misinformation; Arabic; fact-checking; pandemic; social media; infodemic

Introduction

The COVID-19 pandemic gave rise to a parallel "infodemic" characterized by an "overabundance of information both online and offline" [1]. Misinformation refers to false content—with or without a mixture of true facts and/or events—shared without the knowledge of its inaccuracy, and disinformation refers to false information spread with the intent to cause chaos or achieve personal gains [2]. Misinformation as a term inherently acknowledges that the spread was not necessarily ill-intentioned. Because the intent of the user cannot always be established, we used the term misinformation rather than disinformation. Due to its emotionally provocative nature, misinformation reaches an audience up to 6 times faster than true news on social media platforms [3-5]. COVID-19 misinformation has had far-reaching consequences on health [6-9], economic stability, and inciting racially motivated hate crimes [10-13].

Social media platforms amplify the spread of misinformation by transforming the information landscape from a traditional top-down model of knowledge transmission to a decentralized "self-mass communication model" [14,15]. In the Arab world, social media has become a primary news source for many, with 61% of Arab Youth using social media as a news source [16]. Five Arabic-speaking nations are among the top 10 for social network adoption, with Facebook and WhatsApp being the most popular platforms [17,18]. This reliance on social media was particularly pronounced during the pandemic, with online surveys revealing that 34.4% of Jordanian and 41% of Iraqi participants depended on social media platforms for pandemic updates [19,20]. Arabic-language Facebook pages and groups showed marked increases in user engagement, post frequency, and interactions on misinformation-spreading pages between 2020 and 2021 [21].

Fact-checking has emerged as a crucial tool to address misinformation but faces many challenges in Arab countries, where the media has low credibility due to its association with government control and propaganda [14]. Overt censorship and weaponization of fake news lead to self-censorship among both journalists and fact-checkers [14,22]. Debunking misinformation is further complicated by cultural and religious sensitivities, combined with low literacy rates [14,23,24]. In such environments, fact-checkers often operate independently from traditional media outlets, evolving from social media activism to correct individual claims while promoting media literacy [23]. Fewer than 50% of fact-checkers in the Arab world have a journalistic background compared with 90% in the United States [22].

Several independent fact-checking organizations emerged in the Middle East and North Africa (MENA) region in recent years [25], with the number growing during the COVID-19 pandemic. The Arab Reporters for Investigative Journalism launched the Arabic Fact-Checkers Network in December 2020, now supporting more than 250 fact-checkers across the Arab world [26,27]. Tunisia saw a sharp increase in fact-checking initiatives during the COVID-19 pandemic, with new platforms emerging to combat pandemic-related misinformation. Existing fact-checking projects that had gone dormant were revived and repurposed to address the influx of COVID-19 misinformation [28].

The pandemic-related surge in Arabic-language fact-checking was followed by professionalization. As of July 2019, Fatabyyano was the only International Fact-Checking Network (IFCN)–verified signatory to operate entirely in Arabic. Four other Arabic-only fact-checkers have become IFCN-verified: Maharat, Verify-Sy, Tech4Peace, and Beam Reports [29].

In a context of relatively low health literacy, high social media use, mostly unmoderated social media platforms in the Arabic language, and a global "infodemic" of misinformation, research on the misinformation ecosystem and fact-checking during the COVID-19 pandemic in the Arab world remains limited. Several issues contribute to the spread of misinformation in the region, including a shortage of qualified medical journalists, political rivalries, and a lack of familiarity with "media and information literacy" concepts among Arab journalists [30,31]. COVID-19 misinformation was weaponized to attack rivals, propagate conspiracy theories, and promote certain policies and propaganda, with religion-based misinformation adding another layer of complexity to the infodemic landscape [30,31]. Few studies have examined the specific elements and impacts of COVID-19 misinformation in the Arab world, with existing studies highlighting an abundance of misinformation opposing vaccine mandates, vaccine hesitancy linked to conspiracy beliefs, and widespread acceptance of false narratives about the virus's origin and spread mechanisms [19,20,32,33].

Using fact-checked claims related to COVID-19 collected from Arabic-language fact-checking websites, this study sought to provide a snapshot of the health-related information ecosystem in the Arab world. This helps identify common factors linked to the higher popularity and virality of medical and COVID-19–related misinformation in this context. It contributes to filling a large gap in the literature on COVID-19–related misinformation in non-Western cultural and linguistic contexts.

Methods

Fact-Checked Claim Selection

We compiled a database of 234 fact-checked claims in Arabic published online from March 2020 to March 2022. Claims were included if they were fact-checked by one of the 4 IFCN-compliant Arabic fact-checking sources: Fatabyyano project, Maharat News, Agence France-Presse (AFP) MENA Fact Check, and Verify-Sy. Tech4Peace and Beam Reports were later certified by the IFCN but were not included in our analysis. Table 1 provides an overview of 13 active Arabic fact-checking sites at the time of our data collection. Fact-checked claims included Arabic claims in both colloquial

(‘*amea*) and classical Arabic (*fasHa*), as well as claims that were translated into Arabic. Excluded claims included those marked as false as of their published date on the fact-checking site but that had since been revoked, claims unrelated to COVID-19, and claims published outside of the selected timeframe.

Table 1. Overview of fact-checking sites in Arabic[a].

Fact-checking site	IFCN[b] verified	Based in	Year established
Fatabyyano project	Yes	Jordan	2014
Maharat News	Yes	Lebanon	2004
Agence France-Presse MENA[c] Fact check	Yes	France (Headquarters) and Lebanon	2017
Verify-Sy	Yes	Syria	2016
Misbar	No	Jordan	2019
No Rumors	No	Saudi Arabia	—[d]
Matsad2sh	No	Egypt	2018
Saheeh Masr	No	Egypt	2019
Da begad	No	Egypt	2013
Tech4Peace	No[e]	Iraq	2016
Falso (Facebook page)	No	Tunisia	2020
Tayqan	No	Palestine	2017
Beam Reports	No[e]	Sudan	2021

[a]Our sample included data only from the 4 IFCN-verified sources.
[b]IFCN: International Fact-Checking Network.
[c]MENA: Middle East and North Africa.
[d]Year established unknown, also site no longer active.
[e]Tech4Peace and Beam Reports became IFCN-verified after data collection was completed.

Selecting claims that were already debunked leverages the expertise of fact-checkers in identifying viral, consequential, or frequently questioned misinformation, allowing us to target the most relevant content. It also allows us to analyze individual claims, articles, and broader narratives. Relying on IFCN-certified sources ensures credibility and standardization in the fact-checking process [34].

Data Collection

Our individual units of analysis were already fact-checked claims. The following data were collected about each fact-checked claim: title in Arabic, translated title in English, URL link to the original claim, screenshot of the original claim, fact-checking site (1 of 4), date of spread on social media (if a claim was duplicated on multiple platforms, this value was the earliest date of spread), date of publication or debunking on the fact-checking site, source type (ie, regular user, media personnel, newspaper or journal, and physicians or scientists), social media platform type, language of the original claim (if the claim was translated from another language into Arabic), engagement data (likes, shares, and views), number of duplicate posts of the same claim (even if the wording of the claim was altered, as long as the premise of the claim was the same), and content moderation on the platform of spread. These data were gathered through analysis of the 4 fact-checking sites and their accompanying links and references. A comprehensive database was built using KoboToolbox.

Regarding duplication of a certain claim on multiple webpages or URLs, this information was taken from the fact-checking website, if available, as fact-checking websites aggregated duplicate claims themselves. This was the summation of the duplicate posts of the same claim, even if the wording of the claim was altered, as long as the premise of the claim was similar or identical. The individual data collector did not verify this number independently.

Platform content moderation data were collected during initial data extraction. They were defined by the original social media platform including the equivalent of a “reader warning” that this was a false claim or the removal of the link or URL completely. If the claim was moderated in English but not Arabic, the claim was determined to be not moderated. If the claim was duplicated and moderated in one version but not the other, the version with maximum engagement was used to determine moderation by the original social media platform. If data collectors could not determine moderation, “unknown” was selected.

After the initial phase of data collection across the 4 fact-checking sites, 2 coders, HS and IM, scrutinized the dataset before starting the coding analysis process and merged 17 duplicate claims that had the same premise to reach a final sample size of n=234 unique claims. As the research gathered publicly-available information and did not involve human subjects, it was deemed that an IRB review was not required.

Coding Analysis

To analyze the misinformation presented in these fact-checked claims, we developed a codebook of 5 different variables: *misinformation type, narrative typology, framing typology, medical jargon,* and *societal implications*. Our coding framework was developed through both deductive and inductive approaches to analyze COVID-19 misinformation in Arabic media.

The *misinformation type* variable adapts Wardle's information disorder framework (false or misleading claims regardless of demonstrable intent) and answers the question, "Why is this false?" [2].

Narrative typology was adapted from FactCheck.org and refers to the narrative central to the content of the claim. This category refers to the main content of the claim, not the features that lead to its spread.

Framing typology was inductively developed to analyze the most pertinent elements of the claims, such as religious connotations, political connotations, and other relevant characteristics. This category refers to the attribute of the claim that leads to its spread.

Under *medical jargon,* the presence or absence of medical jargon was noted, as technical language may serve as a rhetorical device, potentially to increase perceived credibility without reliable evidence of genuine expertise [2]. Notably, all 3 coders are practicing physicians in various medical specialties. Due to linguistic particularities in Arabic, including the separation of formal Arabic (Modern Standard, *fasHa*) from more colloquial dialects (*'amea*) and the fact that the only country that teaches medicine in Arabic is Syria (others teach in either English or French), the line between medical jargon and vernacular discourse is starker in Arabic than it is in English. Practically speaking, to help address this variable, we used the standard of an Arabic speaker in the Middle East with a high school degree as a reference point for perceived medical jargon. Examples of keywords not considered medical jargon are *allergy, dementia, blood clot, cancer,* and *paralysis*. Examples of keywords considered medical jargon are *anaphylaxis, Parkinson's Disease, deep venous thrombosis, sarcoma,* and *paraplegia*.

The *societal implications* variable was adapted from the social determinants of health model to determine involved aspects of social function [35,36]. This comprehensive typology enables examination of misinformation construction, perceived credibility, and potential societal impact.

To build the codebook for analysis, we selected a pilot sample of 13 claims to analyze. All 5 authors were blinded when coding, and responses were then unblinded and discussed. To ensure consensus among coders, the analysis variables, their subcategories, and their definitions were re-evaluated and revised during the pilot analysis. After finalizing the coding schema, each fact-checked claim was coded twice by 2 blinded coders, HS and IM, and Cohen κ values were calculated using SPSS Statistics for Windows (version 29.0; IBM Corp) to ensure intercoder reliability [37]. The Cohen κ coefficients were 0.88 for *misinformation type*, 0.913 for *narrative typology,* 0.72 for *framing typology,* 0.794 for *medical jargon*, and 0.752 for *societal implications* ($P<.001$ for all categories). To resolve individual differences in the coding of claims, a third coder, SR, coded the discordant claims to create a consensus dataset. Our coding schema is explained in Table 2. Notably, the variable *narrative typology* had very low intercoder reliability in the pilot phase of the data analysis. As such, its defined subcategories were merged to include "origins, existence, diagnosis, prevention, transmission, and cures of COVID-19," a rather broad subcategory, to ensure strong intercoder reliability, at the expense of granularity.

Table 2. Coding schema according to *misinformation type, narrative typology, framing typology, medical jargon,* and *societal implications*. Examples are available in Multimedia Appendix 1.

Variable	Defined subcategories
Misinformation type	• Satire or parody—content that has no intention to harm but does have the potential to mislead (refer to [2] for more details) • Misleading—false connection or false context (headlines, visuals, or captions do not support the content) or genuine content is shared with false contextual information (eg, real images or studies that have been taken out of context) • Imposter content—genuine and credible sources (eg, news outlets or government agencies) are impersonated. Sources must be credible and impersonated to be considered imposter content. "Fake experts" are not considered imposters. • Fabricated or manipulated—fabricated content is made up and 100% false and is designed to deceive and do harm. Manipulated content is genuine information or imagery that is manipulated to deceive (eg, deepfakes or other kinds of manipulation of audio and/or visuals).
Narrative typology	• Origins, existence, diagnosis, prevention, transmission, and cures of COVID-19 • Vaccines • Misrepresentation of public health guidance
Framing typology	• Religion—examples include biblical passages, religious scriptures, the Kaaba, Quranic verses, the Torah, Hadith, use of the Pope, imams, mosques, etc • Distortions of science and medicine—use of scientific papers or medical language, whether partially true or completely false, to support the piece of misinformation, including "fake experts" • Xenophobia or nationalism—use of alienation of other countries or pride in Middle Eastern countries to support the piece of misinformation and racism or discrimination, especially against Asian or African countries • Politics—examples include political figures, laws or policies, and government • Entertainment or satire—use of satire or parody, celebrity popularity to spread misinformation about the celebrity, and gossip • Prophecies—use of predictions or forecasting about the future

Variable	Defined subcategories
	• Conspiracy theory—a theory that rejects the standard explanation for an event and instead credits a covert group or organization with carrying out a secret plot • N/A—none of the above apply
Medical jargon	• Medical jargon used • No medical jargon used
Societal implications	• Economy—including employment, housing, food insecurity, and/or poverty • Education—including personal educational status, status of schools and universities, language, and literacy • Health care—including health literacy, access to vaccines, COVID-19 treatments, hospital status, health care provider workforce, and medication access • Environment—including neighborhood, city settings (urban, rural, etc), crime and violence, neighborhood disparities, climate change, etc • Society and culture—including religious and cultural implications, government, laws and policies, social disruption and cohesion, and political change • N/A—none of the above apply

Results

Fact-Checking Site Characteristics

AFP was the most active fact-checking site, accounting for 49.6% (116/234) of claims debunked, followed by Verify-Sy with 26.5% (62/234), Maharat with 17.1% (40/234), and Fatabyyano with 6.8% (16/234; Table 3). Verify-Sy had the shortest median time from date published on the platform of spread to date published on the fact-checking site (2.5, IQR 1-5.8 days), followed by AFP (7, IQR 4-16 days), Maharat (12, IQR 3.5-24 days), and Fatabyyano (38.5, IQR 9-117 days). The median number of likes the claims had on the original platform was highest for claims debunked by Verify-Sy (581, IQR 117-4222.5), followed by AFP (510, IQR 119.5-6650), Fatabyyano (423, IQR 106-1500), and Maharat (203, IQR 35-273). The median number of shares of claims was highest for claims debunked by AFP (268.5, IQR 102.8-2825), followed by Fatabyyano (247, IQR 62-486), Verify-Sy (164.5, IQR 40.5-523.5), and Maharat (27.5, IQR 5.5-67.5).

Table 3. Activity of fact-checking sites during the COVID-19 pandemic.

Fact-checking site	Claims fact-checked, n (%)	Number of days from being published on the platform of spread to date fact-checked, median (IQR)	Number of likes on fact-checked claims, median (IQR)	Number of shares or retweets of fact-checked claims, median (IQR)
AFP[a]	116 (49.6)	7 (4-16)	510 (119.5-6650)	268.5 (102.8-2825)
Verify-Sy	62 (26.5)	2.5 (1-5.8)	581 (117-4222.5)	164.5 (40.5-523.5)
Maharat	40 (17.1)	12 (3.5-24)	203 (35-273)	27.5 (5.5-67.5)
Fatabyyano	16 (6.8)	38.5 (9-117)	423 (106-1500)	247 (62-486)

[a]AFP: Agence France-Presse Middle East and North Africa Fact check.

Platforms and Sources

Facebook was the most common platform of spread, with 72.7% (170/234) of claims shared on Facebook (see Table 4). A total of 29.1% (68/234) of claims were shared on Twitter (now X). Newspapers or journals and organizational websites followed with 13.7% (32/234) and 6.9% (16/234) of claims, respectively. Regular users were the source of the greatest number of claims, responsible for 56.8% (133/234) of the claims. Newspapers or journals followed, contributing 26.9% (63/234) of the claims, followed by physicians or scientists, contributing 6.4% (15/234) of the claims, and media personnel, contributing 5.6% (13/234) of the claims. For traceable claims, 36.3% (85/234) originated in English, 25.2% (59/234) were translated from various languages (Russian, Italian, French, German, Spanish, and others), and 23.1% (54/234) of claims originated in Arabic. For 14.1% (33/234) of the claims, we could not determine the language of origin.

Table 4. Platforms, source types, and languages of origin of fact-checked claims (N=234).

Variable	Claims, n (%)[a]
Platform of spread	
Facebook	170 (72.7)
Twitter	68 (29.1)
Newspapers and journals	32 (13.7)
Organizational websites	16 (6.9)

Variable	Claims, n (%)[a]
Source	
Regular users	133 (56.8)
Newspapers and journals	63 (26.9)
Physicians and scientists	15 (6.4)
Media personnel	13 (5.6)
Language of origin	
English	85 (36.3)
Translated from various languages	59 (25.2)
Arabic or not translated	54 (23.1)
Unknown	33 (14.1)

[a]Percentages exceed 100% when summed because individual claims could be disseminated across multiple platforms.

Claim Analysis

The most common *misinformation type* was "fabricated or manipulated" content at 54.9% (128/234), followed by "misleading" content at 36.9% (86/234), "satire or parody" at 4.3% (10/234), and finally "imposter content" at 3.9% (9/234). The most common *narrative typology* of fact-checked claims was related to "origins, existence, diagnosis, prevention, transmission, and cures of COVID-19" at 47.2% (110/234), followed by "vaccines" at 30% (70/234), and "public health guidance" at 22.7% (53/234). The most common *framing typology* was the "distortion of science and medicine" at 29.6% (69/234), followed by "entertainment or satire" at 23.6% (55/234), "politics" at 18.9% (44/234), "conspiracy theory" at 13.3% (31/234), "religion" at 8.6% (20/234), and "other (xenophobia or nationalism, prophecies, and N/A)" at 6.0% (14/234). For *medical jargon,* most claims did not rely on medical jargon 85.5% (200/234). The most common *societal implications* were "health care" at 43.5% (101/234), followed by "society and culture" at 38.4% (89/234), followed by claims that had no identifiable implication, "N/A" at 12.5% (29/234). These were followed by "environment" at 3% (7/234) and "education" at 2.6% (6/234; Table 5).

Table 5. Qualitative analysis or typology of fact-checked claims (N=234).

Variable	Claim, n (%)[a]
Narrative typology	
COVID-19 origins, diagnosis, prevention, transmission, and cures	110 (47.2)
Vaccines	70 (30.0)
Public health guidance	53 (22.7)
Misinformation type	
Fabricated or manipulated content	128 (54.9)
Misleading content	86 (36.9)
Satire or parody, imposter content, other	19 (8.2)
Framing typology	
Distortion of science and medicine	69 (29.6)
Entertainment or satire	55 (23.6)
Politics	44 (18.9)
Conspiracy theory	31 (13.3)
Religion	20 (8.6)
Other (xenophobia or nationalism, prophecies, N/A)[b]	14 (6.0)
Societal implications	
Health care	101 (43.5)
Society and culture	89 (38.4)
No identifiable implication	29 (12.5)
Other (environment, education)	13 (5.6)

[a]Percentages may not add up exactly to 100% because of rounding.
[b]N/A: none of the above apply.

Characteristics of the Top 20 Fact-Checked Claims

For further analysis, we identified the top 20 claims in our dataset based on the highest number of total shares or retweets (average 31,502 shares or retweets, SD 18,589; Table 6). Of these claims, 17 were fact-checked by AFP, and 3 were fact-checked by Verify-Sy. All claims were spread on Facebook. In addition, 3 of these claims also spread via Twitter, another 3 spread via YouTube, and finally, 2 spread via Instagram. The source of 16 of the claims was regular users, 3 originated with newspapers or journals, and 1 came from media personnel. Eleven claims related to "COVID-19 origins, existence, diagnosis, prevention, transmission, and cures," 6 to "misrepresentation of public health guidance," and 3 to "vaccines." Seventeen were categorized as "fabricated or manipulated content," and 3 were categorized as "misleading." *Framing typology* was categorized as "conspiracy theory" for 4 claims, "politics" for 5 claims, "religion" for 4 claims, "entertainment or satire" for 4 claims, "distortion of science and medicine" for 2 claims, and "N/A" for a single claim. Twelve of the claims were categorized as having *societal implications* related to "society and culture," 4 had societal implications related to "health care," and 4 claims had no applicable societal implications.

Table 6. Overview of the top 20 fact-checked claims (N=20).

Characteristic	Claim, n (%)[a]
Verification source	
AFP[b]	17 (85)
Verify.sy	3 (15)
Platform of spread*	
Facebook	18 (90)
Twitter	3 (15)
YouTube	3 (15)
Instagram	2 (10)
Source type of claim	
Regular user	16 (80)
Newspapers and journals	3 (15)
Media personnel	1 (5)
Type of claim	
COVID-19 related	11 (55)
Public health misrepresentation	6 (30)
Vaccine-related	3 (15)
Content type of claim	
Fabricated or manipulated	16 (80)
Misleading	4 (20)
Framing typology of claim	
Conspiracy theory	4 (20)
Politics	5 (25)
Religion	4 (20)
Entertainment or satire	4 (20)
Distortion of science and medicine	2 (10)
N/A[c]	1 (5)
Societal implications of claim	
Society and culture	12 (60)
Health care	4 (20)
N/A	4 (20)

[a]Percentages exceed 100% when summed because individual claims could be disseminated across multiple platforms.
[b]AFP: Agence France-Presse.
[c]N/A: none of the above apply.

Discussion

Principal Findings

On the basis of the fact-checked claims in our sample, Facebook accounted for the largest share of debunked claims, followed by Twitter, with regular users being the source of most debunked claims. While this aligns with global trends in misinformation spread [38-40] and social media use in the MENA region [17,18], we acknowledge that this finding may partially reflect fact-checking organizations' selection priorities due to reach, visibility, or established partnerships, rather than the actual distribution of misinformation across platforms. However, despite partnerships between Facebook and 3 of the 4 studied fact-checking sites (AFP, Verify-Sy, and Fatabyyano), only 50% of content in our dataset was moderated by the original platform. Facebook's content moderation faces significant challenges with non-English content, with only 13% of moderation efforts in 2020 addressing content outside the United States, and only 766 moderators serving 220 million Arabic-speaking users [30,41]. In our study, 61.5% (144/234) of claims were translated, with 36.3% (85/234) translated from English. This echoes other studies finding that amplification of Western misinformation through Arabic subtitles or voice-overs on popular Arabic Facebook pages was common during the pandemic, particularly evidenced by vaccine opposition data in the literature [21,42].

Media sources accounted for 26.9% (63/234) of debunked COVID-19 claims, with media personnel responsible for an additional 5.6% (13/234) according to our findings. Media-sourced misinformation in our dataset primarily covered government quarantine and vaccination measures. According to the literature, there are systemic challenges in medical journalism in the Arab world: a critical shortage of journalists knowledgeable about health, leading to incomplete or distorted coverage, state media control, and political framing of health issues [43]. MENA journalists faced multiple challenges accessing accurate, timely updates from health authorities and faced government restrictions on information access [30,44]. These difficulties were exacerbated by policies using the pandemic to justify control over information flow [44].

Although physicians or scientists generated a small percentage of claims in our dataset, the literature suggests that physician credibility and epistemic authority likely facilitated a disproportionate impact [45] because their content generates significantly higher engagement (known as "top-down" misinformation) [46]. Our analysis revealed that misinformation shared by physicians primarily questioned vaccine effectiveness or emphasized risks, corroborating findings from previous studies on misinformation in the United States [47]. Moreover, other recent United States–based studies demonstrated decreased trust in the public health care sector and physicians, in turn leading to increased vaccine hesitancy [48,49]. In the Arab world, where trust in the public health care system is already low, this institutional mistrust would be particularly problematic for public health compliance [33,50].

The most common *misinformation type* in our study was fabricated or manipulated content (128/234, 54.9%), followed by misleading content (86/234, 36.9%), with many claims often appearing as legitimate news articles or videos. Previous studies highlight how posts containing manipulated pandemic-related content had some of the highest levels of engagement on social media platforms in the Arab world. For example, in Egypt, Facebook posts that reconfigured or imitated existing news articles to align with false narratives were among the most widely shared forms of misinformation [51], echoing findings from other studies in global settings [46].

The most common *framing typology* within our fact-checked claims was the distortion of science and medicine through unsubstantiated scientific claims. This framing typology was particularly relevant to vaccine-related misinformation, accounting for 42% (29/70) of vaccine-related claims. Moreover, medical jargon use was common within this claim typology (31/70, 44%). One possible explanation for belief in and dissemination of this misinformation type may be attributed to the high prevalence of low health, science, or digital literacy among the general population, with medical jargon contributing to misunderstanding and mistrust of legitimate health guidance [52-54].

Politics and conspiracy theories combined were the second most common framing typologies and comprised 9 out of 20 top fact-checked claims. These claims often revolved around government containment measures and vaccines. Public authority actions were a common misinformation target in prior work [46], including on Arabic Twitter, where government infringement on civil liberties was found to be a common topic, especially vaccine mandates [32]. Conspiracy theories were less common in our data but were disproportionately associated with vaccines. Political misinformation and conspiracy theories are interrelated with institutional mistrust, facilitating the acceptance of conspiracies as truths in prior studies [55,56]. This dynamic is particularly problematic in the Arab world, where trust in public health care systems is low and conspiracy theory acceptance has been linked to vaccine hesitancy [33,50].

In our study, religion-themed misinformation accounted for only 8.6% (20/234) of the debunked claims, frequently underscoring beliefs that the pandemic was a divine test, as previous literature had discussed [20]. These claims often suggested that followers of other religions had left their faiths or converted to Islam due to fear surrounding the pandemic. Despite previous literature suggesting that fake religious remedies and fake scriptures are a common thread of the religious misinformation in the Middle East [57], only 4 of the claims labeled religious in our dataset involved such topics, possibly reflecting a bias or preference on the part of fact-checkers to avoid debunking such content.

As expected, most coded claims had implications for health care, increased anxiety, and widened health disparities during the pandemic [8,58]. In Lebanon, misinformation was thought to impede the consistent application of public health measures [59]. Vaccine-related misinformation and

conspiracy theories possibly contributed to high rates of vaccine hesitancy in the Arab world [60,61]. Moreover, lower socioeconomic groups were found to have greater exposure to misinformation, lack of access to credible information, and heightened anxiety around misinformation [8,51,58]. Society and culture was the second most common implication in our dataset, reflecting the blurred lines between health and political and conspiracy-related misinformation. During the pandemic, some MENA governments fueled political conflicts and suppressed dissent by spreading conspiracy theories, downplaying the severity of the crisis, and implementing laws to criminalize "fake news," thus tightening control over information flows [14,30,62]. Given the low health, digital, and media literacy levels across the region [52,63,64], addressing misinformation in the Arab world requires a multifaceted approach that acknowledges the region's unique cultural and political contexts.

Limitations

Our analysis revealed that pandemic-related activity of Arabic fact-checking sites was relatively low. The small sample size of 234 debunked claims may not be representative of the broader, more intricate misinformation ecosystem that existed in the region. In particular, the high rates of claims originating in English may have reflected the availability of English-language claims, which may have been easier for Arabic fact-checkers to adapt, rather than tackling claims that only appeared in Arabic. Moreover, self-censorship and the limited journalistic background of fact-checkers in the region may be contributing to a biased sample of misinformation being presented in the debunked claims, particularly the lack of religious claims in a region where information is often viewed through sectoral or religious lenses [14,22]. The inability to analyze private chats, such as those on WhatsApp, which is a popular social media platform in many Arab countries, is also an important limitation [17]. Tracing the evolution of each fact-checked claim proved challenging, particularly when time stamps were absent or when the claim spread in slightly varying contexts. As a result, some data about the language of origin, source types, and claim moderation may be incomplete or biased. In addition, standardizing engagement metrics across all platforms proved to be extremely challenging. As a result, data regarding the top 20 claims should be interpreted with caution.

In addition to the inherent biases of the data collection, the authors and coders, including SR, HS, and IM, are all physicians who practice in various medical fields. As such, biases inherent to the profession of medicine (eg, what is or is not considered medical jargon) may be a limitation of our study. In an attempt to mitigate this, we created our codebook with strict definitions in our pilot phase of the study. However, when robust intercoder reliability could not be achieved even with strict definitions in place, we merged some subsets of variables (eg, "origins, existence, diagnosis, prevention, transmission, and cures of COVID-19") at the expense of granularity. We acknowledge that this limits interpretability.

Future Directions

While social media platforms have recently curtailed content moderation activities, including in Arabic, there is a critical need for locally rooted approaches, including establishing formal partnerships with trained Arabic journalist networks, creating dedicated Arabic-language moderation teams, and developing specialized Arabic content verification tools. Additionally, enhancing journalistic accuracy in the region requires addressing both professional and structural barriers that stymie high-quality health journalism, particularly restricting official information that limits journalists' ability to verify information and report independently, while also developing interventions targeting top-down misinformation to restore institutional trust [30,44]. Furthermore, supporting region-specific educational initiatives such as the *Media and Digital Literacy Academy of Beirut* helps viewers parse out misinformation on both traditional and social media platforms [63,65]. Given the plethora of translated claims in our dataset, there is a critical need for cross-language fact-checking collaborations and the development of shared databases to track how misinformation evolves as it moves between languages. Such coordination, in the form of a public-private partnership or a regional information sharing and analysis center [66], would enable fact-checkers to respond more quickly to emerging narratives and better understand how global misinformation patterns influence local contexts [67].

Interventional strategies to combat medical misinformation in the Arab world can be implemented. First, Arabic-language verification tools to combat manipulated content should be developed and deployed. Second, trusted channels for rapid dissemination of accurate health information in Arabic may help address misinformation based on scientific distortion and complex jargon [68]. Finally, while implementing proactive government communication to acknowledge public concerns and rebuild institutional trust would be helpful, media, science, and digital literacy programs may be essential.

Conclusions

Our study examined a curated sample of COVID-19 misinformation in the Arabic-speaking world using claims debunked by independent fact-checking organizations. Our findings demonstrate that fact-checked COVID-19-related claims in Arabic exhibit distinct characteristics requiring more robust interventions. The dominance of Facebook, coupled with the ubiquity of Arabic-language medical misinformation and the dissemination of translated misinformation, suggests the need for enhanced—not reduced—Arabic-language content moderation, cross-linguistic fact-checking collaborations, and culturally appropriate media literacy programs. The proportion of fabricated or manipulated content, distortion of science and medicine as a framing typology, and the use of medical jargon within this typology underscore the importance of building health literacy and particularly eHealth literacy, as the Arab world increasingly relies on social media for news and health information. The significant involvement of media sources and personnel in spreading misinformation and the presence of political misinformation and, to a lesser extent, conspiracy

theories highlight the need for interventions tailored to the particular context of the Arab world, including the restrictive media environment, journalists' ability to access and verify information, timely communication, and efforts to rebuild trust in health and government institutions.

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Generative AI Use

The authors declare that generative AI was not used in the preparation of this manuscript.

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Data Availability

The datasets generated or analyzed during this study are available from the corresponding author on reasonable request.

Authors' Contributions

Conceptualization: HS, SR (equal), DS
Data curation: SR (lead), IM, HS
Formal analysis: HS, SR, IM (equal), EAN, DS
Investigation: SR, HS
Methodology: HS, SR, EAN, DS
Project administration: HS, DS, EAN
Resources: DS, EAN, SR
Supervision: DS, EAN
Validation: SR, DS
Writing—review and editing: SR (lead), DS (supporting), HS (supporting), EAN (supporting)

Conflicts of Interest

None declared.

Multimedia Appendix 1

Examples of COVID-19 misinformation in Arabic, organized by misinformation type.
[DOCX File (Microsoft Word File), 5998 KB-Multimedia Appendix 1]

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Abbreviations

AFP: Agence France-Presse
IFCN: International Fact-Checking Network
MENA: Middle East and North Africa

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